

CHARGE TO THE USC ACADEMIC SENATE TASK FORCE ON INNOVATION: To provide insights into the culture of innovation at USC and recommendations to improve areas of concern.

Our initial goal was to provide insights into faculty engagement with the USC Stevens Center for Innovation (USC Stevens). As a start on this, the Task Force spoke to over 30 faculty members who interacted with USC Stevens, evaluated the processes at other major universities, and collected anecdotal descriptions of recent faculty interactions with USC Stevens. Combined with the Task Force's own experiences, this led to discussions and recommendations in six major areas, as summarized in Sections A-F of the body of this report. This was finally distilled down to the four most critical recommendations, as laid out in Section G, which also functions as the executive summary of this report.

By way of background and to provide context for the task force's deliberation, the mission of the USC Stevens Center for Innovation is provided. We fully support this mission and focused on means to maximize this common goal.

MISSION OF USC STEVENS CENTER FOR INNOVATION (From Website): To maximize the translation of USC research into products for public benefit through licenses, collaborations, and the promotion of entrepreneurship and innovation. USC Stevens Center for Innovation is committed to advancing the creative thinking and breakthrough research at USC for societal impact beyond traditional academic means. We focus on the licensing of technologies, expanding industry collaborations, and supporting start-ups. To achieve this goal, USC Stevens offers a service commitment for commercialization activities, including timely communication with the inventors of the technology, and clearly articulated processes and procedures.

USC Policies Regarding Intellectual Policy

There are two documents available that address the policies at USC for protection and development of intellectual property. One is the USC Intellectual Property Policy (found in appendix A) and the other is the Faculty Handbook. In the Faculty Handbook, section 5 D, it states "A basic function of the University is to contribute to knowledge and culture by creative activity in all academic areas, and to disseminate the results of such creative activity by the most appropriate and effective means. The securing of a patent, in certain circumstances, may be the

most appropriate and effective means of disseminating the knowledge involved, and it is the general policy of the University to encourage and support production of such patents for the purpose of dissemination of knowledge." The USC Academic Senate Task Force on Innovation fully supports this position.

A. Short-Term Gain vs. Long-Term Goals

In order to decide on the policies, procedures and staff for a technology transfer center, it is necessary to agree on what the University views as the priorities of the center. The following is an attempt to articulate appropriate goals, their relative priority and the rationale behind these recommendations.

1. To attract and train students, staff and faculty with entrepreneurial interests and talent

A successful research university survives by constantly recruiting the best and brightest people it can find. Those people have many options and they tend to choose carefully. If they are interested in technology and its commercialization, they will ask our like-minded students and faculty about their experiences here. Our first priority must be to make sure that those experiences and USC's reputation are as favorable as possible.

2. To promote the transfer of research advances and new technologies into goods and services available to the general public

It should be remembered that almost all of the innovative science and technology that a university might commercialize was funded by government grants and, ultimately, by the tax-paying public. We rely on an implicit contract between society and academia whereby society benefits from this investment. The Bayh-Dole Act of 1980 transferred ownership of federally funded intellectual property to the grantee institutions NOT because it wanted to provide them with an additional source of revenue, but in order to empower and motivate them to do a better job of IP commercialization than the federal government was doing.

3. To motivate successful entrepreneurs associated with USC to contribute generously to USC advancement

The most successful research universities rely heavily on the gratitude and loyalty of alumni who cherish their experiences there. This source of revenue far exceeds the shorter term revenue from royalties on their entrepreneurial activities. It is likely to evaporate if the university has been an obstacle to their entrepreneurship.

4. To maximize financial return on the university's portfolio of intellectual property

There is a widespread misconception that universities derive substantial profit from technology transfer. There is nothing wrong with doing so, but such success is rare and derived from a few "home run" events that depended more on the fortuitous outcomes of faculty research than the marketing efforts of tech transfer offices. In fact, most tech transfer offices lose money and most opportunities for commercialization arise from the industry insights and contacts of the academic researchers themselves.

5. To facilitate desirable economic development in the university's neighborhood

USC is Los Angeles' single largest employer and a major property holder and developer. Our relationships to our local neighborhoods and the metropolitan area at large are vital to our activities and their success. Governments are increasingly aware that the largest long-term opportunities for economic growth tend to arise from the innovative activities of local universities and their graduates. One priority of tech transfer should be to encourage the creation and growth of local industry.

B. Faculty as “Customer” and “Partner”

The USC Stevens Center for Innovation serves the needs and priorities of the University of Southern California, but can only effectively do so by directly serving the faculty and other innovators within the USC community. To do so, a customer service model is required in interactions as well as clear, transparent communications with faculty. This in turn requires a clear understanding by USC Stevens’ personnel that providing a positive experience for the engaged faculty members is essential for successful innovation. This is true despite the fact that in some cases the faculty has a conflicted interest in the outcome of the technology transfer. A lack of commitment to an optimized customer service model results in faculty avoiding interactions and involvement with USC Stevens when feasible and ultimately directly counters the goals of the Center and the University.

1. Faculty involvement with USC Stevens can only be successfully driven by providing quality experiences

While avoiding interactions with USC Stevens is in many cases against the legal obligation of faculty in terms of disclosing inventions and intellectual property, a perception of an ineffective technology transfer office encourages such behavior. It is important to emphasize that an aggressive approach to demand disclosures is ultimately futile and only serves to drive experienced innovators further from USC Stevens due to what they may interpret as dogmatic threats. The solution can only lie in USC Stevens’ staff demonstrating to individual innovators as well as the USC community at large that they are able to improve (and not hamper) an inventor’s path towards commercialization of valuable ideas.

2. Faculty’s knowledge and understanding in their areas of expertise should be leveraged as a resource in the commercialization process

An essential aspect of optimizing the customer service experience for faculty at the University is a greater involvement by faculty in the negotiations and collaboration processes towards commercialization. Although this is at times not possible due to conflict of interest, disclosing faculty are often the individuals at the university who best understand marketing aspects of their inventions and the competitive landscape. As a result, including the faculty member when possible in negotiations with outside entities (in direct conversations and/or in closely communicated details of the negotiation progress) serves to both facilitate faculty engagement and potentially advance the larger financial objectives of the university. In recommending this increased faculty involvement, it is important to consider that situations occur when the faculty member’s involvement is instead detrimental to outside collaborations and negotiations. There are a number of reasons for this occurring, many of which can result from the faculty member’s misperception regarding the value of their invention. These are therefore ideal situations for involving a faculty advisory board composed of respected and experienced faculty innovators at the University (see below). In addition, organization of faculty and mentor committees for the development of individual technologies would optimize success of intellectual property disclosed.

3. Broadening the involvement and oversight of the existing faculty advisory committee to a faculty advisory board can help redirect USC Stevens’ priorities towards improved faculty engagement

Although a faculty advisory committee is already incorporated into USC Stevens (The USC Stevens Faculty Advisory Committee), the committee's involvement is somewhat rudimentary at present. Broadening the role of this committee not only would increase faculty engagement with USC Stevens but can also serve to increase the credibility of the Center as a resource that benefits faculty members. This will be discussed in more detail in the following section (C. Faculty Advisory Board):

C. Faculty Advisory Board

In order for a faculty committee to serve the mission of USC Stevens more broadly as well as have oversight functions, the board should be a standing committee whose members are jointly appointed by the Office of the Provost and the Academic Senate. It is recommended that this board be co-chaired by one person nominated by the Provost's office and one nominated by the Academic Senate. Further, half the members of the board should be nominated by each organization. A more independent faculty advisory board would not only invariably shift the priorities of USC Stevens functions towards making the faculty the customer, but it would also serve to make disclosing faculty more likely to accept decisions regarding intellectual property and negotiated agreements as based on the wisdom and experience of their colleagues, rather than on poorly understood (by the faculty), short-term financial priorities.

The board would be charged with advising USC Stevens on ongoing issues on a standing basis. In addition, the board's responsibilities would include developing metrics by which USC Stevens is evaluated, assessing USC Stevens according to these metrics and advising USC Stevens on processes to catalyze innovation. This board would also act as a feedback mechanism by providing consultation when there is disagreement with faculty members.

D. Marketing of Technologies Developed at USC

Marketing is an essential part of the commercialization process and includes:

- (i) Understanding the technology and where it fits into the current market
- (ii) Determining which companies, both in the US and internationally, would potentially be interested in the technology and how the technology could benefit, or augment, their current product portfolios
- (iii) Performing a proper valuation of the technology. This includes understanding where the technology is in the development cycle and understanding what it will take (time, resources, regulatory approval and reimbursement) to get to market

Currently, “marketing” is not included in USC Stevens’s online list of highlighted service commitments (<https://stevens.usc.edu/service-commitment/>). We understand that additional marketing efforts are on-going within USC Stevens, yet marketing remains a perceived area of weakness within USC Stevens. The task force has identified the following areas for consideration:

1. Using third parties that have expertise in marketing in the given technology and that have already developed a network of contacts in that area

It is unrealistic for a relatively small group like USC Stevens to have the in-house expertise to properly market all of the different technologies developed at USC, so contracting marketing work to third parties should be encouraged. In many cases these third parties have already developed the contacts needed to market these technologies to the appropriate companies.

2. Allowing faculty members to be more involved in the marketing of their technology.

As described above, faculty should be regarded as both customer and partner in the processes of moving forward innovations at USC Stevens. Therefore, when conflicts of interest can be avoided, faculty should be queried as to their desired involvement in the marketing of their technology and the negotiation of any licensing deals. In many cases, a faculty member understands the companies that are active in the technology space and has already developed contacts. One size does not fit all when it comes to faculty engagement in the process; some may want to be involved in all steps of the process whereas others may prefer to hand off the work to USC Stevens.

*The “Licensing USC Technologies” page has a link for “search our available technologies” which directs to **one page** summaries of the technology, including Market Opportunity, USC Solution, Value Proposition, Applications, Stage of Development and Intellectual Property. Discussions with a number of faculty members have indicated that they have had little, or no, input with regards to the content of this page. This one page summary appears to be a primary aspect of marketing efforts that have been developed by USC Stevens to attract potential industry collaborators/licensees and is a specific area that could benefit from faculty engagement.*

In 2009, USC Stevens published a report entitled “Venture Capital-University Interface: Best Practices to Make Maximum Impact” which included insights from the venture capital community with respect to “best practices”. Recommendations included the importance of understanding how a given technology/business opportunity fits into a given venture capital’s

business goals, which requires specific expertise in the technology. This area may be an opportunity for more faculty engagement or the use of third party experts.

A key finding from this report was:

“the VCs we spoke to said that the people-innovators are a central consideration of venture deals and that universities do not always understand this or create the right incentives for student and faculty innovation”.

This statement reinforces the task force’s recommendation that faculty are often crucial to the success of a new technology. Further, there are a variety of resources for interested USC faculty to explore the market for their technology such as one of the seven NSF I-Corps Nodes, which hosts on-campus monthly innovation workshops on customer discovery and product-market fit that are open to all USC innovators.

3. Transparency and communication during the marketing and negotiating process

Faculty members have voiced frustration in not being updated regarding their technology’s progress while it is being handled by USC Stevens. The staff of USC Stevens should therefore educate faculty regarding the expected processes from the onset of the project and should proactively communicate with faculty regarding project updates. Furthermore, when the faculty are involved in the company with which the negotiations are being held, the faculty should be notified if there are changes being made to the agreements.

E. Balancing Leadership and Management

USC Stevens was established with a focus on vision, innovation and leadership. Over the years, the center has moved through a number of transitions and most recently underwent a large turnover of personnel. As new staff members have been included in the development of deal structures and other important decisions, concern has been raised that the individuals that are in discussions with faculty or external stakeholders are not, on their own, able to approve terms, etc. If the person that the customer is dealing with has the experience and authority to solve issues of differences between parties and to negotiate a deal within parameters set by the university, it can be expected that satisfaction, both on the part of the customer and the staff, will greatly increase. A focus should therefore be made on equipping USC Stevens staff with the skills to be capable decision makers and once reaching that, allowing the trained and capable staff to be in a position to directly make decisions. To accomplish this important end point, more experienced staff may need to be hired and / or additional training needs to be provided to bring existing staff to this level.

Potentially due to some of the issues described in the sections above, including work load and sometimes multiple layers of approval and oversight, the staff of USC Stevens have at times had prolonged turnaround times. Guidelines for expected response times have been put in place to address this concern. However, they are sometimes not met or important details have been overlooked in order to meet them. Therefore, work load, competency and bureaucratic hurdles should be reviewed to reduce the possibility of irreversible mistakes.

F. Inventor as Decision-Maker

Under the current structure, USC inventors must seek the assistance and guidance of USC Stevens throughout the technology transfer process after they disclose their inventions. Although USC Stevens can choose to release ownership of the invention back to the inventor(s), the inventor cannot otherwise develop their ideas on their own without university permission. We believe that the entire process of faculty engagement can improve by **changing the relationship between faculty innovators and USC Stevens from one of a “right of first refusal” on USC Stevens’ part to a “right of first offer.”** In such a model, the faculty chooses if they want USC Stevens to develop their inventions. The faculty experience will therefore obligatorily be that of a customer, which may serve to greatly enhance the faculty’s trust and partnership with USC Stevens. While we anticipate a large proportion of USC inventors would prefer that USC Stevens develops and funds the technology transfer of their inventions, a small number of more experienced inventors may ultimately choose to develop their inventions on their own. However, even with that being the case, this new model may result in a larger number of disclosures to USC Stevens from those same inventors (as opposed to the difficult-to-quantify reality of some of these inventions being developed outside USC without the appropriate and legal disclosure to USC Stevens). In addition, and most importantly, the “open” environment for innovation that this policy would engender could be an important draw (and recruiting tool) for the type of innovative academicians and scientists that USC seeks and will thus facilitate USC’s continued climb in academic reputation and stature.

Details of Proposed Model: IP developed by USC faculty under their Federal government grants is the property of USC according to the Bayh-Dole Act. Faculty already have the obligation to disclose and assign ownership of any such IP to USC. Under the Bayh-Dole Act, USC has some restrictions on its

ability to reassign patent rights, but USC has the right to license the commercial value of IP as it sees fit, subject to minor constraints contained in the Act that must and can be incorporated into any transfer of IP to another party. We propose that, upon disclosure of IP, USC Stevens offers to the inventors the following two options:

Option A: The inventor(s) negotiate an IP development plan with USC Stevens in which USC would retain ownership and management rights in return for taking on the expense of patent prosecution, marketing and licensing, including revenue-sharing with inventors as now defined in their terms of employment. Section 4.1(a) of USC Intellectual Property Policy, April 3, 2001: "In general, the University will share 50 percent of the net royalty income, if any, derived from an invention with the invention's inventor(s). Since many circumstances surround the development of inventions by University employees, the exact division of income in each case is best determined by the ad hoc committee."

Option B: The inventor(s) take ownership of the IP and all responsibility for its prosecution, marketing and licensing in return for a fixed, transferrable obligation of royalties to USC Stevens on gross sales of products incorporating IP that is under patent protection (unprotected IP is public domain and free for anyone to use). The royalty amount should be sufficiently low in recognition that the long term benefits of making this process attractive for faculty entrepreneurs far outweighs a difference in royalties. We recommend an up to 1% royalty rate that is set based on best practices and determined based on the general class of the technology (e.g., software, hardware, pharmaceuticals, medical devices). This fixed royalty stream would not be subject to the usual sharing with the inventor-owner and could be modified to potentially reward USC co-inventors who choose not to accept the responsibilities of inventor-owners.

While maintaining the requirement that inventors disclose their inventions to USC Stevens, as is their obligation under the Bayh-Dole Act and their employment contract, this will provide USC Stevens with the "right to first offer". After this offer is made, the faculty member would then decide whether to accept the offer or develop the technology on their own. Specific recommendations as part of this include:

- 1. The offer to the faculty by USC Stevens under option A should be in the form of a contract that allows the faculty to understand the process that USC Stevens is following and includes performance milestones that enable the faculty member to terminate the contract if warranted. The terms for termination of the contract would need to reflect the contributions that USC Stevens has made towards the development (for example, if the technology has been supported through certain stages, then certain benefits above 1% royalty are provided to USC Stevens)*
- 2. If option B is chosen (faculty developing their own invention), then that faculty will independently direct and fund the IP prosecution. The faculty would be responsible for managing issues related to inventions that have co-inventors as well as any contractual obligations to funding agencies. Conflicts of interest would have to be disclosed and addressed through the standard university conflict of interest procedures.*
- 3. A development plan should be provided to USC Stevens by faculty who take option B (faculty developing their own invention), such that USC Stevens may periodically make additional offers if progress is not apparent or more promising paths are identified.*

4. *All inventors must agree to Option B (faculty developing their own invention) if that is the option chosen. If the inventors cannot agree as to the disposition, option A (USC developing the invention) would be the default.*
5. *One important metric on which USC Stevens' success should be measured is the percentage of overall disclosures developed by faculty versus by USC Stevens and their overall success rates.*

Such an approach would satisfy both the letter and the intent of the Bayh-Dole Act. It would help to supercharge innovation at USC while insuring that the university directly benefits from its stewardship of IP. It furthermore would place USC Stevens in a position where they can compete as the technology-transfer agent in situations where they can best provide the requisite services, yet enable them to conserve their limited but valuable resources for high-leverage opportunities to facilitate innovation at USC.

G Summary of Most Critical Recommendations

- 1.) USC faculty should be provided with two options regarding their disclosures while ensuring that USC benefits appropriately from their IP stewardship under either option: a.) Allowing USC Stevens to transition their technology, or b.) Allowing USC faculty to transition their own technologies (including IP costs) and providing a fixed royalty obligation of up to 1% to USC.
- 2.) The Faculty Advisory Committee of USC Stevens should be converted into a Joint Provost/Academic Senate Faculty Advisory Board that can facilitate faculty interactions, advise the Provost concerning USC Stevens, and develop and monitor metrics of whether USC Stevens is fulfilling its stated mission, principles and standards.
- 3.) USC Stevens should be tasked with evaluating which technologies it has the capability to evaluate, market and develop. If they do not have adequate resources to support the wide range of intellectual property at USC, the expertise of the staff at USC Stevens should be supplemented with experienced faculty, alumni, entrepreneurs and third party services. USC Stevens should also track the outcomes of each of their marketing efforts (including successful licenses initiated with a business contact from the faculty inventor) in order to more insightfully add resources to the most successful forms of marketing.
- 4.) The goal should be for the staff of USC Stevens to effectively communicate and promptly with all stakeholders, be empowered to carry out the essential responsibilities of technology transfer and should be allowed to carry out negotiations with the minimal possible layers of additional oversight. With limited but reasonable boundaries and adequate expertise, this would streamline the processes of deal making and technology development. Reaching this level of staff competency and independence may required additional training of existing personnel or the hiring of new experienced staff.