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Oregon's Research Universities Propose A Partnership for Innovation and Competitiveness

Summary

Over the past decade, Oregon has achieved great returns on modest investments that link its four research universities (Oregon State, University of Oregon, Portland State, and Oregon Health and Science University) with established industries and new businesses. The Oregon Innovation Council (Oregon InC) and its three signature research centers (SRCs) that focus on nanoscience (ONAMI), biotechnology (OTRADI) and environmental technology (BEST) have achieved a return of seven dollars for every dollar invested by the Legislature.

Nonetheless, the demands of cutting-edge science and competitive industries require a continual upgrading of capacity and expansion of business support and incubation efforts. To address these needs, Oregon's research universities propose a Partnership for Innovation and Competitiveness to:

1. Develop high-speed computer networking capacity among the four research universities to foster collaboration, enhance ongoing research activities dependent on data analytics and provide the scale needed to compete with other states in the rapidly developing world of "Big Data".
2. Expand a distributed network of business incubation and acceleration facilities associated with the state's research universities.
3. Upgrade and update the metals manufacturing industry through stronger research and operational ties to university faculty and students.
4. Build partnerships between the metals and IT industries to design more efficient and cost-effective manufacturing processes.
5. Better support private sector partners and job creation by connecting the state's five Regional Solutions Centers.

This proposal consists of three, coordinated initiatives:

1. An Oregon Research Collaboratory to insure that Oregon's public and private sector researchers match rival states in their access to the latest computer networking technology and can maximize the potential of data analytics (now popularly known as "Big Data") in their fields of research and industry.
2. An Oregon Regional Accelerator and Innovation Network (OREGON RAIN), to be based in the South Willamette Valley, in order to coordinate and leverage the research activities of UO, OSU, Oregon InC and the three SRCs to advance the formation, growth and retention of technology-based startups.
3. An expansion of the Oregon Metals Initiative, to provide better linkages between the metals industry and university researchers, support the development of computationally enhanced manufacturing (another aspect of the potential for "Big Data") and bolster a proposal for \$60 million in federal funds to establish an Oregon-based node in the new National Manufacturing Institute Network.

These focus areas have been selected because, taken together, they offer the fastest path to the creation of high wage, technology-related jobs in Oregon, harness the collective power of our public universities, and have the greatest potential to leverage external dollars for Oregon. The investments proposed herein have been scaled to meet time-sensitive needs with an initial commitment of \$15.5 million in the 2013-15 biennium.

Background

Oregon has a well-deserved reputation for policy innovation, from health care to land use planning to forest management. Over the past decade, Oregon's political, corporate, and academic leadership invested in a novel collaborative agenda by creating Oregon InC and its three SRCs. By providing grants and facilities that link Oregon's research universities with established industries and startups, Oregon InC has yielded the state a return of over seven dollars for every dollar invested by the Legislature. Oregon InC's budgetary request of \$24M for the 2013-15 biennium will build on the success of the three SRCs in nanoscience (ONAMI), biotechnology (OTRADI), and environmental technology (BEST), and add new investments in wave energy, unmanned aerial vehicles, and digital media.

The four research universities, geographically clustered at the northern and southern ends of the Willamette Valley, are powerful economic engines, with FY2012 research expenditures of over \$425M in the north and \$400M in the south. A growing portion of this research funding has come in the form of large federal grants to two or more of the universities. For instance, the Center for Sustainable Materials Chemistry of the UO and OSU received \$20M from the National Science Foundation (NSF); NSF's \$19M Center for Coastal Margin Observation and Prediction involves OHSU, OSU, and PSU; and the U.S. Department of Transportation's \$16M Oregon Transportation Research and Education Consortium includes PSU, UO, and OSU. Besides promoting research at the state's universities, the three SRCs themselves received a prestigious \$1M grant from the U.S. Department of Commerce in 2011. A further example of inter-university partnership, the Collaborative Life Science Building, nearing completion at OHSU's Schnitzer Campus, will be the most advanced research facility in the state, and will bring together researchers, teachers and students from OHSU, PSU and OSU.

New Opportunities

We now seek to expand upon these earlier successes by Oregon InC, the research universities, and their partners, through the following three new initiatives.

Upgrade to Oregon's IT Infrastructure:

All of the Oregon-based innovation drivers described above, including the SRCs, multimillion-dollar multi-institutional research grants, the enhanced Metals Manufacturing partnership, the OREGON RAIN, and existing incubation facilities in Portland, rely critically upon high-speed communication to remain competitive. Still,

Oregon has not kept pace with neighboring states in designing, building, and maintaining state-of-the-art information technology networking and real-time decision support systems. Our ability to grow and retain innovation-driven companies is now threatened by bottlenecks in the flow of information. The next generation of breakthrough research in the fields supported by the SRCs (bioscience, sustainability, and materials science), and other fields of critical importance to our region's economy, will require ultrafast transfer, sharing and analysis of massive datasets. Videoconferencing and high-speed data access are essential tools for incubating new technology-oriented companies outside of major metropolitan areas like Portland. Our neighboring states of California and Washington have made major, ongoing investments to assure that their researchers can reach global collaborators, data repositories, and analytical tools as rapidly as possible. Without comparable outlays, Oregon falls further behind every year, threatening our ability to retain top talent, make the most impactful discoveries, claim intellectual property, and translate these assets into products and jobs.

We propose a three-step remedy to this situation through upgrading the IT connectivity of Oregon's four research universities and their statewide partners:

- 1) A substantial planning exercise analyzing and building upon the lessons learned by other states and regions that have upgraded their computing infrastructure as part of larger economic development strategies;
- 2) Initial pilot projects to (a) link OHSU's Center for Spatial Systems Biomedicine in the Collaborative Life Science Building with PSU's Computer Science Department and the nearby PSBA and OBI, and (b) connect OSU, UO and the companies and labs in the OREGON RAIN incubation facilities; and
- 3) A longer term implementation of a full statewide IT network that would let our businesses, universities, and agencies tap into national and global high speed systems, based on the plan developed in (1).

We are requesting \$4.6M (\$4.0M in capital and \$0.6M in operations) to start this major effort to develop the Oregon Research Collaboratory.

The intent would be to then design and implement a more comprehensive statewide IT solution to speed access to regional, national and global networks for all of Oregon's companies, universities, and agencies, coupled with specific new tools to foster more collaborations among the state's researchers, and affect a more competitive system of research capabilities within the state. Full funding for this infrastructure would be sought in future biennia from a mix of public and private sector sources.

South Willamette Valley Accelerator (OREGON RAIN):

In addition to the direct benefits of the research sponsored by the SRCs, the collaborative environment they have fostered has also led to the growth of two incubation facilities adjacent to PSU and OHSU — the Portland State Business Accelerator (PSBA) and

OTRADI's Business Incubator (OBI) — which have spawned startup companies and strengthened economic development clusters throughout the region and state. Once established, the OREGON RAIN would form a southern counterpart to the Portland-based innovation cluster, with primary components located adjacent to UO in Eugene and OSU in Corvallis. This effort will build upon a record of creating more than 45 spinout companies and 600 jobs over the last 10 years in the South Willamette Valley. By first linking these two South Willamette centers, and eventually connecting all four, Oregon would have a powerful, distributed network of business acceleration facilities, services, and staff expertise that could collectively generate new discoveries, research grants, intellectual property, startup companies, and high paying jobs. The expected outcome is a tripling in new business and job creation in this region of the state alone.

We are requesting \$7.5M (\$2.5M operations and \$5.0M capital) for the 2013-2015 biennium including \$5M for facilities acquisition and improvement in Eugene and Corvallis, \$2M for staffing, including student interns, and \$0.5M for business program development.

Metals Manufacturing:

Oregon retains one of the most dynamic metals manufacturing industry clusters in the nation, and they currently have research collaborations with OSU, PSU, and Oregon Institute of Technology through the Oregon Metals Initiative (OMI), a public-private-academic partnership. OMI has recently started discussions with Intel, IBM, and other regional IT leaders, as well as with the Pacific Northwest National Laboratory and Boeing, about using sensors and “big data” analytics to greatly enhance the efficiency with which manufacturers and their suppliers consume electricity, water, and scarce materials. New, more sustainable manufacturing practices could in turn open the door for the expansion of existing companies and the launch of new ones. These concepts could be used to create a new, Oregon-based node in the National Manufacturing Institute Network, a \$1B initiative launched last year by President Obama.

We are requesting \$3.4M (\$2.4M operations and \$1.0M capital) in the 2013-2015 biennium, to hire metals-related faculty, launch corporate-driven research projects, and upgrade testing equipment at the state universities, all of which could increase the competitiveness of a \$60M Manufacturing Institute proposal as well as regional industries.

Long-term benefits of these investments

We have outlined a package of three new investments intended to jump-start innovation-based economic development across Oregon. These components are complementary to the state's ongoing support for the Oregon Innovation Council, and take advantage of time-sensitive opportunities. If successful, these initiatives would position Oregon to:

1. Upgrade and update the metals manufacturing industry through stronger research and operational ties to faculty and students in the state's universities, leading to

improved products, profitability, and more competitive graduates entering the workforce.

2. Use partnerships between the Metals and IT industries to design much more efficient and cost-effective, next-generation manufacturing processes, which could form the basis for a \$60M region-wide proposal to create a node in the new National Manufacturing Institute Network.
3. Have a distributed and networked pipeline of business incubation and acceleration facilities associated with the state's research universities, allowing new companies to form, grow, and move within the state as their needs and markets evolve.
4. Use high-speed computer networking to shape its four research universities into an integrated and agile web of complementary skills, spinning out new companies and graduates that are more competitive with more populous and wealthy states, while generating larger and more successful grant applications.
5. Connect the five Regional Solutions Centers to each other and to public and private sector partners throughout the state to facilitate computer-enhanced decision-making about complex policy issues.

With these initial investments, Oregon can be better poised to create high-wage jobs, fill a major research infrastructure need that allows our universities to be more competitive in seeking external funding through collaboration, and lay the foundation for future scalability of essential projects.

