

Review of Faculty of Science University of British Columbia

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Executive Summary

This report constitutes the first review of the Faculty of Science at the University of British Columbia in over 15 years. We are pleased to say that, after an uncertain period that saw five deans in as many years, the last five years after the appointment of Prof. Simon Peacock as Dean have been a period both of stability and of growth. Indeed, Dean Peacock received near universal praise from all quarters during our visit. He and all members of the Dean's Office are commended for the prudent operation and steady academic direction of the Faculty, which has allowed it to prosper and make significant advances in several important areas. There has been considerable expansion and improvement in infrastructure for many departments and institutes, while a few others eagerly await further attention.

The undergraduate and graduate populations have both grown considerably over the past 15 years, while maintaining a continuing commitment to high quality of delivery. The Faculty's academic plan provides for a tapering of overall undergraduate enrollments and an increase in graduate enrollments. With a revised (and regrettably only partially-understood) budget model, the Faculty will enjoy little growth for the foreseeable future unless it is more aggressive about directly increasing its revenues. It plans to do so through increased international undergraduate enrollments. This plan is not without risks, given its current level of investment in international recruitment, but it is one of the few variables under its control. A strong fund-raising campaign has been announced with some early wins; a not-entirely favourable perception of the Faculty by alumni may be a challenge to finding a large set of individual donors. We are pleased to observe that on the one hand the Faculty is experimenting with bold new educational ventures such as the Carl Wieman Science Education Initiative that helps to work with high-enrollment classes, while on the other hand investing in low-enrollment, intensive programs such as Science One. That said, both these initiatives and Skylight are due for a review.

The research capability of departments within the Faculty is generally of high quality, and ranks overall within the top two or three in Canada and roughly within the top 20 or 30 in the world—higher in some specific areas. This is a commendable achievement, and yet we believe the talent within the Faculty is capable of bigger things. With the Faculty now having achieved a high level of stability, it can look forward and cultivate higher ambitions.

Overall, we find the Faculty to be largely healthy and prosperous. Our comments will mostly be devoted to specific advice that we feel qualified to provide, given the evidence provided or that the review team was able to gather during its visit.

1. Overview

The stated purpose of this review is as follows.

To review the strength and balance of the Faculty's teaching and research activities, academic programs, and service; to evaluate the Faculty's leadership and administration; to assess the Faculty's standing nationally and internationally; and to advise on the future development of the Faculty.

The minimal set of topics that was to guide the Review Panel included:

1. Undergraduate Education and Student Learning.
2. Graduate Education and Post-Doctoral Training.
3. Research.
4. Community Engagement.
5. People.
6. Physical Infrastructure.
7. Financial Resources.
8. Leadership and administration.
9. Future development.

The Review Team was struck in Summer 2011 and was provided at that time with a thorough *Self-Study* written by the Dean and his office, an overview of each department within the Faculty, and the terms of reference for the review. During the team's on-campus visit 28-30 September 2011, the team was given some additional documents regarding the Faculty budget and its Advancement agenda. The team met with a wide variety of UBC employees, including the Provost, the Dean of Science, the Deans of other faculties within the University, academic and non-academic staff in the Dean's Office, Science department heads, postdoctoral fellows, graduate students, undergraduates, and unionized and non-unionized staff within the Faculty. Several of the meetings were very well attended (including meetings with the Deans and with the Heads), but others were quite poorly attended. The Review Team was bemused by the variation in attendance but drew no conclusions.

The next sections of this review attend to specific items in the terms of reference.

2. Undergraduate Education and Student Learning

Undergraduate education has certainly been a focus of the Faculty of Science over many years and has been the focal point for a number of innovations such as Science One, the Carl Wieman Science Education Initiative, first year seminars and cohort based learning.

The impacts of these initiatives are being felt by the students themselves, who share enthusiasm for the programs. Students appear to be moving through their programs to completion in reasonable proportions, with rigorous training that positions them well in the global work environment. They share a sense of community with each other and the larger academic community. There is a shared sense of the University's and Faculty's commitment to undergraduate learning.

- The Faculty of Science benefits greatly from UBC's reputation as a high quality, international institution and the recruitment efforts of the University on behalf of its Faculties. Demand for enrolment is sufficiently high that the Faculty enjoys a well-educated, well prepared student body. Competition between institutions, however, is growing, and the Faculty could benefit from increased participation in the University's recruitment effort, perhaps with additional focus on programs that students might be unaware of given the nature of their high school training.
- While the student body appears to be diverse in nature (arising from international, national, and local recruitment), the Faculty and University has established a goal of increasing its international participation. We believe that the Faculty would benefit from investing its activities in countries where direct representation is not particularly strong at present.
- We are intrigued by the "My Learning Plan Initiative" and the potential it holds. That being said, it has yet to gain the kind of traction that it requires to provide the anticipated benefits. The engagement of students appears to be largely limited to the point of first contact as they enter the Faculty. They see it as an exercise that reminds them of their high school experience, and as of yet do not invest their time on it on an ongoing basis. It is not yet part of an "integrated" advising system.
- The Faculty has implemented a student development program with two staff that delivers programs such as "Get into research", "Meet your prof", "Get ready for December now" and "Beyond the BSc". Recognition from peers and students alike suggest that the program is reaping benefit.
- The Faculty has begun to implement a program aimed at early detection of students at risk. This activity is one we believe could yield great benefits. At present, the program does not have sufficient buy-in from academic staff to identify and counsel students before potential consequences begin to accumulate. The Faculty should work with the Departments to incorporate early warning signs (mid-term grades, clicker responses, etc.) that appear before the first term is complete. There would also be value in expanding these activities to incorporate information arising from other Faculties and units.

- The Faculty of Science makes an effort to communicate with its students, but the effectiveness of this communication is still hit and miss. Students report that many of their colleagues see electronic communications as spam, while the Faculty and advisors views these communications as “expected” reading. The result is a communication gap that needs attention.
- Students expressed the need for more effective advising at both the Faculty and Department level, especially in the bigger programs. Advising is viewed as difficult to access, superficial and not always responsive to their needs. Web based advising and navigation is sufficiently complex that students revert to Google searches rather than following the logical flow of web sites. A clear present risk (and potential area of opportunity) is that students would rather go to senior students for advice than to professional advisors. It is worth noting that these complaints came from high caliber students that are highly engaged in the Science faculty. Advisors themselves expressed concerns arising from staffing levels relative to demand.
- Some Departments expressed a sense of disenfranchisement with their lack of participation in the introductory science curriculum; indeed they feel a sense of exclusion from this program. They feel their ability to attract students to their honours programs is affected by lack of visibility in introductory classes. This is perhaps a good time to reconsider the overall objectives of the introductory curriculum, including Science One.
- Students in the General program may not experience the same Faculty of Science as other students. The Faculty should reflect on the positive value of a general degree and look at the design of the program to deliver that value to students. In doing so, they should more effectively share the full range of learning experiences with these students. There is also a need to more effectively communicate the value of a general degree to students (Princeton provides an interesting role model). Currently there is a perception that many of the students in the general program are those who cannot effectively compete to get into the program of their choice.
- Despite some of the strongly positive messages we heard about the nature of undergraduate learning, we also learned about a disconnect between the Faculty and its alumni. We would have appreciated more information and opportunity to explore this issue. Clear and valuable connections with alumni are an important part of building an international reputation.
- The Carl Wieman Science Education Initiative is a bold experiment in undergraduate education that has attracted significant attention. It has captured the imagination of staff and students alike. The outcomes of this evidence-based initiative have not fully emerged. Many constituencies both within the university and beyond await the outcomes. An investment in communicating these outcomes using the same evidence-based approach would be of significant benefit to the Faculty of Science and UBC.

- The self-assessment and our consultations revealed a lack of clarity about areas of responsibility between the Carl Wieman Science Education Initiative and Skylight. The role of Skylight appears to have been changing over time and there was some uncertainty about Skylight being able to take over the role of Wieman as it moves towards completion. Indeed the relationship between Skylight and other units that supporting teaching and learning needs to be explored. This will need to be addressed in the near term future.
- Students expressed a hope that there would be programs introduced to address the preparation of international graduate students to teach in the undergraduate learning environment. They did so reflecting on the importance of an international learning experience. This is not a challenge that is unique to UBC or the Faculty of Science.
- We did not get a good sense of how the “honours” degree works, or the rationale for requiring 132 credits for honours.

3. Graduate Education and Post-Doctoral Training

The graduate student program appears to be healthy and vibrant. The information we were presented did not allow us to rigorously address the quality of the graduate student population, or how it varied across the departments, but anecdotal information suggests it is at least on par with other research intensive universities. Students appear to receive mentorship both in terms of their academic programs, but also in terms of the mechanics of moving to completion. While times to completion appear similar to other Canadian institutions, we see value in an effort to encourage more timely moves to completion.

- Graduate enrolment has increased significantly in recent years and the Faculty indicates interest in continued expansion of its Ph.D. program. While achieving this goal will require additional fiscal and infrastructure resources, we believe it is a worthy goal. The current level of 4.1 graduate students per research professor is lower than some of UBCs significant competitors.
- While graduate support levels appear to be similar to other research intensive universities, students felt pressure on personal finances due to the high cost of living in Vancouver. The high cost of living does affect the competitiveness of any given level of funding. Moreover, changes in funding packages after the fourth year, based on what appears to be an unrealistic expectation that students can achieve their PhD during that time period, appears to put students in a situation where they were better funded in the early stages of their graduate study than in the later stages.
- Post-doctoral fellow are well integrated in the research activities within their laboratories, but do not necessarily feel connected to a larger academic or social community. The post-doctoral office seems to have begun addressing these concerns, but it still early in its implementation. There is a role for this office in addressing challenges an individual PDF might have with their supervisor, which can often leave

the PDF feeling exposed. The office might also look into differences in stipends for PDFs across the Faculty and campus.

- Post-docs expressed a desire to engage in career development activities such as teaching, but felt a lack of support for such activities from their supervisors. There may well be structural obstacles that might be examined to improve opportunities for career development in this area.
- The numbers of PDFs and RAs is quite high as would be expected in a top-rate science faculty in a research university.

4. Research

The Faculty of Science employs a diverse array of talented scientists and staff. The impact of their contributions is reflected by strong Tri-Council and CFI funding, international citations, and an array of national and international awards. The Faculty is frequently a leader on large collaborations that set the frontier of discovery in their disciplines. These collaborations draw in significant funding from programs and agencies such as CECR, NCE, CREATE, Genome Canada and others. The research enterprise is a clear contributor to the University's strong and growing international reputation.

- The importance of interdisciplinary science is clearly reflected in research activities on campus. This is reflected in an array of centres and institutes that promote collaboration, extensive use of shared facilities, and the integration of interdisciplinary research activities into the learning experience on campus. That being said, it is not clear what mechanisms are in place to further encourage cross-disciplinary activities.
- Notwithstanding, there is a need to reflect on the design and operation of centres and institutes. The formation of centres and institutes sometimes appears to be *ad hoc* in nature. Some are built around space use issues while others are responding to unique research opportunities. Some serve as an administrative home for academic staff, while others make use of staff employed at the department level. Reporting lines are not always clearly defined and frequently there is not a clear connection between their daily activities and the University's broadly stated goals in learning and discovery. There is a need to connect the leadership of centres and institutes to Departments, Faculties and the University as a whole. Likewise, students, postdocs and professors inhabiting centres and institutes may feel displaced from the activities of their home departments and may require further connectivity.
- Research productivity is strong and appears to be growing. The research professoriate is supported by excellent infrastructure, an investment in teaching only staff, modest teaching loads, financial support for innovation, and a merit system that rewards excellence. With that in mind we see reason to expect an upward trajectory

in terms of research funding, graduate student training, research publication, and impact.

- In much of our consultations, the discussion focused on the teaching enterprise and challenges associated with budgets and finance. Some observed that this emphasis has also been true of communications within the Faculty. Academic staff who are working to keep their research programs going on a high level in an increasingly competitive world of research funding would like to see more emphasis on and facilitation of outstanding research.
- The Faculty and University are well positioned to move to higher levels in research, but we worry about a sense of complacency. We saw this play out in a number of ways and at a variety of levels. We were surprised by the lack of focus on research in many of our conversations. We did not hear many concrete plans about moving already good research programs to the next level. We rarely heard faculty or staff talking about leveraging outside resources, despite their history of doing so in the past. We did not hear about dreams for new research facilities, new research areas, or new collaborations.
- While there are relatively few mechanisms available to increase funding levels, it appears a relatively underutilized fund within the Faculty is the NSERC Industrial Research Chairs programme. Researchers with commercializable research may also consider NSERC CRDs, or other technology transfer vehicles.

5. Community Engagement

Community engagement is one of the key planks in UBC's strategic plan, and also a goal of the Faculty of Science. The Faculty of Science is engaged in a variety of outreach activities, ranging from the Beaty Museum and Botanical Garden, through to the co-op program, activities with local schools, math and science competitions, summer camps, aboriginal initiatives, cafes, public lectures and the free Science 101 course. These activities reflect the Faculty's interest in promoting science literacy as a means to encourage participation in science, their interest in facilitating knowledge translation, as well as their commitment to communicating the importance of science to the community at large. Science students are also involved in these efforts, and the more engaged students think of themselves, with pride, as UBC ambassadors to the greater Vancouver community.

- The Faculty of Science is actively engaged in a wide variety of outreach activities, but there is little coordination of these activities. Visitors may find it hard to discover opportunities that are open to the public.

- Community engagement is an important part of a university's activities. We are not clear how this activity will be promoted within the new budget model. Quality outreach cannot be maintained by side of the desk activities.
- The Beaty Museum is a wonderful facility that supports teaching and learning at UBC. There is a need to clearly articulate the role and mandate for the museum in teaching, research, and community service and to examine its organizational structure and funding in this context.
- Over the past five years, some aboriginal outreach has been undertaken through Science day camps and activities associated with the Beaty Biodiversity Museum, and the Land and Food Systems. While a small number of students of aboriginal descent have been very successful in Science programs, the Faculty recognizes the need to do better on this agenda in its strategic plan.
- We often heard that UBC's location, at the edges of the city, not easily accessible by Skytrain, presents an obstacle to greater connection between the campus and the community. Nonetheless, we think that more creative thinking and programming can better bridge this gap.
- What was described as a relative lack of engagement amongst alumni is also an obstacle to greater community engagement and changing this is one of the goals of the new Campaign. But, during our visits, we heard more complaints about this, than ideas about how to solve it.

6. People

By and large, the students, faculty and staff in the Faculty of Science are happy to be here and committed to learning and discovery. They love their work environment and genuinely feel a strong sense of connection and community. They feel supported by their Faculty and their Departments. To the extent that were able to determine, the Faculty is effective in recruiting talented people. Collectively they create an environment of inquiry.

- There is a spirit of creativity in this Faculty that came out in many of our discussions. This was particularly evident in discussions relating to the learning environment, where there seems to be a shared sense of commitment.
- While the Faculty is successful in recruitment and retention, students and staff frequently comment on challenges associated with the high costs of housing, long commute times, or availability of daycare. These are real challenges that presumably have an effect on productivity, but we ultimately cannot evaluate the extent to which this is true. These challenges are ones that have to be addressed if the University is to

continue to move forward. Compared to other universities facing such challenges, the University has endowment lands that provide significant opportunity. The University will need to find a way to place value on recruitment and retention of top scholars in order to make appropriate decisions.

- The strategic use of tenure-track instructors to deliver a significant portion of the Faculty's teaching enterprise is well accepted across the Faculty. The Faculty may want to consider expanding the job description for this position to include an expectation that instructors will conduct research on teaching and pedagogy as many of them already do this.
- We welcome the new Professor of Teaching level that provides tenured instructors with a well structured, long term career path.
- Over the last five years, the Faculty of Science has done an exceptional job becoming a workplace of choice for women faculty. With the clear support of the Dean and Provost's office, the fruits of this work can already be seen in an increase of women within the ranks of the faculty, and in leadership positions within the faculty. There are still issues that could be improved, such as partner hiring and daycare, but overall the Faculty is to be commended for taking women's issues seriously and becoming a leader in this area across campus.

7. Physical Infrastructure

The Faculty has made excellent progress in renewal of its physical infrastructure in recent years. Many staff who were once housed in aging facilities are now working in buildings brought up to current standards. There are, however, challenges that remain. While the amount of space available appears to be adequate to meet today's needs, it is unclear that there is sufficient space to accommodate needs of the future, especially the desire to increase training of graduate students and post-doctoral fellows. We were not given any long range plan for infrastructure development.

- The Faculty has identified spaces that are most urgently in need of renovation (mathematics, physics, teaching laboratories), and is positioned to make progress should funding become available. They continue to place renewal of infrastructure high on their list of priorities for fund raising.
- The University has not yet identified sources of support required to maintain infrastructure arising from CFI's past investments.
- We see a need for development of an infrastructure plan that reflects the goals and aspirations set out in the University's and Faculty's strategic plan. This may currently be on hold given a modest ability to take on new students.

8. Financial Resources

The Faculty operates on a variety of income sources, not all of which were clear to us. The bulk of Faculty funding comes from the operating grant (\$78 M), which is primarily directed towards the costs of salaries and benefits of academic staff, support staff and students. The base operating budget is supported by other sources of funds such as the CRC program, fees for services, and investment allocations. We were not provided with information about the use of these funds, and cannot comment on how they are utilized. While we worked with limited information, it is our sense that these funds are allocated and shepherded carefully and wisely. Indeed we were impressed by the scale of operation that the Faculty of Science is able to support using these funds.

- While the financial resources of the Faculty appear to be used effectively, we are worried about how budget allocations in the future will be made. The University has begun to implement a new budget model, and clarity is still lacking in how this will unfold. While a stated goal of the model is to increase transparency, perceptions about the emerging budget model were inconsistent. Furthermore, there is a perception that the “model” has been changing over time. This could lead to an inconsistency between institutional goals and behaviours. There is not a shared sense of how funds will be allocated and what outcomes will be rewarded.
- A key role for the Dean and his staff will be to interpret the impact of the new budget model to Departments and Centres, and to work with them to shape their academic activities to prosper within the new budget framework. There is a clear need to ensure that quality will be rewarded within this new framework.
- The new budget model has placed a fiscal obligation on faculties to deal with the consequences of the loss of mandatory retirement. We were provided with an estimate of \$1M as the annual costs of this obligation in the immediate future. We did not see a plan to address this obligation.
- The University’s enrolment management strategy and its new budget model suggest that the Faculty of Science will be required to implement a modest reduction in undergraduate enrolment in the coming years (200 students). We did not see a plan to address this challenge, although we got the impression that the goal was to replace these domestic students with international ones.
- We observed inconsistent perceptions about goals associated with graduate enrolment. On the one hand we heard about an over-enrolment in the realm of several thousand students at the institutional level. On the other hand we observed that the Faculty is seeking to increase its Ph.D. enrolment. The fiscal implications need to be resolved.
- Our reading of the materials we received suggested that neither the University, nor the Faculty were in growth mode, especially not at the undergraduate level. However,

we heard from some Heads and faculty members that the only way to increase funding was by increasing enrolment and that they felt pressure to do so. The review committee remains perplexed as to how to square these inconsistent communications.

9. Leadership and Administration

There is a strong sense across the Faculty and University of good leadership within the Faculty of Science. Dean Peacock and his team were frequently commended for their consultative and collaborative style, their ability to encourage innovation, and their commitment to both their Faculty and University. The Faculty of Science is viewed as having developed effective and collaborative relationships with the University administration and other Faculties. Many were pleased with the stability in leadership within the Dean's Office. These are perceptions with which we agree. There is a rare sense of optimism that has emerged under the guidance of this leadership team.

- The Faculty has prepared a strategic plan that reflects the goals and aspirations of the University as articulated in Place and Promise, the UBC Plan. The Faculty plan as described in the self-study report lays out 7 commitments, 19 goals, and 56 strategies to achieve specific goals. These goals reflect major aspects of an academic institution in a general sense, and as such provide guidance for decision making. Nonetheless, we see additional value in an effort to prioritize goals and couple these priorities to a plan for allocation of fiscal resources.
- The groups of Heads within the Faculty appear to be strong and responsible leaders who work well together, balancing individual department goals with those of the faculty. Nonetheless, we heard that there is some reluctance among faculty to take these positions, and few of those in these positions now seemed excited to be thinking about a second term. This is not unusual, but it may be worth considering how to better support or incent those in these very important roles.
- We see considerable opportunity to coordinate administrative activities to improve value for service. Communications, administrative IT, outreach, stores are possible examples. Encouraging and managing change is often a challenge; leadership at the Faculty level will be required to encourage such change, while recognizing at times that for example the IT needs of different groups may not easily harmonize with a centralized view.
- As already alluded, the “new budget model” appears to be the source of considerable confusion. Different parts of the university see it very differently and as a result the kinds of behaviors it elicits will be unpredictable until the model is developed more completely and communicated more effectively. We were intrigued at how UBC viewed it as a model with a number of drivers, while Chairs see a single budget driver (undergraduate enrolment) over which they have no control. Unless a more consistent view of the model can be developed, the model will fail to deliver the anticipated benefits.

- The Faculty has yet to imagine how it will translate the new budget model to its departments and staff. At present Heads are being asked to manage their Departments using their academic judgment (as they have been in the past). While they are aware of the implications of a strict translation of their budget into the new budget framework, they have not yet been asked to participate in a Faculty wide effort to optimize their success within the new framework. Department heads are concerned with how to protect their resources. This can be a distraction to thinking about how to achieve their academic goals and aspirations in a changing environment where new resources will not flow easily from within the university. A key challenge will be to increase external investment in an effort to drive quality.

10. Future Development

Advancing Science, the strategic plan developed by the Faculty of Science, in 2009, provides the framework for moving forward, and it is divided into the same topical headings as we have used in our report. The plan is a solid one, and Heads and faculty were familiar with its goal. However, these goals are seldom tied to specific metrics, and the metrics were not prioritized. While all the departments and centres within the Faculty of Science appear to be contributing to the larger mission, and we could see no reason to eliminate or engage in major re-structuring, we also did not receive the kind of information that would have allowed us to speak to which departments, or areas of research, were clear strengths, worthy of greater investments, and which area were in need of greater improvement. A clearer prioritizing of areas of research strength to build upon might be helpful to balance out the (praiseworthy) emphasis on teaching. It is the research profile that will more directly translate into international visibility and reputation. (And, somewhat ironically, it is this reputation, more than the teaching innovations, that will then help to draw more international students).

- Part of planning for the future is fund-raising. We heard about the success of the Faculty's fund raising efforts, which has contributed some \$70 M to the Faculty over the past 3 years. We were not provided sufficient information to evaluate the nature of these contributions or the nature of the operation that has been tasked with contributing \$150 M to the University campaign. We do note that the focus of development has been to enable renewal of infrastructure as opposed to growing an endowment to support operations costs.
- The Faculty of Science is actively involved in University level discussions about initiatives in sustainability and policy. Both of these initiatives have the potential to distinguish the Faculty and University from its peers. In particular, the concept of a living laboratory where large scale investments in sustainable infrastructure can be demonstrated to have a significant impact is a bold concept that could build reputation at the same time as generating economic benefit. The University's designation as a municipality uniquely positions UBC relative to its peers.

11. Key Recommendations

The review team greatly enjoyed its time at the University of British Columbia. The students, faculty, and staff with whom we spoke were clearly engaged in their work and our conversations were mostly lively and convivial. We did not, as is often the case during reviews, get the impression that there were many with axes to grind, or who were looking to benefit themselves or their units at the expense of others. People seemed willing to share their opinions readily and openly without any fear of repercussions. Not once were we told to keep something that was said strictly confidential. The atmosphere of inclusion and openness engendered by leadership at both the Faculty and University level is commendable. However, it is worth noting that turn-out to some sessions was extremely small, and we are at a loss as to how that should be interpreted.

Some aspects of the Faculty's function such as its budget model depend on factors external to it. Our views on some of these issues were communicated orally to the Provost. We restrict our recommendations to those that can be acted on directly by the Faculty.

- As the University becomes more involved in actively recruiting students, it is important to involve faculty in such efforts, not only as active participants, but in helping to shape strategic priorities.
- Continued attention should be placed on improving the advising experience for students. Presently, communication with students and academic advisors appears to be spotty. It should be possible to better tap into the potential of "My Learning Plan" by making it part of a more integrated advising experience for students.
- More thought needs to be given to the integration of the Wieman mission and the Skylight program. Further, both programs, together with Science One, are due for a focused review.
- It is advisable to harmonize the exposure of beginning Science students to the introductory courses of all Science departments so as to equalize the opportunity for all disciplines to attract students to their academic programs.
- We recommend expansion of the Ph.D. program, which may require placing more attention on how to best structure attractive funding packages.
- More attention should be placed on the design, operation, and integration of interdisciplinary centres and institutes, including the Beaty Museum.
- A more comprehensive plan should be developed for infrastructure development over the next decades to better support the needs and goals of the Faculty. Also required is a shorter-term plan on dealing with the infrastructure needs of a few particularly disadvantaged groups, as identified in the *Self-Study*.

