

REVIEW OF CREAT FACILITIES  
SPRING/SUMMER 2012

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## INTRODUCTION AND BACKGROUND

The Core Research Equipment and Instrument Training (CREAIT) Network was established in 2004 to make better use of the new federal funding opportunities that provided unparalleled opportunities for renewal of research infrastructure and overall growth in research. At its inception the goal was to increase accessibility to expensive instrumentation and also provide training opportunities for graduate students. It has now grown to 10 satellites, and employs 40 full time staff that operates and maintains over 50 pieces of equipment valued at approximately \$40 M. Detailed information on the history of CREAIT and the infrastructure it manages was provided as a report to the committee to assist in our review.

In advance of our review, we were provided with a 2011 CREAIT Network Report that provided detailed information on CREAIT and its user base. To facilitate input to the committee from users and staff, both groups were invited to provide written input to the committee. The committee also convened two two-hour town hall meetings with the users and staff on June 4<sup>th</sup> and 5<sup>th</sup>, respectively. We also had separate one-hour meetings on June 6<sup>th</sup> with Mike Turbrett (Operations Manager of CREAIT), David Miller (Director of OCP, and the person to whom CREAIT reports) and Dr. Chris Loomis, Vice President (Research). A summary meeting was held with Dr. Ray Gosine on September 12<sup>th</sup>.

The committee's first observation was the high level of interest in our review. Approximately 35 separate letters of input were provided to the committee, mostly from users of CREAIT facilities. Comments provided by users were strongly positive for CREAIT as a concept, although there were many suggestions for improvement. Furthermore, our town hall meetings were well attended by both users and staff, and both groups required the full two hours. Our individual meetings noted above also went beyond the allotted time due to the number of issues discussed.

From these meetings a number of issues emerged. These include:

1. Concern from users and staff about transparency and communication. Specific among these include understanding how decisions were made about closing satellites, determining user fees and priorities for instrument acquisition.
2. Decision making that appeared to be *ad hoc*. This issue does not simply emerge from the preceding point, but relates more to the sense that there appears to be no overall plan upon which decisions are based.
3. Related but distinct to "1" is financial transparency. This specifically relates to how funding flows through CREAIT. It is not clear how CFI IOF, indirect costs of research, core funding provided by the VPR, and user fees are used to fund specific aspects of CREAIT operations.
4. Related to "3" is a sense among staff of significant insecurity. Without knowing how their operations are funded, many feel very vulnerable. This impacts how they interact with users and hence the overall operation of

- satellites (i.e., how does equipment maintenance and staff training affect the budget for user fees).
5. The staff's role is unclear. Are they meant to only maintain and operate equipment, or should they be research colleagues for those that use satellites?
  6. The overall organization of CREAT is unclear. Many did not know how CREAT relates to the administrative structure of the university and who is responsible for various aspects of CREAT's operations.
  7. Likewise, users and satellites were unaware of each other, their capabilities, and their operational practices.
  8. The role of Principle Investigators (those that authored the grants that made possible the acquisition of instrumentation managed by CREAT) was unclear. Since considerable effort was required by these individuals to acquire the instrument, there was a desire for clarity and consistency for the benefits of this effort.
  9. Users were not clear on the role of CREAT in developing grant applications and there was a sense that there was bias against grants that would acquire equipment that would not reside within a CREAT satellite.
  10. There appeared to be no scientific leadership in managing the direction of CREAT.
  11. Many CREAT satellites did not have functioning scientific advisory committees.
  12. Expectations of users for services provided by CREAT was variable. Some wished only to have their samples converted to data, while others wanted personnel in their lab to be trained and become proficient in the methods used in the different CREAT satellites.
  13. Related to "11", the level of training provided by different CREAT satellites was variable.
  14. There did not appear to be clear criteria for what determined whether equipment should be housed within a CREAT facility. Likewise, it was therefore not clear what criteria should be used to remove equipment from CREAT, and where that equipment would go.
  15. There was inconsistency for providing access to CREAT satellites. Some allowed qualified individuals unrestricted access while other satellites were only available when CREAT staff were present.
  16. Web information about CREAT was incomplete and out of date. As a result, many within the university community do not know what is available, and what analyses are possible on site.
  17. Instrumentation with similar capabilities is scattered between satellites.
  18. The vast majority of instrumentation and use is within the Faculty of Science. Faculty elsewhere on campus (especially Engineering and Medicine) has opted to retain personal control of major instruments.
  19. What type of instruments should be in CREAT? If the instruments are heavily reliant upon the techniques used, and the Principle Investigators are the only the people capable of supervising their use, then this equipment should remain under the PI's direct control.

20. It was felt that there are examples to be learned from following models at other universities. However, in developing our report we were unable to gain access to operational information at other universities that could be applied at Memorial.

Overall, the committee is convinced that the CREATIT concept at Memorial University is one that has had a positive effect. However, in moving forward there are a number of issues that need to be resolved.

These include:

1. The extent to which the funding model for CREATIT should be stabilized.
2. What distinguishes CREATIT infrastructure from that maintained by individual faculty. Presumably faculty will see a loss of control for an increase in university support for their infrastructure but the precise nature of that relationship needs to be defined.
3. Appropriate engagement of the academic community to the planning and operation of the CREATIT inventory. Specifically, this would include the identification of what new equipment is required, what equipment is in need of upgrade, and what equipment should be removed from the CREATIT inventory.

## **RECOMMENDATIONS**

The CREATIT concept is a valuable one. While there is not unanimity amongst academics for the concept, the majority supports it, particularly our new faculty. For that reason, our recommendations are based upon the assumption that CREATIT model needs to be stabilized, better engaged with the academic community, and a critical tool for advancing Memorial's agenda for becoming a more research intensive institution. Furthermore, we also believe that the CREATIT model is an important mechanism through which the university can realize its research goals, and potentially a very important mechanism to provide a recruitment advantage for faculty that require access to sophisticated laboratory equipment. We also believe that there was considerable merit in the organizational structure for CREATIT as originally conceived and that the Advisory Board for the CREATIT Network be the appropriate group that should be charged with determining how to proceed with our recommendations.

### **1. *CREAIT needs a clear vision.***

Arguably, the two most important mechanisms by which Memorial can implement its strategic research plan are through the targeted hiring of new faculty, and the acquisition of appropriate instrumentation. Furthermore, if the vision is clear and the selection committee confident that a candidate with the appropriate skills can be recruited, then it is possible that the instrumentation should be obtained *prior* to recruitment. This will have the effect of amplifying the impact of CREATIT by not only supporting existing research, *but* assisting in the recruitment of new

researchers. For this to work, Scientific Advisory Committees have to be engaged on an ongoing basis so there is clarity on what capabilities realistically exist now, and what new benefits new instruments can provide.

Clarity of vision will also mean that the different CREAT satellites will have clarity in their roles and responsibilities in supporting and managing critical infrastructure, providing access to users, and training students in the use of this equipment.

***2. A well-defined economic model needs to be developed.***

Major expenses of CREAT include the initial purchase of the equipment, its installation and maintenance and support of the staff. The model should be developed such that the cost to users should not be prohibitive. To do so it is important that before any equipment is purchased we know what the costs (both time and money) will be if samples are sent elsewhere for analysis. If it is not possible to do so more economically or efficiently at Memorial then it is best not to proceed. If we are acquiring new instrumentation, it is important that a long-term maintenance contract be included in the acquisition cost to defray operating costs and expense to users.

***3. A new management structure.***

The management structure was a mystery to most users and some staff. In developing a plan for the VPR office, there needs to be direct oversight of CREAT from a senior administrator and we recommend that this should be the direct responsibility of an Associate VPR. For this reason, we recommend that CREAT should be removed from being within Major Research Partnerships to facilitate the direct reporting line to an Associate VPR.

***4. Better and current information available on the CREAT web site.***

The complete CREAT inventory and its capabilities need to be better communicated to the university community. This is best done via a current and comprehensive web site for the CREAT network.

***5. An analysis of what is the appropriate number of CREAT satellites***

There was a sense that there may be too many CREAT satellites. It would be appropriate to examine the functions of the different CREAT satellites to determine whether we are using an appropriate model to cluster instrumentation, or whether some other combinations may be more appropriate.

***6. Appropriate and consistent treatment of PI's whose grants are used to equip CREAT.***

There appeared to be inconsistency in how PI's who wrote the grants upon which the CREAT infrastructure was purchased were treated. There needs to be an incentive and acknowledgement of the contribution of these individuals, and it needs to be consistently applied.

**7. A recognition that users of CREAT facilities may either wish to simply be guided through the easiest path necessary to obtain their data, or those for whom the techniques are critically important. Staff needs to know so that expectations can be met.**

Users and staff need to understand each other's expectations. Making this clear at the outset will be critical in making better use of instrumentation.

**8. A recognition that space within CREAT satellites is limited. For that reason, guidelines must exist for the type of equipment that should reside within this space, and more importantly the criteria for removing instruments.**

Given that we believe CREAT should be continued in the future, then it is important that we properly manage the life cycle of instruments within our satellites. Use of equipment should be monitored and if it appears that the level of use does not benefit from being located in a central facility, then there needs to be a plan developed to determine whether the equipment should be moved to an individual research lab or decommissioned.

**9. Annual general meetings for CREAT satellites that allow users to become familiar with the different uses of the infrastructure. It will also allow staff to better engage with researchers on research questions of mutual interest.**

The benefit of CREAT facilities extends also to bringing researchers together that use common techniques. We need to take advantage of this opportunity by providing a venue to make this happen.

**10. For CREAT to make the best use of its human resources, opportunities should available for the continuing education/training of staff/users.** This could aid in providing users with knowledge of the capabilities of the instruments and allowing for new opportunities for knowledge translation and collaboration.

**11. Memorial should develop a plan to either bring the acquired equipment/instruments in units other than Science under CREAT or implement an alternative, possibly distributed mechanism in order to ensure their long-term sustainability and maintenance.**

### **CONCLUDING REMARKS**

The recent trend in research, and one that will persist for the foreseeable future is the requirement for sophisticated and expensive instrumentation that is used in a variety of different disciplines. Having these instruments purchased, operated and maintained by individual researchers or disciplines will involve duplication that will add expense without increasing research capacity. The CREAT model counters this phenomenon and developed and managed appropriately will assist the university in maximizing its level of research productivity with the resources available. It is likely for this reason that the Board of Directors for the

Canada Foundation for Innovation lauded Memorial's approach to making critical scientific instrumentation widely available to the university community for research and graduate student training and may be part of our unique organizational structure that may enhance our success in future federal grant competitions.