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Applying Research to the Market

An Overview of Technology Transfer in Washington State

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Introduction

New technology has accounted for much of Washington's economic growth. Many of our industrial icons—Boeing, Microsoft, and Amazon—have been born and nurtured by technology developments. Advances in aerospace, clean technology, agricultural practices, and information and communications technology have made the state a leader in innovation.

There is a wealth of knowledge and technology found in the state's public research institutions, investment in technology transfer programs within these organizations have generated great benefits. Over the past five years, academic, business, and legislative leaders in the state have come together in order to accelerate these programs like never before.

This report gives a brief overview of technology transfer, why it is important, and how the process might be enhanced in Washington State.

A Brief History of Technology Transfer

Technology transfer is the process by which research, knowledge, and technology move from the laboratory to the marketplace and society. Its main objective is to take these discoveries and innovations owned by the public and turn them into marketable products and services as efficiently as possible in order to benefit the public. These benefits take the form of new products, services, jobs, and companies.

Most public research within the United States comes from government-funded labs and from universities. Washington's major research institutions include the University of Washington (UW), Washington State University (WSU), the Pacific Northwest National Laboratory (PNNL), and the Fred Hutchinson Cancer Research Center. Since our report is done in tandem with the goals of the Washington Clean Technology Alliance, we have included overviews of the first three because of their powerful influence on clean technologies.

The process of modern technology transfer originated from the policies set by the Bayh-Dole Act. *The Economist* called the law "possibly the most inspired piece of legislation to be enacted in America over the past half-century." Passed by Congress in 1980, the goal of the Bayh-Dole Act was to encourage technology transfer and stimulate economic growth. The legislation contained a uniform patent policy that gave research institutions ownership and management of intellectual property that had been funded by federal research grants. The purpose was to encourage commercialization of new technologies, promote ventures, and put the U.S. back on the international playing field of innovation. The end result was an upwelling of patent applications, technology transfer offices (TTO), intellectual property licensing, and ventures founded (Phan, P. & Siegel, D., 2006).

Some of the benefits of the Bayh-Dole Act include (Loise, 2002):

- The rapid growth of technology industries anchored around research universities.
- The creation of 6,652 start-ups formed between 1980 to 2008, with 3,381 companies still operating at the end of 2008.
- Within the period of 1996 to 2007, 279,000 new jobs were created and $187 billion was added to the US GDP through university-licensed products.

While the Bayh-Dole Act has not infringed on the ability of academic researchers to conduct research, it has created the option for faculty to pursue the commercialization of their research.

Importance of Technology Transfer

Academic and business communities have increasingly come to value the benefits provided by robust technology transfer programs. They include:

- Revenue: Academic institutions have three overriding functions: teaching, research, and service. By connecting with the private sector, institutions have more opportunities to access resources that support these functions. Two easily measurable gains are licensing revenue and royalty fees. A survey of 183 U.S. research institutions performed by the Association of University Technology Managers (AUTM) in FY2010 recorded $2.4 billion from licenses (Zuhn, D., 2011). In 2009, Washington research universities received over $50 million in commercialization revenues (Rhoads, 2012).

- Reputation: Those three functions of academia are also augmented by building the institution's reputation. Although it may not be measurable, prestige in academic and business circles is extremely valuable. By providing world-class technology to the public, public research can attract and retain talented entrepreneurial staff. It will also draw the private sector to collaborate in research with the institution.

- Job Creation: Technology transfer programs can be great vehicles for job creation. Starting up new companies and supporting them until they can become fully independent is an important part of a dynamic economy. These programs also help create new products, services, and industries so existing companies can expand and stay current in their product and service offerings. The Biotechnology Industry Organization (BIO) determined that licensing of university IP created more than 279,000 jobs and contributed more than $82 billion to the U.S. GDP from 1996-2007 (Roessner, et. al., 2009).

- Benefits to Society: The innovations derived from federally funded research have impacted society on many different levels. Although they may not be economically quantifiable, their influence is unquestionable. University research has produced vaccines, diagnostic tests for breast cancer, and thousands of other health improvements. UW's labs produced an instrument that measures atmospheric haze (Holcomb, K., 2012) as well as the camera pill, making it possible for doctors to spot the earliest signs of cancer (Infoniac.com, 2011). In order to promote public awareness, AUTM publishes the Better World Project. This annual report highlights health, environmental, and other societal benefits that university technology transfer produces.

- Science and Business Relationships: One of the major challenges identified by those marketing innovations is the business and science communication barrier. A study assessing the productivity of TTO's cited one scientist who said:

> "Industry has a lack of understanding of what an academic institution does and a lack of understanding of what a university faculty member's responsibility is to their institution. There are some companies I don't even deal with because their approach to dealing with an academic entity is so poor. They feel that basically we owe them by our position at the university because the state pays our salaries" (Siegel, D., et. al., 2001).

TTO's encourage and improve business and science relationships. Examples include partnering experienced entrepreneurs with researchers who are interested in commercializing their product. This creates a synergy that multiplies as these relationships grow. The businessman can find new ways the product can succeed on the market and learn ways science influences industry. At the same time, the researcher can discover what types of technology the market desires. The partnerships are catalysts for innovation, providing more resources, perspectives, hiring opportunities, and new technology.

Models for Technology Transfer

Several different philosophies have emerged since the passage of the Bayh-Dole Act that research institutions have employed to accomplish their mission.

- Patent-to-Production Model: Company Starts - Although licensing and start-up companies are objectives for all, some TTO's make it their main focus. This model offers a variety of resources for inventors and entrepreneurs including funding opportunities, mentoring programs, patent filings, entrepreneurs-in-residence, and incubators for startup companies. Results tend to be higher numbers of disclosures, patent applications, and startup companies. The goal is to help researchers navigate to their goal of commercialization.

  The UW Center for Commercialization uses this strategy through a variety of entrepreneur-focused programs. Their regularly published metrics, the New Ventures Facility, and the "W" Fund all foster the spirit of commercialization both internally and externally. Another example is MIT's Technology License Office, which has a "Volume Strategy" that aims for maximal licenses and startups (Nelsen, 2011). MIT's mantra invites faculty, students, and industry to get involved and develop new technologies. A successful illustration of this model can be found in the development of Washington's biotech and medical device industry. Almost a third of the sector's firms in the state are founded from technology licensed from Washington research institutions (Washington Life Science, 2006).

- Land-Grant University Model: Disseminating Research through Strategic Partnerships - The tradition of Land-Grant Universities is to connect university research to the public. In this arrangement, business and academia collaborate on an agenda of projects relevant to the industry. A prime example of this service is the Cooperative Extension

System, in which local industries can work with a regional extension office to develop new technologies for their business. This model gives research centers insight into potential research directions that not only advance knowledge, but also benefit economic development. Both parties benefit from the research as well as the networking byproduct. Graduate students can meet future employees and firms can work alongside other participating companies.

WSU, Washington's largest land-grant university, partners with many local industries, especially agriculture, to expand and apply research. A leading example is Washington's wine industry, which has collaborated with WSU for more than 60 years. This $3 billion/year industry includes over 600 wineries, providing jobs and prestige for Washingtonians. Recognizing the value of their university partnership, the Washington Association of Wine Grape Growers has committed $7.4 million to a new WSU Wine Science Center Facility.

The Corporate Affiliates Program at UW is a similar example where industries can influence research and education, access the resumes of top quality students, and develop businesses. The Computer Science and Engineering program has an impressive list of members like Microsoft and Amazon. This program benefits the participating companies and the University, as well as adding value to one of Washington's major industries.

- The Man on the Moon Model: Focusing on an Objective - In the mid-to-late twentieth century, universities were inspired to focus research efforts towards victory in the space race. The same type of focus exists today in the War on Cancer, in which billions of public funding dollars for basic research go towards curing cancer. This includes $30 billion in federal research investment through the National Institutes of Health. Other rising visions are energy independence and clean energy. This type of resolution requires national, state, and regional long-term commitments. Research Institutions who

participate in this model usually have better access to funding opportunities to carry on their work through focused funding programs set up to achieve the national objective.

- World-Class Research Expertise: A Contracting Model - Research Institutions that are widely known for excelling in particular fields of study hold a unique position in the technology transfer realm. They are able to attract companies, faculty, and students that are interested in leading research within a particular expertise. The institution focuses on developing a proficiency that will attract intellectual assets, corporate partners, and prestige. In this case, TTO's will focus on managing intellectual property, research contracting, and managing relationships between the researcher and the company within the domain of the expertise. PNNL exemplifies this approach and offers a variety of contract models for companies to enter into with researchers.

The Big Three Research Institutions in Washington

Washington State has a variety of public research institutions, providing the state with a rich knowledge foundation. Three, in particular, are leaders in transferring their research through the market and into the hands of the public. The first two are the state's research universities, Washington State University and the University of Washington. The third is Pacific Northwest National Laboratory, operated by Battelle through a contract with the Department of Energy.

Washington State University

"The Washington State University Research Foundation (WSURF) is a non-profit Washington corporation whose mission is to facilitate the efficient transfer of technology, proprietary information, and inventions from Washington State University (WSU) to the private sector thus benefiting University, the inventors and society."

Washington State University continues to fulfill its mandate as a land grant university by providing accessibility and service to surrounding communities. One key way the university gives back to the public is through the Washington State University Research Foundation (WSURF), a non-profit organization that advances technology licensing and startup guidance for WSU innovators, as well as University-Industry collaborations.

- *Support Personnel:* The WSURF staff helps researchers with disclosing, patenting, marketing and either licensing or a starting a company with their invention. The team is led by interim executive director, Anson Fatland (Associate Vice President for Economic Development and External Affairs at WSU). The commercialization managers have notable backgrounds in physical, agricultural and life sciences. An associate director, fiscal analyst, federal reporting officer, and technology-licensing associate also enrich

the staff. In addition to this support team, eight Entrepreneurs-in-Residence (veteran industry experts) search for promising innovations to develop and market.

- *Start-up Funding and Gap Financing:* WSURF managers assist inventors in searching for grants and other funding opportunities, such as the Technology Gap Fund. This endowment comes from WSU and the Washington Research Foundation for promising innovations to reach the level where they can attract seed investment.
- *Facilities:* A major form of support for WSU innovators is found at the Research and Technology Park, located about a mile from the Pullman campus. The park hosts two technology transfer facilities for growing companies as well as incubator space for small startups. It is currently home to nineteen companies who can access research labs, computing centers, technical assistance, and communications technology.
- *Industry Relations*: Washington State University uses its extension services as a key way of connecting with Washington industries. Some examples of industry collaborations include the wood-plastic composites market, the tree fruit industry, wheat breeding, grape growers, and biofuels. WSU has research-extension centers in regions where the research is applicable. They also maintain an online search engine for technologies available for licensing. Once a technology is selected, standard agreements are available to speed along the process.

University of Washington: Center for Commercialization (C4C)

"To make the University of Washington the best place in the world to do research by providing unparalleled commercialization support to our entrepreneurial researchers."

The 2011 marked the first year that the University of Washington received over $1 billion in grant and contract research funding. The UW Center for Commercialization (C4C) is responsible for the effort to ensure that the innovations coming from these funds make their way to the market. In the fiscal year 2011, the C4C reported:

  - 356 Innovations disclosed (mostly engineering & medicine)
  - 9 Company start-ups
  - 336 Patent applications
  - 66 Patents awarded

- *Support Personnel:* The C4C has programs for researchers, industry leaders, and startups to help advance university technology transfer. The effort is led by, Vice Provost, Linden Rhoads, who directs teams for Industry Relations, Intellectual Property Management, New Ventures, and Technology Licensing. Other teams include Entrepreneurs-in-Residence (EIR) and the Entrepreneurial Faculty Fellows Program (EFFP). EIR's help identify and develop promising innovations for commercialization over the course of 6-9 months. The EFFP was founded in 2011 in order to recognize the top entrepreneurial researchers at the University. During their two-year terms, they advise other UW researchers and C4C programs for the advancement of entrepreneurial aspirations.
- *Start-up Funding and Gap Financing:* UW inventors are given an array of funding opportunities through the C4C. One source is the newly established W Fund, a venture fund created by UW. Launched in June 2012, the fund looks to invest $20 million over the next four years in startups from UW and other Washington research institutions. A variety of investors have partnered together including the Washington Research Foundation, venture capital firms, law firms, leading entrepreneurs, and more. The fund will include UW's Student Venture Associates in its investment process, providing the participants with valuable experience and skills in the financial industry. (DeSilver, D., 2012).

  Another option available through the C4C is Commercialization Gap Funding. Similar to WSU's Technology Gap Fund, this endowment is co-sponsored by Washington Research Foundation to help small companies develop enough to attract seed

investment. Grants of up to $50,000 are available, accompanied by a team of project management support and advisors.

Other funding includes various industry-specific awards/grants/competitions from the University and its partners. The C4C also aids with applications to state grants like the Life Sciences Discovery Fund and the Washington Research Foundation Gift Program, as well as the U.S. Small Business Administration grants.

- *Facilities:* Earlier this year, the C4C introduced its own business incubator as part an objective to double the number of UW spinout companies. The New Venture Facility not only provides space, but also educational events and roundtable discussions with industry leaders. The space will eventually be able to host 25 companies, creating an environment for knowledge spillover.
- *Industry Relations:* Companies interested in UW new technologies can search available technologies through the C4C website. An "as is" Express Licensing Program is available for those who wish to expedite the process. Another option for companies is to participate in Corporate Affiliate Programs. This structure provides participants with opportunities to collaborate with UW researchers as well as each other. Some benefits include updates on new technology, hiring faculty as consultants, access to research facilities, licensing intellectual property, and hiring future graduates.

The C4C also reaches out to the business community through an innovation showcase, co-hosted by the Washington-based Technology Alliance. This quarterly event features 3-6 presentations by innovators and is attended by a variety of investors, entrepreneurial leaders, and service providers.

In order to foster communication between science and business leaders, the C4C offers a Training Xchange program. This two-fold curriculum aids researchers in explaining and promoting their research. Corresponding training is given to business professionals who will be using the new developments.

Pacific Northwest National Laboratory

"We transform the world through courageous discovery and innovation"

The Pacific Northwest National Laboratory is operated by Battelle under contract with the US Department of Energy. As a consolidated government and private laboratory, PNNL is uniquely positioned to advance technology transfer.

- *Staff:* PNNL's Technology Transfer and Economic Development staffs are located with the Technology Deployment and Outreach office. The technology transfer team is composed of a variety industry veterans who provide successful interactions with those who wish to license PNNL and Battelle developed technology. The Economic Development Office helps regional and some national businesses advance in the technology economy. Examples of their services are technical support, alerting services for federal SBIR/SBTT funding, locating relevant government financing or private capital, and connecting mentors with those entering the industry.
- *Facilities***:** PNNL is part of the Tri-Cities Research District, which provides collaboration opportunities and fosters innovation. Located in Richland, WA, the district includes WSU-Tri-Cities, Port of Benton, leading engineering and construction firms, and a variety of other private businesses. This 1,700 acre mixed-use area features a high-tech business incubator, diverse laboratories, and offices.
- *Industry Relations:* PNNL offers a variety of options for collaborative research. Companies can choose from these agreements:

    - Cooperative Research & Development Agreement (CRADA)- Costs are shared and benefits both PNNL and its partner.
    - Direct Contract with Battelle- Company funds and deals directly with Battelle.
    - License Agreements
    - Technology Assistance Program- 40 hours of PNNL staff time annually.
    - User Facilities Agreement- Gives access to Department of Energy Laboratories

- Work for Others- Access to PNNL's capabilities, company gives full reimbursement of research cost.

Factors Contributing to Effective Technology Transfer

- Technology Transfer Office Staff: Innovation extends far beyond the confines of research labs. Finding a way to make that new knowledge accessible to the public is just as important as the initial discovery. In order for this process to be most effective, an experienced and diverse technology transfer office (TTO) team is necessary to take the science and turn it into a publicly accessible form.

  These are complex tasks. Staff must be outstanding in a variety of cutting edge, difficult, and technical competencies. Beyond the difficulty of dealing with a world-class technology that is the basis for a technology transfer transaction, business relations are a key priority. Contracts, startup funding, business startup complexities, legal issues, and technical communications are some of the typical issues that TTOs face.

  Acquiring and retaining quality staff is a resource intensive, continuous process. One-time indulgences that attract prestigious entrepreneurs and talented staff aren't enough. Rather, permanent funding and supportive teams are required to retain those innovators. TTO's staff should ensure faculty and students will not have to neglect their research or classes. With adequate funding and other resources, TTO's dramatically increase the institution's capacity for technology transfer.

- Campus Culture: Within academic cultures, the drivers for academic career advancement are very different from that of the private sector. The track to tenure rests on being a respected teacher, doing strong peer-reviewed research, and presenting the research through publications and conferences. The career path promotes extreme knowledge specialization within the peer group of the discipline. As one person explained it, within academia "prestige is the highest currency."

In almost all academic settings, the track to tenure does not adequately reward professors trying to commercialize their research. The time a faculty member spends creating a successful venture with research is not weighted the same as the time spent teaching and doing research. Taking time to commercialize research hinders the prospects of reaching tenure because the time spending doing it is not valued in the typical career track. In today's world, where higher education institutions have fewer resources and mounting pressure to publish, attempting to commercialize research is a difficult endeavor to undertake.

- Location: As demonstrated by Silicon Valley and the greater Boston area, a research center's location is extremely relevant to the volume of technology transfer. The number of licenses and licensing income is directly dependent on the concentration of technology firms in their region (Friedman, J. and Silberman, J., 2003). Other entities necessary for success include strong research centers (typically universities), venture capitalists, angel investors, knowledgeable legal groups, and associations that provide networking opportunities. Beyond these factors, the sheer size of the sector--"critical mass" in the region--is an important factor. Washington State is a robust source of many of these factors and has enormous potential to foster the stream of innovation and commercialization.

- Public Research-Industry Communication: A study targeting effective university-industry collaborations took a survey of stakeholders in the technology transfer process (business leaders, TTO staff, and university scientists). When asked to identify the barriers, the overwhelming majority agreed that a lack of understanding regarding university/corporate/scientific norms was the hardest obstacle to overcome (Siegel, D., et. al., 2003). Because of the variance in academic and business environments, finding people who understand the market to partner with scientists is critical (LeFaivre, 2012). The Entrepreneurs-in-Residence (EIR) programs at UW and WSU are designed for

such a purpose. EIR's identify technology with market potential and help the scientist understand the marketing process.

Because the fields of business and science are so different, the more opportunities for interaction enhance the potential. Networking opportunities are valuable for sparking innovation and moving ideas forward. Universities, businesses, and trade associations can host networking events, roundtable discussions, and innovation showcases for optimal knowledge transfer.

- Public Policy: The most important way government can positively affect technology transfer is by staying involved. Greater understanding of the process and its benefits to society is critical for public policy leaders to advance the issue. The past few years have seen efforts that have removed many of the legal barriers to technology transfer, but continuous evaluation of the law is necessary. Beyond removing obstacles, states must also provide incentives for university-industry collaborations and entrepreneurial efforts. These can come in the form of R&D and small business tax credits or public funding for the state's existing programs.

- Public Funding: The Washington Economic Development Commission collected information from focus groups and personal interviews with stakeholders from the commercialization process. The most cited obstacle for both business leaders and researchers was funding the early stages of innovation such as intellectual property protection and seed investment (2005). Multiple sources of financing are required to move concepts to products. It is important that both public and private organizations understand these costs and invest throughout the entire commercialization process.

  A key area that public policy makers should give attention to is gap funding. The time between when a marketable technology is identified and when it can attain external

investment is extremely precarious for entrepreneurs. Public investment in that gap will encourage innovators to move forward with commercialization.

- Business Community Climate: In the commercialization process, the public research institutions are not solely responsible for seeking business partnerships. Innovation relies on constant fueling from the business sector, especially by "recycling the investment." Once a startup business gets going or a company takes off through a licensed technology, it is important that they return to the research and invest in new innovations. Companies can be motivated to reinvest by a business climate that encourages entrepreneurship. Rewarding these efforts with recognition and prestige is an effective way of atmosphere.

Factors Accelerating Technology Transfer

Washington State has an array of opportunities to improve the potential of technology transfer. We have provided several recommendations for academic, government, and business communities that reflect the factors discussed in the previous section. Although each community has its own unique part to play, cooperation and respect among each is required.

Each recommendation includes a brief explanation, the present progress of the initiative, and which parties have the most influence in its implementation.

- Encourage Student Innovation: Students are not only a source of ideas and ambition, but potentially powerful entrepreneurs. They are powerful influencers of campus policy. Opportunities to cultivate an entrepreneurial atmosphere on campuses include supporting entrepreneurial clubs, providing access to commercialization training and resources for students doing research, holding business plan competitions, and increasing interaction with the business community.
    - *Status:* Outstanding work developing these efforts has occurred in the past decade. Both WSU and UW offer a variety of courses, connections, and business plan competitions for students who are interested in entrepreneurship. Currently the majority of participants in the competitions are business majors. Further coordination with the research community is recommended in order to expose research students to commercialization opportunities. Judges of the competitions include business leaders, but more opportunities are needed to bring student ideas out into the business world.
    - *Responsible Party:* Universities should continue to develop these curricula and programs. The business community should increase its involvement in entrepreneurial clubs and programs.

- Elevate Commercialization Within the Academic Culture: To increase faculty participation in commercialization, the incentives must be greater than they currently stand. One strategy is weighting commercialization efforts in tenure consideration. Additionally, institutional metrics for technology transfer should be publicized both internally and externally to increase awareness. Greater recognition of entrepreneurial faculty from the academic and business communities is a pressing need.
    - *Status:* Currently, UW's Entrepreneurial Faculty Fellows program recognizes leading faculty researchers. These fellows serve as mentors to other faculty and students, as well as advise the UW C4C on several of its programs. The "Kauffman Foundation Outstanding Postdoctoral Entrepreneurship Award" is another good example of externally rewarding researchers who pursue entrepreneurship.
    - *Responsible Party:* Universities should review their tenure structure and increase recognition of faculty entrepreneurial efforts. The business community and foundations should recognize outstanding entrepreneurial faculty.

- Continue Funding of the STARS Program: The STARS program goal is to bring entrepreneurial researchers into Washington. However, if the funding cycle does not support both recruitment process and ongoing programs, the program's success will be in jeopardy. Ways of ensuring sufficient funding include allowing previous cycle funds to carry over to the next and dedicating and funding separate accounts for the STARS program (Lidstrom, M. & Grimes, H., 2009).
    - *Status:* The FY12 Washington State House budget reduced STAR funding by 36%.
    - *Responsible Party:* Legislative leaders should review the STARS funding structure.

- Enhance the Entrepreneurs-in-Residence (EIR) Program: The EIR program is an effective tool for placing mentors, researchers, facilities, and funds together in one

place. This is an extremely capital efficient way to advance technology transfer in public institutions.

- *Status:* WSU and UW together host a total of twelve EIR's with a variety of impressive and resourceful backgrounds.
- *Responsible Party:* Foundations and the state legislature should ensure continued EIR funding and review the possibility of increasing EIR funding in the future.

- Improve Funding of Technology Transfer: Developing the capacities of Washington's technology transfer offices require funding of the staff, facilities, and programs. Without these resources, researchers cannot optimally pursue commercialization in addition to their research and coursework.
  - *Status:* Currently state and university funding for TTO's is limited. However, increasing support programs like EIR, STARS, and Gap Funding helps accomplish the TTO's mission.
  - *Responsible Party:* Public and private foundations should work with TTO's to provide the services they need to advance their mission.

- Provide a Variety of Gap Funding Opportunities: The period between a researcher moving ideas from the lab to the market is called the "valley of death" with good reason. Government dollars find this research too "applied" for public funding and private dollars find this stage too risky for investment. In order to fill this gap, businesses can invest through research collaborations with the university and foundations can allocate money to new and existing gap funds, awards, and targeted grants.
  - *Status:* The W Fund an excellent example of academic, business, and legislative leaders coming together to help close the gap for university innovators.
  - *Responsible Party:* Foundations, universities, business community, and legislature should increase investment in gap funding.

- Create Innovative Industry Environments: The business community needs to champion the idea of technology transfer. Commissions, trade associations, and other business groups should recognize businesses who work well with public research institutions. Avenues for partnerships include collaborating in research with public research institutions investing in entrepreneurs from the public research arena.
    - *Status:* Several Washington agricultural commissions, with centralized leadership have invested in WSU's research programs. Translating this model to other industries has been a challenge because of the decentralized organization of different sectors.
    - *Responsible Party:* The business community should invest and collaborate with public researchers.

- Reform Ethics Laws: Legal barriers to researchers working with for-profit businesses can discourage both parties from pursuing technology transfer. Removing these obstacles will enhance these partnerships.
    - *Status:* Opinions of the current ethics laws vary depending on the type of technology transfer
    - *Responsible Party:* State legislators and public research institutions should collaborate to review and reform the current laws.

- Increase Awareness of Technology Transfer Benefits: Promoting the value of technology transfer is critical to future development. A compelling action towards this would be establishing consistent metrics that reflect the successes of technology transfer. Avenues that can be used to educate the community include, but are not limited to public forums, industry meetings, policy advocacy, and media attention.
    - *Status:* WCTA's annual meeting and panel on technology transfer are good springboards for this type of exposure. Public research institutions have online databases that can be further developed.
    - *Responsible Party:* Everyone can make efforts to increase awareness.

- Host Networking Opportunities: The more interaction between innovators and business, the more established the relationships will become. Examples of events for this synergy include innovation showcases for investors, pre-entrepreneurial showcases, forums on technology transfer, entrepreneurial panels for faculty education, and business tours of public research facilities.
    - *Status:* The Technology Alliance's Innovation Showcase is a good model that could be used to create showcases for exclusively public research innovations.
    - *Responsible Party:* The business community and public research institutions should each make efforts to connect with the other. Trade associations can be leaders.

- Connect Researchers with Market-Savvy Advisors: Entering the business world after working in a laboratory setting requires an entirely new perspective. In order to make this transition as efficient and effective as possible, researchers need to work alongside an experienced entrepreneur. This pairing should advance the product and educate the researcher throughout the process. Public research institutions often provide these services, but the business community should also create these relationships.
    - *Status:* The EIR programs at UW and WSU are excellent examples, as previously discussed. PNNL offers a Mentor Protégé Program that gives marketing services to innovators.
    - *Responsible Party:* Trade associations can provide match-up services and consulting services to entrepreneurial researchers. Public research institutions should continue to develop and expand mentoring services.

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