

Engineering College Council Meeting
March 26, 2009
423 ILR Conference Center

Members Present: Kenneth Arnold, James Becker, Joseph Bonventre, Jay Carter, Sarah Fischell, *Gregory Galvin, Michael Goguen, Geoffrey Hedrick, Frank Huband, William Hudson, *Andy Kessler, *Brian Kushner, *Lowell McAdam, Venkatesh Narayanamurti, John Neafsey, Chris Ober, Justin Rattner, Robert Shaw, William Shreve, Roger Strauch, James Wrightson.

New Members *

Emeritus Member Present: Richard Aubrecht

Bill Shreve welcomed the council and gave an overview of the meeting agenda.

The meeting presentations and materials can be found at:

<http://www.engineering.cornell.edu/ecc>

Username: spring09

Password: spring09

Goal of the Meeting:

To engage the ECC in brainstorming revenue opportunities to help offset the budget reductions (Phase I).

Desired Outcome is:

List of ideas for revenue opportunities to help offset the budget reductions.

College Update – Chris Ober

Overview of the Meeting - The College in a Period of Transition

The College is in a period of transition in a number of ways. We are transitioning from a period of wealth to one of more limited means. We are transitioning to a new provost so we are going to have new opportunities to interact with Day Hall in ways we never could before. The College of Engineering is truly an asset to the University.

Introduction of New Deans, Directors, and Faculty

Chris introduced Marjolein van der Meulen as Interim Associate Dean for Research and Graduate Studies and Tsuhan Chen, who is the new chair of ECE, replacing Clif Pollock. New faculty were announced: Jeff Tester, Croll Family Professor of Sustainable Energy, Chemical and Biomolecular Engineering, as well as new assistant professors Hadas Kress-Gazit in MAE,

Noah Snavely in CS, Xiling Shen in ECE, Salman Avestimehr in ECE, Brandon Hincey in MAE, and Delphine Gourdon in MSE.

ECC Leadership

The Council is undergoing a leadership change. Bob Shaw has agreed to become chair and Sarah Fischell, vice chair.

Current State of the College

Six faculty searches are in progress. There are fewer faculty searches, both at Cornell and nationwide, which may increase the quality of the pools, but will also heighten the importance of making hires that help us meet our strategic goals.

The Department of Theoretical and Applied Mechanics (TAM) merged with Mechanical and Aerospace Engineering (MAE) effective January 1, 2009. This decision was based on our new fiscal constraints and consideration that TAM was one of the last TAM departments in the country. Many of the 13 TAM faculty are close to retirement. It had no undergraduate program and had a modest research program.

Research in Sustainability and Energy

Chris highlighted that energy is part of our strategic plan and it is an area that is very timely for Cornell. Fortunately, several departments in the college have active programs in this area. The College has put together a website summarizing energy activities in the college and university at <http://www.geo.cornell.edu/eas/energy/>.

We have begun to build our energy activities in two main areas: in the Cornell Center for a Sustainable Future (CCSF) and the KAUST-CU Center for Energy and Sustainability. The mission of CCSF is to advance multidisciplinary research, promote and cultivate energy collaborations in and beyond Cornell. It is focused on three areas: energy, environment and economic development. The College's main focus will be in the energy area.

Jeff Tester is the first Croll Family Professor of Sustainable Energy and Associate Director of CCSF. He has testified before Congress and has actually influenced the direction of energy activities in this country and will be extremely valuable.

Professors Lynden Archer (CBE) and Emmanuel Giannelis (MSE) have led the effort to win one of four KAUST Centers for Energy and Sustainability. The KAUST-CU Center focuses on a technology platform of novel hybrid nanomaterials recently discovered at Cornell. The King Abdullah University in Saudi Arabia wants to build a distinguished and open university. KAUST provides an opportunity for Cornell to be a positive influence in the Middle East.

Faculty Diversity

One of our objectives has been to grow faculty diversity. Kent introduced the Strategic Oversight Committee (SOC), to help promote diversity. The SOC process as resulted in a very diverse set of recent faculty hires.

Recruiting

Recruiting for graduating students has dropped substantially, (interviews are down between 25-40%). Chris encouraged the ECC to let us know about their companies' opportunities for hiring and interviews that would help our recruiting efforts.

Admission Trends

Admissions statistics for undergraduates for the incoming class look strong. Our admit rate has gone down (this is a positive trend) while the number applicants is way up. The quality of admitted students is also up. There is some pressure to grow the undergraduate population but, at the same time, there is a correct and serious concern among the Board of Trustees that if you grow the student numbers too much, the quality of the education will go down. There are also infrastructure constraints at the University that constrain short term growth in undergraduate enrollment.

Cornell's engineering enrollment is up significantly compared to our peers. We are also seeing strong growth in terms of women's enrollment in engineering, while under-represented minorities (URM's) and international students basically remain unchanged. We are making an effort to grow diversity in all areas.

Tuition is one way to balance the books. We want students from all walks of life to attend Cornell so we have held tuition increases for this next period to 4% in the endowed part (smallest fractional increase in years). In terms of the contract colleges (i.e., CALS) the resident and non-resident tuition has increased 7%. Cornell is doing its best to hold the tuition increases down. A significant part of the endowment is going to be used to help pay tuition for those in need of financial aid. The University is strongly committed to using the endowment to help with financial aid.

Graduate Student Enrollment

Graduate student enrollment is up. Our goal is to achieve 1 Ph.D., 2 M.Eng., and 3 BS students per faculty each year – 3:2:1 goal.

Research Expenditures

In terms of research expenditures, Cornell Engineering is doing well. We are experiencing a slight downturn caused by a reduction in the funding of our centers. We've been fortunate to

have major NSF centers here. Some of them are reaching their sunset periods, so the funds are drying up. Cornell now has three proposals for energy centers.

In terms of distribution, we have a lot of federal money, however, we get relatively little industry and state money. As a result of the economy, the idea of getting more State money is minimal for the next two years. The best chance for fundraising is working with industry. Cornell could be strategically placed to help companies to become more innovative.

The distribution of Cornell's federally sponsored research shows that the DHHS is the largest portion (51.8%) followed by NSF (31.5%). One member commented that due to the legislation that was passed a month ago, NIH funding will increase, and no one knows where it's going to go. It might go with a bioengineering type of approach which could be a huge opportunity that could be pursued. Chris responded that he has just asked Marjolein to be plugged into a group that can steer this forward and to get the different department chairs to think about this. It's a huge opportunity and is something Cornell Engineering has to be part of.

It is more complicated to receive NSF funding as that agency will not have special calls for stimulus funding. NSF will only fund proposals that are in the pipeline already. Cornell has people in Washington, D.C. feeding us information about funding opportunities. There is recognition that we need to be careful not to fund ongoing activities on one-time funds.

Departure of Tim Dougherty

Tim Dougherty '88, Assistant Dean for Alumni Affairs and Development, will be leaving engineering on April 2 to take on a new position as Vice President for Advancement for the Armand Hammer United World College of the American West (UWC-USA) in Albuquerque, New Mexico. Jim Mazza, Campaign Director and Jessica Traynor, Associate Director, will fill his position on an interim basis while a search is being carried out.

Engineering Budget – University Allocation

Due to overall budget challenges, University funding will drop significantly in the next few years. The immediate impact was the reduction of faculty searches in FY09 from 12 to 5 or 6. FTE's may be reduced by as much as 10-15% over the next few years. The College has worked hard to increase the size of the faculty and a reduction of 15% will bring us back to where we were 10 years ago. The Dean will be challenged to meet budget reduction targets while maintaining quality.

The faculty/student ratio is very important. It affects the rankings. Everything in the rankings is related to this except the quality and the quality of a course depends on who we hire.

Directors and chairs have been working with individual faculty if they are considering retirement. Those who do retire are provided emeritus offices, and those that maintain an active research program continue to have research space.

Impact on buildings: the New Life Sciences Building has been completed. It is the home of BME. Gates Hall (the CS/CIS Building) is on pause and its future is uncertain. The Physical Sciences Building construction is continuing, although it has not yet received the level of gift funding that was planned. The Olin Hall infrastructure upgrade is well underway. The 4th Fl. Addition of ECE is on indefinite hold and the new Engineering Building is on indefinite hold. The departments have been asked to be prepared to free up between 10-15% of their space to accommodate future needs. They are conducting their own space audits to do this.

Theoretical and Applied Mechanics (TAM) Merger into Mechanical and Aerospace

Implementation of the TAM merger was made after extensive study of the competitiveness of the department. It is one of the last TAM departments in the country and represents the end of a trend. TAM has 13 faculty, many of whom are close to retirement. There is no undergraduate program, although faculty teach our undergraduate math courses. A transition team has been appointed consisting of Lance Collins, chair; Michel Louge, Alan Zehnder and Andy Ruina. The TAM faculty have been given tenure in MAE as of March 1, 2009 and some of the TAM faculty plan to associate with additional departments.

College Goals for 2009

A primary goal is to address the budget challenges. The college needs to identify new and existing resources and, therefore, the focus of the ECC meeting was to help identify new revenue opportunities. Other goals include:

- Strengthen the undergraduate program
- Increase research funding and the graduate program in strategic areas of the College to achieve the 3:2:1 plan
- Fundraising. Any gift to the annual fund today is worth much more than it was last year

College Budget Update – Cathy Dove

Cathy Dove gave an update on the College budget and discussed the external and internal factors affecting the budget.

- External factors
 - Stock market drop (endowment)
 - Decrease in philanthropy
 - NYS budget problems: initially we thought that this was going to be significant, but it turns out that given the magnitude of other issues it is one of the smaller impacts on the overall Cornell budget.
 - Need for additional financial aid
- Internal factors
 - Support of ongoing programs with non-recurring revenue

- Creation of new programs and facilities assuming gifts and endowment increases would be available

There is a structural budget problem of about \$215M/year that needs to be addressed over the next two years (FY10-11). For FY10 the University applied an across the board approach for the budget reduction. The total impact in FY10 for Engineering is approximately \$6.5 million:

- \$3.1 million due to a base reduction from the University. The College expects a similar reduction in FY11.
- \$1.6 million due to the reduction in investment income (on invested funds). The expectation is that investment income will continue to decline in FY11 and FY12 at similar levels.
- \$1.8 million for other reductions and adjustments

In addition to adjusting base budgets, the university is taking immediate steps to improve its cash position. First is the issuance of \$500M in bonds. Second, the university needs to draw down \$75 million in campus fund balances. \$25 million is coming from colleges and units in spring 2009. Engineering's share of this withdrawal is \$2.5 million. Engineering has about \$80 million in unrestricted fund balances. These funds are used to support operations, facility expenditures, faculty start-up expenses, and are "savings" accounts for challenging years. The University anticipates needing a second drawdown in FY10; Engineering is not yet aware of how much the college will have to contribute.

While the College had a total FY09 budget of about \$160 million, much of that is restricted and therefore cannot be used to address the budget reduction. The University funding to the College is about \$55 million. The College does not retain tuition for any of its undergraduates, but does keep 80% of MEng revenue. A recent analysis shows that Engineering does not receive all the net revenue it brings into the University; Engineering is subsidizing other colleges and units. On the revenue side, Engineering does have the ability to increase MEng enrollment and retain most of the tuition. However, there is limited capacity and not sufficient market demand to increase the size of that program indefinitely. With the exception of sponsored programs, other major revenue sources (e.g. gifts, investment income) are likely to be down in the short term).

On the expense side, the largest expense is salaries and benefits. Staff salaries can be adjusted pretty quickly. Faculty size is a longer-term issue that can only be adjusted over time. Salaries and wages for employees are frozen for next year. There are no union employees in engineering. The really big cost, quasi fixed cost, is tenure and tenure-track faculty. There are guidelines if you declare financial exigency. There are some universities that have done that and have been able to let go of faculty, but that's not a strategy that we plan to employ.

The College (nor the University) is not prepared to reduce salaries at this time, other than on an individual level if performance or productivity warrants a reduction. One reason for this is that the University has worked very hard over the last few years to make faculty and staff salaries

competitive and we don't want to backslide if at all possible. The College is reducing facilities expenditures as well as general and capital expenses. The College is maintaining graduate student support. Graduate tuition is actually coming down and it's been frozen. Stipends are going up slightly.

College of Engineering Summary

The base reduction is \$3 million for FY10 plus a reduction in payout of about \$1.5 million. Engineering has an additional \$1.8 million that we had to get in alignment, so the impact in FY10 is about \$6.5 million. Engineering's total operating budget is about \$162 million. A budget reduction cannot include the following: 1. Restricted Fund Activities (sponsored programs). 2. Tenured faculty salaries. 3. Some other annualized commitments that we have. Therefore, the reduction of \$6.5 million impacts approximately \$49 million which results in a reduction of effectively 13%.

The Budget Advisory Task Force was established to develop recommendations that address the College's significant budget challenges. This group has been gathering information, has defined a set of budget principles, is learning about the finances of the college, and has identified a number of areas that it believes should be explored as long-term opportunities for revenue generation and cost reduction possibilities. The budget principles resulted in the following FY10 strategies:

- Continue to invest in some critical areas. The College continues with limited faculty hiring.
- Continue with a few facilities projects.
- Increase revenue where it's logical (M.Eng. revenue).
- Encourage voluntary departures (including retirement incentives, as well as reduced hours) and
- Protect core mission activities of teaching and research by absorbing as much of the reduction in central college administrative functions as much as possible. Academic units were allocated reduction targets based on each department's proportional share of unrestricted revenue.

The College also reduced expenditures in FY09 in anticipation of budget reductions. As of November, most staff positions were frozen. One half of the faculty searches were cancelled. TAM was merged into MAE. Unnecessary general expenses were eliminated, and many facilities projects were stopped.

Retirement offer: 1. The University has rolled out a staff retirement incentive. It has been well received across the University. In Engineering, there are about 30 eligible employees; currently only 4 have applied. 2. On the faculty side, Directors and Chairs have been meeting with individual faculty who are of retirement age, talking to them about their situation and trying to structure something that might work for both parties.

Details for FY10 reduction strategy:

- Increasing M.Eng. enrollment and implementing a new M.S. Option (2-year program). There are a few academic departments where the M.Eng. doesn't quite fit and the University agreed that this 2-year M.S. program would use the same revenue sharing model that is used for M.Eng.
- Reducing \$2 million in cost of positions, including approximately 8-10 involuntary reductions of staff plus several lecturers and vacant positions. On the faculty side 2 departments each are giving up a faculty line, and we are anticipating a number of retirements.
- Reducing programs – a little over \$2 million.
- Use of approximately \$700,000 in fund balances.

FY11 and beyond

Next year the College will face additional reductions, possibly comparable in scale to FY10. The University has not yet determined how base reductions will be allocated. In addition, the plan payout for invested funds likely will decrease an additional 15% next year, and then perhaps another 11% the year after. The College is also planning for the impact of declining gifts.

Going forward, reductions will be made more strategically than was possible for FY10. A planning process is being developed to review programs and priorities in the context of the strategic plan, to implement efficiencies as well as to collect benchmark data and conduct productivity analyses, etc. A continuing priority is to support current faculty and staff by leaving positions vacant.

Differences between higher education and industry:

Four areas that might be different in the education world vs. industry:

- Economics of higher ed
 - Hard to adjust “production” in short term
 - Fixed costs
 - Core mission activities people intensive
 - Value not measured by bottom-line --> debates
- Reward system
 - Arms race
 - Rankings
- Culture
 - Decentralization is real
 - Decision making culture and independence of the faculty – reserves example
- Historical lack of a forcing function
 - High demand
 - Little price sensitivity

Revenue Growth Opportunities Breakout Sessions

Four breakout sessions were held to discuss revenue growth opportunities: 1. government sources, 2. industry and foundation sources, 3. undergraduate and graduate degree program sources, and 4. non-degree program sources. The notes from the individual sessions are appended to the minutes. Several ECC members expressed a strong interest in being engaged in follow-up activities on these topics.

Sustainable Energy Systems at Cornell – Jeff Tester

Jeff Tester gave a presentation on the Sustainable Energy Systems at Cornell. He gave an overview of what we are facing and asked for the ECC's advice and input, particularly at this early stage. There are several directions we can pursue. There's a lot happening with stimulus funds, plus the DOD budget which we want to be responsive to.

His 10 years of research on sustainable energy at MIT led to the text book, *Sustainable Energy Choosing Among Options*. He presented several suggestions for making the transition to sustainable energy, including supporting a balanced program of basic and applied research for both renewable and non-renewable supply and end-use options. We need to promote energy (with fellowships, etc.). Develop human capital by enhancing energy education and research at universities, centers, etc. Cornell provides a rich portfolio of necessary skills and competence to tackle the multi-disciplinary challenges of sustainability.

Cornell's approach to sustainability addresses 3 key elements of CCSF: Economic Development; Energy; Environment. Nationally, we need to promote sustainability. Cornell stands out as an institution that has made a strong commitment to sustainability. We have the necessary skills and portfolio of faculty, background and experience to tackle multi-disciplinary problems. Cornell has the depth and breadth for this (from Agriculture and Life Sciences and Veterinary Medicine, to Physical Sciences, Humanities and Social Sciences, to Engineering with Earth and Environmental Science, to Ecology to Economics and Business). Cornell created a multi-disciplinary center to establish a way in which there could be in depth participation on research and education across these 3 domains: energy, economic development and environment. Mission: CCSF advances multi-disciplinary research and cultivates innovative collaborations within and beyond Cornell to foster a sustainable future for all. The main activities include: the Academic Venture Fund, faculty recruitment, educational initiatives, and research program development.

In order to increase its presence in the energy sector, Cornell may have to realign faculty and bring in some new faculty. There are a number of opportunities at Cornell for research and energy. Energy initiatives underway at Cornell are: advanced materials for energy applications; geo-engineering for carbon management, geothermal energy recovery and unconventional fuel upgrading; biomass to energy and fuels, energy infrastructure – electric power systems, smart grids, storage; sustainable buildings.

Cornell can have a competitive advantage if we have some support from this council and others. The University has responded to 3 energy research proposals that are active right now. Major grant solicitations: DOE Frontier Research Center (multi-year grants) would give us the ability to bring in more than 10 investigators at a time. NSF IGERT: allows a multiple group of faculty to work on graduate education. Cornell is on the path to getting a full proposal on connecting geoscience and engineering across a number of domains and has about a 1 in 5 chance of being granted a proposal. There are also educational opportunities -- sustainability literacy all across Cornell.

The University is building a Cornell faculty team for wind energy. (Lab of Ornithology, MAE, and MSE linkages). GE has become a big player in wind energy. Cornell is also tied to the AWEA, the American Wind Energy Association. A suggestion was made to consider Florida Power and Light. Currently there is no real longstanding involvement with wind power in Ithaca.

The College of Engineering has identified over \$50 million in needs for its energy initiatives. Most of that is for faculty positions, graduate fellowships and facilities. \$22 million has already been raised in the capital campaign. Cornell has a really important opportunity to elevate and highlight what Jeff and others are already doing. There's a great fundraising opportunity here.

Dates for Fall 2009 Meeting

It was decided that the Fall 2009 Meeting will be held on Thursday, October 29th (reception/dinner) and Friday, October 30 (8:00-4:00 p.m.).

Capital Campaign Update - Tim Dougherty and Jessica Traynor

Fundraising in current economic situation

Jessica indicated that since 1988, gifts to universities have gone up and FY '08 was a record-breaking year, but began to decline as the recession deepened, and will most likely continue to do so. Over \$1 billion went to higher education. Cornell was one of the top 10 universities in 2007-08 in fundraising and came in as number 9. We lag behind our peers as far as growth in the last year. We are trying to bolster our annual gifts, which are cash gifts, which during a budget crisis are extremely important. They can be used at the discretion of the deans and the provost. Since the depression, we have found 3 factors affecting donations: 1. strength of the stock market, 2. the overall health of the economy as measured by gross domestic product, 3. tax law.

The #1 reason someone has made a gift is that someone asked them to.

Fundraising approaches we are taking: keep close ties to donors, pursue annual, unrestricted gifts, continue capital campaign with the understanding that the time frame may be extended.

The annual fund is at 58% of the FY09 goal. The University is finding that donors are honoring existing commitments, but new pledges and gifts are down significantly.

Campaign Update

Cornell is one of 4 schools that is undergoing a capital campaign of over \$4 billion. The University is at 47% of the capital campaign goal. Engineering has raised \$180 million (our goal is \$375 million). The campaign priorities are to support undergraduate students, fellowships, faculty chairs and program initiatives, such as energy work, as well as facilities.

Staffing Update

Tim Dougherty gave an update on AAD staffing. Jim Mazza will fill the interim assistant dean's role while the search to fill his position goes on and Jessica will be involved as well. Department chairs and directors, along with the engineering dean, have been very active in the current year and have done 409 face to face visits with alumni in FY 08.

Specific AAD staff have been aligned to work with specific departments. The College has also worked closely with the alumni association in the last 2 years to streamline and focus their efforts, i.e., eliminating dues, which allowed the alumni association to focus more on its mission of fundraising. The average gift for ECC members of this group this last fiscal year was almost a half million dollars, which is really extraordinary. Another thing that's striking is the council's giving to the College of Engineering's Annual Fund. The average amongst the members is \$1,693.

ECC members can be very helpful with the fundraising process. In addition to giving to the engineering annual fund, members can also participate in the campaign process. The College welcomes this group's involvement in any and all of these processes.

Bob Shaw challenged each member to write a Tower Club gift -- a minimum giving of at least \$5,000 and, ideally, \$10,000 if possible and to make it undesignated to the Engineering fund (Dean's discretionary fund).

Dean's Search Update – John Siliciano

John Siliciano, Vice Provost and Michael Matier, search manager, gave an update on the dean's search. Currently, the search committee has received 232 prospects, which is a very large pool. Names are kept completely confidential for most of the process.

In several weeks, the committee will develop a list to contact immediately to invite them to preliminary interviews. It's very clear early in this search that the dean of engineering is a very attractive proposition. The quality is quite high with very successful people from both industry and academics, who are diverse in gender and ethnicity. There have also been internal nominations which shows that the faculty hold these persons in esteem.

Finalists will be determined by this summer and will be invited to campus in late August or early fall. It is likely there will be 8-15 on the short list for preliminary interviews, and out of that list 4-5 will be invited to campus in the early fall. There will be mechanisms in place for candidates to meet with faculty, staff and students, as well as for the council to be involved. The new dean will probably be in place by January 2010. The Council can always communicate with the search team through the confidential email addresses that are given in the dean's search updates.

Notes from Research Revenue-Government Breakout Group

A new era is emerging in Washington, D.C. Strategic shifts are emerging on the civil side of the United States government (USG), and these shifts are creating a lot of opportunities. To leverage the opportunities, we recommend changes in how the university addresses US Government proposals.

Currently, Cornell is working well on the NIH and NSF areas of the economic stimulus (APRA). On other economic stimulus areas, the effort is not very focused and opportunities will be missed. This parallels the University's general experience with the USG; federal funding is low in comparison to peer institutions, particularly in DoD and DOE.

Background and Issues:

Structural elements are needed to do well. An understanding and analysis of Administration department / agency issues, needs and funding is essential to a timely response to opportunities. Currently, the University has only 3 individuals in Washington, D.C. and they report at top levels.

A proactive view for is needed to identify, analyze and address opportunities in the USG departments and agencies in which the faculty does not have established relationships. This should likely include more representatives, connections with industry, connections with National Laboratories and leverage of Cornell alumni. Part of the goal should be to achieve early discussions that can "shape the game of what gets funded."

For example, the economic stimulus contains at least \$20B in funding for the Department of Energy (DOE) in areas that usually have discretionary funding closer to \$200M – a two orders of magnitude increase. DOE will need help in shaping effective expenditures. You should expect that some of Cornell's peers (such as MIT) are already engaging in DOE potential opportunities.

Beyond DOE, large opportunities exist each year in the Science & Technology (S&T) funding in DoD. Some of this is internal funding for DoD laboratories. However, a significant portion of this funding is developed by "plus-ups" in Congress – often referred to as "earmarks". The S&T earmarks have become a core part of the S&T community (often increasing the requested DoD S&T budget by up to 50%) and many universities participate in this. It should be noted that S&T earmarks still have to be reviewed and approved by the appropriate S&T community before award. Our New York delegation should be helping Cornell in this area.

Department of Homeland Security is another area of potential opportunity. In all these areas the increased opportunity is not limited to the economic stimulus funding. Baseline civil budgets are expected to rise in 2010 and beyond.

Recommendations:

Keys to success in addressing these USG opportunities are facilitating faculty connections with the appropriate USG offices and assisting with proposal preparation. A support structure from the University is needed. Today, OSP appears to more of a regulator than a facilitator; this creates “bottlenecks”. One idea that seems to work in other colleges is to establish an OSP for the College of Engineering and use this OSP to provide administrative support for proposals.

Although each proposal will require significant time from the faculty, there are administrative tasks in writing proposals that are not content related and that could be “off-loaded” to free up time for the professors. This is a best practice in industry and leads to more effective proposals.

In general, Cornell’s Washington, D.C. presence should be increased to effectively address these increased opportunities. This should include closer working relationships with New York legislators in Congress.

Summary:

Our principal recommendations are to improve the opportunity identification processes (which include enhancing Cornell’s Washington presence) and to provide better proposal support structures that will increase the effectiveness of the faculty’s research capture capability. These “investments” will be repaid many-fold through the “overhead cost allocation” that the resulting contracts bring to the University.

Notes from Research Revenue-Industry/Foundation Breakout Group

Cornell's strong faculty and outstanding students place it near the top of most lists for potential industry-university interactions, but the low level of collaborations with industry is indicative of the fact that Cornell has not been able to realize this potential. As we explored the reasons for this difference, we identified several contributing factors.

1. Cornell is significantly more difficult to work with than most other universities. Our group consisted of ECC members from small and large corporations as well as faculty, and each of us had one or more stories of how seemingly straightforward collaborations were either difficult to establish or never got started because of the process required to work with Cornell.
2. Cornell has created an infrastructure designed to protect intellectual property (IP). The aim of these groups is to maximize income for the university, but the effect is to prevent Cornell innovations and technology from being used and making the difference that it could in the world.
3. Despite this team focused on protecting Cornell IP and protecting Cornell from unintended obligations or liability, there seems to be no one inside the administration responsible for making deals happen. Credit is given for completing deals and generating IP revenue for Cornell, but no one tracks deal flow – how many deals never get to the negotiation stage, and how many never make it through the process. Only completed deals are tracked.
4. Cornell has a single process for IP management, but Cornell's IP portfolio is diverse and different colleges and departments have distinctly different needs. Cornell's potential partners come from different industry segments and government where the business models are very different. As a result this one-size-fits-all approach, Cornell's IP process is not a good fit for all technology areas within Cornell's portfolio or for most potential partners.

Primary concerns

1. At this time of global problems with the environment, energy, and global and national economies, Cornell needs to maximize their contribution to solving these problems. The current partnering and technology transfer process will not generate the deals that can create the largest impact from Cornell's technology and IP.
2. Entrepreneurship is an ambition for many younger faculty members. The current process for IP management at Cornell stifles entrepreneurship, and could make hiring and retaining the best new faculty members more difficult.
3. Faculty are on the front lines for industrial partnerships. They do not receive the support they need to make deals happen. One specific area of special concern is the lack of anyone to evaluate the financial side of industrial partnerships. This financial deal evaluation is not an area

of strength for most faculty members.

4. Most of our approaches to solving these problems will require additional resources in some areas to “prime the pump” before new revenue is realized. Adding support personnel will be difficult to find at a time of expense cutting and cost controls.

Recommendations

1. Because of the diversity of the IP portfolio and the need for great flexibility in deal creation, we recommend the provost grant the Engineering College the right to create deals with industrial and government partners on a pilot basis. We recommend that an individual approves pilots (initially the Dean?) and also takes responsibility for making deals happen and for managing risk. Success will be judged by the number of deals generated, the relationships built between faculty and industrial partners, and the revenue potential through licensing, grants, and sponsored research.
2. Review the success of university-industry relationship programs at peer institutions with respect to these same metrics.
3. Continuously evaluate the pilot projects to extract what works best and incorporate the learnings into revised processes for the college.
4. As interactions with industry increase and revenue increases, scale up the program and hire/assign additional support staff as needed. In particular, provide the support for financial evaluation of deals and risk mitigation within deals.

Answers to Breakout Questions

1. *What makes a university most attractive to industry?*
Industrial partners look for outstanding faculty and students to partner with in areas of mutual interest. They want their researchers to collaborate with universities with a minimum of overhead and bureaucratic red tape. Most interactions with universities are early-stage in the product creation lifecycle. It is impossible to predict outcomes at this stage, and equally impossible to predict value. Relationships at this early stage must incorporate trust as much as common interest and mutual benefit.
2. *How can Cornell better market our strengths to industry?*
One ECC member said, “It is way too hard to find the front door at Cornell, much less to know what is behind it.” The current process requires potential partners to come looking for technology at Cornell. Proactive, targeted outreach to industry is needed in areas where Cornell wants collaborations. Industry decision makers are busy people. Cornell needs to either get their attention or create champions for Cornell within their organizations. Alumni can help with this, but in addition the process for starting interactions needs to be transparent and straightforward. Complex legal agreements erode trust and create delays as attorneys do their jobs of protecting the rights of industry and the university. These complexities and delays are

frustrating for researchers on both sides of the potential partnership. If Cornell is harder to work with than other schools, industry will partner preferentially with other universities.

3. *Do current economic conditions offer unique opportunities for universities to partner with corporations?*

We did not discuss this in detail, but companies continue to look for ways to stretch their R&D investments, and the economic stimulus plans coming from the new administration offer huge opportunities for new sources of funding. Government agencies with small staffs are suddenly responsible for budgets that are orders of magnitude larger than previous budgets. They need ideas on how to structure their spending. Cornell needs to participate in proposals for new areas of research in addition to responding to Requests for Proposals (the traditional approach). Cornell does not have the staff to provide inputs to all of these government agencies, but by partnering with industry, Cornell can be part of larger efforts to get access to a share of stimulus money.

4. *Should we form alliances with other universities and the private sector to increase the strength of our research partnerships and technology transfer?*

Yes, but the current process inhibits these partnerships. Experience with the KAUST Cornell Center may help us understand how to make partnerships easier to create.

5. *What are other universities doing that we should emulate?*

Robust programs at Stanford and UC Berkeley were discussed as examples to study and emulate. The Berkeley Wireless Research Center was cited as an example where industry partners felt they achieved a 20:1 leverage of their research dollars. The goodwill, grants and donations that result from programs at these schools dwarf the income from licensing of IP. Cornell lawsuits to get IP income were discussed as means to stifle interactions, eliminate trust, and build barriers to collaboration with industry.

The study done by a subcommittee of the trustees of the university was also mentioned as a possible source of ideas and best practices.

6. *Should we provide more infrastructure and support for start-up companies?*

This was not directly discussed, but the challenge Cornell presents to start-up companies was discussed as an impediment. Start-ups face many challenges. If Cornell adds to these challenges and thereby makes success more difficult, start-ups and Venture Capitalists will look elsewhere for new technology. I believe that VCs are better able to provide infrastructure and support than Cornell is.

Next Steps

1. Bill Shreve to contact Chris Ober to discuss recommendation 1, contacting the Provost to get authorization for partnering pilots within the Engineering College. This request can come from

the ECC or the Acting Dean.

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2. Offer to have a subcommittee of the ECC look at best practices at peer institutions and report back to Chris Ober with suggestions. As a part of this effort, get a copy of the Trustee Report on technology transfer at peer institutions.

Notes from Degree Programs Breakout Group

The group talked about revenue opportunities in two categories:

1. Tuition related
2. Industry-related (re. degree programs)

Tuition-Related Ideas

MEng related suggestions:

- Look at the MEng programs that are under capacity and determine:
 - Is it a “marketing” problem?
 - Is so, who/how does it get fixed?
 - Is it a “structural” problem?
- Should resource allocation (in terms of “capacity” for programs) be better aligned with forecasted industry needs?
 - E.g., with stimulus money funding “infrastructure” programs, there are real shortages in civil engineering/project management/engineering management.
 - Suggestion: should we do a better job of marketing our existing systems management program?
- “Load-balancing” suggestions: should we do a better job “marketing” internally, to get more students to migrate from “over-capacity” areas to “under-capacity” areas? Also, should we rethink the rules in switching areas mid-stream, to facilitate more of the desired load balancing?

Is the 3:2:1 ratio what we should stick with, or should we rethink it with revenue optimization in mind?

Should prices be raised for international students being funded by regulated sources (e.g., governments), recognizing that there is likely to be very little impact on enrollments. Should there be more targeting and more strategic interactions with particular international regions?

- E.g., Middle East. - many of our peers are “planting the flag” with local facilities, etc.
- Africa - great opportunity to focus on oil/gas rich countries.

Industry-related suggestions

- Novel “experiential learning” ideas, modeled after examples in Europe.
 - Target industry to pay for an “experiential learning” style course that is specifically designed to work on a real-world problem facing the company.
- In Civil Engineering, target industry to sponsor more professional accreditation programs.
- Should Cornell have a more formal industry liaison program, like MIT’s?

- Search for ways to have corporations sponsor whole programs, e.g., BP pays for a project management program at MIT.
- Generate great MEng projects pulled directly from industry, marketed both internally (to students) and externally.

Overall, in both areas, it was observed that Cornell has great resources and technologies, but is lousy at “Marketing”. I.e., packaging/communicating what we have in a way that triggers the most instant interest, and is most compelling, to both industry and prospective students.

Notes from Non-Degree Programs Breakout Group

- “One day university” – find 4 faculty who are great speakers on their research area and take them to major metropolitan area and do a one-day set of lectures/discussions. Open to the public who pay \$400 or so per day to attend.
 - Energy
 - Engineering alone vs. including other departments
 - “Big Red in the Big Apple” – 4 separate sessions and then panel. 10% discount for alums
- Exec. Education – how to manage an engineering resource such as software engineers and tech resources. Focus on program management.
- Distance learning – e-Cornell
 - Incentive system for faculty
 - Certificate for project management
 - Ask Industrial leaders what they and/or their employees need
 - Could be for industry or the public
- International experience – encourage students to take Co-op summer courses and then study abroad in the fall. Summer courses bring revenue to the college. Would only work for students who can afford to pay tuition in the summer and then again in the fall when they are studying abroad.
- Royalty revenue – Alan Powell, San Diego
 - What’s the problem? Bill’s comment – can’t find the front door.
- Online certif. programs
 - Use of NYC facility
- Facilities – rent out
 - Nanofabrication
- Masters projects – outsource
 - Get support from industry