

ASSOCIATION OF
PUBLIC AND
LAND-GRANT
UNIVERSITIES



**Commission on Innovation, Competitiveness, and
Economic Prosperity (CICEP)**

A · P · L · U CICEP New Metrics Project Analysis

a report to the
National Science Foundation's
National Center for Science
and Engineering Statistics (NCSES)

March 31, 2013

in fulfillment of NSF Order for Services # NSFDACS12P1431, 8/30/2012



About A·P·L·U

The Association of Public and Land-grant Universities (A·P·L·U) is a research and advocacy organization of public research universities, land-grant institutions, and state university systems with member campuses in all 50 states, U.S. territories and the District of Columbia. The association is governed by a Chair and a Board of Directors elected from the member universities and university systems. President Peter McPherson directs a staff of about 45 at the national office in Washington, D.C.

The association's membership includes 217 members, consisting of state universities, land-grant universities, state-university systems and related organizations. The total includes 74 U.S. land-grant institutions, of which 18 are the historically black institutions. In addition, A·P·L·U represents the interests of the nation's 33 American Indian land-grant colleges through the membership of the American Indian Higher Education Consortium (AIHEC). A·P·L·U institutions enroll more than 3.5 million undergraduate students and 1.1 million graduate students, employ more than 645,000 faculty members, and conduct nearly two-thirds of all federally funded academic research, totaling more than \$34 billion annually.

With roots going back to 1887, A·P·L·U is the nation's oldest higher education association. In 1963, the American Association of Land-Grant Colleges and Universities merged with the National Association of State Universities to form the National Association of State Universities and Land-Grant Colleges. On March 30, 2009, the association adopted the name Association of Public and Land-grant Universities or A·P·L·U (the name of each letter is pronounced).

A·P·L·U is dedicated to advancing learning, discovery and engagement. The association provides a forum for the discussion and development of policies and programs affecting higher education and the public interest.

About CICEP

A·P·L·U's Commission on Innovation, Competitiveness, and Economic Prosperity (CICEP) is focused on:

Developing and promoting the adoption of resources and tools that help A·P·L·U institutional leaders to organize, evaluate, and communicate their institution's work in local and regional innovation, competitiveness, and economic prosperity.

1. Sharing strategies to expand the role that A·P·L·U institutions have in economic development by initiating and sustaining interaction with industry, government, non-profit organizations, and other stakeholders.
2. Leading efforts to bring clarity and visibility to the impact of APLU institutions on local and regional innovation, competitiveness, and economic prosperity.
3. Providing opportunities for A·P·L·U institutions to share practices across a range of university contributions to innovation, competitiveness, and economic prosperity including: entrepreneurship; business development; talent development through education and training; and social, cultural, and community development.
4. Through regular workshops and meetings, the Commission is assembling a set of tools, resources, and standards of practice that universities can use to make the most effective contributions to innovation and economic growth, and to communicate their value in these areas.

Members of the Commission include representatives from A·P·L·U institution's offices of: academic affairs; research and graduate administration; public and governmental affairs; business and engineering departments; outreach and economic development; technology transfer; and entrepreneurship programs.

Acknowledgements

Many individuals and organizations have contributed to the work described in this report. A·P·L·U and CICEP are grateful for and wish to recognize the contributions of the following.

The A·P·L·U CICEP New Metrics Working Group

The following individuals participated in activities of the New Metrics Working Group at various times from 2007 through 2013. Titles and institutions reflect individuals' affiliation at the time of their work on the A·P·L·U CICEP New Metrics initiative.

Working Group Chairs

Dana Bostrom

Director of Innovation and Industry Alliances
Portland State University
Co-Chair, 2009 to 2011

Elizabeth Hoffman

Executive Vice President and Provost
Iowa State University
Co-Chair, 2007 to 2009

Dennis Hoffman

Director, Seidman Research Institute
Arizona State University
Co-Chair, 2007 to 2009

Chitra Rajan

Associate Vice President for Research
Iowa State University
Co-Chair, 2011 to 2012

Diana Robinson

Director, Center for Governmental Studies
Northern Illinois University
Co-Chair, 2013 to present

Arjun Sanga

Assistant Vice President, Technology Transfer and Executive Director, South Texas Technology Management
University of Texas
Co-Chair, 2012 to present

Mary L. Walshok

Associate Vice Chancellor, Public Programs
University of California, San Diego
Co-Chair, 2009 to 2011

David Winwood

Chief Executive Officer, UAB Research Foundation and Senior Associate Vice President for Economic Development and Innovation Alliances
University of Alabama at Birmingham
Co-Chair, 2011 to 2013

Working Group Members

Elizabeth L. Ambos

Assistant Vice Chancellor
California State University

James R. Baker

Director, Technology & Economic Development
Michigan Technological University

Burton A. Bargerstock

Director, Communication & Information Technology
Michigan State University

Irma Becerra-Fernandez

Interim Vice President for Engagement
Florida International University

Rod Casto

Executive Director, Research Foundation
University of South Florida

W. Mark Crowell

Executive Director, U.Va. Innovation and Associate Vice President for Research
University of Virginia

Kevin Cullen

Director, Research &
Enterprise
The University of Glasgow

Carolyn Dahl

Dean, College of Continuing
Studies
University of Alabama
System

Henry J. Durand

Senior Associate Vice Provost
of Undergraduate Education
University at Buffalo

David Earwicker

Assistant Vice President,
Sponsored Research
Administration
California State University

Karl M. Engelbach

Director, Federal
Government Relations
University of California,
Davis

Nancy E. Franklin

Director of Strategic
Initiatives, Outreach
The Pennsylvania State
University

David A. Gard

Assistant Vice President for
Economic Development
Indiana University

Michael Georgiopoulos

Interim Dean, College of
Engineering and Computer
Science
University of Central Florida

Birgit Green

Director of Outreach
Texas Tech University

Jacquelyn Gervay Hague

University of California Davis
University of California Davis

**Teresa Helmlinger
Ratcliff**

Assistant Vice Chancellor for
Extension
North Carolina State
University

Alexis Holzer

Assistant Director, Economic
Development
Washington State University

Lyla Houghlum

Executive Director, Western
Extension Directors
Oregon State University

Rod Howe

Assistant Director,
Community & Economic
Vitality
Cornell University

Frank D. Jackson

Governmental Relations
Officer
Prairie View A&M University

Irma Johnson

Educational Outreach
Kentucky State University

Anne C. Kaplan

Vice President for
Administration & University
Outreach
Northern Illinois University

Marnie LaVigne

Director, Business
Development
University at Buffalo

Geoffrey M. Maruyama

Associate Vice President
University of Minnesota

Dean McCorkle

Extension Program Specialist
The Texas A&M University
System

Jerry McGuire

Interim Associate Vice
Chancellor for Economic
Development
University of North Carolina
at Greensboro

Gene Merrell

Associate Vice President for
Economic Development and
Chief Technology Transfer
Officer
University of Idaho

Stephen R. Mosier

Vice Chancellor for Research
& Federal Relations
University of North Carolina
at Charlotte

Matthew Mroz

Senior Associate
Innovation and Partnerships
State University of New York
(SUNY) Research Foundation

Mehmet Öztürk

Executive Director, Research
& Evaluation
Arizona State University

Christopher J. Reese

Director of Community
Relations
California State University,
Fullerton

Joshua L. Rosenbloom

Associate Vice Provost for
Research
University of Kansas

Josh Trapani

Senior Policy Analyst
Association of American
Universities

Charles Triplett

Oregon University System

Kathleen M. Tweeten

Director, Extension Center
for Community Vitality
North Dakota State
University

Sherryl D. Weems
Associate Vice Provost
University of Buffalo

James J. Zuiches
Vice Chancellor, Extension,
Engagement & Economic
Development
North Carolina State
University

Participants in the A·P·L·U CICEP New Metrics Pilot

The following individuals and institutions participated in the pilot of the A·P·L·U CICEP New Metrics during the spring and summer of 2012. Titles and institutions reflect individuals' affiliation at the time of their work on the A·P·L·U CICEP New Metrics initiative.

Andrea Anderson
Patent Manager
South Texas Technology
Management
University of Texas

Linda Freed
Director, Grants and Faculty
Development
University of Wisconsin, Osh-
Kosh

Anne Kaplan
Vice President for Outreach,
Engagement, and
Information Technologies
Northern Illinois University

Cristi Carson
Director of Institutional
Research
University of Southern Maine

David Gard
Executive Director, Office of
Vice President for
Engagement
Indiana University

Cameron McCoy
Executive Director, Corporate
Engagement Office
University of Oklahoma

Dennis Cebulski
Assistant Director, Office of
Research and Sponsored
Programs
University of Michigan

Michael Georgiopoulos
Interim Dean, College of
Engineering and Computer
Science
University of Central Florida

Gene Merrell
Associate Vice President for
Economic Development and
Chief Technology Transfer
Officer
University of Idaho

Nicole Colomb
Enterprise and Economic
Development Executive
Virginia Commonwealth
University

Mary Givens
Director, Office of University
and Industry Ventures
Boise State University

Matthew Mroz
Commercialization Associate
State University of New York
(SUNY) Research
Foundation, for
SUNY College of
Environmental Sciences and
Forestry, SUNY Fredonia
College, and
University of Buffalo

Kathy Felts
Assistant Director of
Institutional Research
University of Missouri-
Columbia

Alexis Holzer
Assistant Director, Economic
Development
Washington State University

Erin Flynn
Associate Vice President for
Strategic Partnerships
Portland State University

Frank Jackson
Governmental Relations
Officer
Prairie View A&M University

David Owen
Post-doctoral Researcher
Southern Illinois University
Carbondale

Laura Jenski
Vice President for Research
University of South Dakota

John Provo

Director, Office of Economic
Development
Virginia Tech

Chitra Rajan

Associate Vice President for
Research
Iowa State University

James Rankin

Vice President for Research
and Economic Development
University of Arkansas

Martin Shields

Professor of Economics
Colorado State University

Thomas Skalak

Vice President for Research
University of Virginia

Martha Taylor

Assistant Vice President of
Research
Auburn University

Caroline Whitacre

Vice President for Research
The Ohio State University

Rhea L. Williamson

Dean of Research and
Sponsored Programs
Humboldt State University

David Winwood

Chief Executive Officer, UAB
Research Foundation and
Senior Associate Vice
President for Economic
Development and Innovation
Alliances
University of Alabama at
Birmingham

Additionally, we are grateful to everyone who participated in the October 10, 2012 focus groups described herein, and to those who participated in earlier workshops.

The National Science Foundation's (NSF) National Center for Science and Engineering Statistics (NCSES) contracted for the work described in this report, making it possible for us to reach our goal of establishing a set of new measures that universities can use to describe their contributions to regional economies. We are grateful to NCSES for its financial support, and support in the form of guidance and interest, throughout this project. NCSES also funded earlier workshops and related activities.

Other activities that were part of the A·P·L·U CICEP New Metrics initiative were supported variously by the U.S. Department of Commerce's Economic Development Administration (EDA) and National Institute for Standards and Technology (NIST).

This report was prepared by **Robert Samors**, Senior Consultant to A·P·L·U and by **James Woodell**, A·P·L·U Director of Innovation and Technology Policy. Many of those listed above gave time to review and comment on drafts of the report.

There have been so many that have contributed to this effort, we have inevitably overlooked the inclusion of some here. We are sorry if we've forgotten to identify you, but please know that we are grateful for your contribution.

Contents

Executive Summary.....	9
Introduction.....	16
Background.....	17
A·P·L·U New Metrics Pilot Project Methods.....	19
Overview of Focus Group Discussions on October 10, 2012.....	23
Findings from Pilot Project and Focus Group Discussion.....	24
Recommendations and Implementation Metrics.....	28
Recommendations to NCSES.....	33
A·P·L·U's Next Steps.....	35
Appendices	
Appendix A: Agenda for October 10, 2012 Focus Groups.....	37
Appendix B: Final New Metrics Template for Pilot Project.....	42
Appendix C: A·P·L·U New Metrics Pilot Project Participating Institutions.....	54
Appendix D: Two Priority Categories of Metrics for Focus Group Discussion.....	55
Appendix E: Tabled Metrics.....	62
Appendix F: Metrics Focus Groups Participant Roster.....	66

Executive Summary

The Commission on Innovation, Competitiveness, and Economic Prosperity (CICEP) of the Association of Public and Land-grant Universities (A·P·L·U) launched its New Metrics Pilot Project in December of 2011 with the goal of finalizing the identification of potential new measures of university contributions to regional economies. Thirty-two institutions of higher education helped identify and assess the feasibility and usefulness of a range of potential data elements. This process narrowed an earlier set of over 50 metrics to 20 considered the most relevant and accessible. These 20 “CICEP New Metrics” are proposed for near-term implementation by A·P·L·U, and for consideration by the National Science Foundation (NSF) National Center for Science and Engineering Statistics (NCSES).

In Washington, DC on October 10, 2012, the pilot set of metrics was the subject of panel presentations and focus group discussion. The purpose of the focus group discussions was to review the work done by A·P·L·U to identify new measures of university contributions to regional innovation and economic growth (their level of “economic engagement”) and assess the feasibility and utility of the proposed metrics. The 20 CICEP New Metrics emerged from the pilot process, the October 10 focus group discussions, and subsequent analysis of the feedback received throughout.

Findings. In addition to determining the set of 20 measures that would comprise the CICEP New Metrics, the pilot and focus group discussions led to a number of findings:

- The overall value of the CICEP New Metrics pilot project for participating institutions was in bringing together the right people from inside and outside the institutions to examine and evaluate the potential feasibility and utility of these new measures. The process raised awareness among and inspired dialogue among key institutional and regional players.

- There is a clear need for new methods to measure activity and impact not only by universities, but also by a range of actors in the economic development arena, and metrics will serve dual purposes: 1) to provide a national perspective on the efficacy and effectiveness of particular economic engagement programs and initiatives of universities; and 2) to provide universities and their stakeholders with baseline data from which to describe and evaluate the role of the institution in the regional economy.
- The proposed metrics generally focus on outputs rather than outcomes. Participants at the regional and national level expressed strong interest in specific, measurable outcomes (i.e., jobs created), but also acknowledged that many of the university economic engagement activities represented by the metrics do not necessarily lead to such direct outcomes.
- Greater levels of granularity would be required to make the national level data relevant to local and regional stakeholders, and the focus of detailed data and description would depend on the specific stakeholder audience(s) with which the institutions were communicating (e.g., faculty, students, parents, alumni, business and political leaders, policy makers).
- Participants emphasized the need for any data presented – especially at the regional level – to be embedded in narrative about the institution’s economic engagement activities; the consensus view being that data without explanation and context has little value.
- A major issue was the challenge of retrieving data for many of the CICEP New Metrics, either because there was no central data collection point for diffused activities (e.g., service to external clients, student participation in private sector internships), or because the data had not been collected by the institution.

- Institutions also noted the significant human resource requirements necessary to collect the pilot project data – often requiring the commitment of at least one staff member or equivalent – during a period of fiscal belt-tightening. Further, the focus group discussions highlighted significant differences among institutions regarding the existence and collectability of specific types of data.
- While the A·P·L·U CICEP New Metrics Project was specifically designed to re-purpose existing data or fill in data gaps, participants nonetheless noted the potential for data overlap or duplication.

Implementation Metrics. The ultimate goal of the October 10th focus group discussion was to identify those metrics pilot-tested by the A·P·L·U institutions that were the most feasible and useful. These metrics would be recommended to A·P·L·U members as an important tool for planning and assessment of regional economic engagement efforts. These metrics might also serve as a valuable foundation for further investigation by NCSES. A·P·L·U compiled and analyzed the information and comments provided by participants during the three panel presentations, nine focus group discussions and two plenary conversations, and identified the following 20 metrics that will be recommended to the A·P·L·U membership and to NCSES. (Later in this document, annotations to this list make recommendations about defining and implementing the CICEP New Metrics.)

Relationships with Industry: Sponsored Research by Industry

1. Number of grants, contracts and sub-agreements (including federal-pass-through dollars) from private sector entities (including consortia, trade associations, etc.)
2. Dollar value of sponsored research expenditures by private sector entities (including consortia, trade associations, etc.)
3. Number of sponsored research projects by industry sector (Include source/explanation of industry sectors used by institution)

4. Dollar value of sponsored research expenditures by industry sector
5. Number of unique private sector entities funding research grants and contracts (including consortia, trade associations, etc.)

Relationships with Industry: Human Clinical Trials

6. Number of trials conducted during reporting period by phase (capture all possible data, including non-FDA approval protocols; differentiate by phases and/or FDA-approval (or not) to greatest extent possible. Footnote any deviations from template.)
7. Number of subjects participating in clinical trials (active trial participants, only)
8. Dollar value of sponsored research expenditures for/on clinical trials
9. Number of protocols approved during time period
10. Number of trials initiated during time period

Relationships with Industry: Service to External Clients

11. Number of organizations served
12. Number of companies provided on-site technical services

Developing the Regional and National Workforce: Student Employment on Funded Projects

13. Number of students paid through externally funded grants or contracts

Developing the Regional and National Workforce: Student Entrepreneurship

14. Number of entrepreneurship courses/programs (credit and non-credit)
15. Number entrepreneurship courses/programs requiring a capstone project (e.g., business plan, elevator pitch)
16. Number of student start-ups associated with courses, programs, competitions, clubs, or other university-affiliated organizations

Developing the Regional and National Workforce: Alumni in the Workforce

17. Average wages of alumni living in-state

**Knowledge Incubation and Acceleration Programs:
Incubation and Acceleration Program Success**

18. Number of incubator/accelerator full time equivalent employees

**Knowledge Incubation and Acceleration Programs:
Ability to Attract External Investment**

19. Dollar amount of (equity) capital raised by clients and graduates from investors - angel investors, institutional, venture capitalists, individuals (including friends and family)
20. Dollar amount of funding received from federal, state or foundation sources, state or local matching programs or other non-private sources

Recommendations. The focus group discussion generated six specific policy recommendations for consideration by NCSES.

1. Contextualize the Data. Participants agreed that metrics data must be presented within a broader narrative that explains the meaning and value of the data, at both the regional and national level. A·P·L·U urges NCSES to keep these concerns in the forefront as it continues to explore the development of indicators relating federal investments in academic science and engineering to economic growth.
2. Avoid Use of Data for Comparison. A concern remains among institutions that if metrics data are to be collected nationally, comparisons will be made across institutions with different missions, priorities, and resources. National data collection should focus on only those activities that are likely to be undertaken with similar levels of resources and prioritization. Use of collected data should discourage, to the extent possible, comparisons across dissimilar institutions and missions.
3. Recognize Human Resource Constraints. The panel presentations and focus group discussions highlighted the significant human resource requirements for data collection and the significant disparities among institutions regarding the feasibility of collecting specific data. As universities continue to face fiscal constraints, NCSES and other organizations exploring new metrics need to be mindful of the potential costs involved in data collection, as well as the overall feasibility of collecting certain types of data. These cost and resource constraints exist across all types and sizes of institutions. Given NCSES's desire to identify metrics that are objective and replicable nationally, A·P·L·U strongly encourages NSF to maintain its current high level of interaction with the higher education community as it moves forward in this area.

4. Standardize Industry Data. An important theme that surfaced throughout the pilot project and echoed in the focus group discussion was the lack of a standardized framework to record industry-related data. While the NAICS codes provide a potential basis for standardization, the first question that arises is what level of industry detail is appropriate (3 digits? 4 digits? More? Fewer?). A·P·L·U urges NCSES to take a leading role in addressing this issue. The absence of a national standard makes it extremely difficult, if not impossible, to develop relevant and useful information about the nature and value of university-industry relationships across regions and across the nation.
5. Create an information clearinghouse. Focus group participants noted that numerous organizations currently collect – or are considering collecting – data related to the economic engagement activities of universities and other regional and national actors, with the significant potential for duplication of data and effort. They recommended that a national clearinghouse or central database of current and planned surveys be developed and made publicly available to avoid such duplication of effort. NCSES is urged to consider developing and maintaining such a compendium.
6. Facilitate Federal Agency Cooperation. NCSES is well-positioned to encourage and potentially facilitate the intergovernmental collaboration required to access certain outcome data, such as the employment and wage outcomes of university graduates. Exploring how cooperation might be fostered among federal agencies and between federal and state agencies is a strategically important role that NCSES could play.

Introduction

The Commission on Innovation, Competitiveness, and Economic Prosperity (CICEP) of the Association of Public and Land-grant Universities (A·P·L·U) launched its New Metrics Pilot Project in December of 2011 with the goal of finalizing the identification of potential new measures of university contributions to regional economies. Thirty-two institutions of higher education helped identify and assess the feasibility and usefulness of a range of potential data elements. This process narrowed an earlier set of over 50 metrics to 20 considered the most relevant and accessible. These 20 “CICEP New Metrics” are proposed for near-term implementation by A·P·L·U, and for consideration by the National Science Foundation (NSF) National Center for Science and Engineering Statistics (NCSES). Another 23 metrics were recommended for possible future pilot testing. The 20 CICEP New Metrics are intended to augment and supplement data and other information that universities currently collect and communicate to their various internal and external constituencies about their discovery, learning and engagement activities. The CICEP New Metrics will become one component of the A·P·L·U CICEP “Economic Impact Framework,” which also includes assessment tools that universities can use in examining and planning their economic engagement activities, and guidelines for conducting traditional input-output economic impact analysis and communicating the results of such analyses in the broader context of university-engaged economic development.

In Washington, DC on October 10, 2012, the pilot set of metrics was the subject of panel presentations and focus group discussion. The purpose of the focus group discussions was to review the work done by A·P·L·U to identify new measures of university contributions to regional innovation and economic growth (their level of “economic engagement”) and assess the feasibility and utility of the proposed metrics. The recommendations emerging from the pilot study and focus groups discussions provided the foundation for: 1) a set of new economic engagement metrics to be distributed to A·P·L·U member institutions in early 2013; and 2) recommendations to NCSES

concerning its work to assess the economic impact of federal investments in scientific research.

Background

In 2009, A·P·L·U's Commission on Innovation, Competitiveness, and Economic Prosperity (CICEP) established a high level dialogue among senior administrators of A·P·L·U member institutions and representatives of the national higher education, science and economic development communities to explore new metrics of university contributions to regional economies. This dialogue was inspired by a strong sentiment among these communities that the measures of university economic contributions available to date were limited, focusing in particular on intellectual property licensing and related forms of technology transfer. The new measures would extend well beyond conventional technology transfer measures and include a broad set of descriptors of universities' contributions to the development of "innovation ecosystems" in their regions and nationally.

At the same time, NSF's NCSES was exploring the development of new metrics for gauging the contributions of academic research and development to the U.S. innovation system and the broader economy. NCSES became interested A·P·L·U's effort as a possible mechanism through which to explore new measures.

Similarly, the National Institute of Standards and Technology, the National Academy of Sciences, the National Governors Association, and a number of other federal agencies and state and private sector entities were exploring new ways to measure the value and effectiveness of programs focused on economic revitalization, growth, and regional innovation.

Building on this interest, between 2009 and 2011, a core group of A·P·L·U institutions identified and analyzed potential categories of metrics and individual measures. Twice during that period (February 2010 and October 2011) the results of this process were

vetted by selected regional and national stakeholders (federal policy and program administrators, state leaders, regional economic development experts, members of the media, and others) in workshops variously sponsored by NCSSES and the U.S. Department of Commerce Economic Development Administration (EDA).

By the end of 2011, A·P·L·U's New Metrics initiative had identified 56 indicators and data sources for more detailed examination (See Appendix B). These potential measures of university contributions to regional/local innovation and economic activity spanned three major categories and 11 sub-categories of activity:

1. Relationships with Industry
 - 1.1. material transfer agreements
 - 1.2. consortia agreements
 - 1.3. sponsored research and development by industry
 - 1.4. human clinical trials
 - 1.5. service to external clients

2. Developing the Regional and National Workforce
 - 2.1. student employment on funded projects
 - 2.2. student economic engagement
 - 2.3. student entrepreneurship
 - 2.4. alumni in the workforce

3. University-based Knowledge Incubation and Acceleration Programs
 - 3.1. incubation and acceleration program success
 - 3.2. relationships between clients/program participants and host university

Once this list was finalized, the next objective was to identify 15-20 A·P·L·U institutions that would commit to conducting pilot tests of the metrics by identifying and collecting data relevant to the individual proposed metrics. In addition, the pilot

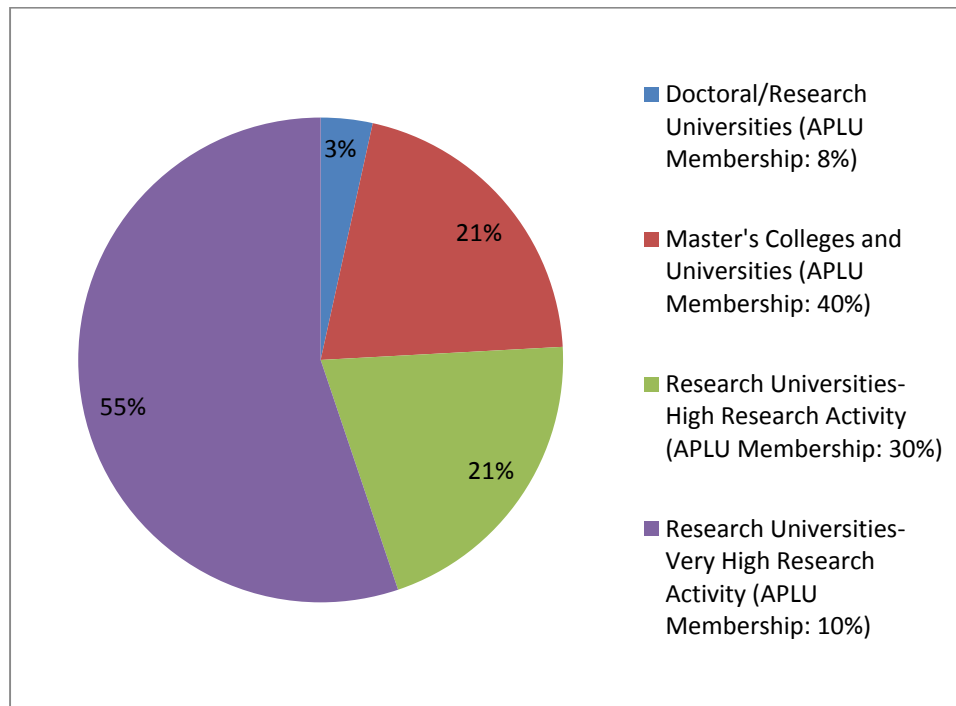
participants would convene meetings with a representative sample of their regional partners to gather feedback on the utility of the metrics to external audiences.

A·P·L·U New Metrics Pilot Project Methods

This template was presented to the A·P·L·U membership at the association's 2011 Annual Meeting. By the end of 2011, more than 30 institutions had expressed interest in participating in the pilot. During December 2011 and January 2012, A·P·L·U hosted a series of conference calls with prospective project participants to develop a common understanding of how each metric should be interpreted and the types of data to be collected. Participants would have latitude, where necessary, to modify these definitions as appropriate for their institution. Any changes in definition of the data elements would be documented and serve as important feedback information for the pilot.

In February 2012, the final New Metrics Template (Appendix B) was agreed to and distributed to 32 institutions (Appendix C) that committed to attempt to collect data in one or more of the three main categories of metrics and hold regional stakeholder meetings to examine the utility of the metrics from an external perspective. The institutions represented the range of sizes and missions encompassed by the A·P·L·U membership, though participation was skewed toward larger research universities. Proportions of participating institutions by Carnegie Classification are included in Figure 1 below. At least nine institutions were also participating in the federal Science and Technology for America's Reinvestment: Measuring the Effect of Research on Innovation, Competitiveness and Science (STAR METRICS) initiative.

Figure 1: Proportion of Participating Institutions by Carnegie Classification



Over the next seven months, A·P·L·U hosted bi-weekly conference calls to monitor the progress of the institutions participating in the study. These calls were also used to answer questions that arose as institutions began to collect specific data, and provided participating institutions with opportunities to learn from each other how and where to locate different types of data, facilitate intra-campus discussions, and address other challenges.

Between February and April 2012, each pilot campus made an effort to identify, collect, collate, and analyze relevant data. The data collection process varied widely across institutions. In some cases, existing databases were mined for relevant information and any identified “gaps” were the focus of more intensive discussions at the service unit level. Several institutions established teams or committees to oversee the data collection and monitor efforts to uncover missing information. At several campuses, data

collection involved methodical unit-by-unit conversations to determine where specific data was housed and whether it existed at all. At the conclusion of this process, institutions provided documentation of their efforts to collect data, including information about the sources of data for each measure, the effort required in collecting the data, and any institutional and definitional challenges the universities encountered and how they resolved them. This information was included in the final project analysis conducted by A·P·L·U and described below.

During the late spring and early summer of 2012, study participants conducted regional stakeholder meetings designed to engage a group of partners in a detailed conversation about the potential utility and value of specific metrics. The regional meetings took many forms. Some followed a “world café” approach developed by A·P·L·U in conjunction with a professional facilitator and representatives from several participating pilot institutions. The “world café” method allows all participants to provide input into all of the content being examined by rotating small groups through a series of discussion sessions. The comments provided during each of those sessions is summarized and provides the foundation for the next group to allow for a more well-informed dialogue.

Other meetings were designed and implemented by individual institutions based on the character of their communities and the stakeholders participating in the meetings. For example, several institutions held several hours of discussion in a campus conference room with a small group of external stakeholders, but did not opt for smaller “breakout” discussions. In several instances, institutions used existing partnership forums (Chambers of Commerce, regional economic development organizations, etc.) to discuss and receive feedback on the proposed metrics.

Similarly, the type of information shared by campuses with their stakeholders varied from workshop to workshop. Some institutions provided detailed information on the results of the metrics data that had been collected, while others reviewed individual metrics with stakeholders but did not provide campus-specific detail. Still other

institutions held much more general discussions that focused on the types of information external partners would find most useful without discussing the specific A·P·L·U metrics or any campus data.

As part of the observations and input provided by the regional stakeholders during these meetings, some institutions employed two different types of rating tools to solicit feedback on the potential utility of specific metrics. The A·P·L·U Metrics Rating Sheet included a list of all 56 proposed metrics that could be ranked on a 5 point scale (5 = Very Useful; 1 = No Opinion). In addition, stakeholders were asked to identify the ten most useful and ten least useful metrics, and an additional five metrics that needed further refinement.

By the conclusion of the pilot project, 23 institutions had collected data and/or met with their regional stakeholders. A·P·L·U received data reports or other forms of analyses of the data collection process from 16 institutions. Fifteen institutions submitted summaries of regional stakeholder meetings. Eight universities conducted a metric rating or ranking exercise with their regional partners.

The data, comments, and stakeholder rankings were compiled and analyzed by A·P·L·U staff from August to October 2012. Based on this analysis, the metrics were grouped into three categories:

- Priority 1/Recommended Metrics – Measures that provide the highest level of utility and feasibility
- Priority 2/Contingent Metrics - Measures with potential utility and feasibility but that require further study
- Priority 3/Tabled Metrics – Measures that are not recommended for further study at this time

The pilot universities were then asked to participate in an online survey and comment on the metrics groupings (Agree; Neutral; Disagree). Sixteen institutions completed the survey and provided thoughtful and useful perspectives on the preliminary findings that emerged from the stakeholder meetings. The end result of this process was two groups of proposed metrics that became the subject of the October 10, 2012 focus group discussion:

- Priority 1/Recommended Metrics – Measures that provide the highest level of utility and feasibility (11 metrics)
- Priority 2/Contingent Metrics - Measures with potential utility and feasibility but that require further study (23 metrics)

Appendix D provides a detailed list of the Recommended and Contingent Metrics. Appendix E is a detailed list of Tabled Metrics.

Overview of Focus Group Discussions on October 10, 2012

The participants in the October 10, 2012 focus group discussion included representatives from universities participating in the pilot project and several regional stakeholders identified by pilot universities. The national stakeholder participants included representatives of several federal agencies and other national policy organizations with a strong interest – or active engagement – in developing new measures of university contributions to economic growth. As a general rule, the organizations invited had participated in either or both of the two previous New Metrics workshops in 2010 and 2011. Many participants from the earlier workshops—from both the higher education and national policy communities—were invited to the October 2012 focus group discussions in an effort to maintain a level of continuity in the ongoing discussion. (See Appendix F for a full roster of the focus group participants.) To enable the national stakeholder community to most effectively discuss, analyze, and evaluate the priority metrics, the October 10, 2012 meeting was organized as follows. (See Appendix A for the complete meeting agenda.)

- An expert panel made a brief presentation on each main discussion topic (University Data Collection, Regional Stakeholder Experience, National Measurement Initiatives) to provide background and context for each of the ensuing focus group discussions.
- Each presentation was followed by an in-depth, facilitated focus group discussion about the usefulness and feasibility of the priority metrics in the context of the specific theme discussed in the preceding expert panel presentation.
- Feedback from the first two focus groups was discussed during a luncheon plenary session, while feedback from the third session—and preliminary conclusions from the meeting—was reviewed during the final plenary session at the end of the day.

Throughout the day's sessions and discussions, participants were reminded that the analysis and ideas generated would be synthesized into this report to NCSES. In addition to helping to shape the metrics that A·P·L·U would recommend to its member institutions, feedback collected from the focus groups and throughout the pilot process would result in recommendations regarding how NCSES might proceed with efforts to identify new measures of the contributions of scientific research to the economy.

Findings from Pilot Project and Focus Group Discussion

The overall value of the CICEP New Metrics pilot project was in bringing together the right people from inside and outside the institutions to examine and evaluate the potential feasibility and utility of these new measures. Internally, the pilot raised awareness among administrators at various levels of the need to develop new methods to measure, assess, and communicate economic innovation and development activity. Further, the process created new dialogues within institutions about the importance of collecting and compiling particular types of data and the processes and resources required to do so.

The pilot also provided a valuable opportunity for universities to engage in thoughtful and thorough discussions with key external partners who would ultimately be end-users of the data. The external stakeholders contributed essential information about which metrics they would find meaningful, and their input added validity to the final analysis. The pilot also provided a mechanism to identify those proposed metrics which were either not useful or not feasible to measure.

The focus groups proved an excellent forum for wide-ranging discussion about the importance and challenges of measuring university contributions to regional economies. There was widespread agreement that there is a clear need for new methods to measure activity and impact not only by universities, but also by a range of actors in the economic development arena. The participants also clearly conveyed that any metric will have a dual purpose: 1) to provide a national perspective on the efficacy and effectiveness of particular economic engagement programs and initiatives of universities; and 2) to provide universities and their stakeholders with baseline data from which to describe and evaluate the role of the institution in the regional economy.

A consistent theme that emerged from both the regional stakeholder meetings and the October 2012 focus group discussions was that the proposed metrics generally focus on outputs rather than outcomes. Participants at the regional and national level expressed strong interest in specific, measurable outcomes (i.e., jobs created), but also acknowledged that many of the university economic engagement activities represented by the metrics do not necessarily lead to such direct outcomes. A·P·L·U recognized this issue at the outset of its CICEP New Metrics initiative in 2009. The challenge confronting the academic community and its constituents in the innovation and economic development area is the need to shift the conversation from what historically has been measured (outputs) to what types of long-range impacts (outcomes) universities want to have on their regional economies. Thus, in an effort to build on data that is readily available and acceptable to institutions, the first step was to identify existing metrics that held the most promise for measuring economic impact. These metrics will inform the conversation about the role of universities in economic

development, and help bridge efforts to move from measuring institutional outputs to outcomes. One tool identified as having great potential for framing this process is the logic model. Linking institutional inputs with their associated outputs and outcomes provides a useful conceptual model for incorporating long-term impact into institutional planning.

Participants strongly agreed that greater levels of granularity would be required to make the national level data relevant to local and regional stakeholders. Further, the focus of detailed data and description would depend on the specific stakeholder audience(s) with which the institutions were communicating (e.g., faculty, students, parents, alumni, business and political leaders, policy makers). The participants also emphasized the need for any data presented – especially at the regional level – to be embedded in narrative about the institution’s economic engagement activities; the consensus view being that data without explanation and context has little value. Numerous focus group participants expressed concerns about the potential misuse of data by external parties, especially if explanatory or contextualizing narrative is absent. Several university representatives noted that concerns about misuse of the data had hampered data collection at their institutions.

The issue of contextualizing economic engagement metrics data was also an important theme in the February 2010 workshop. Economic engagement in its broadest forms often involves activities that are difficult to quantify and differ significantly from traditional and more straight-forward measures such as numbers of patents, licenses, start-ups, jobs created, etc. However, the non-traditional activities (e.g., student employment and entrepreneurship activities, economic-related services and assistance provided to external parties, incubation and acceleration activities) can be important indicators of university participation in and contributions to economic growth. Providing a narrative framework for this new metrics data is of equal importance at both the national and regional level.

Another major issue discussed during the focus groups was the challenge of retrieving data for many of the CICEP New Metrics, either because there was no central data collection point for diffused activities (e.g., service to external clients, student participation in private sector internships), or because the data had not been collected by the institution. Many participants agreed that it would be worthwhile to develop new campus systems to streamline and centralize data collection and retrieval, and that direction and support from institutional leadership would facilitate the data collection process.

Institutions also noted the significant human resource requirements necessary to collect the pilot project data – often requiring the commitment of at least one staff member or equivalent – during a period of fiscal belt-tightening. Further, the focus group discussions highlighted significant differences among institutions regarding the existence and collectability of specific types of data. Data availability issues included the degree of institutional research activity, the role and mission of the institution in its regional economy, and the level of engagement in certain types of activity. An additional area of concern was the degree to which potential new metrics duplicate existing data being requested by other national organizations.

While the A·P·L·U CICEP New Metrics Project was specifically designed to re-purpose existing data or fill in data gaps, participants nonetheless noted the potential for data overlap or duplication. They encouraged any further refinement of the proposed metrics to take into full consideration data already being requested by organizations such as the Association of University Technology Managers (AUTM), National Business Incubators Association (NBIA), Association of University Research Parks (AURP), STAR METRICS and the NSF Higher Education Research and Development Survey (HERD) in their annual surveys. Several participants suggested developing a metrics database that catalogues all of the data being requested of universities at the national level.

The third panel presentation on October 10th explored these issues of potential overlap in data collection efforts, focusing on a sample of national metrics development efforts

currently underway at several federal and national agencies, including STAR METRICS, NIST's Federal Intramural Technology Transfer Metrics initiative, and the National Academy of Sciences' Panel on Developing Science, Technology, and Innovation Indicators for the Future. The questions posed to the panelists were "What is the degree to which the A·P·L·U CICEP New Metrics effort complements other national efforts to develop economic engagement-related metrics?" and "Is there duplication?" The consensus of the presenters, echoed in the ensuing focus groups discussions, was that the A·P·L·U CICEP New Metrics effort both complemented and supplemented other national projects. Only in the case of STAR METRICS did the potential for duplication arise in one or two very specific areas (e.g., student participation on federally-funded research grants). As noted above, approximately one-third of the pilot participants also participate in the STAR METRICS project. However, during the pilot phase of the A·P·L·U project the issue of duplication with STAR METRICS was never broached.

Recommendations and Implementation Metrics

The ultimate goal of the October 10th focus group discussion was to identify those metrics pilot-tested by the A·P·L·U institutions that were the most feasible and useful. These metrics would be recommended to A·P·L·U members as an important tool for planning and assessment of regional economic engagement efforts. These metrics might also serve as a valuable foundation for further investigation by NCSES. A·P·L·U compiled and analyzed the information and comments provided by participants during the three panel presentations, nine focus group discussions and two plenary conversations, and identified the following 20 metrics that will be recommended to the A·P·L·U membership and to NCSES. Notations have been added about areas for potential improvement.

Relationships with Industry: Sponsored Research by Industry

In addition to the specific comments listed below, there was significant interest in identifying the geographical location of the private sector entities associated with the specific metrics. Cautions were raised about the potential challenges of differentiating

in-state vs. out-of-state by institutions whose regional service area crossed multiple state lines. In addition, location data should focus on where the “work” is being conducted rather than the corporate headquarters of the participating private sector entity.

1. Number of grants, contracts and sub-agreements (including federal-pass-through dollars) from private sector entities (including consortia, trade associations, etc.)
 - *Participants recommend that a detailed breakdown of specific types of private sector entities be included in this metric. Pass-through funding should be clearly defined.*

2. Dollar value of sponsored research expenditures by private sector entities (including consortia, trade associations, etc.)
 - *Data request should specify a detailed breakdown of specific types of private sector entities*

3. Number of sponsored research projects by industry sector (Include source/explanation of industry sectors used by institution)
 - *Discussants urged the development of a single, national list of industry codes suitable for use by universities and stakeholders; discussion centered on North American Industry Classification System (NAICS) codes, but with the caveat of what level of NAICS codes was most useful and appropriate.*

4. Dollar value of sponsored research expenditures by industry sector
 - *Discussants felt strongly that “numbers of...” had much greater value than “dollar value” of projects and specific entities, but acknowledged the potential benefit of adding more detail to the industry expenditures section of the NSF HERD survey. As above, a single standard definition of “industry sectors” needs to be established.*

5. Number of unique private sector entities funding research grants and contracts (including consortia, trade associations, etc.)

- *The term “unique” is problematic; a possible alternative is “discrete”; direction should be provided indicating that a “consortium” or “trade association” should be treated as a single “entity”.*

Relationships with Industry: Human Clinical Trials

Participants were divided over the applicability and value of clinical trial metrics, but there was consensus that this could be an optional set of metrics for institutions with medical facilities. In addition, there was great interest in expanding clinical trials to include animal trials conducted by veterinary schools. Participants did not provide specific comments about the clinical trial metrics, but these measures are provided to NCSES as a point of reference.

6. Number of trials conducted during reporting period by phase (capture all possible data, including non-FDA approval protocols; differentiate by phases and/or FDA-approval (or not) to greatest extent possible. Footnote any deviations from template.)

7. Number of subjects participating in clinical trials (active trial participants, only)

8. Dollar value of sponsored research expenditures for/on clinical trials

9. Number of protocols approved during time period

10. Number of trials initiated during time period

Relationships with Industry: Service to External Clients

Participants agreed that service to external clients is a vital element of any university’s engagement with and contribution to the regional economy. Strong concerns were raised about the difficulty of collecting data in this area, due to the diffuse nature of

the activity, the lack of central data collection, and inconsistencies in how specific activities are captured (i.e., through Sponsored Programs offices or other administrative units on campus). However, if those data collection hurdles could be overcome, these metrics could have significant value both on and off campus.

11. Number of organizations served

12. Number of companies provided on-site technical services

- *Participants emphasized the need to specify the types of services being provided.*

Developing the Regional and National Workforce: Student Employment on Funded Projects

13. Number of students paid through externally funded grants or contracts

- *Participants suggest this number be normalized across institutions (i.e., percentage of students paid through externally funded grants and contracts)*

Developing the Regional and National Workforce: Student Entrepreneurship

Participants agreed that this is an emerging set of university activities that may have a direct impact on future regional economic growth. Therefore, universities should be encouraged to track data relating to student entrepreneurship activities, even if these precise metrics are not used.

14. Number of entrepreneurship courses/programs (credit and non-credit)

15. Number entrepreneurship courses/programs requiring a capstone project (e.g., business plan, elevator pitch)

16. Number of student start-ups associated with courses, programs, competitions, clubs, or other university-affiliated organizations

Developing the Regional and National Workforce: Alumni in the Workforce

There was consensus that alumni employment and salary data would be extremely useful to both internal and external stakeholders at the national and regional level. However, all acknowledged that obtaining that data is difficult given current privacy laws. They suggested that the federal agencies would be best suited to engage state employment agencies in an effort to develop uniform guidelines and protocols that would allow institutions and others to access meaningful data about the employment and wage histories of college graduates. Participants also indicated that this data should be differentiated by undergraduate and graduate status and by discipline.

17. Average wages of alumni living in-state

- *Participants suggest modifying metric to indicate number of alumni employed in state.*

Knowledge Incubation and Acceleration Programs:

Incubation and Acceleration Program Success

18. Number of incubator/accelerator full time equivalent employees

- *Job creation is a much-desired but difficult to measure metric. Numbers of full-time employees in incubators/accelerators may provide some indication of how university support and engagement can create jobs, but it is a small portion of university activity and the role of the institution in creating those jobs is unclear. Nevertheless, this metric serves to connect university engagement to job creation.*

Knowledge Incubation and Acceleration Programs:

Ability to Attract External Investment

Participants emphasized the need to expand the definition of incubation and acceleration activities to include “proof of concept” programs and other knowledge development/diffusion activities. Participants were also interested in collecting information about the number of companies formed through incubation/acceleration activities.

19. Dollar amount of (equity) capital raised by clients and graduates from investors - angel investors, institutional, venture capitalists, individuals (including friends and family)

20. Dollar amount of funding received from federal, state or foundation sources, state or local matching programs or other non-private sources

➤ *Data should not include SBIR/STTR funding*

Recommendations to NCSES

In addition to the 20 CICEP New Metrics listed above, the focus group discussion generated six specific policy recommendations for consideration by NCSES.

1. Contextualize the Data. Participants agreed that metrics data must be presented within a broader narrative that explains the meaning and value of the data, at both the regional and national level. A·P·L·U urges NCSES to keep these concerns in the forefront as it continues to explore the development of indicators relating federal investments in academic science and engineering to economic growth.
2. Avoid Use of Data for Comparison. A concern remains among institutions that if metrics data are to be collected nationally, comparisons will be made across institutions with different missions, priorities, and resources. National data collection should focus on only those activities that are likely to be undertaken with similar levels of resources and prioritization. Use of collected data should

discourage, to the extent possible, comparisons across dissimilar institutions and missions.

3. Recognize Human Resource Constraints. The panel presentations and focus group discussions highlighted the significant human resource requirements for data collection and the significant disparities among institutions regarding the feasibility of collecting specific data. As universities continue to face fiscal constraints, NCSES and other organizations exploring new metrics need to be mindful of the potential costs involved in data collection, as well as the overall feasibility of collecting certain types of data. These cost and resource constraints exist across all types and sizes of institutions. Given NCSES's desire to identify metrics that are objective and replicable nationally, A·P·L·U strongly encourages NSF to maintain its current high level of interaction with the higher education community as it moves forward in this area.
4. Standardize Industry Data. An important theme that surfaced throughout the pilot project and echoed in the focus group discussion was the lack of a standardized framework to record industry-related data. While the NAICS codes provide a potential basis for standardization, the first question that arises is what level of industry detail is appropriate (3 digits? 4 digits? More? Fewer?). A·P·L·U urges NCSES to take a leading role in addressing this issue. The absence of a national standard makes it extremely difficult, if not impossible, to develop relevant and useful information about the nature and value of university-industry relationships across regions and across the nation.
5. Create an information clearinghouse. Focus group participants noted that numerous organizations currently collect – or are considering collecting – data related to the economic engagement activities of universities and other regional and national actors, with the significant potential for duplication of data and effort. They recommended that a national clearinghouse or central database of current and

planned surveys be developed and made publicly available to avoid such duplication of effort. NCSES is urged to consider developing and maintaining such a compendium.

6. Facilitate Federal Agency Cooperation. NCSES is well-positioned to encourage and potentially facilitate the intergovernmental collaboration required to access certain outcome data, such as the employment and wage outcomes of university graduates. Exploring how cooperation might be fostered among federal agencies and between federal and state agencies is a strategically important role that NCSES could play.

A·P·L·U's Next Steps

A·P·L·U CICEP will proceed with the following next steps toward dissemination of the CICEP New Metrics:

Re-draft definitions for each data element. Feedback is continuing to be analyzed, and additional input being gathered, in order to shape clear definitions for each of the measures in the CICEP New Metrics.

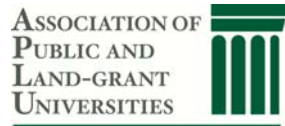
Publish the CICEP New Metrics. The measures will be shared with presidents, senior research officers, provosts, and others at A·P·L·U member universities, and will be made available on the A·P·L·U web site.

Prepare and publish a CICEP New Metrics User Guide. In addition to the 20 measures being made available online, A·P·L·U CICEP will produce a User Guide for institutions interested in working with some or all of the New Metrics. The User Guide will include ideas for actions that institutions can take, and ways of using the New Metrics both internally and for conversation with regional stakeholders.

Develop a logic model. To work toward communicating the connection between our input/output measures and outcomes, and also toward including outcomes measures in future versions of the New Metrics, CICEP will begin work on developing a logic model that can be used for these purposes.

Begin investigation of inclusion of the New Measures in national surveys and reports.

While it is not the intention of A·P·L·U to develop a national, centralized reporting mechanism for the CICEP New Metrics, work will continue to connect with organizations (like NCSES) that already collect, or are planning to collect, similar data from universities. We will work with such organizations to develop strategies related to if and how some sub-set of the CICEP New Measures might be included in others' data collection.



APPENDIX A

APLU Focus Group Discussions on

NEW METRICS TO MEASURE UNIVERSITY CONTRIBUTIONS TO REGIONAL ECONOMIES

Wednesday, October 10, 2012

Hall of States Building
444 North Capitol Street NW, 3rd Floor
Washington, DC

Objective: To inform national stakeholders about the experiences and conclusions of the APLU New Metrics Pilot Project and identify the utility of those conclusions to national policy makers and program managers exploring or developing new measures of program/actor effectiveness in regional innovation and economic growth. The Focus Group Discussions will center on the potential relevance and utility of approximately 15 potential metrics that garnered the highest levels of interest and support from universities and regional stakeholders during the pilot project.

AGENDA

- | | |
|---------------------|---|
| 8:00-8:30 am | Registration |
| 8:30-9:00 am | Opening Plenary Session
Welcome: Howard Gobstein, Executive Vice President, APLU
Opening Remarks: Jim Woodell, Director of Innovation & Technology Policy, APLU <ul style="list-style-type: none">• Welcome• Introductions• Overview of APLU New Metrics initiative• Explanation of goals for the day |
| 9:00-9:30 am | Plenary Panel Discussion #1
University Experience Identifying and Collecting Data <ul style="list-style-type: none">• Panel of university representatives, reflecting the range of institution types and experiences encountered by metrics pilot group• Moderated discussion about pilot participants' experiences in identifying and compiling data, including successes and challenges encountered
Moderator: Marvin Parnes
Associate Vice President for Research
University of Michigan |

Panelists: Michael Georgiopoulos
Interim Dean, College of Engineering and Computer Science
University of Central Florida

Marnie LaVigne
Associate Vice President of Economic Development
University at Buffalo

Diana Robinson
Director, Center for Governmental Studies
Northern Illinois University

Rhea Williamson
Dean, Office of Research and Sponsored Programs
Humboldt State University

9:40-10:40 am

Focus Group Discussion Breakout Session #1

- Participants discuss university experiences with a focus on what worked well and potential areas for improvement.
- Goals of the discussion include: 1) providing non-university participants with a clearer understanding of the data collection process and potential areas for improvement; 2) examining relevance, usefulness, and feasibility of data collection for “consensus” metrics; 3) gathering suggestions for potential new or revised metrics; 4) identifying potential impact of metrics pilot on future campus actions

Facilitators: Erin Flynn
Associate Vice President for Strategic Partnerships
Portland State University

David Gard
Executive Director, Office of the Vice President for Engagement
Indiana University

Kathy Schmidtke Felts
Assistant Director, MU Institutional Research and Quality
Improvement University of Missouri

10:40-11:00 am

Break

11:00-11:30 am

**Plenary Panel Discussion #2
Feedback from Regional Stakeholders**

- Two university representative/regional stakeholder pairs provide the regional perspective on potential new metrics and the university-stakeholder dialogue
- Panel will outline the approaches used and potential areas for improvement

Moderator: Andrew Reamer
Research Professor, Institute of Public Policy
George Washington University

Panelists: Alexis Holzer
Assistant Director, Economic Development and External Affairs
Washington State University

Spencer Cohen
Senior Policy Advisor
Washington Economic Development Commission

Steve Wyatt
Vice Provost for Economic Development
University of Missouri

J. Michael Brooks
President
Regional Economic Development Inc. (REDI)

11:40 am-12:40 pm

Focus Group Discussion Breakout Session #2

- Participants will discuss external stakeholder perspective with a focus on relevance and usefulness of consensus metrics.
- Goals of the discussion include: 1) providing non-university participants with a clearer understanding of the regional stakeholder outreach process, challenges and successes; 2) examining relevance, usefulness, and feasibility of data collection for consensus metrics; 3) gathering suggestions for potential new or revised metrics; 4) identifying potential impact of metrics pilot on future campus/stakeholder actions

Facilitators: Martha Taylor
Assistant Vice President for Research
Auburn University

Tasha Anderson
Business Research & Economic Development Liaison
University of South Dakota

Alexis Holzer
Assistant Director, Economic Development and External Affairs
Washington State University

12:45-1:45 pm

Lunch/Plenary Session

- After participants gather lunch and begin eating, moderator will ask for report-outs on Focus Group Discussion Sessions #1 and #2

- Moderator will then guide a discussion based on the report-outs

Moderator: Arjun Sanga
Assistant Vice President, Technology Transfer and
Executive Director, South Texas Technology Management
University of Texas

1:45-2:00 pm

Break

2:00-2:40 pm

Plenary Panel Discussion #3
Potential Contributions of APLU New Metrics Project to National Metrics Initiatives

- Panel of representatives of national stakeholders exploring or developing new measures of program/actor performance in regional innovation and economic development will discuss their initiatives and goals.

Moderator: Mark Crowell
Executive Director and Associate Vice President for Innovation
Partnerships and Commercialization
University of Virginia

Panelists: Phil Singerman
Associate Director for Innovation and Industry Services
National Institute of Standards and Technology (NIST)

Kaye Fealing
Senior Program Officer
National Academy of Sciences

George Chacko
Director, Office of Planning, Analysis, and Evaluation Center for
Scientific Review, and Program Manager, STAR METRICS
National Institutes of Health

2:50-3:50 pm

Focus Group Discussion Breakout Session #3

- Participants will discuss relevance of consensus metrics to national measurement and evaluation initiatives.
- Goals of the discussion include: 1) providing all participants with a clearer understanding of the various measurement and evaluation efforts underway across various sectors; 2) examining the relationship between APLU consensus metrics and other metrics development initiatives, integrating input of previous focus group sessions; 3) gathering suggestions for potential new or revised metrics; 4) identifying potential impact of metrics pilot on future university/national stakeholder actions



Facilitators: Caroline Whitacre
Vice President for Research
Ohio State University

Gene Merrell
Associate Vice President for Economic Development and
Chief Technology Transfer Officer
University of Idaho

Cameron McCoy
Executive Director, Corporate Engagement Office
University of Oklahoma

3:50-4:00 pm

Break

4:00-5:00 pm

Closing Plenary Session

Summary of Focus Group Sessions; Next Steps for Stakeholders and Universities

- Report-out on Focus Group Discussion Session #3
- Discussion of possible future impacts of output from APLU New Metrics Pilot Project on national measurement/evaluation initiatives and university actions
- Presentation on future APLU actions relating to metrics

Moderator: David Winwood
Chief Executive Officer of the UAB Research Foundation
and Senior Associate Vice President for Economic Development and
Innovation Alliances
University of Alabama at Birmingham

5:00 pm

Adjourn

APPENDIX B

FINAL NEW METRICS TEMPLATE FOR PILOT PROJECT

RELATIONSHIPS WITH INDUSTRY

Universities and the Economy

Many discoveries made in the lab provide the foundation for innovations that are subsequently licensed to existing companies or new start-ups. At the same time, industrial need is an important factor helping to shape scientific research agendas. For most academic institutions, industrial research is a small but critical component of the total research enterprise and gauging the magnitude of these mutually beneficial exchanges between academic researchers and industrial partners requires measurement of multiple dimensions of this interaction. These include:

- *Material Transfer Agreements* are contracts that govern the transfer of tangible research materials between two organizations and the recipient intends to use the material for his or her own research or evaluation purposes. The MTA defines the rights of the provider and the recipient with respect to the materials and any derivatives. Biological materials, such as reagents, cell lines, plasmids, and vectors, are the most frequently transferred materials, but MTAs may also be used for other types of materials, such as chemical compounds, engineering prototypes, microelectronic chips, and even some types of software.
- *Consortia agreements* are contracts with multiple parties for the purpose of advancing a research agenda. For the purposes of these metrics, at least one of the parties is from or represents industry. The agreement sets out the terms and conditions for managing the consortia activity, the mechanisms for raising and using funds, access to intellectual property resulting from consortia activity, and membership types and obligations. Consortia's research agendas typically focus on pre-competitive topics. Often, consortia members utilize the relationship developed through consortia activities to create a specific sponsored research project related to the consortia research topic.
- *Sponsored research* activities are the basis for the discovery and generation of new knowledge and inventions at universities. Industry sponsored research activities tangibly measure the value of university expertise to industry, while also reflecting the openness of university research to practical and applied issues arising in industry.
- *Clinical trial* data helps to describe the relationship between university research and improvements in health care through drug discovery and contributions to the drug development process. In some geographic regions, clinical trials leverage university expertise and assets to identify subject populations and otherwise under-served or un-served populations and provide them access to new drugs or devices.
- *Service to external clients* reflects the extent to which university expertise or specialized resources (as well as an institution's willingness) help to support industrial activity through the provision of testing, facilities or analytical services; fee-for-services work

(including technical assistance, contractual education and training, and diverse programs provided through agricultural, manufacturing, or educational extension services.

1. Material Transfer Agreements

A contract that governs the transfer of tangible research materials between two organizations and the recipient intends to use the material for his or her own research or evaluation purposes.

Data (Institution must indicate fiscal or calendar year)

- number of incoming executed agreements
- number of outgoing executed agreements

Data Set (Institution must indicate fiscal or calendar year)

- Latest year
- Three years prior
- Five years prior

Sources

- Office of Technology Transfer/Commercialization
- Office of the General Counsel
- Agricultural Experiment Station
- Dean and Department Offices
- Office of Sponsored Programs

2. Consortia Agreements

A contract with multiple parties for the purpose of advancing a research agenda. For the purposes of these metrics, at least one of the parties is from or represents industry. . *Note: identify “research expenditures” as defined by the National Science Foundation.*

Data (Applies to SIGNED agreements only; NO FUNDING required.)

- number of consortia agreements
- number of participating private sector entities (companies, trade associations, etc.)
- research expenditures made by consortia members at the university

Data Set

- Latest year
- Three years prior

- Five years prior

Sources

- Deans and Department Offices
- Office of Sponsored Programs
- General Counsel's Office
- Agricultural Experiment Station

3. Sponsored Research and Development by Industry

For the purposes of these metrics, sponsored research is defined as research and development activities (including direct and indirect costs) from profit-making organizations, whether engaged in production, distribution, research, service, technical assistance, training or other activities. Data collected in this category should be posted along side existing data collected through other instruments (e.g., NSF HERD Survey; STaR Metrics, AUTM Licensing Survey).
Note: identify "research expenditures" as defined by the National Science Foundation.

Data

- number of grants, contracts and sub-agreements (including federal- pass-through dollars) from private sector entities (including consortia, trade associations, etc.)
- dollar value of sponsored research expenditures by private sector entities (including consortia, trade associations, etc.)
- number of sponsored research projects by industry sector (Include source/explanation of industry sectors used by institution)
- dollar value of sponsored research expenditures by industry sector
- number of unique private sector entities funding research grants and contracts (including consortia, trade associations, etc.)

Data Set

- Latest year
- Three years prior
- Five years prior

Sources

- Office of Technology Transfer/Commercialization
- Office of Sponsored Programs
- Technology Transfer Office

4. Human Clinical Trials

Phase I, II or III clinical trials – regardless of whether investigator initiated or sponsor-initiated performed under contract with the developer of the specific drug, device or compound, or under a grant or contract from a federal agency for support of a clinical trial.

Data

- number of trials conducted during reporting period by Phase (Capture all possible data, including non-FDA approval protocols; differentiate by Phases and/or FDA-approval (or not) to greatest extent possible. Footnote any deviations from template.)
- number of subjects participating in clinical trials (active trial participants, only)
- dollar value of sponsored research expenditures for/on clinical trials
- number of protocols approved during time period
- number of trials initiated during time period

Data Set

- Latest year
- Three years prior
- Five years prior

Sources

- Office of Sponsored Programs
- Technology Transfer Office
- Offices overseeing clinical trials or related university entities
- Institutional IRB data
- Corporate financial systems
- *iedison* system at NIH
- www.clinicaltrials.gov

5. Service to External Clients

Testing, evaluation, or technical services provided to external clients (industry, government and joint) that includes a specific deliverable product or result. These services may be provided in university facilities and/or on-site at a client's place of operation. The activities involved are "routine", i.e. not research, but the technical assistance, training, and problem-solving involved in Lean Manufacturing, Six Sigma or other approaches that may be beneficial to the firm, protocols may be determined by the client, and no intellectual property is expected to be generated as a result of the activities. Contractual training may be offered by institutions as a fee-for-service educational function. (Note: some public institutions are prohibited by state law from providing these types of services.)

Data

- dollar value of contracts received by institution by type of sponsoring organization
- number of agreements
- number of organizations served
- number of firms contracting for services
- number of individuals contracting for continuing education in business or economic related specialties
* * *
- number of facility use agreements
- number of testing agreements (including location of client, i.e., regional/non-regional)
(Note: avoid double-counting with Knowledge Incubation and Acceleration Programs/Relationships Between Clients/Program Participants and Host University)
* * *
- number of companies provided on-site technical services

Data Set

- Latest year
- Three years prior
- Five years prior

Sources

- University Comptroller
- Office of Business Affairs
- Office of Sponsored Programs
- Extension Services

DEVELOPING THE REGIONAL AND NATIONAL WORKFORCE

Universities and the Economy

University students and alumni have a positive impact on regional innovation and economic growth. Through university employment on funded projects, or placement with employers, students develop knowledge and workplace skills valuable to both them and their employers. Students make important contributions to the enterprises in which they are placed, and to the project teams to which they are assigned, and the income they earn helps defray the cost of their education.

In addition to employing students on funded projects and placing them with business, universities also invest in students by helping them develop entrepreneurial skills, through a variety of academic courses and programs, as well as competitions and other entrepreneurial-related activities. Student entrepreneurs contribute to the economy through businesses they start while still in school, and/or by starting or being involved in new businesses upon graduation.

Students become alumni, many of whom get jobs in the region or state. Universities' contribution of talent to the workforce represents perhaps their most important contribution to economic prosperity.

1. Student Employment on Funded Projects

Wages paid to students for work funded through external grants and contracts. Since institutions are encouraged to differentiate among funding sources, including federal, industry, industry foundations, private and non-profit foundations, it would be possible to identify students' contributions to research projects through the payments made on externally funded contracts and grants.

Data

- number of students paid through externally funded grants or contracts
- dollars paid to students
- average hourly wage

Data Set

- Latest year
- Three years prior
- Five years prior

Sources

- Finance Office
- Payroll Office
- Office of Sponsored Programs

2. Student Economic Engagement

Student participation in private, public, or nonprofit sector organizations for the purpose of developing practical work-based experience in their field of study or a specific profession or occupation.

Data

- number of students participating in internships, externships and work-based learning experiences by type of activity (regardless of whether academic credit is earned)
- number of employers sponsoring/hosting students by industry type
- monetary value of any paid work-based learning experience (Monetary value of volunteer hours is NOT required.)
- industry in which student participating in work-based learning experience was/is working two years after graduation

Data Set

- Latest year
- Three years prior
- Five years prior

Sources

- Office of Academic Affairs
- Office of Student Affairs
- Career Development Offices
- Service Learning/Community Engagement Program Office(s)
- Academic Departments

3. Student Entrepreneurship

Academic course offerings and programs, and extra-curricular activities, student competitions (e.g., local, regional or virtual competitions for business plans, robotics, etc.), and other initiatives where students have the opportunity to think, plan and act as entrepreneurs.

Data

- number of entrepreneurship courses/programs (credit and non-credit)
- number of students enrolled in entrepreneurship courses/programs
- number entrepreneurship courses/programs requiring a capstone project (e.g., business plan, elevator pitch)

* * *

- number of individual student entrepreneurship-related competitions
- number of students participating in competitions and related activities
- number of student start-ups associated with courses, programs, competitions, clubs, or other university-affiliated organizations

Data Set

- Latest year
- Three years prior
- Five years prior

Sources

- Registrar
- Colleges/Schools
- Departments
- Office of Sponsored Programs
- Career Development Office

4. Alumni in the Workforce

Data related to alumni residing in the university's home-state.

(Note: it is understood that compiling meaningful data in this area requires consistent access to wage data across all 50 states, which does not currently exist. The goal of collecting in-state alumni wage data where it currently is available is to demonstrate the methodologies currently in place and the value of this data in the public policy arena as a foundation for uniform access to wage data across the country.)

Data

- number of alumni living in-state
- average wages of alumni living in-state
- average wages of alumni living in-state by industry sector
- average wages of alumni living in-state by CIP (academic) code

Data set

- Latest year
- Three years prior
- Five years prior

Sources

- Alumni Relations Office (Central/School/College)
- Development Office (Central/School/College)
- Career Development Office (Central/School/College)
- State Agencies
 - Earnings reports are collected from employers on a quarterly basis by State Employment Security Agencies (SESAs) as part of their process of administering the national system of unemployment compensation. This earnings information is submitted by employee Social Security Number and may be matched to records from other institutions, such as postsecondary educational institutions or participants in federal job training programs, to help assess the earnings and employment outcomes of particular education or training interventions. Because earnings are submitted quarterly, earnings progression may be tracked over time. SESA also collects the employer's industry type and ZIP code of the employer's headquarters, which in many cases allows for the identification of training- or education-related placement and a determination of whether alumni are employed within a particular region or in-state. Any data matching using this source must adhere to the highest standards of data confidentiality and secure data transmission. States typically develop detailed agreements describing the terms and conditions under which such data may be used.

UNIVERSITY-BASED KNOWLEDGE INCUBATION AND ACCELERATION PROGRAMS

Universities and the Economy

Many universities serve as local or regional centers for the development of new businesses. In some cases, new businesses are based on technologies originating from the university. University support for the development and growth of new businesses may be highly involved, including programmatic initiatives such as mentoring and business plan support provided by specialist staff. University support might, on the other hand, be limited to providing physical space in which emerging businesses may reside, typically located conveniently close to the university. Metrics related to new business incubation and acceleration will provide insight into the value of university contributions to company formation, growth and sustainability.

1. Incubation and Acceleration Program Success

Incubation and acceleration “clients” or “participants” are entities that have a formal relationship or agreement, including a set of requirements, with the program sponsor or owner of the physical space. Activities to be measured begin when an entity has declared its interest in or intent to make an idea, technology, or discovery into a product, good, or service and offer it on the commercial market. Success of an incubation or acceleration program is measured here based on clients’ ability to raise capital, success in commercializing—translating ideas or discoveries into by a new or acquired company, and

the clients' success in spurring economic activity, measured here as job creation and access to industry experience for students.

Data

- rate of entry acceptances (*ratio of successful applications to total applications*)
- rate of client success (*ratio of clients successfully completing "requirements" of agreement over total clients*)
- rate of companies still active after graduation (*ratio of graduates still active over total number of graduates*)
- number of full time equivalent employees
- number of students employed (*graduate level/research assistants*)
- rate of increase in hiring

Data set (Institutions must indicate fiscal or calendar year)

- Latest year
- Three years prior
- Five years prior

Sources

- Incubation/acceleration program management
- Application database
- Current and graduated participants

2. Relationships Between Clients/Program Participants and Host University

Relationships between clients and the university may include: licenses or options to license university-owned intellectual property; memoranda of understanding (MOU); letters of understanding (LOU); client sponsorship of research activities at the university; and contracted services - other than research - using university resources.

Data

- number of sponsored research agreements in which clients/tenants support research performed by an investigator at the affiliated university
- dollar value of sponsored research agreements
- number of service agreements/fee for service contracts whereby a specific task is performed for a fee by the university at the request of a client/tenant; may also be referred to as testing and/or analysis agreements, in which the university contracts to perform routine work (not research) for clients/tenants
- dollar value of service, testing or analysis agreements (*Note: avoid double-counting with Relationships with Industry/Service to External Clients*)

- number of licenses or options to license university-owned intellectual property
- number of MOUs, LOUs

Data set (Institutions must indicate fiscal or calendar year)

- Latest year
- Three years prior
- Five years prior

Sources

- Office of Sponsored Programs
- University or College Purchasing or Business Office
- Office of Technology Transfer

3. Ability to Attract External Investment

This metric is a measure of the amount of financial support (capital) received from all external funding sources in support of client or participant business development activities. Sources of funding may include loans or equity investments from: angel investors, venture capitalists, institutions, private investors, family, and friends. Non-equity funding may include foundation and government (SBIR/STTR) sources.

Data

- number of client/tenants reporting (as a percentage of total)
- dollar value of external investments from all sources
- dollar amount of (equity) capital raised by clients and graduates from investors - angel investors, institutional, venture capitalists, individuals
- dollar amount of funding received from federal, state or foundation sources, such as SBIR, STTR, state or local matching programs or other non-private sources

Data set (Institutions must indicate fiscal or calendar year)

- Latest year
- Three years prior
- Five years prior

Sources

- Incubation/acceleration program management
- Clients

- Graduates
- Office of Sponsored Programs

APPENDIX C

APLU New Metrics Pilot Project Participating Institutions

- Auburn University
- Boise State University
- Colorado State University
- Humboldt State University
- Indiana University
- Northern Illinois University
- Portland State University
- Prairie View A&M University
- Southern Illinois University-Carbondale
- SUNY College of Environmental Science and Forestry
- SUNY Fredonia College
- The Ohio State University
- University of Alabama Birmingham Research Foundation
- University of Arkansas
- University of Buffalo
- University of Central Florida
- University of Idaho
- University of Memphis
- University of Michigan
- University of Missouri
- University of Oklahoma
- University of South Dakota
- University of Southern Maine
- University of Texas South Texas Technology Management
- University of Virginia
- University of Wisconsin/Oshkosh
- Virginia Commonwealth University
- Virginia Tech
- Washington State University

Observers

- American Association of State Colleges and Universities (observer)
- Association of American Medical Colleges (observer)
- Association of Public and Land-grant Universities (project coordinator)
- Cal State University System (observer)
- Iowa State University (observer)
- University of Arizona (observer)
- University of Nebraska (observer)

APPENDIX D

**Two Priority Categories of Metrics for Focus Group Discussion
October 10, 2012**

Priority 1 – Measures identified as providing the highest level of utility and feasibility, among the metrics examined. (Renamed “Recommended Metrics”)

A. RELATIONSHIPS WITH INDUSTRY

Sponsored Research by Industry

For the purposes of these metrics, sponsored research is defined as research and development activities (including direct and indirect costs) from profit-making organizations, whether engaged in production, distribution, research, service, technical assistance, training or other activities. Data collected in this category should be posted along side existing data collected through other instruments (e.g., NSF HERD Survey; STaR Metrics, AUTM Licensing Survey). Note: identify “research expenditures” as defined by the National Science Foundation.

- 1.1** Number of grants, contracts and sub-agreements (including federal-pass-through dollars) from private sector entities (including consortia, trade associations, etc.)
- 1.2** Dollar value of sponsored research expenditures by private sector entities (including consortia, trade associations, etc.)
- 1.3** Number of sponsored research projects by industry sector (Include source/explanation of industry sectors used by institution)
- 1.4** Dollar value of sponsored research expenditures by industry sector
- 1.5** Number of unique private sector entities funding research grants and contracts (including consortia, trade associations, etc.)

Service to External Clients

Testing, evaluation, or technical services provided to external clients (industry, government and joint) that includes a specific deliverable product or result. These services may be provided in university facilities and/or on-site at a client's place of operation. The activities involved are "routine", i.e. not research, but the technical assistance, training, and problem-solving involved in Lean Manufacturing, Six Sigma or other approaches that may be beneficial to the firm, protocols may be determined by the client, and no intellectual property is expected to be generated as a result of the activities. Contractual training may be offered by institutions as a fee-for-service educational function. (Note: some public institutions are prohibited by state law from providing these types of services.)

1.6 Dollar value of contracts received by institution by type of sponsoring organization

B. DEVELOPING THE REGIONAL AND NATIONAL WORKFORCE

Student Economic Engagement

Student participation in private, public, or nonprofit sector organizations for the purpose of developing practical work-based experience in their field of study or a specific profession or occupation.

1.7 Number of students participating in internships, externships and work-based learning experiences by type of activity (regardless of whether academic credit is earned)

C. KNOWLEDGE INCUBATION AND ACCELERATION PROGRAMS

Incubation and Acceleration Program Success

Incubation and acceleration "clients" or "participants" are entities that have a formal relationship or agreement, including a set of requirements, with the program sponsor or owner of the physical space. Activities to be measured begin when an entity has declared its interest in or intent to make an idea, technology, or discovery into a product, good, or service and offer it on the commercial market. Success of an incubation or acceleration program is measured here based on clients' ability to raise capital, success in commercializing—translating ideas or discoveries into by a new or acquired company, and the clients' success in spurring economic activity, measured here as job creation and access to industry experience for students.

1.8 Number of full time equivalent employees

Ability to Attract External Investment

This metric is a measure of the amount of financial support (capital) received from all external funding sources in support of client or participant business development activities. Sources of funding may include loans or equity investments from: angel investors, venture capitalists, institutions, private investors, family, and friends. Non-equity funding may include foundation and government (SBIR/STTR) sources.

- 1.9** Dollar value of external investments from all sources

- 1.10** Dollar amount of (equity) capital raised by clients and graduates from investors - angel investors, institutional, venture capitalists, individuals

- 1.11** Dollar amount of funding received from federal, state or foundation sources, such as SBIR, STTR, state or local matching programs or other non-private sources

Priority 2 - Measures identified as potentially providing utility and feasibility, among the metrics examined, but requiring further study. (Renamed “Contingent Metrics”)

A. RELATIONSHIPS WITH INDUSTRY

Consortia Agreements (Applies to SIGNED agreements only; NO FUNDING required.)

A contract with multiple parties for the purpose of advancing a research agenda. For the purposes of these metrics, at least one of the parties is from or represents industry. Note: identify “research expenditures” as defined by the National Science Foundation.

2.1 Number of consortia agreements

2.2 Number of participating private sector entities (companies, trade associations, etc.)

2.3 Research expenditures made by consortia members at the university

Human Clinical Trials

Phase I, II or III clinical trials – regardless of whether investigator initiated or sponsor-initiated performed under contract with the developer of the specific drug, device or compound, or under a grant or contract from a federal agency for support of a clinical trial.

2.4 Number of trials conducted during reporting period by Phase (Capture all possible data, including non-FDA approval protocols; differentiate by Phases and/or FDA-approval (or not) to greatest extent possible. Footnote any deviations from template.)

2.5 Number of subjects participating in clinical trials (active trial participants, only)

2.6 Dollar value of sponsored research expenditures for/on clinical trials

2.7 Number of protocols approved during time period

2.8 Number of trials initiated during time period

Service to External Clients

Testing, evaluation, or technical services provided to external clients (industry, government and joint) that includes a specific deliverable product or result. These services may be provided in university facilities and/or on-site at a client's place of operation. The activities involved are "routine", i.e. not research, but the technical assistance, training, and problem-solving involved in Lean Manufacturing, Six Sigma or other approaches that may be beneficial to the firm, protocols may be determined by the client, and no intellectual property is expected to be generated as a result of the activities. Contractual training may be offered by institutions as a fee-for-service educational function. (Note: some public institutions are prohibited by state law from providing these types of services.)

2.9 Number of organizations served

2.10 Number of companies provided on-site technical services

B. DEVELOPING THE REGIONAL AND NATIONAL WORKFORCE

Student Employment on Funded Projects

Wages paid to students for work funded through external grants and contracts. Since institutions are encouraged to differentiate among funding sources, including federal, industry, industry foundations, private and non-profit foundations, it would be possible to identify students' contributions to research projects through the payments made on externally funded contracts and grants.

2.11 Number of students paid through externally funded grants or contracts

2.12 Number of employers sponsoring/hosting students by industry type

Student Entrepreneurship

Academic course offerings and programs, and extra-curricular activities, student competitions (e.g., local, regional or virtual competitions for business plans, robotics, etc.), and other initiatives where students have the opportunity to think, plan and act as entrepreneurs.

2.13 Number of entrepreneurship courses/programs (credit and non-credit)

2.14 Number entrepreneurship courses/programs requiring a capstone project (e.g., business plan, elevator pitch)

- 2.15** Number of student start-ups associated with courses, programs, competitions, clubs, or other university-affiliated organizations

Alumni in the Workforce

Data related to alumni residing in the university's home-state. (Note: it is understood that compiling meaningful data in this area requires consistent access to wage data across all 50 states, which does not currently exist. The goal of collecting in-state alumni wage data where it currently is available is to demonstrate the methodologies currently in place and the value of this data in the public policy arena as a foundation for uniform access to wage data across the country.)

- 2.16** Number of alumni living in-state
- 2.17** Average wages of alumni living in-state

C. KNOWLEDGE INCUBATION AND ACCELERATION PROGRAMS

Incubation and Acceleration Program Success

Incubation and acceleration “clients” or “participants” are entities that have a formal relationship or agreement, including a set of requirements, with the program sponsor or owner of the physical space. Activities to be measured begin when an entity has declared its interest in or intent to make an idea, technology, or discovery into a product, good, or service and offer it on the commercial market. Success of an incubation or acceleration program is measured here based on clients’ ability to raise capital, success in commercializing—translating ideas or discoveries into by a new or acquired company, and the clients’ success in spurring economic activity, measured here as job creation and access to industry experience for students.

- 2.18** Rate of entry acceptances (ratio of successful applications to total applications)
- 2.19** Rate of client success (ratio of clients successfully completing “requirements” of agreement over total clients)
- 2.20** Rate of companies still active after graduation (ratio of graduates still active over total number of graduates)
- 2.21** Number of students employed (graduate level/research assistants)
- 2.22** Rate of increase in hiring



Relationships Between Clients/Program Participants and Host University

Relationships between clients and the university may include: licenses or options to license university-owned intellectual property; memoranda of understanding (MOU); letters of understanding (LOU); client sponsorship of research activities at the university; and contracted services - other than research - using university resources.

Number of licenses or options to license university-owned intellectual property

APPENDIX E

TABLED METRICS

RELATIONSHIPS WITH INDUSTRY

1. Material Transfer Agreements

A contract that governs the transfer of tangible research materials between two organizations and the recipient intends to use the material for his or her own research or evaluation purposes.

- number of incoming executed agreements
- number of outgoing executed agreements

5. Service to External Clients

Testing, evaluation, or technical services provided to external clients (industry, government and joint) that includes a specific deliverable product or result. These services may be provided in university facilities and/or on-site at a client's place of operation. The activities involved are "routine", i.e. not research, but the technical assistance, training, and problem-solving involved in Lean Manufacturing, Six Sigma or other approaches that may be beneficial to the firm, protocols may be determined by the client, and no intellectual property is expected to be generated as a result of the activities. Contractual training may be offered by institutions as a fee-for-service educational function. (Note: some public institutions are prohibited by state law from providing these types of services.)

- number of agreements
- number of firms contracting for services
- number of individuals contracting for continuing education in business or economic related specialties
- number of facility use agreements
- number of testing agreements (including location of client, i.e., regional/non-regional)

DEVELOPING THE REGIONAL AND NATIONAL WORKFORCE

Universities and the Economy

University students and alumni have a positive impact on regional innovation and economic growth. Through university employment on funded projects, or placement with employers, students develop knowledge and workplace skills valuable to both them and their employers. Students make important

contributions to the enterprises in which they are placed, and to the project teams to which they are assigned, and the income they earn helps defray the cost of their education.

In addition to employing students on funded projects and placing them with business, universities also invest in students by helping them develop entrepreneurial skills, through a variety of academic courses and programs, as well as competitions and other entrepreneurial-related activities. Student entrepreneurs contribute to the economy through businesses they start while still in school, and/or by starting or being involved in new businesses upon graduation.

Students become alumni, many of whom get jobs in the region or state. Universities' contribution of talent to the workforce represents perhaps their most important contribution to economic prosperity.

1. Student Employment on Funded Projects

Wages paid to students for work funded through external grants and contracts. Since institutions are encouraged to differentiate among funding sources, including federal, industry, industry foundations, private and non-profit foundations, it would be possible to identify students' contributions to research projects through the payments made on externally funded contracts and grants.

- dollars paid to students
- average hourly wage

2. Student Economic Engagement

Student participation in private, public, or nonprofit sector organizations for the purpose of developing practical work-based experience in their field of study or a specific profession or occupation.

- monetary value of any paid work-based learning experience (Monetary value of volunteer hours is NOT required.)
- industry in which student participating in work-based learning experience was/is working two years after graduation

3. Student Entrepreneurship

Academic course offerings and programs, and extra-curricular activities, student competitions (e.g., local, regional or virtual competitions for business plans, robotics, etc.), and other initiatives where students have the opportunity to think, plan and act as entrepreneurs.

- number of students enrolled in entrepreneurship courses/programs
- number of individual student entrepreneurship-related competitions
- number of students participating in competitions and related activities

4. Alumni in the Workforce

Data related to alumni residing in the university's home-state.

(Note: it is understood that compiling meaningful data in this area requires consistent access to wage data across all 50 states, which does not currently exist. The goal of collecting in-state alumni wage data where it currently is available is to demonstrate the methodologies currently in place and the value of this data in the public policy arena as a foundation for uniform access to wage data across the country.)

- average wages of alumni living in-state by industry sector
- average wages of alumni living in-state by CIP (academic) code

UNIVERSITY-BASED KNOWLEDGE INCUBATION AND ACCELERATION PROGRAMS

Universities and the Economy

Many universities serve as local or regional centers for the development of new businesses. In some cases, new businesses are based on technologies originating from the university. University support for the development and growth of new businesses may be highly involved, including programmatic initiatives such as mentoring and business plan support provided by specialist staff. University support might, on the other hand, be limited to providing physical space in which emerging businesses may reside, typically located conveniently close to the university. Metrics related to new business incubation and acceleration will provide insight into the value of university contributions to company formation, growth and sustainability.

2. Relationships Between Clients/Program Participants and Host University

Relationships between clients and the university may include: licenses or options to license university-owned intellectual property; memoranda of understanding (MOU); letters of understanding (LOU); client sponsorship of research activities at the university; and contracted services - other than research - using university resources.

- number of sponsored research agreements in which clients/tenants support research performed by an investigator at the affiliated university
- dollar value of sponsored research agreements
- number of service agreements/fee for service contracts whereby a specific task is performed for a fee by the university at the request of a client/tenant; may also be referred to as testing and/or analysis agreements, in which the university contracts to perform routine work (not research) for clients/tenants
- dollar value of service, testing or analysis agreements (*Note: avoid double-counting with Relationships with Industry/Service to External Clients*)
- number of MOUs, LOUs

3. Ability to Attract External Investment

This metric is a measure of the amount of financial support (capital) received from all external funding sources in support of client or participant business development activities. Sources of funding may include loans or equity investments from: angel investors, venture capitalists, institutions, private investors, family, and friends. Non-equity funding may include foundation and government (SBIR/STTR) sources.

- number of client/tenants reporting (as a percentage of total)

APPENDIX F

Metrics Focus Groups

October 12, 2012

Participant Roster

Nish Acharya

Director, Office of Innovation and
Entrepreneurship
U.S. Department of Commerce,
Economic Development Administration
Email: nacharya@doc.gov

Zoe Ambargis

Chief, Regional Input-Output Modeling Systems
(RIMS II) Section, Regional Product Division
U.S. Bureau of Economic Analysis
Email: zoe.ambargis@bea.gov

Beth Ambos

Executive Officer
Council on Undergraduate Research
Email: eambos@cur.org

Ryan Anderson

Director of Industry Relations
University of Nebraska-Lincoln
Email: randerson13@unl.edu

Tasha Anderson

Business Research & Economic Development
Liaison
University of South Dakota
Email: Tasha.Anderson@usd.edu

KeiAnna Beckett

Administrative Assistant
APLU
Email: kdbeckett@aplu.org

KeiWana Beckett

Administrative Assistant APLU
Email: kbeckett@aplu.org

Linda Kay Benning

Associate Director, Extension & Outreach
APLU
Email: lbenning@aplu.org

Anthony Boccanfuso

Executive Director
University Industry Demonstration Project
Email: aboccanfuso@nas.edu

Mark Boroush

Senior Analyst, National Center for Science and
Engineering Statistics
National Science Foundation
Email: mboroush@nsf.gov

Ronda Britt

Project Officer, Higher Education R&D Survey,
NCSES
National Science Foundation
Email: rbritt@nsf.gov

J. Michael Brooks

President
Regional Economic Development, Inc. (REDI)
Email: jmbrooks@gocolumbiamo.com

Steven Ceulemans

Mirzayan Science and Technology Policy Fellow
The National Academies
Email: sceulemans@nas.edu

George Chacko

Director, Office of Planning, Analysis, and
Evaluation Center for Scientific Review, and
Program Manager, STAR METRICS
National Institutes of Health
Email: george.chacko@nih.gov

Spencer Cohen

Senior Policy Advisor
Washington Economic Development
Commission
Email: spencer.cohen@wedc.wa.gov

David Cox

Executive Assistant to the President for
Partnerships and Administration
University of Memphis
Email: davidcox@memphis.edu

Mark Crowell

Executive Director for
Innovation Partnerships & Commercialization
University of Virginia
Email: mcrowell@virginia.edu

Tag Demment

Associate Vice President, International
Development
APLU
Email: mwdemment@ucdavis.edu

Kaye Fealing

Senior Program Officer
National Academy of Sciences
Email: kfealing@nas.edu

Kathy Felts

Assistant Director
MU Institutional Research & Quality
Improvement
University of Missouri
Email: feltsk@missouri.edu

Erin Flynn

Associate Vice President for Strategic
Partnerships
Portland State University
Email: erin.flynn@pdx.edu

David Gard

Executive Director
Office of the Vice President for Engagement
Indiana University
Email: dagard@indiana.edu

Shari Garmise

Vice President, USU/Office of Urban Initiatives
APLU
Email: sgarmise@aplu.org

Michael Georgiopoulos

Interim Dean
College of Engineering and Computer Science
University of Central Florida
Email: michaelg@ucf.edu

Howard Gobstein

Executive Vice President
APLU
Email: hgobstein@aplu.org

David Goldston

Director of Government Affairs
Natural Resources Defense Council
Email: David.goldston@gmail.com

Laura Haas

Knowledge Center Director
Office of International Programs
APLU
Email: lhaas@aplu.org

Kathy Hale

Senior Science Resources Analyst, NCSES
National Science Foundation
Email: khale@nsf.gov

Ann Hammersla

Director of Policy
Office of Technology Transfer
National Institutes of Health
Email: hammerslaa@mail.nih.gov

Robert Hardy

Director
Contracts and Intellectual Property
Management
Council on Government Relations
Email: rhardy@cogr.edu

Steve Heinig

Director, Science Policy
American Association of Medical Colleges
Email: sheinig@aamc.org

Ann Claire Hervy

Chief Operating Officer
Africa-U.S. Higher Education Initiative
APLU
Email: achervy@aplu.org

Alexis Holzer

Assistant Director
Economic Development and External Affairs
Washington State University
Email: alexisholzer@wsu.edu

John Jankowski

Director, R&D Statistics Program, NCSES
National Science Foundation
Email: jjankows@nsf.gov

Mervin Jebaraj

Research Assistant, Center for Business and
Economic Research
University of Arkansas
Email: mjebaraj@walton.uark.edu

Nirmala Kannankutty

Senior Advisor/Senior Social Scientist, NCSES
National Science Foundation
Email: nkannank@nsf.gov

Azam Khan

Deputy Chief of Staff
United States Patent and Trademark Office
United States Department of Commerce
Email: azam.khan@uspto.gov

Beethika Khan

Senior Science Resources Analyst
National Center for Science and Engineering
Statistics
National Science Foundation
Email: bkhan@nsf.gov

Kei Koizumi

Assistant Director for Federal Research &
Development
White House Office of Science & Technology
Policy
Email: kkoizumi@ostp.eop.gov

Marnie LaVigne

Associate Vice President of Economic
Development
University of Buffalo
Email: lavigne2@buffalo.edu

David Malakoff

News Writer, Science Magazine
American Association for the Advancement of
Science
Email: dmalakof@aaas.org

Cameron McCoy

Executive Director, Corporate Engagement
Office
University of Oklahoma
Email: cmccoy@ou.edu

Stephen Merrill

Executive Director
Board on Science, Technology & Economic
Policy
National Academy of Sciences
Email: smerrill@nas.edu

Gene Merrell

Associate Vice President for Economic
Development
University of Idaho
Email: gmerrell@uidaho.edu

Mark Milutinovich

Program Director, Research Competitiveness
Program
American Association for the Advancement of
Science
Email: mmilutin@aaas.org

Afroze Mohammed

Associate Director of Strategic Alliances
Office of Economic Development
Virginia Tech National Capital Region
Email: afroze@vt.edu

Barry Moore

Emeritus Reader in Economics
University of Cambridge
Email: bcm1@cam.ac.uk

Jeri Mulrow

Program Director
Information and Technology Services, NCSSES
National Science Foundation
Email: jmulrow@nsf.gov

Chris Mustain

Vice President
Council on Competitiveness
Email: CMustain@compete.org

Brandi Parker

Senior Policy Advisor
U.S. Department of Commerce
Economic Development Administration
Email: brandi.parker@uspto.gov

Marvin Parnes

Associate Vice President for Research
University of Michigan
Email: mgparnes@umich.edu

Christopher Pece

Senior Analyst
National Center for Science and Engineering
Statistics
National Science Foundation
Email: cpece@nsf.gov

Pete Pellerito

Senior Policy Consultant
State Economic Development and University
Relations
Biotechnology Industry Organization
Email: ppellerito@bio.org

Sean Pool

Managing Editor, Policy Analyst
Center for American Progress
Email: spool@americanprogress.org

Michael Ransom

Associate Director
Office of Corporate & Institutional Partnerships
Carnegie Mellon University
Email: mransom@cmu.edu

Andrew Reamer

Research Professor, Institute of Public Policy
George Washington University
Email: areamer@gwu.edu

Kacy Redd

Associate Director
Science & Mathematics Education Policy
APLU
Email: kredd@aplu.org

Diana Robinson

Director, Center for Governmental Studies
Northern Illinois University
Email: drobinson@niu.edu

Marty Romitti

Senior Vice President
Center for Regional Economic Competitiveness
(CREC)
Email: mromitti@crec.net

Joshua Rosenbloom

Program Director, Science of Science and
Innovation Policy
National Science Foundation
Email: jrosenb@nsf.gov

Bob Samors

Senior Consultant
APLU
Email: rsamors@aplu.org

Arjun Sanga

Assistant Vice President, Technology Transfer
and Executive Director, South Texas Technology
Management, University of Texas
Email: sanga@uthscsa.edu

Susan Shows

Senior Vice President
Georgia Research Alliance
Email: sshows@gra.org

Phillip Singerman

Associate Director for Innovation and Industry
Services
National Institute of Standards & Technology
Email: phillip.singerman@nist.gov

Mark Skinner

Vice President
State Science and Technology Institute
Email: skinner@ssti.org

Miron Straf

Deputy Director, Division of Behavioral and
Social Sciences and Education
The National Academies
Email: mstraf@nas.edu

Martha Taylor

Assistant Vice President for Research
Auburn University
Email: taylomm@auburn.edu

Josh Trapani

Senior Policy Analyst
Association of American Universities
Email: Josh_Trapani@aau.edu

Mel Ustad

Director of Commercialization
State of South Dakota
Email: Mel.Ustad@state.sd.us

Ayoko Vias

Administrative Assistant
APLU
Email: avias@aplu.org

Caroline Whitacre

Vice President for Research
The Ohio State University
Email: whitacre.3.osu.edu

Rhea Williamson

Dean, Office of Research and Sponsored
Programs
Humboldt State University
Email: Rhea.Williamson@humboldt.edu

Susan Winter

Science Advisor, SBE
National Science Foundation
Email: swinter@nsf.gov

David Winwood

Chief Executive Officer, UAB Research
Foundation
and Senior Associate Vice President for
Economic Development and Innovation
Alliances, University of Alabama at Birmingham
Email: winwood@uab.edu

Jim Woodell

Director of Innovation & Technology Policy
APLU
Email: jwoodell@aplu.org

Steve Wyatt, J.D.

Vice Provost for Economic Development
University of Missouri
Email: wyattR@missouri.edu

Paul Zielinski

Director, Technology Partnerships Office
National Institute of Standards & Technology
Email: paul.zielinski@nist.gov