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## Transforming Oregon

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### INTRODUCTION

Oregon is a small state (250,000 km<sup>2</sup>) with a small population (3.9 million citizens). It's bordered by California to the south and Washington State to the north, both larger states with more diverse industry and employment bases. Historically, agriculture, timber, and mining have been Oregon's biggest employment and export sources.

Oregon has a unique geography with lush forests from its Pacific Ocean coast to the Cascade Mountain range running down its center, and more arid climates east of the Cascade Range. The timber industry, logging and sawmills, thrived in Oregon since the beginning of its statehood and through the 1970's providing Oregonians with above-average-wage jobs and a strong export economy. Environmental laws, both state and national, caused a steep decline in timber harvesting and lumber production in the 1970's, and Oregon's citizens and government realized that new industries needed to be grown and pursued to maintain an adequate standard of living and tax revenues.

Discussions started in the early 1980's led to a number of private and public initiatives to take advantage of new technologies that could potentially become the foundation of a new economy. The state did have a number of high-technology firms with a substantial presence, including Hewlett

Packard, Tektronix, and later Intel Corporation. It also had a number of strong research universities including Oregon State University, the University of Oregon, and Oregon Health Sciences University. Recognizing these resources, discussion groups convened and various plans were proposed and evolved to increase the entrepreneurial startup creation in the state. This paper focuses on those key efforts that involved public funding as part of this overall effort and the valorization of research within the state.

### OREGON RESEARCH AND TECHNOLOGY DEVELOPMENT ACCOUNT (ORTDA)

ORTDA, under a different name, was created in 1986 by the Oregon State Legislature as a government venture-capital entity run by state employees, funded by proceeds from the Oregon Lottery (state-sponsored gambling) of \$ 12.3 million, and focused on commercializing research at Oregon's universities. It was troubled during its life by legal challenges from within the state itself over the state's ability to hold private equities (it can't, by statute), privatized, and went through several further changes and challenges before the remaining assets were eventually transferred to the fund co-managed by the author, Northwest Technology Ventures.

Despite this turmoil, ORTDA (and its variously named incarnations) was successful by several measures. It funded 50 companies, 21 of which were university spinoffs and over 40 % were outside the major Portland (Oregon) urban region, and employment in these companies peaked at 1600 jobs. Over \$ 290 million was raised in follow-on financing by these 50 companies, and the value of the Portfolio peaked at over \$ 32 million. Unfortunately, a final legal challenge from

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the state froze ORTDA's assets at an inflection point in the stock market and the state realized only about \$ 6 million in distributions before the remaining assets, valued at under \$ 1 million, were transferred to the author's venture fund.

This is a cautionary tale for governments anywhere in providing venture funding. By its nature venture funding is a long-term endeavor to fully realize value and accomplish broader economic development goals. During the timeframe of venture-funded investments before a return is realized, government undergoes changes to elected leaders, administrative goals and structure, and strategic imperatives. These political and administrative instabilities must be considered at the time of the original investment and the venture activity isolated to the extent possible in order to fully accomplish originally established goals. Oregon's leaders learned from the ORTDA experience and later established a funding entity called the Oregon Growth Account that invested in new and pre-existing private venture firms, rather than directly into companies, with a strict requirement of return on investment within the context of broader economic development goals for Oregon.

### **OREGON GROWTH ACCOUNT (OGA)<sup>1</sup>**

In 1995 the State of Oregon launched the Oregon Growth Account (OGA) to stimulate venture capital investment in Oregon. Funding of the OGA comes from a percentage of the Oregon State Lottery proceeds. Investments made by the OGA are in the form of limited-partnership (LP) interests in new or pre-existing venture capital funds with the stipulation that at a minimum the state money invested in those funds be invested within the state of Oregon. If a company moves outside of Oregon after initial funding the venture firms can continue to invest. Investment decisions are made entirely by the individual investment firms and the funds are held accountable for their return on investment, although economic development results are monitored as well and used for political support.

The OGA is managed by a board of citizens appointed by Oregon's governor and chaired by the Oregon State Treasurer. All limited-partnership interests are housed in a

state-created endowment fund which is constitutionally allowed to hold private equities, whereas the state of Oregon is unable to do so.

The initial concept for the OGA was to invest in early-stage venture funds with the intention of creating more start-up companies in Oregon, as well as furthering the commercialization of university research in the state. Early investments were of this sort, including the author's fund, Northwest Technology Ventures, funded in 2002 and focused on commercializing university research in engineering, software, and biotechnology. As the startup climate improved, the OGA extended their funding to firms specializing in later-stage, venture growth and buyout funding. Recently, after the success of the early-stage Oregon Angel Fund, a contractually bound group of wealthy individuals, the OGA became an investor in this annually-raised fund as well.

During its 17-year lifetime the OGA has invested more than \$ 75 million in 27 venture fund entities and estimates that their investments have lead to annual cumulative employee payrolls in Oregon of \$ 86 million/year. The financial returns of the fund's individual investments have varied from complete write-offs to positive returns, with the aggregate return, distributions of cash or stock plus current portfolio values, in the negative single digits. These numbers are in line with U.S. venture-fund performance in the last decade, where the recessions adversely affected individual company performance and exits (generally asset sales or mergers). This return does not include the state income tax paid by portfolio company employees, or corporate income taxes.

In 2013 the OGA's assets will transition to a new government-created entity created under the Oregon Investment Act, which will aggregate other business funding vehicles, such as debt and tax credits, currently offered by other government entities for economic development.

### **OREGON INNOVATION COUNCIL (OREGON INC)<sup>2</sup>**

With the support of the Oregon University System, Oregon business leaders, university representatives, and Oregon state legislators had been meeting for several years as the Oregon

<sup>1</sup> [www.oregon.gov/treasury/](http://www.oregon.gov/treasury/)

<sup>2</sup> [www.oregon4biz.com/](http://www.oregon4biz.com/)

Council on Knowledge and Economic Development, with a focus on creating the incentives and infrastructure for knowledge-driven economic development. This group was later formalized as the Oregon Innovation Council (Oregon InC) in 2005 and is funded by state government. One of their goals was to identify areas where Oregon's research universities could collaboratively focus their resources in ways that would attract additional funding to reach a critical mass of research and resultant company formation in areas of importance to Oregon. Three "Signature Research Centers" developed as a result of these efforts and are operating today:

- Oregon Nanoscience and Microtechnologies Institute (ONAMI)
- Oregon Built Environment and Sustainable Technologies Center (BEST)
- Oregon Translational Research and Drug Development Institute (OTRADI)

In addition to these research centers, several industry initiatives were defined and those operating today are: Oregon Wave Energy Trust (OWET); Drive Oregon; and the Food Innovation Center operated by Oregon State University.

Since its inception, Oregon InC's initiatives have raised over \$ 300 million in federal and private grant funding, leveraging funds provided by the Oregon legislature at a ratio of over 7:1. An audit committee within Oregon InC examines results from their various initiatives, compares these results to original goals, and using various result metrics recommends continued support and further funding as warranted. The overall results of Oregon InC's efforts have met and exceeded original expectations, and won consistent support from Oregon's legislators and governor.

Likely of most interest to the readers of this paper is ONAMI, the first of Oregon InC's signature research centers and the most evolved in its structure, university co-operation, and physical and virtual valorization facilities. ONAMI has been cited as a model for economic and research development throughout the United States.

## **OREGON NANOSCIENCE AND MICROTECHNOLOGIES INSTITUTE (ONAMI)<sup>3</sup>**

<sup>3</sup> [www.onami.us](http://www.onami.us)

ONAMI was created in 2003 and developed around existing facilities and research centers within the state university system, falling under Oregon InC's oversight in 2005. ONAMI is organized as a non-profit entity and has a number of components in its business model, which include:

- Physical facilities for research and incubation
- Access to laboratory facilities and researchers within Oregon and outside the state
- Grant funding for research within Oregon's universities and for university technology commercialization
- Entrepreneurs-in-residence to facilitate the commercialization process
- Assistance in procuring federal research and small-business grants
- Sponsoring outreach events to share research results and connect with industry
- Assisting affiliated companies find suitable private and venture financing

ONAMI's headquarters facility is the Microproducts Breakthrough Institute (MBI) in Corvallis, Oregon near the Oregon State University (OSU) and situated within a building donated by Hewlett-Packard on their Corvallis industrial complex. This facility was created as a joint venture between OSU and the Pacific Northwest National Laboratory (PNNL) in eastern Washington State. The MBI offers extensive facilities, including a machine shop as well as prototyping facilities for micro-channel device fabrication and analysis, and office facilities.

Other ONAMI facilities include:

- The Center for Advanced Materials Characterization (CAMCOR), located on the University of Oregon campus in Eugene, Oregon, and offering nano material synthesis and analysis capabilities
- The Center for Electron Microscopy and Nanofabrication (CEMN) located on the Portland State University campus in Portland, Oregon
- The Oregon State University Electron Microscopy and Imaging Facility in Corvallis, Oregon

All of these facilities, and many of the researchers supporting them, can be accessed through ONAMI on a reasonable

fee-for-service basis for new and established Oregon companies. Where new business entities have been formed to commercialize Oregon-based university research, ONAMI offers grants to prove out commercial possibilities using their facilities and researcher network.

ONAMI has been widely cited as national model for state innovation-based economic development investments. Since Oregon is neither a large nor wealthy state the resources available to ONAMI have been comparatively modest: \$ 20 million in capital construction funds (although that amount was more than matched by industry and philanthropic contributions) and \$ 27 million in operating funds (including \$ 5 million appropriated for FY 12-13). These have been invested in research capacity, shared-user facilities and assistance to early-stage technology companies with specific economic development outcomes (revenue to state-based entities, high-wage job creation/retention, attractiveness to industry and funds considering Oregon investments).

Selected examples of ONAMI outcomes to date are:

1. Federal and private research dollars leveraged  
= \$273 million

Annual nanoscience and microtechnology research awards to ONAMI members from Federal and private sources have risen from \$ 9 million in FY 2004 before ONAMI was incorporated, to a high of \$ 42 million (net of intra-Oregon subcontracts) in FY 2010. The total net research awards from FY 2005 through FY 2012 exceed \$ 238 million. In addition, industry and private entities have made significant donations of equipment, facilities and services, exceeding \$ 35 million.

2. Number of business start-ups  
= 31 Funding = \$ 108 million

The ONAMI Gap Grants program matches technology from the Universities with entrepreneurial expertise from the business community. Grants up to \$ 250,000 are provided after a rigorous review process of seasoned business and technology professionals. To date, Gap Grants have been made to 31 University - Startup projects. These entrepreneurial projects have garnered over \$ 114 million

in venture and capital funding (\$ 14 million federal and \$ 100 million private). This compares to a total ONAMI expenditure of \$ 6.6 million over the same period (FY 2006 – FY 2012).

3. Number of people employed (not including research growth impact) = 115

As of June 2012, there were 115 full-time-equivalent jobs reported by the Gap Grant companies. This figure continues to grow, especially due to the success of several gap companies that have received A-round funding or are positioned to do so in the near future.

4. Total leveraged revenue and investment to-date  
= \$ 387 million

Federal and Private Research Awards to ONAMI members \$ 238 million  
(including \$ 55 million in Federal earmarks/ Presidential budget items)

External capital and SBIR grants to Gap Grant companies \$ 108 million

Major Corporate Gifts (equipment, facilities, and services) >\$ 35 million

5. Patents = 43

Since 2005, ONAMI Member Researchers have filed 294 Invention Disclosures and received 43 Patents in nanoscience or microtechnology. Licenses and licensing revenue are also climbing.

ONAMI's single largest commercialization success to date has been Home Dialysis Plus, a startup that developed a micro-channel dialysis blood filtration system at OSU with gap funding from ONAMI, and raised over \$ 50 million in equity funding from a syndicate of large venture capital firms.

## PORTLAND STATE BUSINESS ACCELERATOR<sup>4</sup>

<sup>4</sup> [www.pdx.edu/accelerator/](http://www.pdx.edu/accelerator/)

In 2005 Portland State University (PSU) opened its business accelerator in Portland Oregon to provide incubation space for businesses created from PSU research. The 36,000 ft<sup>2</sup> building had been purchased through PSU's foundation and leased back to the university on favorable terms. Originally, the building was the home of an architectural firm and had no laboratory space. The Portland Development Commission, a local government-run entity devoted to economic development, provided funding to add wet labs in order to house biotech and chemistry-based startups.

The number of businesses created from PSU research proved too meager to support the building and the below-market leases it needed to offer, and the space was opened to the community at large. Currently, the accelerator is fully leased with 30 companies and over 200 employees on site. It regularly hosts events for the investor community to receive presentations from its tenants, and is the center for many regional entrepreneurial events.

Selection of tenants is based on a preference for companies using science-based technology or software information technology. The applicant should be a start-up company or one that is less than 5 years old and can get to a software product within 24 months or a bioscience product within 36-48 months.

Companies currently being incubated include wet-lab users, like DesignMedix, a PSU-research-derived start-up developing malaria therapeutic drugs and Floragenex, a genomics analysis company that originally was a spinoff of the University of Oregon. Both of these firms were funded in part by the author's venture firm, Northwest Technology Ventures.

Other tenants include companies like APDM developing accelerometer-based systems for analyzing walking gait of patients using digital-signal processing technology developed by PSU professors, and Lifecom, using artificial intelligence software for medical and clinical diagnosis.

The success of the accelerator is due to several key factors: a manager who is also affiliated with a venture capital firm and tightly connected with the funding and local entrepreneurial community; a university with a strong business school and entrepreneurial vision; and a supportive business and government community.

## PORTLAND SEED FUND<sup>5</sup>

In 2011 the city of Portland decided to create a small seed fund for its growing startup companies in the region. Portland has a strong entrepreneurial software community, particularly in the mobile and internet spaces. Using a process of formal Request for Proposal, they chose a manager based on their proposal to use small amounts of money to seed a large number of startups. The managers looked at similar funding models, like "Techstars" and "Y Combinator," and created a model they felt suited the Portland environment of entrepreneurs, angel investors, business mentors, and venture capital community.

The seed fund's structure is similar to conventional venture capital firms, with the two managers in a general partnership and the investors as limited partners. One manager had a strong background in venture capital and the other was a well-known consultant to local startup companies who also managed the Portland State Business Accelerator. Instead of investing as a limited partner to the fund, the city donated \$ 700,000 to the non-profit Oregon Entrepreneurs Network (OEN), which then invested those funds with the managers as a limited partner. The city also granted \$ 140,000 to the general partnership to get the fund launched. By allowing the OEN to be the limited partner rather than the city, the city hopes that the OEN, well known and highly regarded statewide, will reap the fund's returns and expand its services and outreach. Another local city also participated, along with the Oregon Growth Account and private investors, raising a total of \$ 3 million.

The fund's investment model is to solicit proposals from prospective startups and select 7-8 companies at a time. These are regarded as a "class" and presented to the investment and mentoring community in public events where they present their businesses. Four classes over two years should result in at least 25 funded during the 2-year investment period of the fund, which has a 7-year life. Initial investments are only \$ 25,000 in the form of a convertible note, with the fund retaining another \$ 50,000 in reserves for each company.

A key component of the fund's model is to subject each selected company to an intense, 4-month mentoring program by seasoned business executives who are often also

<sup>5</sup> [www.portlandseedfund.com](http://www.portlandseedfund.com)

angel investors in the fund. This 4-month period also includes visits to successful companies that can impart useful knowledge to the new company. After this period both the company, which may have modified its business plan as a result of this intense education, and the investors have better insights into the company's future and likely success.

Although the initial funding is small by most funding standards, the young, usually software entrepreneurs have embraced the fund's model strongly. Through the networks of the fund managers, all have found a suitable facility or incubator for their operations, and the 17 companies currently active in the fund have raised a total of \$ 16 million in additional funding to date. In fact, the response to this fund has been so strong that a second fund is contemplated, raising \$ 5 million in 2013 using the same model.

## OTHER OREGON ENTITIES

Valorization of university research in Oregon is aided by the University Venture Development Fund (UVDF). This fund provides state income tax credits to donors that support the commercialization of university research at Oregon's various universities, for example at Oregon State University [<http://campaignforosu.org/uvdf/>].

The Oregon Investment Fund [<http://www.oregoninvestmentfund.com/>] directs a portion of Oregon's public employee pension fund into various private venture-capital funds with the stipulation that they establish a presence in Oregon. The fund also can invest directly in promising companies alongside funded venture-capital firms.

The non-profit Oregon Entrepreneurs Network (OEN) [[www.oen.org](http://www.oen.org)] has been a key entity in creating Oregon's entrepreneurial culture and mobilizing resources to support many of the initiatives outlined in this paper. Started in 1991 as one of the 20 worldwide chapters of the MIT Enterprise Forum the organization grew to become the largest chapter outside of MIT. It is now independent, and has continued to grow and merge with other organizations to become a statewide supporter of entrepreneurs and related events and networking opportunities. The OEN is responsible for Oregon Angel events held annually at various cities around the state where promising, pre-selected startups pitch to the investor crowds, and investments are awarded to winning presentations.

The Oregon Angel Fund [[www.oregonangelfund.com](http://www.oregonangelfund.com)] was

created through the OEN in 2007. This formally organized group of 60+ angel investors, each of whom make annual cash commitments to the fund totaling \$ 3 million in 2012, receive presentations from both startup and growth-stage companies. The members decide as a group which companies to invest in and the amount, which can range up to \$ 850,000 for a single investment. No reserve is made for follow-on investments; any follow-on investment in a prior year's portfolio company must be reviewed as any new investment is. The fund has been sufficiently successful that it has attracted financial investment from other entities, including the public-funded Oregon Growth Account (OGA) discussed earlier. Several university spin-out companies are part of the current OAF portfolio.

The Oregon Technology Business Center (OTBC) [[www.otbc.org](http://www.otbc.org)] started as an initiative of the city of Beaverton, adjacent to Portland, and currently provides incubator facilities, mentoring, and events for aspiring entrepreneurs, as well as networked connections to the funding communities.

Portland is the worldwide headquarters of Wieden+Kennedy, an international advertising and communications giant with multi-national clients like Nike and Coca Cola. W+K sponsors an incubator in Portland called "PIE" [[www.wk.com](http://www.wk.com)] with a mission to create "tech-fueled cultural disruptions." It's been well received by current tenants and has a long waiting list of hopeful entrepreneurs.

## RESULTS

The instigation for many of the entities described in this paper resulted, as stated earlier, from environmental laws which precipitated a decline in Oregon's timber industry, and the jobs associated with it, beginning in the late 1970's. Then the timber industry averaged about 12 % of Oregon's Gross Domestic Product (GDP), which has declined to 5.3 % today. High technology industries – semiconductor, electronics, software, and biotechnology – were modest then and today account for 15 % of Oregon's GDP. Many factors are involved in this transformation, but certainly Oregon's strong response in creating and encouraging entrepreneurial activities and venture capital sources played a major role. Most of these high technology jobs have, however, been developed in Oregon's cities whereas timber jobs were largely rural. As a result, rural portions of Oregon have yet to

recover their timber-era employment and prosperity.

University spinoffs were virtually unknown in the 1970's in Oregon. The enactment by the federal government of the Bayh-Dole act in 1980 gave universities intellectual property ownership of federally-funded intellectual property (IP). The impetus to commercialize university inventions that resulted, combined with many of Oregon entities described in this paper, have lead to a major presence of university spinoffs in Oregon today, which number:

- 25 in bioscience and healthcare
- 4 in water purification and management
- 9 in energy production or management
- 10 in nanotechnology
- 5 in software

These 53 operating spinoffs will continue to grow in number as new Oregon InC initiatives gain maturity, along with developing plans for more incubation at Oregon's major universities.

The local availability of venture capital to Oregon startups has dramatically grown in the last 30 years, and most startups here will have an opportunity to present their proposed businesses to multiple investor groups, both angel and institutional venture capital firms. Not all startups get (or deserve) funding, of course, and those that don't often complain about the lack of funding availability, but that will always be so no matter how much funding is available. It is true that major out-of-state venture capital firms are not well represented in Oregon, and aren't likely to be until Oregon begins to consistently create firms demonstrating large investor returns. That will take time, but at least the startup "seeds" for that success are now in abundant supply in Oregon.

## SUMMARY OBSERVATIONS

Oregon's transformation has strong "grass roots" origins. It has come largely from prominent individuals who, through organizations and educational events, were able to encourage state and local government support, leading to the extensive government involvement in many of the funding entities discussed in this paper. Oregon's government priorities have largely been associated with environmental, K-12 education, and social issues, rather than business development, so a "bottoms up," grass-roots approach was required. While it

was ultimately successful, it took longer to realize and was more subject to political changes. It did, however, develop a strong, collaborative group of diverse supporters which kept pushing their agenda despite political setbacks and remain strong and growing today.

In the author's past he was living in Colorado and managing a semiconductor design and manufacturing facility. As a high-tech executive he was asked to take part in the forming the Colorado Advanced Technology Institute (CATI) in 1981 with the sponsorship of Colorado's then governor, Richard Lamm. This was a governor-driven mandate to create higher-education centers of excellence and promote valorization of university research. In contrast to Oregon this "top-down" effort moved quickly and without extensive political lobbying or resistance from the university system. In the author's opinion such a top-down approach is preferable where government leaders at the highest level can adopt economic transformation as their own goals and drive to make them happen. The potential downside of a "top-down" approach is where a change in political leadership allows reversals if the stakeholders are not solidly in support of the agendas. It appears that the ideal situation is where there is both "top-down" support and a strong "bottoms-up" coalition of supporters with common agendas, as happened in Colorado.

When contemplating new efforts to establish entrepreneurship and valorization momentum it's important to examine the available resources and design solutions that optimally harness those resources to achieve the desired result. Every geographical and cultural situation will be different and will require a good understanding of the individual resources and how they can be connected. Such resources and actions include:

- Identify leaders to bring proposals forward and create associations to help them
- Identify funding resources: government, venture firms, wealthy individuals, large businesses, foundations
- Identify unfulfilled funding needs and create structures to address them
- Identify university support: administration, research centers, business schools
- Organize a mentoring community
- Find business sponsors, e.g. legal and accounting firms
- Find support from current trade associations
- Identify philanthropists and philanthropic foundations
- Identify incubation mechanisms (virtual and physical) and

resources

Some or all of these resources will play a role, and perhaps others specific to a given locale or culture. Getting knowledgeable individuals to lead and organize the entrepreneurial efforts is essential, but the rewards can be substantial, as Oregon has demonstrated.

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