

TESTIMONY

January 18, 2023

**TO: Joint Committee on Semiconductors
Senator Janeen Sollman, Co-Chair
Representative Janelle Bynum, Co-Chair**

**From: Dr. Belinda Batten,
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Chairs Sollman and Bynum,

For the record, I am Dr. Belinda Batten, and I serve as the Senior Advisor to the Provost for Strategic Initiatives at Oregon State University. Our Provost, Ed Feser, co-chaired the Oregon Semiconductor Competitiveness Task Force subcommittee on “University-Industry Partnerships.” He regrets that he cannot be here today.

I’d like to summarize for you some of the recommendations from that subcommittee and note that the subcommittee included representatives from both industry and education. We believe that Oregon has an opportunity to be a leader in the semiconductor sector and respond to this truly generational opportunity. As Intel’s President and CEO, Pat Gelsinger, said at the 2021 Oregon Business Summit, “[Oregon has] more at stake in this discussion than any other state in the nation”.

The federal government is making an unprecedented investment into research, workforce development and manufacturing. The most competitive states in the semiconductor industry will be those that build robust ecosystems comprised of industry, community colleges and universities working collaboratively with local and state government and economic development partners. Oregon State’s industry stakeholders have made it abundantly clear that Oregon colleges and universities should help them address their workforce and R&D needs.

With that in mind, there were three primary recommendations that came from the taskforce, and I will discuss each with some additional background.

1. Invest in the workforce and talent pipeline.
2. Invest in Oregon’s Public Research Universities
3. Invest in Research Facilities.

Invest in the workforce and talent pipeline.

The University-Industry Partnership subcommittee heard from local industry about the need to develop the talent pipeline, and this need extends nationally. The talent pipeline includes a wide breadth of positions from technicians with certified credentials to PhD graduates in engineering, computer science and other degrees that support the semiconductor industry (physics, chemistry, materials). The subcommittee emphasized that Oregon must recognize and value this full talent continuum. To this end, Oregon State is in discussion with Portland Community College, Portland State University, and Linn Benton Community College to identify specific areas where we can collaborate to better serve students who wish to enter the semiconductor workforce. The Committee also learned:

- 56% of the employees in the semiconductor industry hold a bachelors degree or higher; 44% hold a HS or two-year degree;
- the importance of sourcing Oregon-produced bachelor, masters, and PhD level talent for retention purposes;
- deliberate attention to equity diversification of the STEM pipeline is critical!

Invest in Oregon's Public Research Universities.

Oregon needs a stronger R&D/innovation ecosystem, one that can stand with and compete with those in other states. To strengthen this ecosystem, Oregon must invest in public research universities, enabling them to be among the best in the nation.

To address need, the semiconductor task force proposed an initiative to attract 25 new faculty leaders with semiconductor expertise to the state. Such an investment in university research and teaching faculty, graduate students and their requisite laboratories would gather national attention and position Oregon as an R&D and workforce development leader in semiconductors. A state investment of this kind will make Oregon research universities competitive in recruiting talented faculty and students and competitive in federal grant pursuits.

Invest in Research Facilities

An example of the research facilities recommended for investment by the task force is the Jen-Hsun and Lori Huang Collaborative Innovation Complex in the design phase at Oregon State. The Huang Collaborative Innovation Complex is one of the largest capital projects that we have done at Oregon State, and we are very excited about what it means for campus and for supporting the semiconductor industry in both the workforce development and research needs.

- The CIC is being designed as 21st century research and education complex to support team-based interdisciplinary research in a number of areas including materials science and areas supporting the semiconductor industry.
- In addition to housing the fastest university supercomputer on the west coast which will be a resource for the state of Oregon, the facility will be home to a new cleanroom that will enable our faculty to support our semiconductor industry and to train students at all levels—undergraduate through PhD to enter that workforce.
- Oregon State has garnered \$100M in donor investment in the project, and we are bringing another \$38M of university funds. This session to complete the project, we are

requesting \$75M of XI-G Bonds. This investment is critical to support the education and research needs I previously cited.

We are already Pursuing Opportunities

While there is a great deal of attention on the CHIPs Act – and investments in manufacturing, there have already been several proposal calls from the National Science Foundation and Department of Defense agencies. Our faculty have and are in the process of responding to these calls with proposals to help build our ecosystem. For example,

1. We are collaborators with the City of Hillsboro and several other partners on a planning grant from Business Oregon for the establishment of a Center of Innovation Excellence focused on fostering public-private and academic partnerships focused on semiconductor innovation in Oregon.
2. Oregon State submitted a proposal to the National Science Foundation to build a Regional Innovation Engine supporting the semiconductor industry. Among our partners in this effort are Intel, Lam Research, University of Oregon, University of Washington, The Oregon Business Council, and Portland Community College.
3. We recently earned an impactful gift, one of our largest ever, from Intel aimed at Broadening Sustainable Chemical Processing Curriculum and Research at Oregon State and Recruiting, Retaining, and Advancing Underrepresented Students. This gift will support
 - a. The development of a new curriculum in sustainable chemical processing includes learning modules shared in open-source format.
 - b. A research experience for underrepresented minority undergraduates from community colleges transferring to Oregon State
 - c. Bridge-building visits for instructors from minority serving community colleges instructors to learn about Oregon State and train in Sustainable (Chemical) Processing modules

At Oregon State University we have an outstanding team of university leaders helping to steer our efforts in this critically important area, and we would be happy to provide additional information as needed. I will leave you with a reminder of my opening statements. This *is* a generational opportunity, and Oregon should move quickly.