

Engineering College Council Meeting

October 27-28, 2011

423 ILR Conference Center

Members Present: Jim Becker, Lance Collins, Bob Cowie, Sarah Fischell, Greg Galvin, Mike Goguen, Frank Huband, Gretchen Knoell, Bob Shaw, Bill Shreve, Dan Simpkins, Duane Stiller, John Swanson, Jim Wrightson

Emeriti Members Present: Dick Aubrecht, Charlie Brown, Jay Carter

The meeting presentations and materials can be found at:

<https://confluence.cornell.edu/display/ECC/2011+Fall+ECC+Meeting>

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Welcome, Introductions and Overview of the Meeting - Bob Shaw and Sarah Fischell

Bob Shaw and Sarah Fischell welcomed the Council to the Fall '11 ECC meeting. Bob Shaw indicated that the focus of this meeting would be to discuss the College of Engineering's ongoing process to update its strategic plan. He pointed out that a draft of ECC's mission statement and operating guidelines were included in the meeting packets for the members to review. He also noted that Greg Galvin had been elected as a Cornell Trustee.

Executive Summary: College of Engineering Strategic Plan – Lance Collins

Lance Collins gave an overview of strategic planning in the College of Engineering. He indicated that this meeting would be a high-level overview and update on the strategic plan, with a focus on undergraduate education and the bioengineering research thrust area. He mentioned that later in the meeting he would seek the council's input on how this major potential enterprise fits in the context of what we are trying to do as a college.

Lance emphasized that the College of Engineering aspires to be widely recognized as a top-five engineering college in undergraduate and graduate studies. He added that the US News and World Report continues to be the leading metric for rankings. He also noted that in his opinion Caltech, MIT and Stanford, have used engineering to lift their respective institutions into the very high rankings. Lance pointed out that not only does Cornell's College of Engineering aspire to be highly ranked, but the institution does as well. He added that it is critical for the college to be highly ranked in order to attract the most talented students. He also indicated that the CornellNYC proposal could signify a major change in the college allowing Cornell to mimic what MIT and Stanford have been able to do as institutions. Cornell is tied with Brown for 15th in the rankings and Engineering's undergraduate and graduate programs have fluctuated between 8 and 10 in the rankings for the last several years. The college has aspired to improve and we have made systematic improvements, however, the other institutions have also done so, therefore, it is difficult to move up the ladder in the rankings because they are so competitive. Lance noted that Georgia Tech's college of engineering has made the most dramatic change, by offering stipends to graduate students of \$10,000 more than the rest of the colleges. That was

enough of an increment for Georgia Tech to suddenly start attracting outstanding students. They were able to do so through tremendous fundraising efforts which were very successful.

Lance described the vision of the college's strategic plan which is centered around two complementary objectives:

- "The College will directly impact major challenges facing our world;
- The College will produce leaders who take the world in new directions, solving problems and creating new opportunities."

Lance indicated that if he were to identify the single thing that Cornell does better than anyone else in this country it would be its collaborative efforts. He noted that we have both an administrative infrastructure and the ability to bring large groups of people together to take on the most challenging problems of the day (i.e., sustainability, biological medicine and healthcare) which require interdisciplinary research at levels that go beyond groups of two to three people. He pointed out that Cornell is special in its ability to take on major challenges that cover several disciplines, even those crossing over to the social sciences, political sciences, economics, etc., and not just the technical sciences, which is something that we must exploit to the maximum. Secondly, Lance pointed out that we have an amazing ability to produce leadership. All of the rankings weigh heavily on research, so including a statement that has more to do with an educational mission is not something every institution will do. He mentioned that there is a growing concern among every major research university about double-digit tuition increases and that in response to these increases they are changing their financial aid packages. People are asking tougher questions and putting a higher level of scrutiny on education.

Lance outlined the college's four enabling goals:

1. "To recruit, retain and enable a diverse community of exceptional faculty, students and staff
2. To educate undergraduate and graduate students to become global leaders
3. To be world leaders in important areas of research
 - a) to sustain and expand our leadership role in: advanced materials; complex systems, network science and computation; and nanoscience
 - b) to be the premier research university in the emerging areas of energy and the environment; and bioengineering
4. To increase our interactions with industry; and create a fertile environment for entrepreneurial activities for faculty and students."

Lance explained the role of the college and departments. He indicated that the departments are primarily the drivers of what happens in the college. He mentioned that he favors department hiring over cluster hiring because the departments know how to run a search. He noted that if we are to accomplish college-wide goals, the departments need to come together as a larger community and view this as a collective effort. He estimated that we need to hire ~60 faculty over the next five years (about 12-15 searches per year). With respect to the budget, the university is still not out of the woods. He added that as a college we are continuing to take cuts in terms of our operational budget and yet we are hiring thanks to

faculty renewal funds. He mentioned that this is something that the university started and he believes is a brilliant idea.

Lance outlined the strategic planning process for the departments in the college. He indicated that the departments started by developing their own preliminary strategic plans. This was followed by college cross-cutting committees which developed plans that looked at thrust research areas. This was followed by a process to ensure that the departmental view was consistent with the college view. That was a step that was not taken in the previous strategic planning process. Lance indicated that getting the department chairs together with the cross-cutting committee chairs to figure out how to get their interests and our interests aligned with each other was an interesting step which generated new conversations that had not happened before. Next, he indicated that he plans to post these preliminary strategic plans, which is an approach similar to that done by the university. He added that this is really a community strategic plan as opposed to a dean's office plan and, therefore, he plans to post a draft of it and then meet with different groups of stakeholders across the college (faculty, staff, and students) to discuss it before it is finalized. He noted that although the NYC competition slowed down our strategic planning process, it also created some interesting possibilities and paths forward.

Lance described the cross-cutting committees which focused on: Complex Systems, Networks & Computation, Energy & Environment, Bioengineering, Advanced Materials, Global Education, Undergraduate Studies, Graduate Studies, Industry & Entrepreneurship, and Nanotechnology. Each committee has about six faculty members. He summarized the outcomes of the cross-cutting committees and indicated that education is the core mission of the university and its primary deliverable, which is our main responsibility. He noted that one of our challenges is that we are limited by faculty size and that the number of undergraduate students we have (~3,000) has remained the same over the last several years, as well as the size of our faculty (~210). A kind of balance point has been reached, and if there is any significant change in the number of students we admit, we would have to increase the faculty size. He added, then there is the question of how are we delivering engineering education? Should it evolve? Is it evolving and, if so, is it evolving at the right pace? He indicated that Charlie Seyler would give a presentation on the college's undergraduate education during the meeting.

Lance gave a summary of the strengths, weaknesses, opportunities and threats to the Master of Engineering and Doctorate programs. He mentioned that one of the strengths is that students receive value from this degree through hands-on experience; every MEng student at Cornell does a project. He added that some of the weaknesses include: not being uniform across all fields (some MEng programs are stronger than others), it is difficult to manage large class sizes, and there is the perception issue that it is seen as a "cash cow" (because due to our current budget model, this is the only revenue stream that we have control over in the college). He mentioned that the growth in demand of the MEng is timely because it provides a valuable resource to some fields which really value the MEng students, and this is especially beneficial when it enhances the ability of researchers. He mentioned that there is a budget model under review by a Budget Model Committee (of which he is a member) led by Kent Fuchs, that may relieve the MEng as a "cash cow". He added that the current model is archaic and there will be a new model where units will receive some compensation (or subvention) for other parts of the

campus that are critical, but are not as lucrative. Decisions will be made based on academics rather than on finances. He outlined some of the threats which include: other universities are creating MEng programs (so this is becoming more competitive), and the lack of a coherent course structure in some fields. He added that the graduate teaching effort is spread across the MEng and Ph.D. programs, giving a sense of competition between these two programs.

Comment: Lance was asked to comment on the high percentage of international students in the graduate program. During his presentation the night before, he indicated that enrollment in the Masters programs had grown to as much as that of the PhD program and that 49% of the students are international. Also during his presentation Lance indicated that the U.S. needs more leaders in science and engineering and the U.S. now has a policy that makes it more difficult for international students to stay in this country due to visa policies.

Lance responded that he does not think that this is a trend. He indicated that historically our MEng and Ph.D. program have been more international than our undergraduate programs. He indicated that this has been the case across the country for several decades, and one could argue that we have benefited from this because we have kept the brain drain. He added that we were getting the very top people and were keeping them in this country. However, recently, we have noticed that the brain drain is going the other direction. He indicated that if we don't change our policies, and as other developing nations become more developed and offer opportunities that rival ours, then the question will become a more significant one. He indicated that he does think that there is a trend per se but that it is an important question that should be considered.

Lance added that for a long time most of the fields dropped their Masters degree programs. Most of the Masters were for students who did not finish the Ph.D. for whatever reason, however, recently, a couple of our fields have created a new MS. It is basically the MEng program for two years. The students pay the full rate, so-to-speak, but for a two-year period. He indicated that this is very useful for certain disciplines that cannot accomplish everything in one year. He added that as far as supported MS programs, where the students have a fellowship and are doing research, we want to focus those funds on the PhD program (i.e., Materials Science and Engineering, Applied Engineering Physics, and Earth and Atmospheric Sciences). Statistics show that a Masters is beneficial because it is just about the right amount of additional technical training needed to reach a higher level without consuming multiple years.

Lance pointed out that the strengths of the doctorate program are that students receive strong mentoring from faculty, high quality of training, and research in frontier areas. He added that the weaknesses include the programs being too small, the MEng competes for faculty time, and course offerings can be meager. He indicated that the budget model for Cornell is under discussion and will change to become one with a more academic perspective, faculty renewal makes a big difference (younger faculty are much more involved in research). He outlined some of the threats which include: rankings which are tied very closely to this, lack of courses could hurt student recruiting (we are so focused on the undergraduate program that we lose track of the graduate course offerings, ABET forces us to worry about our undergraduate programs, but not our the graduate programs), and faculty demographics and graduation rates. (The Fuchs

goal was to graduate 1 Ph.D., 2 MEng and 3 B.S. students per faculty each year – 3:2:1 goal). Lance indicated that we graduate about .5 Ph.D. students per year, compared to 1 per year by the top schools. He stressed that this is an important way to increase the number of our Ph.D. students, as well as enhance the quality of their experience. Lance explained that when a student is admitted into a particular research group, in the absence of fellowships, the research funding comes out of that group, and these hard line matches where neither the faculty nor the student know each other, do not always work out. So, he added, there is certainly a benefit for people coming under a fellowship which helps to form a cohesive class and creates a sense that the students are all together, and this does not force that hard match at a distance, but gives people a chance to know each other and thus matches are more effective.

For the graduate program, Lance recommended the following: reduce the MEng enrollment where it is necessary (we currently have three students per faculty and we would like to reduce that to two students per faculty), make quality of projects uniform, market properly and focus on “entrepreneurship”. For the PhD Program, he recommended growing the program to 5 Ph.D. students/faculty, increase fellowships, national and philanthropy, enhance course offerings (tied to MEng), make this a high-priority and long-term commitment, and recover tuition in a new budget model. Lance also noted that to increase the number of Ph.D. students we need more financial support (many qualified students are rejected).

Lance indicated that he has been considering the idea of using the MEng courses to augment the Ph.D. program. Mark Campbell, director of MAE, added that one of the issues we are facing is that of quality. If you have 10 Ph.D. students and 30 MEng students, the quality of the MEng students is much lower than that of the Ph.D. students, so rather than have this small interactive class that focuses on high-level research, you are really focused on helping the people at the MEng level get what they need out of the class. So what ends up happening is that it completely dominates that class. He added that this is the main problem that we deal with.

Lance noted that the strongest initiatives at Cornell are “bottom up”. He added that we have identified the following Strategic Plan Thrust Areas that have developed over time. We support these thrust areas through funds to some degree, staff to some degree, and hiring to nurture these thrust areas:

- Advanced Materials (multidisciplinary research that spans multiple colleges, it’s an icon of Cornell, leverages nanotechnology beautifully, it’s flexible). Weakness: aging facilities.
- Complex systems, network science and computation (physical networks, social networking, mining data for information, complexity/emergent behavior). These are core ubiquitous competencies. We have an outstanding center for applied math and its future is one of the questions we have to answer. We have a long history of computational research. Weakness: there no organizing entity beyond CIS. They need to be thinking about how they are going to pull in a big center to coalesce that group.
- Sustainable energy and environment (solar energy, wind and wave energy, earth energy, bioenergy/biofuels). Impact on environment: energy supply technologies leading to energy utilization systems and infrastructure. It leverages existing core strengths in the college. The ACSF (Atkinson’s Center for a Sustainable Future) is making

this a permanent activity in the college. Weaknesses: some of our key players are reaching retirement.

- Bioengineering (human health)
- Nanotechnology: opportunity for self-assembly technology.

Lance pointed out that the new budget model will mean that the college will have more revenue streams at our disposal, which is very beneficial. The fundraising strategy for the university has shifted from being centralized to being a hybrid. Provost Kent Fuchs believes that the colleges should be more empowered to fundraise as necessary. On the other hand, the colleges are responsible for reaching campaign goals in conjunction with the provost. He emphasized that Cornell's top leadership is phenomenal, and 100 years from now they will be talking about the Fuchs/Skorton era!

Lance indicated that he plans to draft a strategic plan based on input from the Directors and Chairs and Cross-Cutting Committees. Then he will share the plan with leadership and the broader community (departments, students, staff, alumni). Next, Lance will modify the plan and finalize it based on the feedback he receives and hopes to complete it by the end of this academic year. He mentioned that the plan will be bulleted points instead of long prose and will focus on how we will optimize an already outstanding program.

Lance discussed the impact of the NYC campus on the College of Engineering's strategic plan. He also indicated that the draft leadership of the NYC campus does not involve him.

Comment (Jim Wrightson): Your mission to lead us to climb the rankings by 4 or 5 slots is great. You mentioned highest among them is winning this NYC campus proposal and I think that would push us over the top. But the other thing is the graduate and PhD programs that sound good. A lot of the rest is bottoms up and is very, very important. But as an observation, it's not very compelling if you look at the competition that is also doing some of the same things. For example, if I look at the bioengineering side, I think we are doing great, but if I look at some of the centers that exist for example at Stanford today that are really good, then I think we will hold our position with respect to them but I'm not sure we're going to make inroads on them. Maybe we'll do a little better with respect to Georgia Tech. In terms of corporations, we also have to work bottoms up, which is similar to what the college is doing but, at the same time, we need to go forward to industry, and have to make a story. Those industry analysts don't do anything for us, however, they grade our story. Your story and your industry analyst is the US News and World Report. I believe they would point out the NYC campus and PhD program.

The Cornell Now Campaign - Kathi Warren

Kathi Warren, Assistant Dean for Alumni Affairs and Development, gave an update on the Cornell Now Campaign and what it means in support of the goals of the College of Engineering's strategic plan. Charlie Phlegar, VP for Alumni Affairs and Development, was an invited guest for this presentation. She indicated that the college will have much more autonomy than we have had in the last three to four years and it will be much more of a partnership than in the past.

Kathi explained that Cornell Now is an extension of Cornell's fundraising campaign through December 31, 2015. It is a commitment to ensure that there is adequate funding in support of

the priorities outlined in the University's Sesquicentennial strategic plan. She added that it is an effort to raise an additional \$1.4B for Cornell by December 31, 2015 and an opportunity for each College to seek support for its most pressing priorities. The priorities include a combination of both current use and endowed funding.

Kathi outlined how this campaign will transform the college by 2015. It could result in additional funds for 25 or more faculty lines, including funds to attract and recruit top-quality URM and women faculty, as well as fund at least four additional faculty lines to create an undergraduate major in BME. It would also provide increased capacity for us in the energy area.

With respect to programs, Kathi indicated that it would enable the college to underwrite the student teams program and other experiential learning initiatives. A successful campaign would also allow the college to provide more student aid and to cut our graduate fellowship gap by almost half (\$30M for 75-100 graduate fellowships), as well as provide enhanced scholarship opportunities for undergraduates (\$11.75M). In addition to student aid, the campaign would also provide funds for necessary facilities and upgrades to support the new BME undergraduate major as well as complete the funding needed for the Physical Sciences Building.

Kathi indicated that the College of Engineering's campaign goal (July 1, 2010 – December 31, 2015) is \$185M (to date \$23.9M has been raised). Our goal for FY12 is \$33M (to date \$2.0M has been raised). The faculty renewal goal for the life of the campaign is \$7.5M (\$4.2M has been raised to date). She indicated that the current FY12 outlook is that we have asked for only \$14M and of that \$7.8M are in process, however, we have yet to receive any response. These are new gifts and commitments. The amount of proposals that were asked for but have been deferred is \$750K and we still have \$95M in asks remaining.

Kathi gave examples of how the campaign is allowing us to do various projects. Due to gifts that we have received, we have been able to establish an engineering leadership program to develop future leaders in the College of Engineering. She indicated that we have been successful in our faculty renewal and she gave the example of some of our new faculty: Andreea Minca, Asst. Prof. ORIE (research focus: resilience of financial networks to contagion) and Greg Fuchs, Asst. Prof. AEP (research focus: solid state systems).

Kathi outlined the role that the ECC is being asked to play or could play within the Cornell Now Campaign. We have established a Major Gifts Committee and its goal is to enhance the efforts of alumni affairs and development by helping to identify, engage, solicit and thank donors across the entire spectrum. The ECC has made great strides in terms of its giving to the University. As recently as five years ago, the council's annual giving percentage was somewhere in the 30% range. Last year, 82% of ECC members gave anywhere to Cornell. She added that we are progressing in terms of the ECC's participation and will continue to focus on getting that up to 100% participation. Kathi added that you can give a gift in support of any campaign priority, which is something that some of the ECC members have already done and, finally, can also participate in future ECC funding initiatives. She indicated that in the past, we have funded the classroom project and student teams, and that she would be happy to devise a strategy for other projects that the council decides to fund.

Kathi indicated that the current members of the Cornell Engineering Major Gifts Committee are: Duane Stiller (chair), Sarah Fischell, Sam Fleming, Dan Simpkins and Roger Strauch. She mentioned that they are seeking additional committee members either from within ECC or newly recruited members. She added that the Major Gifts Committee kick off meeting was held on October 27th, 2011.

Kathi concluded by introducing the new members of her AAD Development Team: Chris Miller, Sr. Development Officer and Anthony Escobar, NYC-based Major Gifts Officer.

Question: Now that the University is putting more responsibility on the colleges for fundraising, how does this effect the old donor access rules, in other words, the control of access to donors?

Kathi responded that there is an extremely collegial collaborative atmosphere here at Cornell, but there are still guidelines. There is a process for clearing (who can do what and when).

Jim Mazza stated that informally this has been working well for the last three years. The idea is that no one is ever solicited for a gift without everyone who has a relationship with that individual knowing about it. He noted that Cornellians have multiple interests so it is very important for example that the director of athletics, the director of the museum, and the dean of engineering to know about the conversations that are underway with our closest friends. In doing this we are better informed and can form better partnerships. He indicated that donor access is being done very well at the University. Charlie Phlegar added that he is optimistic about our donor base.

Strategic Plan: Report on Bioengineering - Michael Shuler

Michael Shuler, Chair, Department of Biomedical Engineering, gave a presentation on the Bioengineering Cross-Cutting Committee. He explained that the committee met to define its goals, requested input from the departments and, subsequently, generated its first draft report.

Mike noted that all of the College of Engineering departments have some “bio” activity and 7 to 8 of them view “bio” as a critical component of their future success. He added that over the last 3 years, the college has hired 7 faculty who have bio interests. He indicated that the bioengineering cross-cutting committee focused on the areas of biomedical engineering, bioprocess engineering and bioenvironmental engineering. He noted that some of the most pressing problems that society is facing are environmental and that the interest in bio has increased significantly. He also pointed out that increased funding from NIH is needed in order to help grow our Ph.D. program.

Mike pointed out that biomedical engineering has been practiced in the college for almost 45 years. However, the efforts in biomedical engineering have been widely dispersed but disciplined focused. Don Bartels initiated interactions with Weill Medical College around 40 years ago and the college has built on those interactions. The BME department was established in 2004 and interactions with Weill Medical College and the Vet College have increased significantly since that time, which has created a great triangle between CoE, Weill Medical School, and the Vet School in terms of complementary functions.

Mike noted that we have a strong MEng program and that for industry this is the preferred degree for BME students. He added that industry often provides a person from their company to help oversee the students, as well as a small amount of funding. He explained that, "The primary mission of the Department of Biomedical Engineering is to educate students to understand the human body as an integrated system and the mechanisms of disease through quantitative engineering analysis, and to use that understanding to design better therapeutic strategies, devices, and diagnostics to improve human health." He added that biomedical engineering bridges engineering and the physical sciences with medicine and biology. Mike also discussed the strategy in forming BME.

Mike discussed the possibility of adding the BME undergraduate major. He noted that student demand for the B.S. is likely to be high and that it will take at least three years to initiate this undergraduate major which will focus on how to look at biology from an engineering perspective. He also pointed out that additional faculty would also be needed in order to implement this major.

Mike mentioned that the college's efforts in bioprocess and bioenvironmental engineering are strong but fragile due to the small number of faculty in those areas, however, if we had additional faculty, we could stabilize and strengthen those efforts.

Mike pointed out that Biological and Environmental Engineering is not part of the college, however, it is an important source of expertise in bioengineering. He noted that the hiring of additional BEE faculty will enhance the college's activities. The college's and BEE's strategic plans need to be coordinated. He added that BEE would be supportive of adding the BME undergraduate major and redistributing undergraduate students to allow a stronger BEE focus at the graduate research level.

Mike outlined the goals and aspirations defined by the Bioengineering Cross-Cutting Committee which will lead the college to become recognized as a national leader in bioengineering research and education. He pointed out that some of the strengths include having a collaborative, interdisciplinary research environment with a diverse student body, and the ability to attract a strong pool of Ph.D. students and students who are highly successful with NSF fellowships. Our key centers (NBTC/CNF, CMM, CCMR) provide outstanding facilities and opportunities. He also discussed some of the weaknesses which include the fact that our BME program is younger than that of the competition and is the smallest of the top 20 BME programs. In addition, the undergraduate bioengineering programs, spanning various colleges, could be strengthened.

Mike indicated that opportunities for BME include establishing a leadership curriculum based on quantitative, multiscale analysis, strengthening connections with the Vet School and Weill Medical College, and having a more diverse student body at all degree levels. He pointed out that some of the challenges we are facing include having insufficient wet lab space in the college (especially for cell cultures), the loss of key faculty (having a small faculty makes programs weaker), and the need for coordination of efforts, particularly with respect to our undergraduate programs.

Mike noted that the focus of bioengineering research will be on the following areas: human health, bioprocessing, energy, and biosensors/instrumentation. Nanobiotechnology will be a cross-cutting theme and could include systems biology. The emphasis of these areas is at the cellular and molecular level. He added that there will be 24 faculty positions (10 BME centric, 9 discipline based BME, 5 in bioprocess/bioenvironmental), at that joint appointments will be possible. He mentioned that 4 BME centric positions will be endowed. He also mentioned that BEE plans to add bioengineering faculty (molecular BME, all areas of bioprocessing and bioenvironmental).

Mike concluded by stating that there is strong student interest in BME and efforts are underway to initiate a BS in BME. The college has a two-prong approach to BME which is to develop both a core department and BME faculty in most of the college's disciplines. He noted that the bioprocess and bioenvironmental areas need further development and that BEE is an important part of this process.

Strategic Plan: Report on Recommended Undergraduate Education Initiatives – Charlie Seyler and Betsy East

Charlie Seyler, Associate Dean for Undergraduate Studies and Betsy East, Assistant Dean for Student Services, gave a presentation on strategic planning for undergraduate education. Charlie Seyler indicated that we will strive to continue what we do well which is to recruit a diverse and very talented student body. He pointed out that the college is highly ranked because we have a traditional emphasis on fundamental engineering and technical expertise as well as analytical skills. Many of our students aspire to not only be engineers, but to also be leaders. He added that in order to go forward and to compete effectively in a global and complex society, especially with the new breed of students we are attracting, we need to prepare ourselves, the faculty, the college and our students, to address complex global issues.

Charlie outlined three key recommendations: increase flexibility of curriculum and student experience to maximize the value that students receive from their Cornell education (i.e., relaxing some of the curriculum requirements so that students can participate in study abroad programs), enhance the quality of teaching through innovative methods and technologies, and expand programs to enhance leadership and enabling skills.

Charlie pointed out that we need to enhance the instruction of our students. The students of today are different than they were 20-25 years ago. Student learning styles have changed. He indicated that he would like increase the number of Teaching Excellence Institute (TEI) staff, led by Kathy Dimiduk, so that we can reach more faculty. He noted that thanks to the TEI the quality of our teaching has improved. Charlie mentioned that he would also like to enhance the quality of our instructional facilities by continuing to modernize them. He added that the gift from ECC members was a great start.

Charlie stated that our younger faculty are effective teachers and that utilizing our undergraduates and TA's effectively is also helpful because they are more in tune with students' needs and are less distant. He indicated that additional resources are needed for equipment and support staff.

Question: Do we have international exchange programs?

Charlie indicated that the College of Engineering has a limited number of Memoranda of Understandings with international universities for exchange programs. He added that these require a lot of staff and effort to maintain, therefore, we want to target schools that would be meaningful to us.

Betsy pointed out that CEE has a very strong program with the University of Cantabria. She mentioned that the college is working on getting more students to study abroad, but it takes a lot of staffing to make this work.

Comment: Does our connection with Technion afford us the possibility of undergraduate studying abroad?

Lance responded that it will certainly provide that opportunity in the future.

Betsy indicated that thanks to the generous gift from ECC Council members, classroom improvements were made (i.e., smartboards, clickers). Bob Shaw added that 30% of the classroom enhancement program has yet to be funded. Betsy indicated that additional resources are needed for space suitable for conversion to teaching, funds to support more TEI staff and to provide long-term funding of the program. Additional funding is also needed to provide leadership training to a wider group of students (Leadershape is a one-week program that takes place at the end of the academic year for a group of 30 students). She mentioned that we were very fortunate to have received generous support for this program from an alumnus). Betsy added that she is in process of advertising for a Director of Leadership Program (which is a pilot program).

Question: Is mentoring still the works?

Rick Allmendinger responded that the Diversity Programs office provides multi-tiered and peer-to-peer mentoring. It is a member of MentorNet, which matches corporate sponsors to students.

Question: Has Susan Murphy's efforts on health and well being been incorporated?

Betsy responded that a "Notice and Respond" video produced by Gannett and Susan Murphy's office, is being shown during the freshman year. She added that we are very much engaged in helping faculty understand the stress students are facing (i.e., due dates of assignments).

Comment: Experiential learning is the best way to learn since it is by leading.

Betsy indicated that we would like to expand participation in student teams to the entire student population.

Impact of NYC Campus – Lance Collins

Lance Collins facilitated a discussion on the mission for creating a complementary campus in NYC. The overriding response he has received from students, faculty, administration and alumni has been very positive about our submitting the CornellNYC campus proposal. However, some concerns have been raised about our ability to do so without negatively impacting the Ithaca campus. Lance noted that this was the first thing that was considered during the planning phase of this proposal, and that out of this concern the hubs concept was born. Lance emphasized that the NYC campus will have one mission and the Ithaca campus will have another, and that both campuses would be outstanding and would drive each other to a higher level, without competing with each other. Lance pointed out that Dan Huttenlocher, Dean of Computing and Information Sciences, and he have collaboratively put the academic pieces of this proposal together. Kent Fuchs and David Skorton looked at the administrative side of this proposal, the Board of Trustees spent a fair amount of time reviewing it, and Cathy Dove, Associate Dean for Administration, has devoted herself to this project. He added that we could not have done this proposal without her. She has done a phenomenal job working on this project.

Greg Galvin expressed grave concerns about what the NYC campus might do to the Ithaca campus. He indicated that he has not seen anything in proposal so far that addresses this concern. He added that the focus has been on how do we win this, but there is real potential for this to be competitive with the Ithaca campus if we have to hire 200 more faculty for NYC, when we are trying to replace 40-60% of the faculty from the Ithaca campus during the same time period. He pointed out that we want to encourage entrepreneurial activity associated with the Ithaca campus, yet we are saying how it is going to be so much easier to do so in NYC because the vc's (venture capitalists) are there and that our tech campus will be focused on entrepreneurial activity. Greg noted that degrees at the graduate level will now compete for students who would rather go to NYC than go to Ithaca because they are more likely to get a job with a VC or get their company funded if they go to the NYC campus. He indicated that the thoughts and ideas that the faculty will be appointed in "Ithaca" departments is a great step that mitigates some of the concerns, however, he added that the university has spent decades trying to forge some sort of close relationship between Weill and Ithaca and in the last 10 years has made significant progress, but it has taken a very long time. He also expressed concern about how will we ensure that this tech campus does not evolve into another Weill and become a standalone campus that isn't really a part of the Ithaca campus? Do we enhance the synergies that we believe will come out of this or protect the downside in such a way that things don't just trickle from Ithaca into NYC?

Rajit Manohar made a suggestion that he wanted to share with the rest of the group. He mentioned that one of the things he was thinking about was the fact that if you look at the hubs, they are a very narrow slice of the College of Engineering. He added that there's a lot more going on -- conspicuously absent is nanotechnology. The reason it is absent is that you don't want to replicate the competition here. You can have a situation where both campuses have the entrepreneurial spirit based on what your current project is and what your current hubs are.

Comment (Greg Galvin): It was pointed out that we are playing this delicate game with Mayor Bloomberg about our strengths in Ithaca and NYC.

Comment (Gretchen Knoell): If we mandate that the students or the faculty spend their first year in NYC and then rotate to Ithaca for approx. one year, this would force a dialogue in Ithaca.

Lance responded that the academic issue has been raised and, actually, computer science, which is at the heart of this proposal, raised it first. He added that this issue has had more to do with culture. CS is a very close-knit group. They have lunch together almost every day, but they formally meet for lunch as a faculty once a week. They have a sense of community and have difficulty imagining how that could be extended to faculty appointments in NYC. They are concerned about how this is going to work and they feel that part of their success is due to the fact that there's a lot of training and sharing that goes on during these informal conversations, which is part of the reason that they are ranked fifth in the country and that they have such an outstanding department. They are not sure how they can project that sense of community all the way to NYC, 250 miles away. Lance pointed out that we don't have a single clear answer to that question, however, we have a clear commitment to finding a way to deal with those issues. He noted that Weill is a great example of the mistakes we don't want to make - He added that the fleet of campus buses and student exchanges between Ithaca and Weill made a huge difference. The biomedical engineering department has an immersion program where all of their students go into NYC for a summer before they start their studies, which builds relationships. Lance indicated that if it were up to him, all the Ph.D. students would start in Ithaca because this is where all of the real coursework is, however, it would be crazy to try to replicate all of that coursework in NYC. Also, there might be other courses that students could start here, but if they wanted more entrepreneurial classes, they could spend some time in NYC and we would have to find a mechanism for them to have a place to stay for a semester.

Lance emphasized that the notion of connectivity is a very critical one. He pointed out that this proposal is very much electrical and computer engineering heavy, so these departments are going to be big players, as well as ORIE. He added that the other departments don't really have a big stake in this game.

Comment (Jim Becker): The NYC campus will be integral to the goals and objectives of the strategic plan. Rather than seeing this as a risk issue, this should be seen as an opportunity issue. If we are lucky enough to win this, we should be looking at how this will make us a great engineering college. Once there is a building, other departments will probably want to be involved in this campus.

Comment (John Swanson): If we win this proposal, we have a much better opportunity to build on this. We are creating a different product. The product of the Ithaca campus is the students, the product of NYC seems to be a different focus, which is that of innovation.

Comment (Dick Aubrecht): It might be useful to look at other models that are available and how other organizations cope with similar types of circumstances. The critical part is having the right leadership and budget models in place to make this happen. Look at corporate models to see how they manage multiple locations. The leadership for this campus needs to be of one mind, to create an integrated operation as opposed to rivals.

Comment (Bob Shaw): My biggest concern is the brain drain on Ithaca. The implementation will be a huge suck of resources unless you plan aggressively to not let that happen. Another concern is if they are part of a department here but are not being required to teach undergraduates, and are required to get tenure here, not there, this might create tensions around promotions. What will it take to be recognized as a member of the Ithaca faculty, as opposed to the NYC faculty?

Lance indicated they certainly have thought about these concerns but he's not sure they have been solved.

Bob Shaw added that as a venture person, he doesn't think NYC is a hub for venture capitalists. There's lots of finance in NYC, but very little venture capital. He asked the question that if Bloomberg hadn't put this on the table, would we be thinking of doing this in NYC and, if so, if we don't win, would we do it anyway? And if we say yes to that, then that's a different answer than if we were just doing this because it's a competition. Also, if we want to do something like this and we want to be in an entrepreneurial environment, why don't we go to California? Stanford wants to get in NY to create a strong East Coast presence, and we would benefit from doing this in the West. If we're just doing this because of Bloomberg's competition, then that would be the wrong way. If we would have done this in NY anyway (as opposed to California or somewhere else), then fine we should do this. He added that some people just don't like to be in NYC, such as him.

Lance responded that we felt that NYC is a strategic location. It's the primary city of the State of New York, and we have in our strategic plan (even before the Bloomberg announcement) that we would like a presence in NYC. Our financial engineering program is down there.

Comment (Jay Carter): It seems that over the last couple of years President Skorton, in particular, has been very sensitive to the humanities feeling left out of the things that are taking place on campus, culminating with the new building announcement made last Friday. So, analogously, maybe it's the same thing here. He is really bending over backwards -- you, Kent and others may have to do the same thing if we go ahead with the NYC campus.

Lance agreed that Skorton is very sensitive to the fact that the sciences and applied sciences get all the attention in the country and he is as well.

Comment (Dan Simpkins): Multinational corporations exist and are successful and do this every day, but generally they don't put competing division so geographically close together that do the same thing. So, if we are going to do this, what if you said that we're going to build a graduate engineering program with this concept in mind, determine where the best place on the planet is to do it and then go do it. It seems to me that NYC would not be one of the places you would pick. It is absolutely inevitable that they will compete with each other due to their close geographic location. Ultimately universities succeed, as do companies, by building brand. And brand has to be built over long periods of time by achieving excellence in everything you do. It is very important to figure out what you can be best at and do it much better than anyone else (the hedgehog strategy). That is, if we can do something in NYC and we can do it better than anyone else, and it causes Ithaca to be damaged in some way, but it increases the

long-term brands of Cornell a hundred years from now and the Cornell brand is stronger than it is today, then it's probably a good thing to do, even if it hurts Ithaca, because that's the natural disruption that happens in everything you do. But if you can't build the brand, and be best at it, then that would actually be worse. He added that the concept of hubs deeply concerned him because it means having to invent a different strategy to make NYC work so that it doesn't compete with Ithaca.

Lance responded that the hubs were created because we felt that we had a different product (although it is still students). It's about technology that gets out into the commercial world in NYC. So, we needed to have from the outset a mechanism in place by bringing together the expertise that will work together. So it's not just about training students, but here it's also going to be about bringing them together so that they can generate technologies that will be pushed out into the media, into the health fields, etc. So the hub wasn't just a gimmick to protect Ithaca, it was also a way to be responsive to the mission of this being different. With respect to the tension issue, some tensions are not necessarily all bad. Some are good. So if the tension that we have is that this new Cornell product is starting to get a certain level of cache, that is not necessarily all bad because that's probably going to force the Ithaca campus to respond in terms of wanting to promote its strengths as well. There are some strengths that won't go away here. There are certain things that can't be replicated in NYC, etc. He indicated that it would be bad if it created some sort of brain drain, and that all the quality people moved from Ithaca to NYC. However, he felt that this won't happen. There's a lifestyle here in Ithaca that is the perfect environment for the deep and profound research we do here. In a way, he added, we are trying to create a university that has the ideal environment for two very different kinds of activities. NYC will be frenetic, busy, and a place where if you want to bump into people and have numerous conversations, that's where you'll be. Ithaca will be this place where you're solving things like, why the "big bang". It's the place where long-range research takes place. From his own research career, he indicated that he's pure Ithaca. He has nothing that remotely would work in NYC. He noted that a lot of faculty will not be interested in NYC at all because that's not the style of research they do. However, he thought that some will realize that they can do both. Those faculty will want to have an office in both locations which we will also want to promote. And there may be some that just decide to leave for NYC to part of this new buzz. The real point is in the aggregate will we improve or hurt our brand?

Comment (Sarah Fischell): this is a high-risk effort for whomever wins; my view is that we didn't have any choice but to compete. But, from a product point of view, we need to know how big of a campus the city wants it to be.

Lance indicated that he believes that our proposal is above the city requirements. At full build out, which is 30 years from now, there will be 250 faculty (about half of whom will be tenure track), and approx. 2,000 students. He mentioned that we have done an economic analysis and it is projected that this will create tens of thousands of jobs.

Comment (Sarah Fischell): The long-term plan is 2,000 students which is significantly more than the enrollment in the Ph.D. and MEng programs of 1,500. Whether or not there's a market for this in NYC, this is much bigger than anything we could ever do in Ithaca and very different from what we do here, which is part of the risk. It's a huge transition problem and suck of resources

to build this size of program. But if the nation and NYC supports this kind of effort, then why not us.

Lance responded that several comments were made that he did not completely agree with. He pointed out that he did not agree with Bob's statement that there's not a lot of venture capital in NYC. However he said, unfortunately, he's the wrong dean to argue this eloquently, but Dan Huttenlocher is much more knowledgeable about this since he's done start-ups. Lance stated that it is his impression that NYC has been ramping up over the last ten years. His recollection is that it is number two behind Silicon Valley.

Comment (Gretchen Knoell): NYC is very strong in social media which has given it a big lift and in computer science. However, it's not a place where you would develop computer chips, that's what Silicon Valley does.

Lance responded that it's a burgeoning sector and the city believes, and we are convinced as well, that NYC has growth potential.

Comment (Frank Huband): Apparently, Mayor Bloomberg announced that they may pick more than one university for this proposal.

Comment (Duane Stiller): In the last 150 years, Cornell has done better than almost any other place in the world, and by the year 2040, the United States will have another 100 million people more than it has today. The globe will have 2 billion more people. We're talking about an economy that will be five times the size of what it is today. Duane indicated that he thinks Cornell can ill afford to not be on the cutting edge of adapting and growing in a rural place that will be so different than the rural place we know today.

Comment (Bob Shaw): He agreed with Duane Stiller, but added that the difficulty is getting people to come to Ithaca. It's a known problem. He's not opposed to a new campus, but he would look at all the possibilities both in the U.S. and possibly abroad to determine which is the most ideal place, geographically, to have this campus. It will be challenge to squeeze the campus onto 10 acres and he would not pick NYC for many reasons.

Lance responded that the mayor is backing it with money, but the land value is high.

Comment (Gretchen Knoell): the beauty of the CornellNYC proposal is that if you are thinking of creating an immersion where the people in NYC have to come to Ithaca and people here have to go to NYC, you're going to get great cross communication and developmental energy that could actually be very additive to Ithaca and to the research triangle created. The economic policy of this local government and the university working together is smart. I think that there will be lots of capital and innovation in NYC.

Comment (Dan Simpkins): He indicated that he is very supportive of this proposal. He thinks it is critical and necessary for our survival and our brand, because we're insular and isolated from industry. If you look at the major venture capitalists, and if you look at the top five venture firms in the U.S., all of them have expanded internationally. They have offices in China, India,

Israel because that is where the growth is; the world is expanding exponentially. We should see this as a laboratory, and if we do it, we should make it a laboratory for how one starts a university and potentially use that knowledge to make that a cornerstone of our knowhow as a university to look to other countries and other places to where there is growth and see if we can touch those places where there is growth.

Comment (Charlie Brown): This is a reminder that when Ezra Cornell founded this institution it was a grand experiment. One of the problems with Weill and Ithaca is that it is a brown field. Changing cultures in brown fields is very difficult. Establishing a cultural relationship at the outset is a lot easier and has a lot to do with leadership. So I would strongly encourage you to not be cheap with the leadership. You want the best, capable person and team there and you need to give them the freedom to create something that isn't Ithaca relocated. It's a brand new experiment. There also opportunity if you don't get it and it's important that you get a transition team in place that talks about the next day in case you don't win, because there are some things you discovered in putting this proposal together that you now know better than you did before and insights about what things you would do differently now on this campus. You can say we didn't get it, but we're better because of it.

Lance indicated that the Mayor's office put a lot of thought into this proposal. It's their attempt to diversify a huge economy. They looked at what can this economy do that is of the right scale (it's not easy to impact the NYC economy because it's so large). Several years of planning took place in advance of the announcement. He indicated that he believes that we will be successful because we have the troops already on the ground there and have a base for building this activity – we're not starting from scratch. We started the campus from scratch, but we are building on our deep roots of alumni there.