Engineering and Technology Industry Council (ETIC)
Capital Investment Proposal for the 2003-2005 Biennium

Summary
In response to the addition of $20 million in Lottery bonds for the Engineering & Technology Industry Council (ETIC) through the Governor’s revised budget, representatives from the seven Oregon University System campuses and the OGI School of Science and Engineering at OHSU have submitted proposals for review by ETIC. The Council’s voting members met on June 18, 2003, and reviewed the proposals. Based on this review, the proposals were updated by the participating institutions. The updated proposals have received unanimous endorsement from the Council members who participated in the review.

The total proposed capital investment from Lottery bonds is $20 million as summarized below. The combined effect of these investments will be to create a substantial increase in Oregon’s ability to increase the number of graduates of its engineering and computer science programs, as well as the ability to increase the national ranking of these programs and the quality of the research and graduates they produce.

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<tr>
<th>$M</th>
<th>Bond Allocation</th>
<th>Expected Private Support</th>
<th>Combined Total</th>
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Attached are the eight proposal summaries for:

- Eastern Oregon University
- OGI School of Science & Engineering/OHSU
- Oregon Institute of Technology
- Oregon State University
- Portland State University
- Southern Oregon University
- University of Oregon
- Western Oregon University
Eastern Oregon University
$300,000 bond investment
$30,000 private support

Summary of Proposal:
The long-term viability of EOU’s Computer Science and Multimedia (CS/MM) degree programs stand at risk as a result of limited faculty, limited faculty support, and aging and undersized laboratory facilities. Thus, this proposal represents high priority funding for maintaining and expanding the CS/MM degree programs. As part of EOU’s overall ETIC investment plan, the intent is to hire new faculty so that a wider variety of courses may be offered and important electives may be offered more frequently. Also, EOU plans to expand faculty support so that faculty will be freed from maintenance responsibilities and security of lab facilities. To maximize the results from the strategic personnel expansions, EOU must upgrade plant and equipment.

Specific capital investment proposals include the following:

- Programming lab includes 16 Linux workstations in a small room.
- Multimedia lab shared with the art department and equipped with 16 Macintosh computers of various vintages.
- New teaching/learning lab and smart classroom for course sections accommodating 20 to 25 students in a new campus building.
- Facilitates classroom demonstrations and enhances communication of abstract topics.
- Enhances capabilities to demonstrate the use of high technology in K-12 education for teacher education programs. Development of a curriculum in computer education and educational technology will provide educators graduating from EOU with knowledge and skills to appropriately use technology in their classrooms.

EOU has worked diligently to respond to the needs of the Oregon employer market and the goals of the legislature, the Governor, State Board, and Oregon taxpayers to develop a high technology field of study in eastern Oregon. However, the ability to capitalize on the above success is hampered by two major limiting factors. First, current faculty size limits the frequency of critical course offerings and seriously limits the number of electives available. Second, aging facilities and outdated equipment reduce the attractiveness of EOU to prospective faculty and students in this highly competitive field. Existing outdated and undersized labs, combined with the lack of a pool of startup funds for faculty to invest in plant and equipment, threaten the long run viability of EOU’s high tech programs. As a result, fewer students currently select EOU as their choice for CS/MM study and some existing students leave EOU to complete their degree plans or change to a different major.
OGI School of Science & Engineering / OHSU

$2,100,000 bond investment
$860,000 private support

Summary of Proposal:
OGI/OHSU requests capital bond funds to support the build-out of the Bronson Creek Building on the OGI/OHSU West Campus and to provide instructional and laboratory equipment for that building. Build-out of Bronson Creek will allow OGI to house, in a single location, the newly merged faculty, graduate students, and curricula in computer science, computer engineering, and electrical engineering. Adding classrooms and upgrading instructional laboratories will increase OGI’s ability to deliver high quality instruction to larger numbers of students at the M.S. and Ph.D. levels in computer science, computer engineering, and electrical engineering.

Funding of this proposal will allow OGI to increase both the quantity and quality of well-trained graduate students in computer science and electrical engineering and to thus produce highly valued employees for Oregon industries (68% of OGI alumni are employed in the local region). It is well known that physical proximity facilitates collaboration and that adequate facilities enhance the quality of instruction and research as well as the ability to recruit additional students and faculty members.

In computer science and electrical engineering, as in other disciplines, the ability to attract high quality graduate students and faculty members, and to deliver highly valued educational programs is based on the strength of the research programs. The Computer Science and Engineering Department at OGI currently ranks 16th in the nation in federal research funding. Most of those funds support Ph.D. students and their faculty advisors. In the most recent academic year for which data are available (2001-02), OGI produced more graduate degrees in computer science and electrical engineering than any other school in Oregon: 59 of 140 (42%) and 33 of 85 (39%) respectively. Strategic plans for OGI call for adding 5 to 10 additional faculty members in computer science, computer engineering, and electrical engineering during the next five years, increasing the graduate student population at 5% per year for each of the next five years, and increasing the level of research funding and numbers of graduates correspondingly. The requested funds will provide the facilities needed to achieve these goals.

Specific results of this proposed investment will be the addition of two new classrooms (one auditorium-style, one instructional style), two new student computing laboratories, a new data center, and new offices and workspaces for graduate students and faculty members in the newly-acquired Bronson Creek building at OGI/OHSU. These enhanced facilities will allow OGI/OHSU to improve its research-based graduate education programs in computer science, computer engineering, and electrical engineering and to attract additional high-quality graduate students and faculty.
**Oregon Institute of Technology**  
$1,000,000 bond investment  
$1,000,000 private support

**Summary of Proposal:**  
The Oregon Renewable Energy Center (OREC) has accomplished several objectives in curriculum development, creative applied research projects, and the development of partnerships with private and public entities. In order to continue progress toward regional and national recognition, laboratory and facility enhancements are extremely important. Improvements in electronic capabilities in classrooms and laboratories made possible by broadband access will impact instructional and research goals.

Funding of this proposal would allow OIT to:

- Build a new education/training facility for renewable energy technologies to support academic courses, training courses, and on-site training certifications as well as applied research in renewable energy systems.
- Expand laboratory capabilities to support innovative applied research projects in renewable energy systems.
- Collaborate with Clackamas Community College to deliver academic programs in renewable energy at the Wilsonville Training Center and to serve the work force training needs of industry in renewable energy.
- Develop the capital infrastructure to electronically deliver engineering and technology courses that will enhance OIT’s ability to double student credit hours.
- The Oregon Renewable Energy Center will deliver academic courses on the web in support of new baccalaureate degree programs in renewable energy.
- Business and industry training courses will be developed for local and electronic delivery in renewable energy technologies.

The funding will enable OREC to fulfill its vision of becoming a world-class applied research and education facility devoted to the rapidly expanding field of renewable energy. The capital investment requested will enable OREC to maximize the investments already made in laboratories and equipment, as well as support electronic delivery of courses in renewable energy for academic degree programs and training for business and industry. The requested funding will enhance the partnership between OIT and Clackamas Community College to deliver three OIT degree programs at the Wilsonville Training Center. A strong electronic connection between OIT/OREC and Wilsonville will substantially strengthen these program offerings. The funding will also strengthen OREC’s emerging applied research program in terms of expansion and improvements in laboratory facilities and through broadband connectivity between OREC and other research centers. Finally, investments in electronic delivery capabilities will support the expansion of other academic degree programs in engineering, engineering technology, and information technology.
Oregon State University
$8,450,000 bond investment
$8,450,000 private support

Summary of Proposal:
OSU’s capital investment proposal complements the main OSU Engineering proposal submitted through ETIC for the 2003-2005 biennium. It incorporates those capital items that will help close the gap in resources needed to meet the two goals of that proposal: to build a top-25 engineering college that delivers the people, ideas, and innovation needed to power Oregon’s knowledge economy and help fill the intellectual capital pipeline with pre-college Oregonians passionate about careers in engineering and technology.

- **Equipment startup for new faculty.** Although the amount of capital equipment required for this startup varies quite widely depending on the specific discipline, $70,000 to $75,000 per faculty member represents an approximate average, and we expect 15 to 20 new hires during the next biennium.

- **Major equipment acquisitions to further propel collaborative Research Clusters.** Research Clusters–Micro2nano, Analog/Mixed-Signal, Environmental Engineering, Kiewit Center/Tsunami Laboratory, Usability Engineering, and Large-Scale Thermal Hydraulics will be the focus for adding faculty and capability in the next biennium. There is a need to invest in several large equipment acquisitions to accelerate capability growth and leadership positions at the national level.

- **Renovations of selected space** for instructional classrooms and laboratories and offices to accommodate quality growth (Dearborn, Batchellor, and Covell Halls). With the enrollment increases OSU has been experiencing the last several years and that are projected to continue, there is a great need for productive classroom and laboratory space. There are a number of spaces in Batchellor, Dearborn, and Covell Halls that can become much more effective with remodeling.

- **Major Renovation of Gleeson Hall** to add capability to grow collaborative research and deliver quality learning experiences. This will produce a significant amount of quality infrastructure critical to attracting the people and delivering the results to achieve our goals. The total renovation is projected to cost more than $20 million. With $6.0 million public funds requested here, along with the private funds that can be raised, we feel that we can phase the project and modernize a major portion of the building at this time.

- **Mobile Laboratory.** Due to its statewide presence and strong credibility with rural 4-H Youth and adults, OSU has the opportunity to leverage its existing programs to infuse business and information technology (BIT) skills into the rural areas of Oregon. However, in these remote areas there is a lack of access to technology classrooms. A BIT Mobile Laboratory would consist of a trailer containing a technology laboratory and a vehicle to pull it.
Portland State University
$5,000,000 bond investment
$5,000,000 private support

Summary of Proposal:
PSU will use the capital bonds as part of the $71 million budget for the construction of the Northwest Center for Engineering, Science and Technology (NWCEST). This facility is the top priority for the College of Engineering and Computer Science, for Portland State University, and enjoys support from the City’s government and business leaders, as well as the congressional delegation. Additionally, this project is a priority for the legislature, which authorized $26.5 million in State Article XI-G bonds (the most ever for an OUS project) in 2001. All involved (key donors, government leaders, and industry executives) agree that the NWCEST is essential to the College meeting its goals to serve more students and build national distinction. The building will support faculty research, which is directly linked to economic growth for business and industry; serve as a magnet for business development, and provide incubator space for emerging technology companies; and promote sustainable economic vitality through the expanded partnerships and collaborations with industry and OHSU.

A focus of the College of Engineering and Computer Science is to build spires of excellence in areas directly related to the region’s economy. This building is key to furthering those goals. For example, it will house the Northwest Photovoltaic Technology Center, Biomechanics Research Center, Intelligent Transportation Systems Laboratory, Surface Quality Modeling Center, and Electronic Packaging Center. The links between engineering and science faculty in the currently identified signature research center – Multiscale Materials and Devices – will also be strengthened. Industry and the legislature, including the Oregon Council for Knowledge and Economic Development (OCKED), have identified the need for this research center and the NWCEST will leverage more research and physical space at PSU to support this effort.

This project will support PSU’s plan to double the number of engineering graduates by 2010. It will also expand research funding bringing new dollars to the state and stimulating the economy through employment. Furthermore, it will create jobs beyond the walls of the University and not just those associated with faculty and research employment. For example, we estimate that the total construction jobs created by this project will be about 350 full-time equivalent jobs and that this will be a 14-month construction project. Our goal is to have the building in place for student use in Fall 2005.
Southern Oregon University
$660,000 ETIC bond investment
$30,000 private support

Summary of Proposal:
SOU will use the capital funds to support the creation of a Center of Academic Excellence in Information Assurance Education and to establish a materials research facility at Southern Oregon University in support of the joint materials science Bachelor's degree with the University of Oregon. The additional investments will make the $40 million projects more effective by improving excellence and laboratory capacity in Materials Science and Information Assurance, thus increasing both the quality and quantity of our graduates.

This past academic year, Southern Oregon University has developed, implemented, and presented a complete undergraduate curriculum in Computer Security and Information Assurance. This program is one of the few undergraduate programs of its kind in the United States. At a recent meeting of the National Colloquium for Information Systems Security Education in Washington, D.C., we were strongly encouraged to apply for National Security Agency certification as a Center of Academic Excellence in Information Assurance Education. As a result, we are applying for NSA’s certification this year and are creating a Center for Information and Infrastructure Assurance Education. Improvement is needed in three areas: 1) faculty and student research, 2) teaching and laboratory facilities, and 3) library holdings in computer security and information assurance. The major challenge to promoting research and development in computer security and information assurance is lack of appropriate facilities. Therefore, we submit this proposal for CSIA laboratory and facility improvement in order to enhance our new program and attain NSA certification.

The proposed capital investment will also develop a materials research facility at SOU. The facility is intended to provide state-of-the-art materials research to the University; to train our students, especially those in pre-engineering and in the proposed Materials Science option; and to serve the regional industrial needs in Materials research and analysis. The facility will act as a focal point for recruiting, retaining, and producing students in engineering and other physical sciences. It will improve the research capability of SOU, provide additional training for our students, and improve the national ranking and reputation of SOU. The requested deposition system, AFM, XRD, and ICP will be the only unit of its kind within a 180-mile radius of SOU. Together with our existing equipment (NMR, TGA, FTIR, DSC, etc.), this facility will attract local industry collaborations in applied research and placement opportunities for our graduates and serve as a major recruiting point for students interested in the engineering and science who like to reside in the southern Oregon region.
University of Oregon (Material Science Institute)
$2,400,000 bond investment
$2,400,000 private support

Summary of Proposal:
Capital funds will be used to renovate laboratory space for new UO faculty and to provide matching funds for federal equipment proposals for materials characterization equipment. An ETIC capital investment would greatly facilitate the Materials Science Institute’s (MSI) achieving the aggressive goals outlined for it in the ETIC program budget for the upcoming biennium.

The long-term plan put forward by MSI to the University is to build a new 125,000 sq. ft. Integrative Science Building intimately connected to the existing science complex. This building would house our existing Center for Advanced Materials Characterization in Oregon (CAMCOR) facilities, a proposed nanofabrication facility, pre-incubator space for start-up companies, space for visiting faculty from OSU, PSU, and Pacific Northwest National Laboratory (PNNL), and space for approximately 25 faculty conducting materials and nanoscience research. The faculty would not be grouped by department, but organized into collaborative clusters to further spur interactions between the participants. It is estimated that this building will cost in the neighborhood of $50 million and will require at least several years of private fundraising to provide the required matching funds for proposed state bonds.

The equipment acquisition plans focus on the characterization and fabrication of new and existing materials. Upgrades of the current electron microprobe, scanning electron microscope, and electron beam writing facilities are planned along with the acquisition of several additional scanning probe microscopes that utilize different excitation and detection mechanisms.

The requested capital funds for renovation and equipment will continue the momentum of the MSI as it strives to enhance its national reputation as a top-tier materials program noted for its research excellence and impact, its innovative degree and graduate internship programs, and the quality and diversity of its graduate students. MSI’s graduates tend to remain in the Northwest, either working for Oregon industry or teaching in colleges or universities. The funds will also provide additional laboratory space and facilities enabling MSI to significantly increase the number of graduate students working towards a Ph.D. degree, perhaps by as much as 20 percent.
Western Oregon University
$90,000 bond investment
$30,000 private support

Summary of Proposal:
A particular challenge to the Computer Science departments in days of shrinking budgets is maintaining up-to-date hardware for both faculty use and student labs. This proposal has two components. The first is to upgrade aging hardware for faculty use and the second is to build a network laboratory. For these two components, WOU is submitting a proposal for $90,000 for the biennium.

Upgrading the hardware for faculty includes a rotation to replace desk machines and rewiring the network infrastructure of the third floor of the Instructional Technology Center (ITC), which houses the Computer Science division. In addition, it includes renewal of site licenses for software that are used in programming classes, a new, more reliable mail and web server for the department (cs.wou.edu), a new printer for the department, and covering the increased cost of monthly connection fees that will be assessed by University Computing Services for the rewiring.

There has been an ad hoc networking lab for several years. It is time to put together a more comprehensive facility that can handle an increase in students. As the Information Systems major grows in numbers, we find there are quarters where a networking class (IS major), a server administration class (IS major), and a parallel programming class (CS major) are competing for use of the same few machines. Developing the networking lab is driven also by a recent faculty hire whose area of expertise is networking and brings to us several years of industry experience in this area. Included in this component is the purchase of kits for small classroom Cisco labs, additional machines, cabling, and some additional furniture such as chairs, workbenches and server racks for the room.

The Information Systems major is growing rapidly. This major contains several classes related to server or database administration, and these classes require a lab containing machines with which students can experiment and over which they can have administrative rights. In addition, we have expanded our networking classes over the last three years. The quality of these classes increases if the students can have hands-on experience. We expect that the additional machines will allow us to continue to increase the number of students in these classes and to enhance the educational experience that these students have in these classes. Finally, we are not a Unix-based campus, but with the advent of Linux and, as more of our students express an interest in graduate school, we find we need to bring back our introductory Unix class, which went away along with our Sequent Balance three years ago. The additional machines will allow us to dedicate some to Linux.