SB

40

<TARGET><BILL>SB 40</BILL><SUBJECT>SB
40</SUBJECT><COMM>SEDC28</COMM></TARGET>

SENATE COMMITTEE REPORT
First Committee of Referral

DATE: 1/28/13

FURTHER: Finance

Date of 5-Day Notice: _____
(in accordance with Uniform Rule 23)

DATE TURNED IN TO OFFICE: 20Feb13

Education Committee considered SENATE BILL NO. 40

SB 40-APPROP: UNIV. ENGINEERING BUILDINGS

"An Act making special appropriations for new engineering buildings for the University of Alaska in Anchorage and Fairbanks; and providing for an effective date."

and recommends:

[ ] be **replaced** with **CS** _____ (_____) *[ ] Same Title [ ] New Title*

[ ] adopt **previous CS** _____ (_____) *[ ] Same Title [ ] New Title*

[ ] attached amendment(s)

[ ] adopt _____Letter of Intent

[ ] further referral to _____Committee

Dept Abbr.	
ADM	LWF
CED	LAW
COR	LEG
CRT	MVA
EED	DNR
DEC	DPS
DFG	REV
GOV	DOT
DHS	UA

NEW FISCAL NOTE(S)				
Dept.	Fiscal	Indet.	Zero	FN #

PREVIOUS FISCAL NOTE(S)				
Dept.	Fiscal	Indet.	Zero	FN #

[+] **APPROPRIATION - no fiscal note**

SIGNATURES AND RECOMMENDATIONS:	PRINTED LAST NAME	DO PASS	DO NOT PASS	NO REC	AMEND
	Dunleavy				✓
	Huggins				-
	Stevens	X			
Berta Gardner	Gardner	X			
CHAIR:					

ALASKA STATE LEGISLATURE

Rules Committee
•
Labor & Commerce Committee
•
Health & Social Services Committee

While in Session
State Capitol, Rm. 7
Juneau, AK 99801
(907) 465-3704
Fax: (907) 465-2529
•
While in Anchorage
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SENATOR JOHNNY ELLIS
MINORITY LEADER

Senate Bill 40 – An Act making special appropriations for new engineering buildings for the University of Alaska in Anchorage and Fairbanks.

Senate Bill 40 completes work begun last legislative session by appropriating the final $47.3 million to complete construction of engineering facilities in Fairbanks and $59.6 million to finish the sorely needed engineering facilities in Anchorage.

Alaska faces a shortage of qualified engineers and some companies are resorting to sending Alaska's engineering work outside. Shortages are especially apparent for electrical, mechanical, mining and petroleum engineers.

Alaska, more than most other states, will require a steady stream of highly skilled engineering professionals to advance critical energy, infrastructure and transportation projects. By investing in an Alaskan engineering workforce, we can assure that our best and brightest students can pursue in-state education and work in here in these well-paying, family-wage jobs.

The effort to invest in Alaska grown engineers enjoys enthusiastic support from a broad coalition of Alaska's engineering businesses and professional organizations, from the fields of construction to resource development. Industry advisory boards for both the University of Alaska-Anchorage and University of Alaska-Fairbanks engineering programs have urged the legislature to appropriate the funding necessary to address growing enrollment and inadequate facilities.

A few of the many engineering professional organizations urging support for upgrading University of Alaska engineering facilities include:

- American Council of Engineering Companies - Alaska Chapter
- Alaska Professional Design Council
- Alaska Society of Professional Engineers
- Institute of Transportation Engineers – Alaska Section
- The Institute of Electrical and Electronics Engineers

For Alaska to move forward and keep our promise to develop our resources, we will need "Alaska Grown" engineers. Investing in UA engineering facilities promotes a strong business climate and ensures that young Alaskans have an opportunity to stay in Alaska and enjoy stable, family-wage job opportunities. I respectfully request your support for Senate Bill 40.

UA Engineering

12/6/2012

Undergraduate Engineering Expansion Initiative

Our Challenge

Alaska faces a shortage of qualified engineers. To respond to the state's need, the University of Alaska Board of Regents set a priority to more than double the annual number of baccalaureate graduates to 200. We are steadily making progress on this goal.

Regents' No. 1 New Construction Priority for Academic Programs

$60.6 million UAA
$48.3 million UAF
Total: $108.9 million (GF) FY14

*** UAF intends to bond for an additional $10 million*

- The Alaska Department of Labor's current projections through 2018 indicate an average of 50 new engineering jobs will be available each year, plus another 70 openings from annual turnover and retirement.
- Many engineers working in Alaska are non-residents - up to 35 percent in some disciplines. These employees lack education and experience in Arctic engineering principles.
- Employers prefer to hire UA graduates, as they are more likely to remain in Alaska. Graduates from both UAA and UAF are essential, especially when addressing Arctic engineering issues and requirements thereof.

Program Growth And Space Needs

Degrees awarded: The number of baccalaureate engineering degrees awarded each year has grown from 72 degrees in 2007, when the UA Board of Regents adopted the Engineering Expansion Initiative, to 143 degrees awarded in spring 2012 - a 98.6 percent increase.

Enrollment: Program enrollment in undergraduate engineering, critical to increasing the number of graduates, has grown significantly, from 806 in fall 2007 to 1,137 in fall 2012 - a 41 percent increase.

Faculty: UAF has 43.5 FTE (full-time equivalent) and UAA has 38.5 FTE teaching and instruction-based research faculty.*

Programs: The engineering programs at UAA and UAF are complementary and collaborative (UAA offers 11 academic degree programs; UAF offers 21).

Current facilities: Both UAA and UAF facilities are cramped and out-of-date in ways specific to their locations and programs. Instructional and specialized lab space must be expanded and improved to meet the needs of today's engineering student. UAA's engineering building was constructed in 1983; UAF's, 1964 (though renovation occurred in 2000). Neither engineering building has the special purpose lab space nor the larger classrooms required for the modern engineering curricula.*

What the projects include: The projects include a mix of new construction and renovation of existing space. UAF College of Engineering and Mines and UAA School of Engineering also provide computer science programs, and graduate education and research in engineering and engineering-related fields to meet Alaska's needs. This effort is primarily focused on the expansion of undergraduate engineering degree production.

UNIVERSITY of ALASKA
Many Traditions One Alaska

For more information, contact Associate Vice President Chris Christensen at 907/786-1689 (ANC), 907/463-3086 (JNU) or visit www.alaska.edu/state.

Meeting the needs of Alaska's employers
Above left: Artist rendering of UAF engineering facility; above right: artist rendering of UAA engineering facility.

"As industry representatives serving on the UAA Engineering Advisory Board and UAF Advisory Council, we feel strongly that it is critical for us to continue to work together in supporting the University of Alaska Engineering programs. Growth in both the UAA and UAF programs are needed to meet the critical demands for engineers in our statewide infrastructure and resource development. These programs are complementary and collaborative and the students graduating from these institutions provide tremendous resources for our industry growth. We commend the governor and the Alaska State Legislature for including the funding for half of these facilities in the FY13 capital budget and we wholeheartedly encourage the legislature to provide the other half of the funding this year for these important projects. Let's cultivate Alaska's future engineers by investing in Alaska!"

-- Richard Reich, PE, Chair-UAA School of Engineering Advisory Board; General Manager, UMIAQ
-- Pete Stokes, PE, Chair-UAF College of Engineering & Mines Advisory and Development Council; Commercial Manager, Petrotechnical Resources of Alaska

Current project status: The Legislature provided half the funding for both facilities last legislative session. This was an extraordinary effort on the part of the legislature and advocates statewide.

Both facilities are now in the design phase and on schedule. The current request for the FY14 capital budget is $108.9 million GF, plus $10 million in bonding authority. With this second half of the funding in place, progress on these facilities can remain on schedule and construction can begin in late spring/early summer of 2013.

UNITED AND STRONG - SUPPORT FOR UA ENGINEERING INITIATIVE

The University of Alaska Board of Regents has called the UA Engineering Expansion Initiative the No. 1 new construction priority for academic programs.

- The Engineering Expansion Initiative is in the UA Board of Regents' capital budget request this year. The legislature funded half of each facility in 2012. This request includes the other half of the required funding for both the UAF and UAA facilities to complete the facilities.
- UAA Chancellor Tom Case, UAF Chancellor Brian Rogers and their separate engineering advisory boards and industry leaders worked to secure funding for planning and design of both facilities last session and are united in support to advance the projects together as a single request.
- The Alaska Legislature understands the need for Alaska to "grow its own" engineers, and in 2010 appropriated $8 million for planning and design for these facilities. Last year, a $104.9 million appropriation for both facilities was included in the capital budget, giving the campuses the necessary funds to move forward with completing design of both facilities.
- Since 2006, private gifts from nearly 900 individuals and corporations totaling more than $29 million to UA Engineering demonstrate strong support from alumni, friends, corporations and foundations.
- UA President Pat Gamble and the UA Board of Regents support moving the initiative forward as one project, and have included it in the FY14 capital budget request to the governor and the legislature this session.

** Source: UA Engineering Plan 2010, an independent benchmark study. For more information, contact Associate Vice President Chris Christensen at 907/786-1689 (ANC), 907/463-3086 (JNU) or visit www.alaska.edu/state.*

STEM occupations help grow Alaska's economy

By Commissioner Click Bishop

This month's Trends focuses on STEM occupations — those requiring specialized skills in science, technology, engineering, and math. The list is varied, from surveyors to engineers and auditors to computer programmers.

STEM jobs generate products and services that have become part of our everyday lives, such as airplanes, smart phones, CT scans, and — especially convenient in Alaska — remote starters for your favorite auto.

Workers in STEM jobs require more formal education — 75 percent require a bachelor's degree or higher. But STEM workers are also among the highest paid, averaging $73,000 a year while non-STEM workers average about $45,000.

In 2008, almost 25,000 of Alaska's nearly 322,000 jobs were STEM-related jobs. The Alaska Department of Labor and Workforce Development predicts that by 2018, we'll see more than 2,700 new STEM jobs and nearly 5,400 more openings as workers retire or change occupations.

Alaska Performance Scholarship

One way we're preparing Alaskans to fill these 8,000-plus projected vacancies is through an Alaska Performance Scholarship. This new program, approved by the Alaska Legislature, would invest in Alaska's students who are attending in-state university or vocational programs. Gov. Parnell has proposed a sustainable funding mechanism for the scholarship program based on recommendations from the Legislature's Joint Higher Education Scholarship Funding Task Force.

"The Alaska Performance Scholarship will lead to increased academic rigor in our high schools as students earn these scholarships," Parnell has said. "The scholarship helps a variety of students — those who seek career and technical training as well as university-level studies — to realize their dreams through their own hard work."

The graduating class of 2011 will be the first eligible for this opportunity.

Alaska Education Tax Credit

The Alaska Legislature expanded the Alaska Education Tax Credit to include more institutions and also for capital projects. The credit provides tax incentives and rewards for businesses that make contributions for vocational courses, programs, and facilities, including those offered at AVTEC: Alaska's Institute of Technology, the University of Alaska, some of Alaska's regional training centers, and Alaska's K-12 schools.

Companies that pay corporate, fisheries business, fisheries landing, insurance premium/title insurance premium, mining license, oil and gas production, and transportation or oil and gas property taxes are eligible.

Donors can receive a credit equal to 50 percent of contributions up to $100,000, and an additional 100 percent for donations between $100,000 and $300,000. Cash donations greater than $300,000 and up to $10 million earn tax credits of 50 percent, with a maximum Alaska state tax credit of $5 million.

In addition to the state tax credit, businesses may qualify for federal tax savings by making charitable cash donations. Business representatives should contact their tax consultants to determine the tax credit benefit of any donation.

Unemployment benefits

Also in this issue is a report on Alaska's unemployment insurance program. More than 63,000 claimants in 2009 received about $130 million in federal and state benefits, which were directly injected into Alaska's economy. This doesn't include the "trickle-down" effect of those dollars in our economy. The U.S. Department of Labor estimates that every dollar paid in UI benefits generates an additional 60 cents of local economic activity.

By ERIK STIMPFLE, Research Analyst; and TODD MOSHER, Economist

Science, Tech, Engineering, and Math

Knowledge-based workers in Alaska

Science and engineering are embedded into the fabric of our lives, from improving everyday activities to developing our economy.

Even during the coldest winter days, we remain warm in comfortably heated buildings and connected to the outside world by television, Internet, and cell phones. Science and technology operate behind the scenes, quietly and efficiently providing most of the comforts of modern living.

This article focuses on the state's scientists, engineers, surveyors, mathematicians, computer programmers, architects, and other workers who need highly specialized skills to do their jobs. These science, technology, engineering, and math occupations are collectively referred to as STEM occupations.

STEM workers' contributions to Alaska's economy are numerous. Geologists search for mineral deposits, and environmental scientists obtain permits before a new mine can operate. In the fishing industry, biologists research ways to raise king crab in hatcheries and determine how many salmon can be harvested each year while ensuring their return in the years ahead. These are just a few examples of STEM activities; science and technology are everywhere in Alaska's industries.

1 STEM Occupations

Categories and 2008 Alaska employment numbers

ARCHITECTS, SURVEYORS, AND CARTOGRAPHERS (1,554)

- Architects, Except Landscape and Naval (321)
- Architectural and Civil Drafters (236)
- Cartographers and Photogrammetrists (82)
- Drafters, All Other (154)
- Electrical and Electronics Drafters (53)
- Landscape Architects (<50)
- Mechanical Drafters (<50)
- Surveying and Mapping Technicians (187)
- Surveyors (464)

BUSINESS AND FINANCE (4,212)

- Accountants and Auditors (1,860)
- Budget Analysts (226)
- Cost Estimators (138)
- Credit Analysts (<50)
- Financial Analysts (244)
- Financial Specialists, All Other (1,470)
- Logisticians (257)

COMPUTER AND MATH SCIENCE (4,385)

- Actuaries (<50)
- Computer and Information Scientists, Research (58)
- Computer Programmers (680)
- Computer Software Engineers, Applications (326)
- Computer Software Engineers, Systems Software (290)
- Computer Specialists, All Other (375)
- Computer Support Specialists (1,124)
- Computer Systems Analysts (465)
- Database Administrators (121)
- Mathematical Scientists, All Other (<50)
- Mathematical Technicians (<50)
- Mathematicians (<50)
- Network and Computer Systems Administrators (541)
- Network Systems and Data Communications Analysts (191)
- Operations Research Analysts (139)
- Statisticians (58)

ENGINEERS (6,145)

- Aerospace Engineering and Operations Technicians (<50)
- Aerospace Engineers (71)
- Agricultural Engineers (<50)
- Biomedical Engineers (<50)
- Chemical Engineers (<50)
- Civil Engineering Technicians (449)
- Civil Engineers (700)
- Computer Hardware Engineers (74)
- Electrical and Electronic Engineering Technicians (310)
- Electrical Engineers (282)
- Electro-Mechanical Technicians (100)
- Electronics Engineers, Except Computer (234)
- Engineering Technicians, Except Drafters, All Other (678)
- Engineers, All Other (1,223)
- Environmental Engineering Technicians (249)
- Environmental Engineers (247)
- Health and Safety Engineers, Except Mining Safety Engineers and Inspectors (226)
- Industrial Engineering Technicians (94)
- Industrial Engineers (83)
- Marine Engineers and Naval Architects (<50)
- Materials Engineers (<50)
- Mechanical Engineering Technicians (<50)
- Mechanical Engineers (288)
- Mining and Geological Engineers, Including Mining Safety Engineers (150)
- Nuclear Engineers (0)
- Petroleum Engineers (482)

LIFE AND PHYSICAL SCIENTISTS (4,739)

- Agricultural and Food Science Technicians (<50)
- Animal Scientists (<50)
- Astronomers (<50)
- Atmospheric and Space Scientists (86)
- Biochemists and Biophysicists (<50)
- Biological Scientists, All Other (194)
- Biological Technicians (480)
- Forest and Conservation Technicians (*)
- Foresters (*)
- Geological and Petroleum Technicians (616)
- Geoscientists, Except Hydrologists and Geographers (331)
- Hydrologists (<50)
- Life Scientists, All Other (<50)
- Life, Physical, and Social Science Technicians, All Other (327)

(continued on the next page)

Defining the STEM workforce

Describing Alaska's STEM workforce is a challenge. There is no accepted national list of STEM occupations, and definitions vary depending on the source and the purpose of the research.

For this article, the Research and Analysis section of the Alaska Department of Labor and Workforce Development created a working definition for STEM occupations as a contribution to the ongoing discussion.

For an explanation of our criteria, refer to the methodology on page 12. Based on these criteria, we identified 135 STEM positions, 132 of which had employment in Alaska in 2008. (See Exhibit 1.)

We organized STEM occupations into eight broad categories: business and finance; computer and math science; architects, surveyors, and cartographers; engineers; social scientists; life and physical scientists; and postsecondary teachers. STEM occupations that did not fit into any of these categories were grouped into "all other."

Forecasted STEM openings

In 2008, Alaska had roughly 24,441 STEM-related jobs, and this number is projected to increase to 27,174 by 2018. (See Exhibit 2.)

An estimated 2,748 new STEM-related positions will be created during the forecast period, and an additional 5,376 will open as workers retire, change occupations, or leave the labor force. All together, more than 8,100 projected STEM openings will need to be filled.

In 2008, the highest STEM employment was in engineering, life and physical sciences, and computer and math science, in that order. (See Exhibits 2 and 3.) Occupations in these categories, as well as in business and finance, are each expected to generate more than 1,000 openings by 2018, and taken together will account for over 77 percent of STEM openings. Engineering-related occupations are expected to produce slightly more than 2,000 openings — the highest of any category.

STEM Occupations (continued)

Alaska, 2008

LIFE AND PHYSICAL SCIENTISTS (continued)	
Chemical Technicians (141)	Materials Scientists (<50)
Chemists (112)	Medical Scientists, Except Epidemiologists (<50)
Conservation Scientists (210)	Microbiologists (<50)
Environmental Science and Protection Technicians, Including Health (189)	Nuclear Technicians (0)
Environmental Scientists and Specialists, Including Health (595)	Physical Scientists, All Other (126)
Epidemiologists (<50)	Physicists (<50)
Food Scientists and Technologists (<50)	Soil and Plant Scientists (<50)
Forensic Science Technicians (<50)	Zoologists and Wildlife Biologists (635)

POSTSECONDARY TEACHERS (834)[1]	
Agricultural Sciences Teachers (*)	Engineering Teachers (*)
Anthropology and Archeology Teachers (*)	Environmental Science Teachers (*)
Architecture Teachers (*)	Forestry and Conservation Science Teachers (*)
Atmospheric, Earth, Marine, and Space Sciences (*)	Geography Teachers (*)
Biological Science Teachers (*)	Mathematical Science Teachers (*)
Chemistry Teachers (*)	Physics Teachers (*)
Computer Science Teachers (*)	Sociology Teachers (*)
Economics Teachers (*)	

SOCIAL SCIENTISTS (478)	
Anthropologists and Archeologists (<50)	Social Science Research Assistants (<50)
Economists (70)	Sociologists (<50)
Geographers (<50)	Survey Researchers (75)
Industrial-Organizational Psychologists (0)	Urban and Regional Planners (220)
Market Research Analysts (<50)	

ALL OTHER (2,094)	
Audio and Video Equipment Technicians (144)	Film and Video Editors (<50)
Audio-Visual Collections Specialists (<50)	Fire Inspectors and Investigators (<50)
Broadcast Technicians (75)	Graphic Designers (172)
Chemical Plant and System Operators (<50)	Multimedia Artists and Animators (<50)
Commercial and Industrial Designers (<50)	Museum Technicians and Conservators (53)
Computer and Information Systems Managers (397)	Natural Sciences Managers (264)
Construction and Building Inspectors (234)	Numerical Tool and Process Control Programmers (<50)
Desktop Publishers (<50)	Sales Engineers (<50)
Embalmers (<50)	Sound Engineering Technicians (<50)
Engineering Managers (426)	Statistical Assistants (54)
Farm, Ranch, and Other Agricultural Managers (<50)	Traffic Technicians (<50)
Farmers and Ranchers (<50)	

[1]There are no employment estimates for individual postsecondary teachers.
An asterisk (*) indicates suppressed data.
Source: Alaska Department of Labor and Workforce Development, Research and Analysis Section

Help wanted: Seeking skilled workers

Over the next ten years, STEM workers will be in demand for a range of occupations. Exhibit 4 lists the STEM occupations forecasted to generate the most job openings from growth and replacements.[1] Accountants and auditors top the list with about 580 total openings. STEM postsecondary teachers

[1]Growth openings are equal to the positive change in employment (i.e., new jobs). Replacement openings are vacancies left by workers who choose another occupation or exit the workforce.

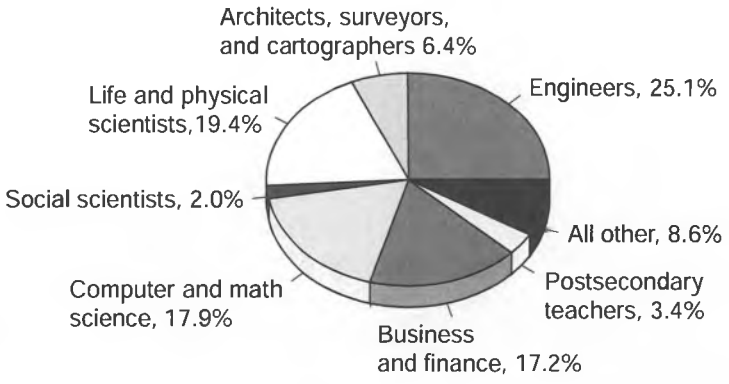
2 Projected STEM Employment by Category
Alaska, 2008 to 2018

Occupational Categories	Employment 2008	Employment 2018	Percent change	Openings, 2008 to 2018 Growth[1]	Openings, 2008 to 2018 Replacement[2]	Openings, 2008 to 2018 Total
Business and Finance	4,212	4,681	11.1%	469	763	1,232
Computer and Math Science	4,385	4,945	12.8%	560	607	1,167
Architects, Surveyors, and Cartographers	1,554	1,757	13.1%	203	520	723
Engineers	6,145	6,755	9.9%	610	1,430	2,040
Social Scientists	478	537	12.3%	59	160	219
Life and Physical Scientists	4,739	5,273	11.3%	535	1,244	1,779
Postsecondary Teachers	834	959	15.0%	125	208	333
All Other[2]	2,094	2,267	8.3%	187	444	631
Total for All STEM:	24,441	27,174	11.2%	2,748	5,376	8,124

[1]Growth openings are equal to the positive change in employment (i.e., new jobs).
[2]Replacement openings are vacancies left by workers who choose another occupation or exit the workforce.
Note: Data for individual occupations are at: http://labor.alaska.gov/research/occs/alaskaoccs/OccList.htm.
Source: Alaska Department of Labor and Workforce Development, Research and Analysis Section

3 Makeup of STEM Employment[1]
Alaska, 2008

Total STEM Employment: 24,441



[1]Excludes self-employed workers, private household workers, most agricultural workers, fishermen, and others not covered by the state's unemployment insurance program.
Source: Alaska Department of Labor and Workforce Development, Research and Analysis Section

are next, with estimated job vacancies of 300-plus.

Engineering-related occupations accounted for eight of the 30 occupations on the list. Civil and petroleum engineers are expected to generate more than 200 openings each, and both professions pay excellent annual wages. Openings for civil engineering technicians may exceed 160 positions, and these workers often train to become fully licensed engineers.

Seven computer science-related occupations made the list, and taken together they account for more than 1,000 job openings. Of this group, computer support specialists topped the list at more than 260 potential openings.

Education is essential

An estimated 95 percent of STEM workers need more than a high school diploma for their positions, compared to just 47 percent of non-STEM workers.[2] About 75 percent of STEM workers need a bachelor's or graduate degree, compared to only 20 percent of non-STEM workers. (See Exhibit 5.)

College degrees that prepare workers for STEM occupations require more math and science courses, and preparation for those classes begins in grade school.

Because an educated workforce is fundamental to STEM jobs, emphasis at the national level is on improving math and science education for students in kindergarten through 12th grade. This push includes getting kids interested in math and science careers as well as maximizing teacher and student performance.

Americans have known for some time that our high

[2]Based on O*NET surveys of occupation incumbent workers, applied to Alaska 2008 employment estimates.

school students lag behind other countries in math and science. Every three years, the Program for International Student Assessment reports test scores in math and science for 15-year-olds, and the 2009 results are not much different from previous years. In math, students in 17 of 33 countries performed better than Americans, and in science, 12 of 33 countries outranked the U.S.

One encouraging sign for Alaska is that more high school students are taking STEM-related courses at the University of Alaska. These dually enrolled students receive high school and college credits for attending college classes.

Between 2002 and 2010, the number of dually enrolled students in STEM-related classes increased from 35 to 417.[3] In 2010, there were 203 students enrolled in math and 101 students taking engineering technology courses. The remainder were enrolled in a variety of STEM-related disciplines such as computer science, biology, biomedical science, physical science, and natural resource management.

STEM jobs pay well

The average annual wage for STEM workers is $73,251 — almost $28,000 higher than for non-STEM workers. As in most professions, STEM occupations that require a higher level of education typically have more earning power.

Workers in STEM occupations earn higher average wages than their non-STEM counterparts at every level of education. (See Exhibit 6.) The difference is greatest at the lower levels of education attainment, where STEM-related technical certificates apparently trump general associate degrees and other certificates.

The wage gap between STEM and non-STEM occupations diminishes with higher levels of education. Still, on average, STEM jobs requir-

[3] Source: University of Alaska, Statewide Planning and Institutional Research

Highest Projected STEM Occupation Openings 4

Alaska, 2008 to 2018

Occupation	2008 Employment	Growth Openings[1]	Replacement Openings[2]	Total Openings
Accountants and Auditors	1,860	225	356	581
STEM Postsecondary Teachers	834	125	208	333
Zoologists and Wildlife Biologists	635	70	213	283
Computer Support Specialists	1,124	136	132	268
Surveyors	464	68	198	266
Geological and Petroleum Technicians	616	67	157	224
Petroleum Engineers	482	50	172	222
Civil Engineers	700	100	114	214
Environmental Scientists and Specialists, Including Health	595	82	107	189
Computer Programmers	680	15	154	169
Civil Engineering Technicians	449	63	104	167
Biological Technicians	480	60	79	139
Computer Systems Analysts	465	75	57	132
Network and Computer Systems Administrators	541	69	59	128
Engineering Managers	426	36	83	119
Urban and Regional Planners	220	27	86	113
Computer Software Engineers, Applications	326	64	48	112
Surveying and Mapping Technicians	187	28	83	111
Computer and Information Systems Managers	397	35	74	109
Computer Software Engineers, Systems Software	290	60	43	103
Mechanical Engineers	288	17	83	100
Geoscientists, Except Hydrologists/ Geographers	331	39	60	99
Architectural and Civil Drafters	236	24	72	96
Environmental Engineering Technicians	249	40	52	92
Mining and Geological Engineers, Including Mining Safety Engineers	150	30	62	92
Architects, Except Landscape and Naval	321	49	37	86
Health and Safety Engineers, Except Mining Safety Engineers and Inspectors	226	20	66	86
Electrical and Electronic Engineering Technicians	310	15	67	82
Conservation Scientists	210	21	61	82
Construction and Building Inspectors	234	26	53	79

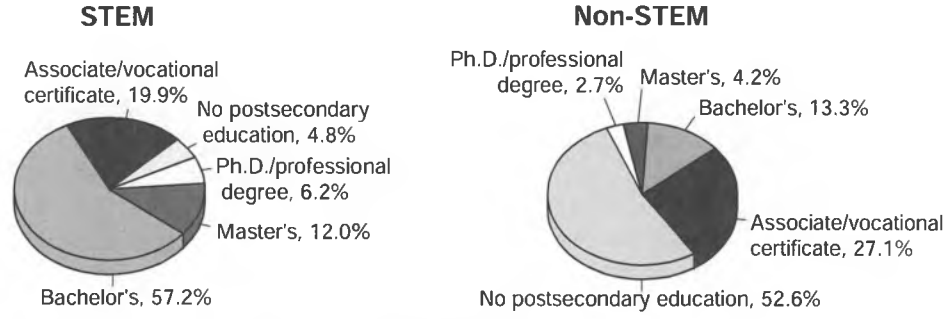
Note: Excludes residual ("all other") occupations.

[1]Growth openings are equal to the positive change in employment (i.e., new jobs).

[2]Replacement openings are vacancies left by workers who choose another occupation or exit the workforce.

Source: Alaska Department of Labor and Workforce Development, Research and Analysis Section

5 Required Education Levels[1]
Alaska, 2008



[1]Based on required education data from O*NET database, weighted by employment.
Source: Alaska Department of Labor and Workforce Development, Research and Analysis Section

6 Average Earnings by Education Level
All Alaska jobs, 2009

Education Level	STEM	Non-STEM	Difference
Associate degree, certificate, or some college	$63,192	$49,059	28.8%
Bachelor's degree	$75,499	$62,732	20.4%
Master's degree	$79,733	$70,731	12.7%
Doctorate or professional degree	$86,052	$82,751	4.0%

Note: Based on O*NET required education data and an employment weighted average of May 2009 OES wage estimates. Excludes residual ("all other") occupations.
Source: Alaska Department of Labor and Workforce Development, Research and Analysis Section

7 Ten Highest-Paying STEM Jobs
Alaska, 2009

Occupation	Annual Wages
Petroleum Engineers	$154,500
Chemical Engineers	$125,820
Engineering Managers	$118,440
Materials Engineers	$108,180
Geoscientists, Except Hydrologists and Geographers	$104,410
Electrical Engineers	$100,250
Industrial Engineers	$98,790
Mechanical Engineers	$98,790
Mining and Geological Engineers, Including Mining Safety Engineers	$95,200
Natural Sciences Managers	$92,340

Note: Based on May 2009 OES wage estimates.
Source: Alaska Department of Labor and Workforce Development, Research and Analysis Section

ing a bachelor's degree pay 20 percent more than those in non-STEM categories, and those needing a master's degree pay 13 percent more.

As a group, STEM postsecondary teachers had the highest wages, with an average salary of about $92,000. (See Exhibit 8.)

For individual occupations, petroleum engineers top the list with average earnings of $154,500, and eight of the ten highest paying occupations are engineering-related. (See Exhibit 7.)

Engineers typically earn a bachelor's degree and spend several years gaining on-the-job experience before they can take an exam to become fully licensed and start earning top-dollar wages.

An aging STEM workforce

There are relatively few young STEM workers. In 2008, only about 9 percent were under the age of 25 (see Exhibit 9), compared to 20 percent of non-STEM workers. This is likely because it takes time to obtain the necessary postsecondary education or training for STEM employment.

Alaska's STEM workforce is aging, and replacements will be needed as these workers retire. About 41 percent of Alaska's STEM workers were ages 45 to 64 in 2008, and many of these workers will retire in the near future. It will be a challenge to replace them, because these workers typically have many years of experience, education, knowledge, and skills built up over a career. However, the large number of aging workers also means continued opportunities for younger workers just starting their careers, provided they have the required education and training.

Most STEM workers are men

STEM workers in Alaska are predominately male, a long-time trend that mirrors the rest of the nation. Business and finance was the only category with significantly more women than men. (See Exhibit 10.) Social sciences had an almost even split of males and females. But in nearly every other category, there were significantly more men.

Engineering had the highest difference, with four males to every female.

However, data from the National Science Foundation suggest that the number of women choosing STEM careers is on the rise. Women made up 27 percent of the nation's science and engineering workforce in 2007, compared to only 12 percent in 1980.[4]

Despite the apparent gender gap in science and engineering, Alaska's women are closing the gap in some individual occupations.

Eight of the top 15 STEM occupations with the highest percentage of females require a background in science. (See Exhibit 11.) Four of those are in the environmental sciences. Conservation scientists are 52 percent female, followed by environmental technicians (48 percent), environmental scientists (47 percent), and environmental engineers (36 percent). In contrast, only 20 percent of engineers overall are women.

Finding qualified workers

Employers who can't find workers locally have to look outside the state. In 2008, about 16 percent of workers in STEM-related jobs were nonresidents, compared to 20 percent nonresidency for non-STEM positions.

Finding qualified Alaska residents is a challenge for employers in a variety of industries. Because most STEM workers need a bachelor's degree or higher, short-term training programs are less likely to provide a quick fix for any worker shortages.

Among STEM occupations, the life and physical sciences category had the highest percentage of nonresidents; about 23 percent of its workers were from outside the state. However, rates for individual occupations can vary widely.

For residency information for specific occupations, refer to the Alaska Occupations Web site, which provides data on more than 500 occupations.[5]

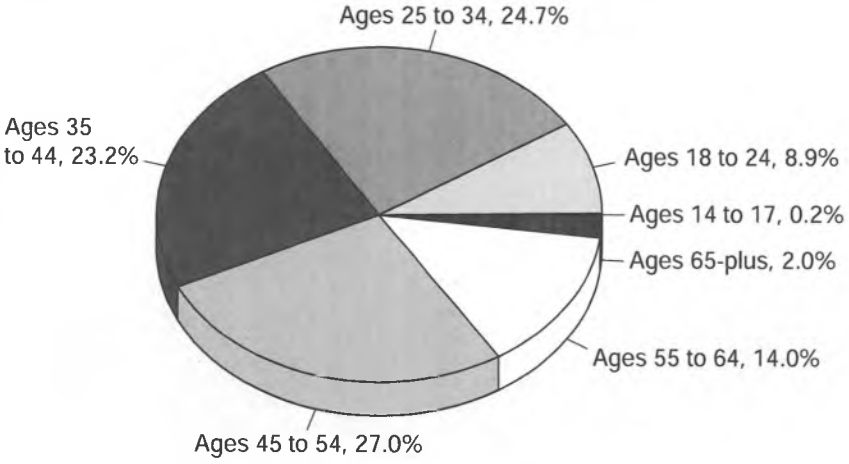
[4]Source: The National Science Foundation's Science and Engineering Indicators 2010 Report
[5]See http://labor.alaska.gov/research/occs/alaskaoccs/home.htm.

Average Wages by Category 8
All Alaska jobs, 2009

Occupational Category	STEM Wages	Non-STEM Wages
Postsecondary Teachers	$91,968	$71,259
Engineers	$89,053	*
Architects, Surveyors, and Cartographers	$69,335	*
Computer and Math Science	$66,853	*
Business and Finance	$65,046	$63,390
Life and Physical Scientists	$62,895	*
Social Scientists	$61,503	$70,863
All Other[1]	$78,266	$44,790

[1]For a list of occupations see Exhibit 1.
*All occupations in this category are STEM.
Note: Based on an employment weighted average of May 2009 OES wage estimates.
Source: Alaska Department of Labor and Workforce Development, Research and Analysis Section

9 Age of STEM Workers
Alaska, 2008



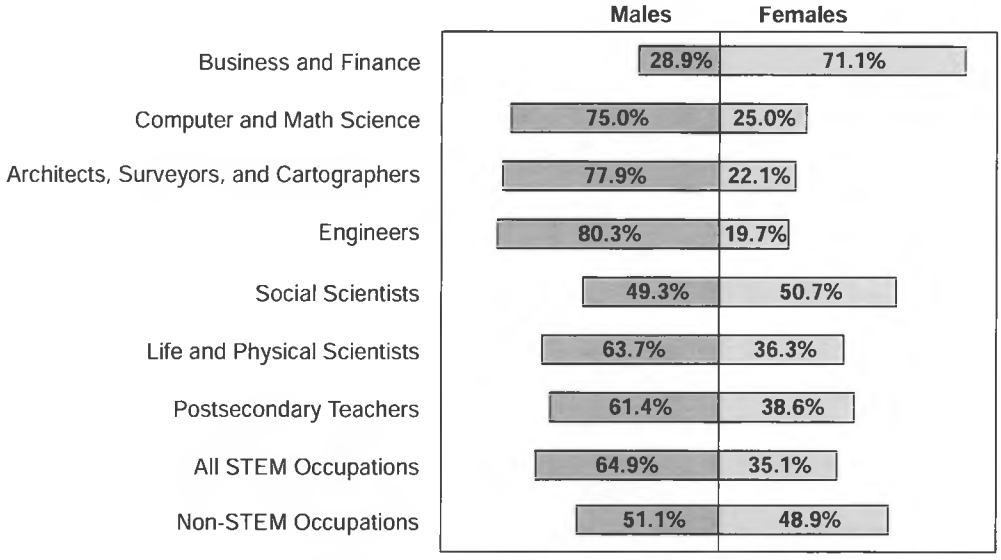
Note: Based on 2008 Alaska Permanent Fund Dividend data.
Source: Alaska Department of Labor and Workforce Development, Research and Analysis Section

The national push for STEM

In 2007, Congress passed the America Competes Act, with the goals of promoting scientific research and development and helping the U.S. stay competitive. The act was partly in response to a 2007 federal report titled "Rising Above the Gathering Storm."

The report concluded that although the United

10 Gender Makeup of STEM Categories
Alaska, 2009



Note: Based on 2008 Alaska Permanent Fund Dividend data.
Source: Alaska Department of Labor and Workforce Development, Research and Analysis Section

11 Highest Percentages of Women
Alaska STEM jobs, 2008

Occupation	Percent female
Budget Analysts	77.9%
Accountants and Auditors	72.7%
Graphic Designers	57.9%
Financial Analysts	54.7%
Conservation Scientists	51.7%
Environmental Science and Protection Technicians, Including Health	47.5%
Environmental Scientists and Specialists, Including Health	47.1%
Urban and Regional Planners	45.6%
Operations Research Analysts	45.5%
Natural Sciences Managers	44.2%
Biological Technicians	42.7%
Chemists	41.6%
STEM Postsecondary Teachers	38.6%
Environmental Engineers	35.5%
Database Administrators	35.4%

Note: Only includes occupations with 100 or more jobs. Excludes residual ("all other") occupations. Gender percentages are based on 2008 Alaska Permanent Fund Dividend data.
Source: Alaska Department of Labor and Workforce Development, Research and Analysis Section

States was still among the world's leaders in scientific research, discovery, and innovation, it was in danger of losing its global technological edge.

The act increased funding for scientific research and development, promoted STEM-related education, and extended tax credits for companies engaged in scientific research.

In late December of 2010, the America Competes Act was reauthorized with bipartisan support and was signed into law on Jan. 4. The act includes research and development tax credits for private companies and more than $40 billion in funding for the National Science Foundation, the Department of Energy, and the National Institute of Standards and Technology.

The America Competes Act is just one example of U.S. efforts to promote STEM-related education. One of the largest is led by a nonprofit group called Change the Equation. This umbrella organization's 110 corporate partners have pledged millions of dollars worth of funding and in-kind contributions to promote STEM-related education.

Research dollars for Alaska

It is difficult to obtain data on the research expenditures of private companies, but information on government funding awarded to the University of Alaska is quantifiable and a good example of how these dollars filter into the state economy.

In 2009, the National Science Foundation awarded $40.5 million for research and $162.2 million for major research equipment to the University of Alaska Fairbanks.[6] Most of the equipment funding was for the construction of a new research vessel, the R/V Sikuliaq, which is scheduled to begin operations in 2014 and will port in Seward.

UAF will operate the 254-foot, $123 million ship, which will be owned by the National Science Foundation and is under construction in Marinette, Wisc. Scientists from Alaska and

[6]Source: The National Science Foundation's Budget Internet Information System, http://dellweb.bfa.nsf.gov/

around the world will have a new platform to study climate change, sea ice, fisheries, and sub-sea volcanic activity.

Research resembles an industry

Scott Goldsmith, an economics professor at the University of Alaska Anchorage, has studied the benefits of scientific research and development conducted by the university. He wrote that research is an economic enterprise comparable to mining, seafood, timber, or oil and gas.[7] Research brings money into Alaska and creates jobs.

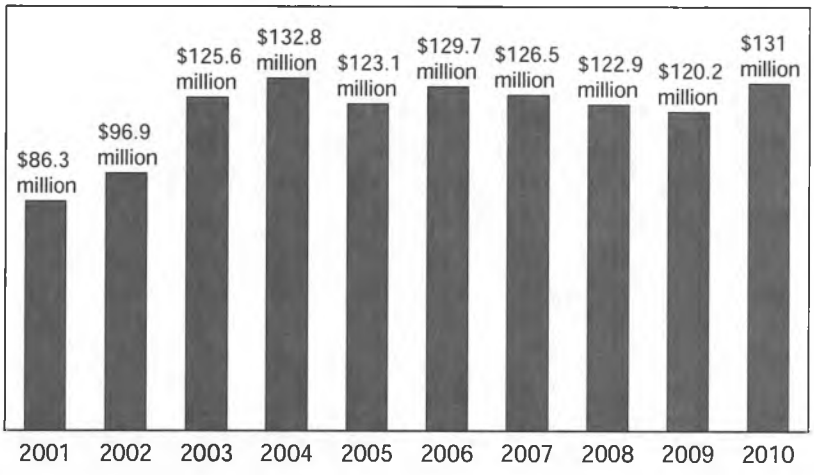
Goldsmith estimated that in 2006, university research money helped fund $52.6 million in payroll — or 1,292 jobs — within the university and an additional 1,100 jobs in Alaska's private sector, or $39.5 million in wages. Research expenditures have increased since these 2006 data.

Research dollars support more than just science. During fiscal year 2010, the University of Alaska spent $131 million on research-related activities. (See Exhibit 12.) These expenditures include wages for employees and the purchase of goods and services from local businesses. The university spends additional money when building new science labs, which provides jobs for construction workers.

Most of the university's research budget comes from nonstate funds. According to the University of Alaska in Review 2010 Report, the university system leveraged $5.70 in external funding for every dollar of state funding provided during fiscal year 2009.

A large portion of that funding came from the federal government, but private grants and donations also contributed significantly. During FY 2009, the federal government provided roughly 86 percent of the funding for UA research; private, local, and other sources funded 12 percent; and 2 percent came from state government.[8]

University Research Expenditures **12**
U of A, fiscal years 2001 to 2010



Note: Includes activities directly related to scientific and academic research, including capital expenditures.
Source: University of Alaska Statewide Planning and Institutional Research

STEM for Alaska's future

The contributions that engineers, scientists, and other STEM workers make to the state are multifaceted, as they solve problems and bolster the economy throughout Alaska's industries. As we move into the future, we need an educated and highly skilled STEM workforce to provide solutions for short-term and long-term challenges of life in Alaska.

[7]Source: Scott Goldsmith, "University of Alaska Research: An Economic Enterprise," UAA Institute of Social and Economic Research, http://iser.uaa.alaska.edu/Publications/ua_econent.pdf
[8]Percentages are based on data from Table 5.07 of the University of Alaska in Review 2010 Report.

February 3, 2013

RE: Letter of Support for Engineering and SB40

Dear Senate Education Committee:

Please support full funding for the University of Alaska engineering buildings. Supporting engineering programs helps generate jobs and economic growth with stability for Alaska.

I was an engineering professor with UA for 24 years, six years at UAF and 18 years at UAA. I have been an active supporter of new engineering facilities and have testified before the UA Board of Regents and legislators on several occasions. In August 2012, I retired from the university but have continued working with middle and high schools to establish better learning opportunities for students desiring engineering experiences and careers.

The issue of additional space being needed for engineering programs has been the focus of advocacy from the community and students for several years. Attached are two of the numerous community commentaries that have been published from 2008 (A.1) and 2012 (A.2-A.3). Also attached is a photo with 14 of my engineering students on the steps of the Capitol (A.4) while advocating for a new building in February 2009. By May 2009, more than 300 engineering students signed a petition for a new building that was submitted to the Governor's office and legislators.

Engineering facility space at UAA is severely lacking and is three times less per student than the national average. The need for additional space is so severe that two building phases are already needed to satisfy current demand. The large shortage was caused by a long standing lack of space that was followed by huge enrollment growth during the past seven years. Currently, funding for only the phase one building has been requested which shows that every penny is needed.

As a member of the Alaska Engineering Academies Advisory Council, I work on establishing engineering academies in middle and high schools throughout Alaska in urban and rural areas and everything in-between. Attached is a January 2012 *Anchorage Daily News* Compass piece (A.5) and a more recent November 2012 Alaska Professional Design Council *Alaska Designs* article (A.6-A.8) about the academies that I co-authored. The implementation of engineering academies is just beginning and public demand for more is growing rapidly. Soon there will be even more graduating high school students knocking at the doors of the UA engineering schools that already need more labs and classrooms.

Please approve the full amount of the requested funds. Thank you.

Respectfully Submitted,

Grant Baker
District 15-H, Anchorage, Alaska
Member, Alaska Engineering Academies Advisory Council, http://www.apicc.org/
Alaska State Leader, Project Lead the Way (PLTW)-national STEM organization, http://www.pltw.org/
Email: grant_baker_2000@hotmail.com
Phone: 907-440-2287 (cell)

CC: Senator Johnny Ellis, Tim Lamkin, Matt Moser
Attachments: Cover letter, supportive articles and documents

low to reach us

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Daily News Opinion

COMPASS: *Other points of view*

University needs help filling Alaska's engineer shortage

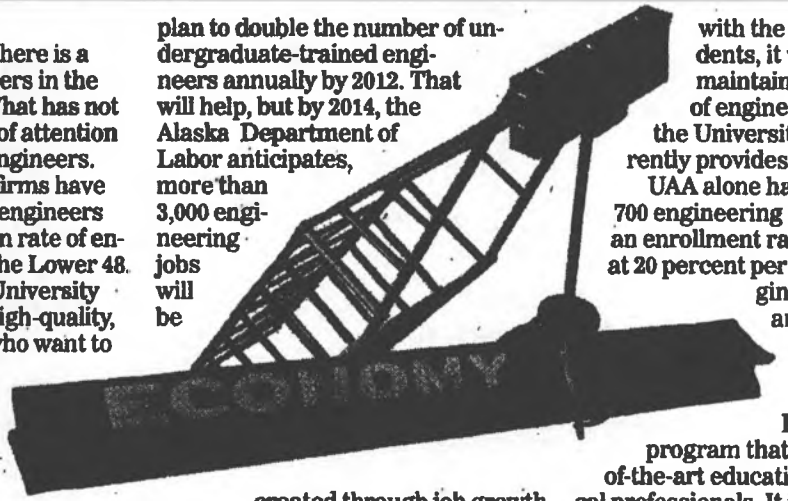
y FRANK RAST

It is well known that there is a ritical shortage of workers in the onstruction industry. What has not eceived the same level of attention ; the parallel need for engineers.

Our Alaska member firms have ad difficulty recruiting engineers nd have a poor retention rate of en- ineers relocated from the Lower 48. /e have found that the University f Alaska has provided high-quality, omegrown engineers who want to ay in Alaska. Unfortu- ately, to date the UAA ystem has not been ble to satisfy the de- and.

Alaska needs an esti- ated 400 new engineers ach year. Currently, the Universi- of Alaska, both in Fairbanks and nchorage, is growing about 100 en- ineering graduates each year.

The university is implementing a plan to double the number of undergraduate-trained engineers annually by 2012. That will help, but by 2014, the Alaska Department of Labor anticipates, more than 3,000 engineering jobs will be created through job growth, retirement and turnover. That's a serious shortage of engineers and will become a major problem for our state if not addressed now.



More important, if funding for facilities and staff does not increase with the number of students, it will be difficult to maintain the high quality of engineering graduates the University of Alaska currently provides.

UAA alone has more than 700 engineering students and an enrollment rate increasing at 20 percent per year. The Engineering, Science and Project Management program is hugely successful. It's a master's program that provides state-of-the-art education for technical professionals. It is one of only 13 such programs in the world accredited by the Global Accreditation Center for Project Management. Enrollment in this program alone has increased by 50 percent since spring 2007.

By 2014, more than 3,000 engineering jobs will be created through job growth, retirement and turnover. That's a serious shortage of engineers.

To maintain these growing — and much-needed — programs, the School of Engineering will have to double the number of faculty members and dramatically increase laboratories and other facilities. UAA's engineering facilities currently occupy 40,000 square feet; a recent space analysis shows that 200,000 square feet is needed.

Funding from the state and tuition covers only two-thirds of revenue to UAA, with remaining funds coming from a variety of sources. Philanthropic contributions are becoming increasingly important. Private support from industry and individuals will help nurture the tremendous growth of the School of Engineering and ensure a steady stream of engineering graduates.

The need to maintain high-caliber local engineering graduates has never been greater. It's time for the University of Alaska's engineering programs to get the funding they need and deserve, for our students and our state. This is a challenge that we hope to meet, with the combined help of the state, the university and our industry partners.

Frank Rast is president of the American Council of Engineering Companies of Alaska.

newsminer.com

Invest in Alaska's engineers

Posted: Wednesday, April 11, 2012 11:06 pm | *Updated: 1:49 pm, Wed Jan 16, 2013.*

By Gordon Pospisil Fairbanks Daily News-Miner | 0 comments

As we look for ways to create a legacy of opportunity for present and future generations in Alaska, we need look no further than our own university. Strong universities create sustained economic opportunities for the surrounding communities.

This is recognized by private industry in Alaska. In fact, since 2007, private gifts from nearly 770 individuals and corporations total more than $26 million to the University of Alaska engineering departments alone. These contributions were made to support the engineering programs that are training engineers for future employment in Alaskan enterprises.

The University of Alaska is making good progress. From 2000 to 2010, of the 1,351 University of Alaska engineering graduates, close to 70 percent remained in Alaska, and more than 50 percent are working specifically in engineering-related occupations. Further, applications and enrollment in engineering are among the highest of all departments.

While we have fine programs, our facilities are lacking in space, equipment and technology to provide state-of-the art instruction required to serve our students. Engineering facilities in Fairbanks and Anchorage date from the 1960s and 1980s, respectively, without significant updates. Accordingly, the UA Board of Regents has called the UA Engineering Expansion Initiative the number one new construction priority for academic programs.

But there is a greater opportunity here than just providing proper instructional and laboratory space for students and faculty. Alaska faces a shortage of qualified engineers. The state Department of Labor and Workforce Development's projections indicate an average of 78 new engineering jobs will be available each year, plus another 189 replacement openings resulting from workers retiring, leaving the Alaska labor force or changing occupations. Alaska's employers prefer to hire UA graduates because of their education, understanding of arctic engineering principles and likelihood of remaining in the state.

In serving on the Engineering Advisory Councils of UA Anchorage and UA Fairbanks, we feel that it is critical for us to work together in supporting the University of Alaska's engineering programs. These programs are complementary and collaborative.

In fiscal year 2011, the Alaska Legislature appropriated $8 million for planning and design. Now it's time to fund the plan to keep the program on track. The University of Alaska is well positioned to create a legacy institution yielding high-quality education and career opportunities for Alaska students while contributing towards a vibrant economy.

With days left until adjournment, we commend the Senate Finance Committee for including these projects in the fiscal year 2013 capital budget, and we wholeheartedly encourage the Legislature to fund these important projects. Let's invest in Alaska!

Gordon Pospisil of Anchorage is the technology manager for BP Exploration (Alaska) Inc. He is chairman of the UAF Department of Petroleum Engineering's Industry Advisory Board and the UAF College of Engineering and Mines Advisory Council. Richard Reich of Anchorage is general manager of UMIAQ, a subsidiary of Ukpeagvik Iñupiat Corporation. An Iñupiaq born and raised in Barrow, he earned a bachelor's degree in civil engineering at UAF in 1988 and an master's in business administration from UAA in 2001. He is chairman of the UAA School of Engineering Advisory Board.

"The Magnificent 14" – Juneau, February 2009

In February 2009, 14 UAA engineering students travelled to Alaska's Capitol in Juneau to advocate for a new engineering building. Their advocacy with legislators was a catalyst for public awareness about the need for new engineering buildings. On the Capitol Steps, from Right to Left - **Back Row**: Brian Glasheen, Garrett Yager, Jeremiah Stack, Alex Bergeron, Michael Lloyd; **Middle Row**: Gan Wu, Natasha Hayden, Kali Korach, Kelvin Goode; **Front Row**: Audrey Alstrom, Cheyenne Alabanzas, Jacob Thompson, Carolyn Stone, James Kase.

adn.com
Anchorage Daily News
Thursday, January 12, 2012
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COMPASS: *Other points of view*

Engineering program growing, needs support

By GRANT BAKER, ROB LANG and TODD BERGMAN


Baker


Lang


Bergman

Rapid growth in these programs to more than 100 students was attributed to the best type of publicity — students telling other students about what they were doing.

The engineering profession is directly tied to the generation of income. For example, every construction project for new development or infrastructure depends upon engineers. It is important to the future of Alaska to keep engineering jobs in the state.

For many years now, it has been well known that producing "home-grown" engineers is important for keeping projects from leaving the state and for attracting new projects to the state. Kids that grow up in Alaska and obtain Alaska engineering degrees tend to remain in Alaska — avoiding expensive turnover for employers that results from hiring out-of-state. In addition, an engineer educated with an understanding of the arctic conditions of Alaska is invaluable to companies and government agencies operating in Alaska.

Student success in college is highly dependent on what happens before college. Better preparation in high school, middle, and even grade school, leads to better success in college. A new movement to attract students to engineering and enhance success is called the Alaska Secondary Engineering Academies Initiative — and it is rapidly gaining momentum.

In November 2009, the initiative was created through a memorandum of understanding signed by a number of state department commissioners, University of Alaska chancellors and the Alaska Process Industry Careers Consortium. The memorandum set a timeline and pathway for establishing engineering academies in middle and high schools throughout all of Alaska, urban and rural.

What is an engineering academy? The ultimate academy is one with a group of teachers within a school, usually around four, that teach a curriculum with an engineering focus. For a high school, specific engineering courses are taught each year in grades 9 through 12. Math, science, English, and physics or other science courses are also included. The curriculum is an excellent one for qualifying students for scholarships, especially the Alaska Performance Scholarship.

One national model used successfully in Alaska is the Project Lead the Way program. As its name suggests, students learn and apply technical skills to design and construct projects.

The desired engineering academy is open to all students, attracts students to STEM, or Science, Technology, Engineering, and Math, engages students and enhances achievement, provides teacher training, contains courses with high quality standards and rigor, has a relatively low cost per student and can be implemented in both rural and urban areas.

Dimond High in Anchorage and Lathrop High in Fairbanks are two examples of engineering academies in Alaska that started just a few years ago. Rapid growth in these programs to more than 100 students was attributed to the best type of publicity — students telling other students about what they were doing. Students learn technical design as well as communication skills that will serve them throughout their lives. The Mat-Su Technical and Career High School also has a Pre-Engineering program with a similar curriculum.

The pathway to engineering is built upon science, technology and math. Other STEM programs that may be less comprehensive than an engineering academy can play an important role. Programs such as Mathcounts, Alaska robotics, summer K-12 engineering and science camps, and other programs can be very effective in attracting students to STEM and integrate well with engineering academies.

An Alaska Engineering Academies Advisory Council is currently being formed. It will be the lead group for coordinating all efforts and for advocacy. Volunteers — including teachers, principals, engineers and other professionals, and government representatives — are needed from all parts of Alaska. The council may eventually have as many as 100 members or more in order to have good representation of the needs throughout Alaska.

It is time for action. Better pathways to professional careers are needed for our kids. The economic future of Alaska depends upon it. Your support through contacting your legislator or school official can help make it happen.

Grant Baker has been an engineering professor for 23 years with the University of Alaska, and for the past several years has worked with high schools to establish engineering academies in Alaska. Rob Lang has been an engineering professor for 10 years at UAA. Todd Bergman is executive director for APICC. He has 28 years of experience as an instructor in business management and as an education administrator. To learn more about the Alaska Engineering Academies effort, contact Cari-Ann Ketterling with APICC at cketterling@apicc.org or 907-770-5250. Letters and resolutions of support, and additional information are available through the APICC website at www.apicc.org.

Alaska Designs

Volume 35, No. 9, November 2012 | The Official Newsletter of the Alaska Professional Design Council

Draft Agenda for AELS Board Meeting Nov. 1-2

The State of Alaska, Department of Commerce, Community and Economic Development, Division of Corporations, Business and Professional Licensing, Board of Registration for Architects, Engineers and Land Surveyors (AELS Board) quarterly meeting is November 1-2 at the Atwood Building in Anchorage, 550 West 7th Avenue, Suite 1860. Highlights of the tentative agenda are outlined below.

Public comment is scheduled Thursday, November 1, at 1:15 pm. The complete agenda is available on the AELS Board website at http://www.dced.state.ak.us/occ/pael.cfm.

Thursday November 1, 2012

8 am Call to Order/Roll Call

8:05 am Review/Amend Agenda

8:10 am Ethics Reporting

8:15 am Review/Approval Minutes of regular meeting August 2-3, 2012

8:30 am Investigative Report

9 am Expenditure Report

9:30 am Regulation Updates

A. Status of Statute changes
   a. AS 08.48.055 Executive Secretary of the Board. (SB 143)(HB337)
   b. AS 08.48.221 Seals
   c. AS 08.48.281 Prohibitive Practice
   d. AS 08.48.341 Definitions
   e. AS 08.48.331 Exemptions

B. Regulation Project
   a. 12 AAC 36.190 Testing Laboratory Reports
   b. 12 AAC 36.068 Eligibility for Landscape Architect

Continued on Page 2

Academies Advance Engineering

By Grant Baker, PE, Todd Bergman, APICC Executive Director, Skip Koch, PE, and Mark Malagodi

This is an exciting time for our youth interested in engineering careers. In the January 2012 Alaska Designs the article "*Academies Aid Students & Teachers, Build Profession*" gave an overview of the effort to establish engineering academies in middle and high schools throughout Alaska. Since then several new developments have occurred that strengthen pathways for our youth desiring professional careers in design.

During the 2012 spring legislative session Anchorage Senator Johnny Ellis was joined by Fairbanks Senator Joe Thomas in working with other legislators to approve funding for two new engineering buildings for the University of Alaska Anchorage and University of Alaska Fairbanks. A strong showing from professional organizations, the community, and industry helped provide the support needed to gain approval by legislators and the Governor.

Total funding for the new buildings is approximately $230M. About half of the funding was approved in 2012 which allows the building projects to move forward into construction phases during summer 2013. The remaining half is on a pathway for approval this upcoming legislative session. However, strong support from industry and the community continues to be needed to ensure full funding of the projects.

The Alaska Professional Design Council (APDC) played a major role in gathering support. For the past three years, APDC presented the need for Alaska grown engineers to legislators through its annual legislative fly-in during February. This year two engineering students from UAA and two from UAF joined the APDC legislative fly-in group to meet with legislators which was very effective and successful.

Now that the facilities needed for our students at the university level are on track to be built, it is important that a system be established that will both attract and enable more high school graduates to enter the university engineering and other technical programs. Preparing students better before they enter college leads to greater success rates and a shorter time to graduate. Engineering academies are ideal for this purpose.

An engineering academy consists of about four teachers within a middle or high school that teach engineering courses. Students on an engineering track also take classes in math, English, and science and learn writing and communication

Continued on Page 2

Inside This Issue

Academies Advance STEM Career Pathways

Continued from Page 1

skills. Students work on projects that instill a desire to learn a variety of topics that help with the design or construction of their projects. Thus, an engineering academy is a cost effective mechanism for engaging students in multiple STEM (Science, Technology, Engineering, and Math) topics.

There are many other benefits of an engineering academy. It prepares students for high paying careers in technical and engineering fields. It better prepares students for college and better qualifies them for scholarships such as the Alaska Performance Scholarship. Engineering academies will provide Alaska with the educated workforce needed in this increasingly technology driven world.

The Alaska Process Industry Careers Consortium (APICC) acts as the facilitator for the Alaska engineering academies effort. APICC organized two legislative luncheons in October 2012 to show the many benefits of engineering academies and to continue building legislative support.

The first luncheon occurred on October 2nd in Anchorage. Approximately 50 folks attended including several legislators and candidates. One highlight was the presentation by the Anchorage Dimond High School engineering academy including two current students. The students discussed their projects and how the engineering academies had helped in their decisions to enter college engineering programs.

The second luncheon was in Fairbanks on October 9th and was also attended by several legislators, legislative office staff, and candidates. The Fairbanks Lathrop High School engineering academy was featured including two students who had graduated and entered engineering programs at the University of Alaska. The students emphasized how the coursework and experience in the engineering academy helped them in their university engineering courses.

Additional material presented at the luncheons showed how the benefits of the engineering academies are aligned with goals set by the Governor's office, University of Alaska, Alaska Department of Education and Early Development, Alaska Department of Labor, and industry. Some of these goals are the strengthening of outreach and partnerships with K12 schools, improving student preparation for college, better training of youth for jobs, and increased hiring of Alaska grown engineers.

Engaged students want to attend school. Schools that started engineering academies such as Dimond High School and Lathrop High School experienced large enrollment growth to well over 100 students

Continued on Page 4

AELS Board Meeting Agenda

Continued from Page 1

Registration by Examination

c. 12 AAC 36.040 Simplified Application for Re-examination
d. 12 AAC 36. 050 Application Deadlines
e. 12 AAC 36.063 Engineering Education and Work Experience Requirements
f. Evaluate and/or Adopt software engineering license regulation

10 am Break

10:15 am Board Correspondence Received Since August 2012

10:45 am Correspondence Sent Since August 2012

10:50 am Old Business
- A. Electronic Signatures
- B. Record Drawing Disclaimers

11 am New Business
- A. Sealing of Engineering Product Related to Oil & Gas
- B. Professional being Regularly Employed in an Office
- C. Email w/attachment from Bert Lent re LAAB Accreditation of Non-degree Programs

12 pm Lunch

1:15 pm Public Comment

2:15 pm Executive Session (review applicant files and CE audit)

Friday November 2, 2012

8 am Reconvene Meeting/Roll Call

8:05 am Executive Session

8:30 am Board Travel
- A. General
- B. NCEES Annual St Louis August 22-25, 2012
- C. CLARB Fall Meeting September 6-8, 2012, San Francisco

9 am Special Committees & Standing Committees

110 am Break

10:15 am National Meeting Reports
- A. NCEES Western Zone (Heieren/Maynard and Hale/Jones)
- B. NCARB Minneapolis (Chair/Rearick/Kelly)

10:40 am Licensing Examiner Report

10:45 am Board Tasks (To Do List)

11 am Read Applications into the Record

11:45 am Board Member Comments, etc.

12:15 pm Adjourn ❖

Academies Advance STEM Career Pathways

Continued from Page 2

each within two years.

Beginning this fall semester, Anchorage Mears Middle School started an engineering academy using the Gateway-to-Technology program developed by the national non-profit organization Project Lead the Way. Both sections of the offered engineering classes are full with many more students wanting to enroll. Mears Middle School feeds into Dimond High.

One reason so many Mears Middle School students are interested is because they heard good things about the Dimond High engineering academy and wanted to try it too. The natural growth of engineering academies into middle schools resulting from positive feedback at the high school level is one of the best ways to build a sustainable and successful program.

Other schools are recognizing the benefits of engineering courses and academies. Eagle River High School has begun establishment of its engineering academy this year. Also, an October 8, 2012, *Peninsula Clarion* newspaper article "KPBSD students engineer the future" tells the success story of engineering at Soldotna High School.

Engineering academies are very compatible and enhance other school activities including science and math clubs, robotics competitions, leadership programs, university summer engineering and science camps for K12 students, and many other activities. Consequently, engineering academies develop a learning environment that produces Alaska grown engineers needed to build everything from buildings, bridges, and roads to telecommunication and power transmission systems.

In addition, innovation and entrepreneurship is an inherent part of engineering academies. Advancements in technologies that can now be taught in the classroom make it much more possible than ever before for students to develop a patent before they graduate from high school. Consequently, the academies builds a source of designers that enhances other Alaska programs such as the new multimillion dollar 49th State Angel Fund or marketable research and innovation programs within the university system.

A growing number of middle and high schools want to implement engineering academies but lack funds to do so. So far there is no designated funding source for engineering academies. Sustained funding is needed to create a stable environment for the students.

Your voice can make a difference. Write to the Governor and your legislator today and ask for their support of the Alaska Engineering Academies.

Folks interested in being involved with the Alaska Engineering Academies, or having general questions, can contact Cari-Ann Ketterling with APICC at cketterling@apicc.org or 907-770-5250. For additional information and downloadable documents, go to the APICC website at www.apicc.org and click on the Alaska Engineering Academies logo. ❖

REAP Lecture Focus in November

The Power of Water - Tidal and Hydrokinetic Energy

Renewable Energy Alaska Project (REAP) announces another installment of its Clean Energy Lecture Series on Wednesday, November 14th, and invites all to join them from 6 to 8 pm at the Anchorage Museum auditorium for "The Power of Water – Tidal and Hydrokinetic Energy in Alaska."

Doug Johnson and Monty Worthington of Ocean Renewable Power Company will talk about Alaska's tidal potential and the work they have been doing in Cook Inlet and False Pass. Jerome (Jerry) Johnson, research professor and Director of the Alaska Hydrokinetic Energy Research Center at UAF, will talk about hydrokinetic power generating devices, recent Alaskan hydrokinetic demonstration projects and what needs to be done to evaluate the economic viability of this energy resource in Alaska.

Those outside of Anchorage can listen in and ask questions on a live Webinar. Click here to register: https://www1.gotomeeting.com/register/245743841.

This free event is a part of REAP's ongoing Clean Energy Lecture Series, happening on the second Wednesday of each month. For more information on this and other Clean Energy Forums go to www.REalaska.org or call 929-7770.

A copy of the forum flyer is available to post online or distribute in your office (see link on APDC website). Upcoming programs include:

- December 12: Lessons from Iceland – Energy Policy from our Arctic Neighbors
- January 9: Energy Plicy for Alaskans
- February 13: Railbelt Wind Power – Updates from Fire Island and Eva Creek
- March 13: Clean Energy and the Military – How Alaska' Bases are Going Green ❖

The Institute of Electrical and Electronics Engineers, Inc. - Alaska Section
P.O. Box 230367 Anchorage, Alaska 99523-0367

February 4, 2013

Senator Johnny Ellis
State Capitol Building 119
Juneau, Alaska 99801

Forwarded by email to: Senator_Johnny_Ellis@legis.state.ak.us;

Subject: SB40, Appropriation for University Engineering Buildings

Dear Senator Ellis:

The Alaska Section of the Institute of Electrical and Electronics Engineers (IEEE) strongly supports SB40, which provides $59.3 million to the University of Alaska to complete the design and construction of a new engineering building at the University of Alaska Anchorage, and $47.3 million to complete the design and construction of a new engineering building at the University of Alaska Fairbanks.

Both facilities are now in the design phase and on schedule. Dramatically increasing engineering enrollments are stressing the ability of both campuses to meet the demand for engineering educations is still an issue as it was last year. It is very important to provide local access for engineering students, or many will either go without, or leave the state to enter other institutions. Many of those who leave the state do not return.

IEEE currently has about 500 members in Alaska. It is the world's largest professional association for the advancement of technology, with over 400,000 members.

Thank you for sponsoring these urgently needed appropriations. Please advise if we can do more to support SB40.

Sincerely,

/s/ Robert Seitz, Chair
IEEE Alaska Section
<seitzak@ieee.org>

CC: Senator Gary Stevens, Kodiak (Chair)
Senator Mike Dunleavy, Wasilla (Vice-Chair)
Senator Bert Stedman, Sitka
Senator Charlie Huggins, Wasilla (Senate President)
Senator Berta Gardner, East Anchorage

UMIAQ

February 4, 2013

Senator Gary Stevens, Chairman - Senate Education Committee
Alaska State Legislature
State Capitol Building
Juneau, AK 99801

Dear Senator Stevens,

The purpose of this letter is to request your support to address the critical needs for the engineers and engineering professionals in the State of Alaska. Specifically, I request your support to help provide the supplemental funding needed to complete the engineering facilities at both the UAA and UAF campuses.

I am a lifelong Alaska, born and raised in Barrow, Alaska. I went to high school in Fairbanks and later received my Bachelor's Degree in Civil Engineering from UAF. My wife and I eventually moved to Anchorage for career advancement opportunities and I later earned my Masters in Business Administration from UAA. I am a licensed civil engineering in Alaska and all of my 30+ years of experience have been through the development of major capital and infrastructure projects in Alaska. I am proud to state that I am a "homegrown" engineer and I attribute my professional career development to both my UA college education and participating in exciting and meaningful projects that brought benefits to Alaska communities.

As a long standing member and current Chairman of the UAA School of Engineering Advisory Board, I know it is our duty to make sure the University of Alaska understands the demands of our professional industry and that we also take the necessary steps to support and advocate for the essential programs, faulty and facilities at the University. Through the collaborative efforts of many stakeholders across the State working together last year, we were able to convince our legislative body to provide funding needed for the engineering facilities at both UAA and UAF. While this was a tremendous success, only half the required funding was provided and we now need to get the job done and secure funding to complete the projects that have been started at both UAA and UAF.

I urge you to continue to support the growth of the engineering programs and facilities at both UAA and UAF in order to meet the demands of our professional industry. We not only need more "homegrown" engineers like myself, but more engineers that are produced through our state's educational institutions. As a resource development state, we need to make sure that the sharpest and most astute minds are used to plan, design, build, operate and maintain the critical infrastructure for our state and our nation.

Respectfully,

Richard S. Reich, P.E.
General Manager

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A MEMBER OF THE UKPEAGVIK INUPIAT CORPORATION FAMILY OF COMPANIES

From: D. Robbins <drobbins.r@gmail.com>
Sent: Friday, February 01, 2013 4:17 PM
To: Sen. Gary Stevens; Sen. Mike Dunleavy; Sen. Bert Stedman; Sen. Charlie Huggins; Sen. Berta Gardner
Cc: Tim Lamkin
Subject: Support UAF Engineering Program: "Finish what we started"
Attachments: Engineering-12-06vs3.pdf; SB0040A.pdf

RE: PUBLIC HEARING ON SB40 - ENGINEERING FUNDING - FEBRUARY 6

I hope you will support SB40: Engineering Facilities Funding. This will continue the program at UAF to train engineers in Alaska. We need to support means for our Alaska kids to get a good education here in the state.

We have youth who want to learn and they value working in Alaska. Too many have had to leave the state, draining our best talent. They have a good work ethic and want to see our state advance. At the same time they will do it right because they care about this state.

This will also boost the University of Alaska, Fairbanks, which has received less than good support this session. It is not the time to drop projects that have begun. We need home grown engineers so we don't have to import them. Local kids will do a great job and should have work here, and not have to leave the state as so many are doing, considering the local demand for engineers.

Thanks!

Doris Robbins

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