

# Multi-Year Infrastructure Plan 2017-2023

**Memorial University of Newfoundland**

**Multi-year Infrastructure Plan**

**Table of Contents**

---

|   |    |
|---|----|
| 1.0 Executive Summary.....  | 1  |
| 2.0 Introduction.....   | 3  |
| 2.1 Overview.....   | 3  |
| 2.2 Situational Considerations.....   | 4  |
| 2.2.01 Students, Faculty, Research.....   | 4  |
| 2.2.02 Fiscal Issues.....   | 5  |
| 2.2.02.1 Newfoundland and Labrador.....   | 5  |
| 2.2.02.2 Canada.....  | 6  |
| 2.2.02.3 Memorial University of Newfoundland.....   | 7  |
| 3.0 Current Capital Deferred Renewal Program.....   | 10 |
| 4.0 Information Technology.....   | 11 |
| 4.1 Voice over IP (VoIP) Telephone Handset replacement.....   | 11 |
| 4.2 Data Centre Servers – Virtual Cluster Upgrade / Storage Area Network<br>Replacement (SAN).....                            | 11 |
| 4.3 Wireless Network Maintenance and Growth.....  | 12 |
| 4.4 Wired Network Refresh and Upgrades.....   | 12 |
| 4.5 UPS (Battery Back Up Systems).....  | 13 |
| 4.6 Addition of Security Infrastructure.....  | 13 |
| 4.7 Centre for Innovation in Teaching and Learning - Classroom Technology<br>Infrastructure Enhancement Plan 2017 – 2020..... | 14 |
| 4.8 Faculty of Medicine – CANARIE Communication Link.....   | 15 |
| 5.0 Projects in Progress.....   | 16 |
| 5.1 St. John’s Campus.....  | 16 |
| 5.1.01 Aboriginal Centre.....   | 16 |
| 5.1.02 Core Science Facility.....   | 16 |
| 5.1.03 Battery Facility.....  | 16 |
| 5.1.04 West Pedway over Prince Philip Drive.....  | 17 |
| 5.1.05 Redevelopment of Reid Theatre.....   | 17 |
| 5.1.06 Faculty of Engineering and Applied Science - Renovation Projects.....  | 17 |
| 5.1.07 MarComm Marketing Office Relocation to Arts Building.....  | 18 |
| 5.1.08 School of Music – Linked Lighting Systems.....   | 18 |
| 5.1.09 Animal Resource Centre.....  | 18 |
| 5.1.10 Faculty of Science/Faculty of Science and Humanities and Social Science –<br>Co-op Space.....                          | 19 |
| 5.2 Marine Institute.....   | 19 |
| 5.2.01 Holyrood Marine Base – Phase IIA Breakwater and Marginal Wharf.....  | 19 |
| 5.2.02 Southside Marine Base Transition.....  | 19 |

|  |    |
|--|----|
| 6.0 Projects in Planning Stages.....   | 20 |
| 6.1 St. John’s Campus.....   | 20 |
| 6.1.01 Faculty of Engineering and Applied Science – Mechanical High Bay<br>Laboratory.....   | 20 |
| 6.1.02 Faculty of Engineering and Applied Science - Bruneau Centre Engineering<br>Renovation.....  | 20 |
| 6.1.03 Faculty of Engineering and Applied Science –Relocation of Electrical and<br>Computer Engineering to the Core Sciences Facility..... | 20 |
| 6.1.04 Faculty of Engineering and Applied Science – Petroleum Engineering<br>Building.....   | 21 |
| 6.1.05 Faculty of Humanities and Social Sciences Research Archival Area.....   | 21 |
| 6.1.06 Faculty of Medicine – Development of Family Medicine Clinics – Level 3<br>Janeway Hostel.....                                       | 21 |
| 6.1.07 Deputy Provost (Students) - Ancillary Operations - UC Landing/CSF Pedway.....   | 22 |
| 6.1.08 Deputy Provost (Students) - Student Wellness and Counseling Centre - 5 <sup>th</sup><br>Floor, University Centre Integration .....  | 22 |
| 6.2 Marine Institute.....  | 22 |
| 6.2.01 Holyrood Marine Base – Phase IIB Ocean Research and Training Building.....  | 22 |
| 6.2.02 Main Campus, Ridge Road - Transfer of Ownership.....  | 22 |
| 6.2.03 Main Campus, Ridge Road - Engineering Technology Centre (ETC) Building.....   | 23 |
| 6.2.04 Offshore Safety and Survival Centre, Foxtrap – Transfer of Ownership.....   | 23 |
| 6.3 Grenfell Campus.....   | 23 |
| 6.3.01 Fine Arts Building – Mechanical HVAC Systems Upgrades.....  | 23 |
| 6.3.02 Fine Arts Building – Fire Alarm and Sprinkler Upgrades.....   | 23 |
| 6.3.03 Arts and Science Building – Classroom Enhancement.....  | 24 |
| 6.3.04 Chalet Residence – Roof Repairs.....  | 24 |
| 7.0 Projects in Early Stages.....  | 25 |
| 7.1 St. John’s Campus.....   | 25 |
| 7.1.01 Faculty of Medicine – Redevelopment of Existing Space – Health Sciences<br>Centre.....  | 25 |
| 7.1.01.1 Upgrade of Medical Education Laboratories – Level 2 HSC.....  | 25 |
| 7.1.01.2 Upgrade of Shared Research Equipment Rooms – Levels 4 and 5 HSC....   | 25 |
| 7.1.01.3 Replace Glass-washing and Sterilization (Materials Processing) Suite....  | 25 |
| 7.1.01.4 Upgrade of Environmental (cool and warm) Research Rooms.....  | 26 |
| 7.1.02 Faculty of Medicine – Development of Existing Space – Faculty of Medicine<br>Building.....  | 26 |
| 7.1.02.1 Development of Shelled-in Laboratory Space – Level 6 for Biomedical<br>Sciences Research.....                                     | 26 |
| 7.1.02.2 Development of Shelled-in Laboratory Space – Level.....   | 27 |
| 7.1.03 Faculty of Business Administration - Building Alterations and Expansion.....  | 27 |
| 7.1.03.1 Repurposing Gardiner Centre Space - Consolidation of Administrative<br>Functions.....   | 27 |
| 7.1.03.2 Classroom Upgrades.....   | 28 |
| 7.1.03.3 Atrium and Informal Student Space Upgrades.....   | 28 |
| 7.1.03.4 Pedway Construction.....  | 28 |
| 7.1.03.5 Functional Space Programming Analysis.....  | 29 |
| 7.1.04 School of Kinetics – Lab Teaching and Research Space.....   | 29 |

|   |    |
|---|----|
| 7.1.05 Campus Master Plan.....  | 29 |
| 7.1.06 Redevelopment of Chemistry-Physics; Science; and, Biotechnology Buildings...   | 30 |
| 7.1.06.1 Faculty of Humanities and Social Sciences - Redevelopment of the Existing Science Building.....  | 30 |
| 7.1.06.2 Faculty of Science - Relocation of the Department of Computer Science.....   | 30 |
| 7.1.06.3 Faculty of Science - Relocation of the Department of Mathematics and Statistics.....   | 30 |
| 7.1.06.4 Faculty of Science - Space allocation for the Department of Physics and Physical Oceanography within the Chemistry-Physics Building..... | 31 |
| 7.1.06.5 Faculty of Science - Relocation of the Department of Psychology.....   | 31 |
| 7.1.07 Faculty of Science - Ocean Frontier Institute.....   | 31 |
| 7.1.08 Sedna Centre.....  | 32 |
| 7.1.09 Additional Space for Technical Services Shops.....   | 32 |
| 7.1.10 Additional Space for School of Pharmacy.....   | 33 |
| 7.1.11 Storage Facility, Mt. Scio Road.....   | 34 |
| 7.2 Marine Institute.....   | 34 |
| 7.2.01 Ridge Road Main Campus Enhancement.....  | 34 |
| 7.2.02 Mt. Scio Parking Lot and Access Road.....  | 35 |
| 7.2.03 Offshore Safety and Survival Centre, Foxtrap – Enhancement.....  | 35 |
| 7.2.04 Safety and Emergency Training Centre, Stephenville – Facility Upgrade.....   | 35 |
| 7.2.05 Vessel Fleet Improvements.....   | 36 |
| 7.3 Grenfell Campus.....  | 37 |
| 7.3.01 Child Care Centre.....   | 37 |
| 7.3.02 Fine Arts Theatre – Life Safety Upgrades.....  | 37 |
| 7.3.03 Accessibility Audits.....  | 38 |
| 8.0 Projects for Future Consideration.....  | 40 |
| 8.1 St. John’s Campus.....  | 40 |
| 8.1.01 Life Sciences Building.....  | 40 |
| 8.1.01.1 Faculty of Nursing Consolidation.....  | 40 |
| 8.1.01.2 School of Pharmacy Expansion.....  | 40 |
| 8.1.01.3 School of Social Work Expansion.....   | 40 |
| 8.1.02 Faculty of Law - New Building.....   | 41 |
| 8.1.03 Faculty of Science - Facility Issues at Ocean Science Centre.....  | 41 |
| 8.1.04 School of Music – Expansion.....   | 41 |
| 8.1.05 Faculty of Humanities and Social Sciences - Nexus Centre for Collaborative and Interdisciplinary Research.....                             | 42 |
| 8.1.06 Faculty of Humanities and Social Sciences - First Year Success (FYS).....  | 43 |
| 8.1.07 Faculty of Education - Teaching Through the Arts Centre.....   | 43 |
| 8.1.08 Faculty of Education - Psychology Counselling Centre.....  | 43 |
| 8.1.09 Faculty of Education - Play Based Model Classroom.....   | 44 |
| 8.1.10 Faculty of Medicine – General Facilities Upgrade – Health Sciences Centre.....   | 44 |
| 8.1.11 Deputy Provost (Students) - Ancillary Operations - Emergency Power Improvements to R. Gushue Hall.....                                     | 44 |
| 8.1.12 Deputy Provost (Students) - Ancillary Operations - R. Gushue Hall Renovation.  | 44 |
| 8.1.13 Deputy Provost (Students) - Ancillary Operations - Future Food Service/Retail Space.....   | 45 |

|   |    |
|---|----|
| 8.1.14 School of Graduate Studies – Accommodations.....               | 45 |
| 8.1.15 School of Graduate Studies – Collaborative Work Space.....     | 45 |
| 8.1.16 MUN Botanical Garden – Conservatory.....                       | 46 |
| 8.1.17 MUN Botanical Garden – Field Centre/Interpretation Centre..... | 46 |
| 8.1.18 MUN Botanical Garden – Research Greenhouse.....                | 46 |
| 8.3 Grenfell Campus.....  |    |
| 46    8.3.01 Land Acquisition.....                                    |    |
| 46    8.3.02 Western Region School of Nursing Consolidation.....      |    |
|   | 46 |
| 9.0 Completed Projects.....   | 47 |
| 9.1 Current Capital Deferred Renewal Plan.....                        | 47 |
| 9.2 Information Technology.....                                       | 47 |
| 9.3 St. John’s Campus.....  | 48 |
| 9.4 Marine Institute.....   | 49 |
| 9.5 Grenfell Campus.....  | 49 |
| 10.0 List of Appendices.....  | 50 |
| Appendix 1 - Blank Project Brief Template                             |    |
| Appendix 2 - Project List   |    |
| Appendix 3 – Project Brief Submissions                                |    |
| Appendix 4 - Multi-Year Infrastructure Template                       |    |
| Appendix 5 – Deferred Maintenance 5 Year Plan                         |    |

## 1.0 EXECUTIVE SUMMARY

Memorial University of Newfoundland (MUN) is a multi-campus, multi-disciplinary, public, teaching/research university. There is significant infrastructure already in place, some of which requires renovation and upgrades; new infrastructure being planned, and under construction; and, as well, a significant list of future projects to be considered. This document serves to update Memorial's *Multi-Year Infrastructure Plan 2014-2020* (2014-2020 Plan) and has been prepared with input from representatives of each Faculty, School and a number of individual Departments.

Since the 2014-2020 Plan was written, the economic situations in Newfoundland and Labrador and, to a lesser degree, Canada have changed dramatically. This is important, as typically more than 70% of all the University's revenue is sourced through Government grants. In 2013, Newfoundland and Labrador was expected to be the runaway leader in economic growth among all provinces. A dramatic drop in the price of oil has reduced provincial revenues and the Province now advises that beyond 2016, economic growth is expected to be curtailed by a combination of factors thus leading to a requirement for further provincial deficit reduction measures. Provincial reductions to date are expected to result in a reduction to MUN's base budget of \$24.9 M annually by 2019-20. At the federal level, Canada's spring budget predicted a budget deficit of \$29.4 billion in 2015/16 declining to \$14.3 billion by 2020/21. On November 1, 2016, the federal government's fall economic statement predicted a further increase in its deficit projections. While the continued deficit is not good news, the 2016 federal budget did contain positive initiatives for education – funding programs were announced to support “shovel ready” post-secondary infrastructure projects and research.

MUN's spending on the construction of new infrastructure assets in recent years has been significant. This Plan identifies a number of projects which are: currently underway; in the planning stages; in the early stages; for future consideration, and; as well, lists recently completed projects.

Although budgets have yet to be established for some projects, based on those projects for which budgets have been established, it is not unreasonable to assume that funding required to complete the projects which are ongoing and in the planning and early stages of consideration will be, at a minimum, in the range of \$400-500 million. This means that if funding can be maintained at the average level of the past 5 years, it will take a number of years to complete the projects as currently underway, in the planning or early stages of consideration. This in turn implies that, there is a limited capacity for the University to undertake other future projects within the 2017-2023 timeframe of this Plan. It is noted; however, that it may be prudent to carry out planning for projects expected to proceed within the next few years so that they would be eligible and ready to avail of future federal, “shovel ready” infrastructure programs. As well, initiatives that could provide new sources of funding may need to be explored.

Typically, persons may think an infrastructure Plan is about buildings. This Plan is more than that – it includes new buildings; renovation and additions to existing buildings; wharves; marine vessels; site components; Current Capital Deferred Renewal; and, Information Technology (IT). Current Capital Deferred Renewal and IT are discussed under separate headings in this Plan. Renewal projects under these headings need to be carried out in order for specific components to remain operational. Block funding is a good tool for funding projects in these categories.

In the case of the Current Capital Deferred Renewal, MUN's Facilities Condition Index, a metric which is used to measure the relative condition of a building or a facility, has increased noticeably

since the 2014-2020 Plan. This is an indicator that an increase in the amount of annual funding being provided for projects in this category needs to be considered.

Decisions concerning which projects to proceed with and which to defer are not easy. Available funding is one consideration, but not the only one. In order to provide a tool that may assist with priority setting, in preparation for this update, proponents were requested to provide Project Briefs which explained how a requested project fits in with the University's various strategic and framework initiatives. The proponents' submissions are presented in an Appendix to this Update. As well, consideration may be given to issues which were raised in the face to face meetings that may not be readily apparent in reading individual Project Briefs. These include: (i) concern over the "worn" state of some of the older campus buildings; (ii) the lack of suitable gathering spaces for students; (iii) the shortage of office space for graduate students; (iv) the need for updated laboratories, especially for research; and, (v) the lack of availability of suitable storage space.

A final point for consideration is the interrelationship or domino effect of various projects. The completion of the Battery and Core Science Facilities, among others will result in a significant re-arrangement of a number of functions on campus and lead to vacancies in existing buildings and a further round of relocations as these assets become repurposed – an updated Campus Master Plan would be a beneficial tool to help plan these relocations.

## 2.0 INTRODUCTION

### 2.1 Overview

The purpose of this document is to update Memorial's *Multi-Year Infrastructure Plan 2014-2020*. In recognition that the Infrastructure Plan evolves over time, the intent of the current document is to add on to and complement the previous document, rather than replace it. Accordingly, the previous document will continue to serve as a reference on some issues and the current document will attempt to give a concise statement of current and future Infrastructure issues. These needs have been identified through meetings with representatives of each Faculty, School and a number of individual Departments. Additionally, each proponent was asked to complete a project brief (see Appendix 1 for blank template) detailing what has changed with respect to each project request since the last iteration of the Infrastructure Plan and; also, to provide details concerning needs that were not listed in the previous Plan.

Although this document bears the title, *Multi-Year Infrastructure Plan 2017-2023*, the requests of the various Faculties, Schools and Departments have served to create a list of potential projects that will take a significantly longer time line to complete. The bulk of infrastructure activity in the coming years will involve projects that are already ongoing; or, currently in the planning stages. Some additional projects will be added - the challenge is in deciding what additional projects need to be considered for development within the 2017-2023 timeframe.

In reviewing the list of potential projects it can be difficult to prioritize projects that should proceed in future years. While an important constraint is available funding, other considerations also come into play. The *Multi-Year Infrastructure Plan 2014-2020* provided summary information on MUN's Vision, Mission and Values and various Policy and Framework initiatives, all of which can be used as guidance for decision making. Descriptions of the content of the various strategic and policy initiatives have not been included in this update; however, when completing the Project Briefs, proponents were asked to explain via a sentence or two how the requested projects fit in with these various strategic and framework initiatives. Appendix 2 provides a listing of projects and provides an indicator of how proponents have identified which initiatives the project supports. Details concerning a particular project can be found by reference to the information as submitted by proponents (with minor edits) with respect to a particular request as appearing in Appendix 3. Hopefully, this information can be of assistance in making future decisions.

As well, it is worth noting several issues that were raised in the face to face meetings by Deans and Departmental representatives which may not be readily apparent in reading individual Project Briefs. These include: (i) concern over the "worn" state of some of the older campus buildings; (ii) the lack of suitable gathering spaces for students; (iii) the shortage of office space for graduate students; (iv) the need for updated laboratories, especially for research; and, (v) the lack of availability of suitable storage space.

The 2014-2020 Plan presented the Current Capital Deferred Renewal Program and Information Technology under individual headings and separated all other projects into 5 categories:

- Category 1 - Current Renewal & Replacement infrastructure Projects
- Category 2 - Current & New Priority Capital Projects
- Category 3 - Future Priority Capital Projects
- Category 4 - Self-Funding Project (Battery Facility)



## Category 5 - Marine Institute

Current Capital Deferred Renewal Program projects and Information Technology projects often are such that they need to be carried out in order for specific components of facilities to remain operational and/or efficient. In this document, as was the case for the 2014-2020 Plan, initiatives within these two areas are discussed under individual headings; however, the remaining projects are presented under headings as follows:

- Projects in Progress
- Projects in Planning Stages
- Projects in Early Stages
- Projects for Future Consideration
- Completed Projects

One other point is worthy of note. The inclusion of a project in this Plan does not necessarily mean that a project will proceed. Memorial's *Capital Projects* policy, remains in effect for capital projects, as does the *Information Technology Project Approval* policy for IT projects.

As time progresses and priorities and fiscal situations change, some of the currently listed future priority requests may never be initiated while others not currently contemplated may be deemed as necessities. An additional category, deferred projects, could be considered for future Plan updates.

## 2.2 Situational Considerations

### 2.2.01 Students, Faculty and Research

Memorial University of Newfoundland (MUN) is a multi-campus, multi-disciplinary, public, teaching/research university with students spread across four campuses: the Memorial University Campus in St. John's; the Marine Institute Campus in St. John's; the Grenfell Campus in Corner Brook; and, the Harlow Campus located in the town of Old Harlow, Essex, in England. As well, Memorial University extends its classrooms beyond their physical locations through 450 distance education courses. Accordingly, the infrastructure requirements are diverse and include needs for new construction, renovations and deferred maintenance for buildings, site components, marine vessels and information technology.

The *2015 President's Report* indicates minor variances in the total annual enrolment of full and part time undergraduate and graduate students. For the period 2009 to 2014, enrolment rose from 17,378 in 2009 to a peak of 18,236 in 2012 and then fell back to 17,568 in 2014. On closer examination; however, there is an important trend to note. There has been an increase in the number of graduate students each year, from a low of 2,673 in the fall 2009, to a high of 3,716 by fall 2016. This is of significance for infrastructure, as graduate students typically place a greater demand on office and research space as compared to undergraduates. As well, as graduate students are more likely to be accompanied by family than are undergraduates, their requirements for housing accommodations requirements are different than undergraduates.

In response to the needs of the various course offerings and programs, and to provide oversight and guidance to the Faculty and the Schools, MUN employs academic executive, academic management and academic staff. Any variances in staffing, even if only marginal, can be a

challenge to space and infrastructure planning as the ability to offer flexible office space in most buildings is not something that is readily available.

The *2015 President's Report* indicates slight variances in the level of Research Funding over the past 10 years as follows:

| Fiscal Year | Research Funding (\$) |
|-------------|-----------------------|
| 2014/2015   | 94,362,000            |
| 2013/2014   | 91,620,000            |
| 2012/2013   | 101,461,100           |
| 2011/2012   | 110,005,000           |
| 2010/2011   | 97,871,000            |
| 2009/2010   | 90,974,000            |
| 2008/2009   | 90,196,000            |
| 2007/2008   | 87,128,000            |
| 2006/2007   | 88,774,000            |
| 2005/2006   | 90,117,000            |

The implications for infrastructure from these numbers are not readily apparent; however, in meetings with Faculty, School and Department representatives there were a number of instances that dated and limited research space were raised. This may be a factor that has a negative impact on the ability to attract increased research funding. Planned infrastructure initiatives, notably, the construction of the new Core Science Facility and the subsequent upgrade and repurposing of space freed up in the existing Science and Chemistry-Physics buildings should help to address this.

## **2.2.02 Fiscal Issues**

Memorial University exists in the global environment. It competes with other universities in Canada and beyond for students, academic staff and research funding. This Plan's focus is infrastructure, but it must be recognized that the need for infrastructure is directly related to the needs and requirements of students, academic and research personnel. By reference to MUN's *Consolidated Financial Statements* it is noted that typically more than 70% of all the University's revenue is sourced through Government grants. By reference to the *2015 President's Report*, it is noted that, for the period 2010/11 to 2014/15, federal funding provided between 42 to 50 percent of MUN's total research funding; and, provincial funding provided between 17 to 27 percent of the total research funding. Accordingly it is important to understand provincial and federal fiscal positions and how governments' decisions may relate to the university and its infrastructure requirements.

### **2.2.02.1 Newfoundland and Labrador**

The provincial fiscal situation has changed dramatically since the previous Infrastructure Plan which reported that: "Newfoundland and Labrador was expected to be the runaway leader in economic growth among all provinces in 2013". A dramatic drop in the price of oil has reduced provincial revenues and the effect has been further compounded by lower production levels.

In its *2016 Budget Speech*, Government stated that: “Real GDP fell by 2.3 per cent as oil production fell by 20.5 per cent due to lower output from all three projects – Hibernia, Terra Nova and White Rose. Investment also declined by 8.1 per cent as higher spending on the Muskrat Falls development was offset by lower spending on Vale’s nickel processing facility in Long Harbour, the Hebron project, and residential construction. Employment fell by 1 per cent and the unemployment rate increased by 0.9 percentage points to 12.8 per cent in 2015.” The *Budget Speech* also advised that: “Beyond 2016, economic growth is expected to be curtailed by a combination of factors, including declines in capital investment as major projects move beyond peak development and the requirement for further provincial deficit reduction measures. Most main economic indicators are expected to be lower in 2021 than current levels.” Budget 2016 announced a number of expenditure reduction initiatives including a reduction in the regular operational grant to Memorial University by \$14 million.

This is on top of reductions made in the previous year. Per the Office of the Provost and Vice-President (Academic) Blog as posted on April 21, 2016, the 2016 provincial budget has resulted in a reduction to MUN’s base budget of \$24.9 million annually by 2019-20, including the salary attrition piece.

On Friday, July 22, 2016, CBC News reported that: “An international credit ratings agency is painting a grim picture of Newfoundland and Labrador’s finances, downgrading the province’s credit rating to the make it the lowest in Canada, and keeping its outlook as negative. Moody’s announced Thursday (July 21, 2016) [sic] it had downgraded the rating from Aa2 to Aa3, noting the amount it expects the province to spend on financing its debt will reach 12 per cent of total revenue by 2020, a level not seen in the province since 2004”.

Future provincial budgets may introduce additional measures that could have an impact on the University. Memorial may need to explore initiatives that could provide new or increased funding.

#### **2.2.02.2 Canada**

At the federal level, *Budget 2016* advised that Canada could expect a deficit of \$29.4 billion in 2015/16. Over the remainder of the forecast horizon, deficits were expected to decline from this level to \$14.3 billion by 2020/21. On November 1, 2016; however, the federal Finance Minister released a fall economic statement with predictions that the treasury will run a total of \$114.9 billion in deficits between 2016/17 and 2020/21. This compares to *Budget 2016’s* prediction of \$83.2 billion in shortfalls over the same period. While the continued deficit is not good news, the 2016 federal budget did contain positive initiatives for education, some of which are outlined below.

*Budget 2016* proposed increases in Canada Student Grant amounts by 50 per cent: from \$2,000 to \$3,000 per year for students from low-income families; from \$800 to \$1,200 per year for students from middle-income families; and, from \$1,200 to \$1,800 per year for part-time students. Increased grant amounts will be available for the 2016/17 academic year. In total, these measures will provide assistance of \$1.53 billion over five years, starting in 2016–17, and \$329 million per year thereafter.

Additionally, *Budget 2016* proposed up to \$2 billion over three years, starting in 2016/17, for a new Post-Secondary Institutions Strategic Investment Fund, a time-limited initiative that will support up to 50 per cent of the eligible costs of infrastructure projects at post-secondary institutions and affiliated research and commercialization organizations, in collaboration with provinces and territories. This initiative is intended to enhance and modernize research facilities on Canadian campuses and improve the environmental sustainability of these facilities. Applications for funding were to be submitted by May 9, 2016 and approved projects must be substantially completed by April 30, 2018. Costs incurred after that date will not be eligible for funding under the program. Of note, is that these projects had to be “shovel ready”; in other words pre-planning of the projects must have already occurred such that once the funding source was identified, the projects could quickly move to construction.

*Budget 2016* also proposed an additional \$95 million per year for research, starting in 2016/17, on an ongoing basis to the granting councils as follows: \$30 million for the Canadian Institutes of Health Research; \$30 million for the Natural Sciences and Engineering Research Council; \$16 million for the Social Sciences and Humanities Research Council; and, \$19 million for the Research Support Fund to support the indirect costs borne by post-secondary institutions in undertaking federally sponsored research. This means that with the funding provided to the granting councils in Budgets 2015 and 2016, a total of \$141 million in new annual resources will be made available to the granting councils going forward.

As well, *Budget 2016* proposed an initiative to promote Canada as a destination of choice to study and conduct world-class research. Mitacs, a national not-for-profit organization, builds partnerships between academia, industry and the world to create a more innovative Canada. *Budget 2016* proposed the provision of \$14 million over two years, starting in 2016/17, to the Mitacs Globalink program. This funding will support 825 internships and fellowships annually, helping Canadian universities to attract top students from around the world and enabling Canadian students to take advantage of training opportunities abroad.

### **2.2.02.3 Memorial University of Newfoundland**

MUN’s spending on the construction of new infrastructure assets in recent years has been significant. The costs incurred for assets under construction to date, according to the Notes to the Financial Statements, have been as follows:

| Year | Assets Under Construction (\$) |
|------|--------------------------------|
| 2015 | 55,487,000                     |
| 2014 | 141,954,000                    |
| 2013 | 160,050,000                    |
| 2012 | 106,100,000                    |
| 2011 | 37,143,000                     |

During 2016/17, efforts focused on a number of infrastructure projects; the most significant being the University’s Residence Renovations; Aboriginal Centre; Core Science Facility; Battery Facility; and, the Pedways over Prince Philip Drive – East and

West in St. John's; and, the Marine Institute's Marine Base – Phase IIA, Breakwater, Marginal Wharf and Restoration of Existing Wharf in Holyrood. The projects are at various stages: the Residence Renovations being completed in 2016, the others are in progress with some tenders remaining to be called, except for the Aboriginal Centre which requires that funding be sourced prior to tenders advancing – the project is “shovel ready”.

There has been some assistance from the government with respect to several of these projects.

In April, 2016 the Atlantic Canada Opportunities Agency (ACOA) announced \$4.5 million to support the innovative technologies and network upgrades that will allow connectivity across Newfoundland and Labrador, Canada and beyond. The technology will also enable all of Memorial's campuses, faculties, locations and centres to participate in and contribute to programming and projects taking place at the Battery Facility.

In July, 2016 it was announced that, the Core Science Facility would receive \$125 million in joint federal-provincial funding, with \$99,855,277 coming from the Government of Canada through the New Building Canada Fund's Provincial-Territorial Infrastructure Component–National and Regional Projects, and \$25,144,723 coming from the Province of Newfoundland and Labrador. As well, the Government of Canada, via ACOA would be providing a \$3 million contribution for the Holyrood Marine Base.

As well, the University submitted four applications for projects for funding consideration under the federal Post-Secondary Institutions Strategic Investment Fund program: (i) the Battery Facility; (ii) the Animal Resource Centre; (iii) the Deferred Maintenance Program; and, (iv) the Aboriginal Centre. In September, 2016 it was announced that the federal government is providing Memorial University \$14.4 million for its new Animal Resource Centre and in October, 2016 support of 4.125 million was announced for the Battery Facility.

The University has identified additional projects to be in the planning stages and others in the early stages for considerations. This planning effort is important and will help prepare for sourcing funding in future years through other “shovel ready” government initiatives.

Although budgets have yet to be established for some of these projects, based on those projects for which budgets have been established, it is not unreasonable to assume that the funding required to complete the projects which are ongoing and in the planning and early stages of consideration will be somewhere in the range of \$400-500 million. This means that if funding can be maintained at the average level of the past 5 years, it will take a number of years to complete the projects as currently underway, in the planning or early stages of consideration. This in turn implies that, there is a limited capacity for the University to undertake other future projects within the 2017-2023 timeframe of this Plan. The use of a spreadsheet, such as the one appearing in Appendix 4 (Multi-Year Infrastructure Template) may be of assistance in planning which projects to proceed and which to defer.

Based on inputs from proponents, there are a number of projects in addition to those as listed in the 2014-2020 Plan which have been brought forward for consideration. Some of these can be considered as innovative, others as a natural progression or domino effect as a result of the eventual completion of currently ongoing projects. In any case, all must be considered and will be listed as part of this update to the Infrastructure Plan.

### 3.0 CURRENT CAPITAL DEFERRED RENEWAL PROGRAM

New construction initiatives can be exciting and garner significant attention; however, an important component of infrastructure planning that must not be overlooked or given lesser attention is the condition of existing infrastructure. The Principles of the Deferred Capital Renewal Program are well explained in Section 3.0 of the 2014-2020 Infrastructure Plan (2014-2020 Plan) and need not be repeated in this update.

Funding of the current capital deferred renewal program has been a challenge as a result of the Province’s decision to cease providing funding (Provincial Deferred Capital Renewal budget allocation) to Memorial for this initiative effective fiscal 2015/16. The University; however, allocated \$7.0 M in 2015 and \$8.0M in 2016 to this important program.

As stated in the 2014-2020 Plan, the Facilities Condition Index (FCI) is a metric which is used to measure the relative condition of a building or a facility. According to the consulting company that has been engaged by Memorial to maintain and update the University’s VFA Asset Management Data base, typically the commercial industry has adopted FCI values relating to the following conditions:

|          |                             |
|----------|-----------------------------|
| 0 - 5%   | Excellent to Good Condition |
| 5 – 10%  | Good to Fair Condition      |
| 10 – 20% | Fair to Poor Condition      |

Since the 2014-2020 Plan was written there has been a change in Memorial’s FCI as follows:

| Location                                 | FCI per 2014-2020 Plan | Current FCI |
|--|------------------------|-------------|
| MUN on Campus                            | 21%                    | 28.1%       |
| MUN off Campus                           | 26%                    | 36.0%       |
| Corner Brook Sir Wilfred Grenfell Campus | 21%                    | 28.0%       |
| Entire Campus                            | 21.6%                  | 28.5%       |

The current FCI’s pertain to 109 buildings and related supporting infrastructure such as site components and buried utilities. Since the completion of the 2014 report, a number of additional assets have been added to the portfolio – predominantly underground infrastructure; shared assets with the Health Science Complex have been reconciled; and, additional existing buildings have had detailed assessments completed. The above Table is an indication that the existing and relative condition of MUN’s infrastructure is worse than was previously reported in the 2014-2020 Plan. Exclusive of increases required to offset inflation, the Consultant now estimates that, for the next 15 years, MUN would need to dedicate \$22,583,300 annually to its Deferred Capital Renewal Program to maintain its portfolio in its current condition with an FCI of 28.5%. To achieve a FCI of 12% would require an annual allocation of \$44,900,000 for each of the next 15 years (the 2014-2020 Plan had indicated an annual allocation of \$26,000,000 for 15 years would achieve an FCI of 12%). Subject to the availability of funding, consideration could be given to budgeting an annual block of funding somewhere within the range of \$22.6 – 44.9M.

Based on an assessment of building components, a 5 year plan of required deferred maintenance projects has been developed. The list for the St. John’s and Grenfell campus is quite lengthy and may be reviewed by reference to Appendix 5.

## **4.0 INFORMATION TECHNOLOGY**

Per its Information Technology Project Approval Policy, Memorial University encourages the usage of standard and integrated information technology to support and enhance operations and management. The university strives to ensure that information technology projects are compatible with existing hardware and software, are cost and energy efficient, well organized, highly visible and accessible to the university community. To achieve this, as stated in the 2014-2020 Plan, the IT infrastructure must enjoy long-term, stable and appropriate funding support.

IT projects often serve multiple facilities and multiple groups across the broad university community. As well, aspects of the IT initiatives deal with the replacement and update of existing IT infrastructure and must occur on an ongoing basis in order for the technology to remain functional and effective. Accordingly, as in the case for the Current Capital Deferred Renewal Program, a case can be made for a separate block fund to cover the portion of the IT initiatives that pertains to the renewal of existing infrastructure. New initiatives could continue to be dealt with on a project by project basis. Specific IT initiatives, currently in progress are as follows:

### **4.1 Voice over IP (VoIP) Telephone Handset replacement**

Information Technology Services (ITS) requires continuous investment in the St. John's campus VoIP telephony system. There is an immediate need to extend MUN's telephone support agreements and to replace a significant number of VoIP phones and other aging infrastructure that are approaching end of life and are no longer supported by vendor support agreements. In total, 2432 VoIP phones have reached the end of support in their life cycle and need replacement. Failure to replace these devices will negatively impact ITS's ability to upgrade VoIP software, provide security updates and improve voice mail services for all users.

The replacement plan will be carried out in two phases between 2016 and 2019. Phase 1 involves: (i) the replacement of the '7912' type phones in 2016-2017. In total, 1672 replacement phones are required; (ii) the renewal of phone system support contracts for 3-5 years to ensure that MUN has adequate tier-2 vendor support to address critical system failures. Vendor support is also critical for proper planning and implementation of emerging telephony features and services; and. (iii) the replacement of support systems for analog devices (fax, alarms etc.). This work should be completed by 2017-2018. Phase 2 requires the purchase of an additional 953 replacement devices, including the '7940', '7960', '7911' and '7963' model phones and is planned between 2017-2019.

The preliminary design work for this initiative is complete. Advancements in VoIP technology have resulted in significant changes since the creation of the original infrastructure plan. There has been a need to replace or reduce the number of handsets to eliminate unsupported models to allow Information Technology Services to maintain the overall health of the telephone system.

### **4.2 Data Centre Servers – Virtual Cluster Upgrade / Storage Area Network Replacement (SAN)**

MUN's Information Technology Services Department anticipates significant expansion of core services over the next three to five years. New clients are expected to transition their services into the primary and secondary ITS data centres. This is in addition to several major IT projects that will require ITS to expand its data centre infrastructure. These include document imaging, SharePoint, Office 365 and numerous research infrastructure projects.



Several infrastructure projects are required, including an upgrade to the main VMware cluster (a cluster of “virtual” servers). This virtual infrastructure is considered critical infrastructure; is the foundational infrastructure for over 80% of ITS’s servers; and, is a critical part of MUN’s business continuity and disaster recovery process. ITS is predicting that its data centre capacity is going to double in capacity over the next 3 years, requiring an investment for the hardware, software and support.

Additionally, to support the increased capacity of the main server environment, ITS must also replace its aging storage area network (SAN) and backup infrastructure. The vast majority of MUN’s critical data is stored on ITS SAN and backup infrastructure. This includes: research data; student; human resources; finance; security; privacy; email; and, a vast array of other services.

Preliminary design for this initiative is currently underway.

#### **4.3 Wireless Network Maintenance and Growth**

Students, faculty and staff expect a robust and available wireless network to meet the growing needs on campus. To achieve this, significant investment is required to sustain Information Technology Services existing wireless network and to expand wireless coverage across the St. John’s campus. To achieve a “wireless everywhere” strategy, coverage should be expanded by roughly 40% and investment is needed to replace aging wireless access points across numerous buildings. This will bring full wireless to all buildings and strategic outdoor areas.

In 2016, ITS added over 144 wireless access points and improved service in several buildings including: Education; Faculty of Medicine; Arts and Administration; Science; Engineering; Field Hall; and, Chemistry-Physics. It has been determined the St. John’s Campus needs an additional 800-900 wireless access points, in addition to the existing 1100 wireless access points, to provide full wireless coverage.

Detailed Design for this initiative which, will take until 2019 to carry out, is complete.

#### **4.4 Wired Network Refresh and Upgrades**

MUN’s wired network is a critical part of the IT infrastructure on the St. John’s campus. This wired network provides the necessary foundation for all other services including: multiple data centres; CANARIE; MUN’s wireless network; building controls; and, application services. It is important that the wired network be well maintained and current.

To maintain a healthy wired infrastructure, upgrades have been planned in three phases. These include:

(i) Replacement of the ‘edge network switches’, or the point at which users connect to the system. This involves the replacement of approximately 400 data closet switches over the next 3 years. MUN’s last edge switch infrastructure replacement was over 8 years ago and the equipment is now 3 years beyond its expected end of life. Failure to replace the edge switch infrastructure will result in significant failures impacting network traffic. This includes MUN’s wired, wireless, inter-campus and research traffic and will result in major user impacts in all buildings, departments and Faculties;

(ii) Replacement of central networking equipment. To assure continued stability within the campus network, increased availability and increased capacity for all users at all campuses, it is necessary to replace central networking equipment that has reached the end of its useful life; and,

(iii) Replacement of MUN’s network traffic management hardware. This hardware is used to assure proper management of the University’s internet connection. In the last year, ITS replaced core network

switches in all buildings, except for two buildings where existing hardware will transition to an unsupported state in mid-2017. Upgrades are required on the final 2 core network elements within the enterprise network.

Detailed Design for this work is currently underway.

#### **4.5 UPS (Battery Back Up Systems)**

UPS battery backup systems provide uninterruptable power supply that provides protection and redundancy to critical ITS network, data centre and telephony infrastructure. Investment is needed to replace and maintain ITS managed UPS infrastructure (there is additional infrastructure maintained by Facilities Management which is not included in this initiative). About 50% of the ITS battery backup infrastructure is new; however, contract renewals on existing equipment are required to ensure proper vendor support is in place - this will be due in the 2018-2019 fiscal year. The remainder of the devices are of varying ages and will require replacement and renewal. This work is required in the 2017-2018 fiscal-year.

UPS infrastructure replacement was not included in the 2014-2020 Plan. An initial project scope for the work has been developed.

#### **4.6 Addition of Security Infrastructure**

IT security threats have increased at a rapid rate in the last three years. Three major factors are contributing to the threats at Memorial University: (i) a rise in number of attacks - most attacks on systems originate from the web. As these threats target specific systems, they are difficult to detect and prevent at the network level; (ii) the increased complexity of attacks - the complexity of threats directed toward end-users is increasing. In the past, the vast majority of threats were individual in nature and were targeting a single user or system. These threats have evolved and now target an organization's entire infrastructure; and (iii) Increasing threats from mobile devices - the increased use of mobile devices leads to the storage of critical information and easy access to this information. This increases the need to protect these devices.

ITS and the Office of the CIO have determined that several replacement and/or new solutions are needed to help secure Memorial Universities critical infrastructure. These include:

1. Purchasing a commercial grade antispam product to replace the current open-source email spam solution to help deal with emerging email threats to MUN's critical data and infrastructure.
2. Acquiring additional network perimeter Intrusion Detection infrastructure to protect MUN's network and data centre assets. In early 2016, ITS purchased half of the infrastructure required to implement advanced Intrusion Detection for all MUN network traffic. Additional infrastructure and licensing will be required in 2017 to activate these systems and provide deeper insight into existing and future security threats on MUN's infrastructure.
3. Acquiring Security Incident and Event Manager (SIEM) - in 2017-18, ITS would like to purchase and install Security Incident and Event Manager (SIEM) physical infrastructure. This will provide critical logging infrastructure to allow ITS to detect and eliminate threats in a proactive manner, before they impact critical systems.
4. Acquiring an Enterprise Mobility Management (EMM) Solution - for the last 10 years, MUN has been using Microsoft Active Sync to manage its fleet of roughly 1000 cell phones and tablet type devices. To continue to secure and provide critical services like email to these mobile devices,

ITS requires the purchase of a commercial grade mobility management solution. It is anticipated this technology will be needed in the 2017-18 timeframe.

Preliminary design work for this initiative is already complete.

#### **4.7 Classroom Technology Infrastructure Enhancement Plan; 2017 – 2020**

The Centre for Innovation in Teaching and Learning (CITL) is Memorial University's lead in the use of educational technologies in teaching and learning; in the delivery of the university's online education offerings; and, in the provision of educator development. CITL's Classroom Technology team is responsible for the design, installation, and maintenance of multimedia equipment in approximately 180 classrooms, learning spaces and meeting rooms across campus.

In 2012, CITL, the Office of the Registrar, and the Department of Facilities Management were awarded joint funding from Memorial University's Classroom/Teaching Infrastructure renewal project. This five year project committed to the renovation of 10 classrooms and additional technology for 50 shared classrooms. CITL fulfilled this commitment and exceeded expectations by completing substantial interior renovations to an additional classroom (bringing the total to 11). The upgrades were completed in September 2016.

CITL has relied on the Province's annual Classroom/Teaching Infrastructure fund to enhance and maintain teaching and learning technologies in shared classrooms. In fiscal 2015/16, Government suspended this funding thus; Memorial must source alternate funding to continue technical upgrades, maintenance, and future technology improvement projects. CITL's Classroom Technology team has identified three priority areas to be completed over the next three years:

Priority #1 is to equip shared classrooms that currently lack basic audio/visual technology. There are a number of rooms (C2022; C2024; C3055; ED2002; ED2004; ED3023; and, ED4010) that lack this and are currently serviced by portable multimedia carts. The improvements would bring these classrooms up to the CITL standard and incorporate the following needs: (i) modern instructors teaching station; (ii) modern computer, monitor and software; (iii) digital document camera; (iv) digital laser powered projector; (v) modern 16:9 format projection screen; (vi) Blu-ray player; (vii) modern laptop connections; (viii) quality audio system with wireless microphone and connections for assistive listening devices; and (viii) state-of-the art switching and control system with remote monitoring capability.

Priority #2 is to replace aging lamp based video projectors with new laser powered alternatives. The laser powered projectors offer 1080p resolution, are low-maintenance, more reliable and provide a lower total cost of ownership – this translate to better image quality, less class disruption and increased staff efficiency. These projectors will reach end of life over the next three years and will have to be replaced.

Priority #3 addresses the technology needs of semi-shared classrooms (EN1054; EN2040; EN1051; EN1052; PE2001; and, C2045). These classrooms are owned by individual departments, but are also utilized by the Registrar's Office for classes and events. After an owning department has scheduled its own classes and events for the semester, the remaining time is made available to the Registrar's Office for general use. Although this arrangement ensures a more efficient use of classroom space, it has created several problems: (i) The technology installed in these classrooms was funded by the individual departments and based on their specific needs - thus the level of technology varies and often does not

reflect CITL's classroom standards; (ii) The technology in some rooms has not been updated in many years - thus the audio/visual system does not support modern digital formats; newer laptops and tablets cannot be connected; and, the image quality of outdated equipment makes it difficult for students to read the material being presented; and, (iii) This arrangement has fostered an ongoing debate on who bears the fiscal responsibility for maintaining the technology in these semi-shared classrooms - the owning department is responsible for the cost associated with maintaining or replacing their own equipment but; as there are other users, there is also a compelling argument that some of the costs should be borne centrally as the spaces are also used for general classroom use. CITL will work with the owning department and Registrar's office to determine an appropriate future model for shared usage, financial responsibility, and support. The end goal is to ensure all classrooms are equipped with a standard set of modern teaching technology and that a common support model is clearly defined and implemented.

CITL will collaborate with the Department of Facilities Management on the aforementioned proposed projects. As well, CITL will consult and cooperate with other departments as they too may be working on plans to upgrade these semi-shared spaces.

This initiative is currently at the concept stage.

#### **4.8 Faculty of Medicine – CANARIE Communication Link**

CANARIE is a network that designs and delivers digital infrastructure for research, education, and innovation. CANARIE provides the digital infrastructure required for researchers and scientists to share data-intensive information, thus facilitating globally collaborative partnerships. According to CANARIE's website, currently, over one million researchers, scientists and students at nearly 2,000 Canadian institutions have access to the CANARIE network; thus, it would be a tremendous benefit for Memorial University to have a communication link to the network for research, educational, and commercialization purposes.

The Faculty of Medicine houses a next generation health informatics and data analytics hardware and software platform designed to facilitate the rapid interrogation and integration of complex source data from multiple partner organizations. This hardware provides the Faculty with one of Atlantic Canada's fastest computing environments and the capacity to be a Canadian leader in analytics; however, despite this capacity, Memorial University does not have the processing speed to join the CANARIE network. This project would see the installation of a communication link to CANARIE. This project would be undertaken with the involvement and cooperation of Memorial University's Information Technology Services department.

Section 4.1 of the 2014-2020 Plan identifies CANARIE as one of the four networks Memorial should support. Development of the initial program scope to facilitate the required communication link is currently underway.

## **5.0 PROJECTS IN PROGRESS**

With the exception of the Aboriginal Centre, construction on aspects of these projects, are in progress. A very brief description of each project follows:

### **5.1 St. John's Campus**

#### **5.1.01 Aboriginal Centre**

The vision is to have a centrally located, highly visible, dedicated, Aboriginal space that would allow for programming growth; support an elder in residence program; provide gathering/performing/lounge space; offices for Aboriginal Resource staff; study rooms; a seminar/conference room; a kitchen; washrooms; student lockers; and, a storage room (Section 6.1.3 of the 2014-2020 Plan refers). The proposed site is the current warehouse space adjacent to the Henrietta Harvey Building. The project is "shovel ready" and waiting for funding to be sourced prior to proceeding to tender.

#### **5.1.02 Core Science Facility**

The Core Science Facility (CSF) is planned to have a gross area of approximately 44,499 m<sup>2</sup> (479,000 sq. ft.) for science laboratories, associated offices, and other shelled-in space (Section 6.1.1 of the 2014-2020 Plan refers). The facility is intended to promote inter and multi-disciplinary approaches to science. The research and teaching space will be occupied primarily by the Departments of Biochemistry, Biology and Chemistry in the Faculty of Science, and the Department of Electrical and Computer Engineering in the Faculty of Engineering and Applied Science. On completion of the new facility, and the relocation of these functions from their current locations, there will be a need for renovation/re-working of spaces which will be vacated.

Construction on the new structure began in the fourth quarter of 2015 with project completion initially expected for the fourth quarter of 2019. This date has since been pushed into 2020. On July 21, 2016, a note was posted on the MUN Gazette's website advising of the cancellation of the major construction tender for the Core Science Facility because the bids received for this work were higher than expected. Efforts are now underway in conjunction with the project's chief consulting firm to rework the package with a view to re-tender as quickly as possible.

#### **5.1.03 Battery Facility**

The Battery Facility is being developed as a multi-use public engagement and innovation space (Section 8.0 of the 2014-2020 Plan refers). The Battery Facility will be cost-neutral to the University as it is being developed as a revenue-generating entity that will recover all costs related to its operation. Renovations to provide graduate student accommodations are complete - several floors comprising of 87 studio-type rooms are now occupied by student residents. Work is continuing on upgrades to the Conference Centre and Office Tower to accommodate the Harris Centre; the Office of Public Engagement; the Gardiner Centre; and, the Genesis Centre. As well, the original City and Pool Wings have been demolished. All work is anticipated to be complete in early 2018.

#### **5.1.04 West Pedway over Prince Philip Drive**

The underground tunnel adjacent to the East Pedway has been upgraded and in June, 2016 the East Pedway was taken down. The span of the West Pedway which crosses Prince Phillip Drive between the Chemistry-Physics Building and the Earth Sciences Buildings will be removed and replaced with a new span which connects the Chemistry-Physics Building directly to the University Centre (Section 6.1.10 of the 2014-2020 Plan refers).

#### **5.1.05 Redevelopment of Reid Theatre**

Due to asbestos and other safety concerns, the Reid Theatre closed in February, 2012. Section 6.1.2 of the 2014-2020 Plan described other shortcomings of the Theatre and the need for its redevelopment.

Abatement of hazardous materials has been completed. Consultant meetings have been held for the redevelopment phase and concept designs are complete. A prime consultant has prepared design specifications, drawings and a Class B cost estimate; the project is now at the fund raising stage.

#### **5.1.06 Faculty of Engineering and Applied Science - Renovation Projects**

Memorial Engineering is midway through its eight-year growth plan of doubling the Faculty of Engineering and Applied Science between 2012 and 2020 (Section 6.1.6 of the 2014-2020 Plan refers). This expansion is occurring simultaneously with major infrastructure initiatives on campus. Some of these projects will not be complete until 2020 (or later) thus, there is an ongoing need to undertake renovations, some of which may be required on an interim basis, until the final locations planned to house the various engineering functions are completed. These renovation projects include but are not limited to, the following:

- 1) Classrooms EN 2043, 3000, 3029: accommodate increasing enrolments, larger and more classes, additional sections and courses;
- 2) Office areas EN 3000A, 4019, 4021, 4028 and 4030: accommodate a larger complement of Co-op Coordinators, a new departmental organizational structure, new Office of the Director of First Year Engineering, and higher occupancy of existing spaces to accommodate growth;
- 3) First Year Student Help Centre: EN 3076A and B, growth of activities and mentorships for first year students as per the student retention initiatives in the growth plan;
- 4) Departmental office area: IIC-1021 (Process Engineering Department Office);
- 5) Lab renovations: EN 1038 (ECE), 1022 (H2S Lab), IIC labs (ventilation), 1026A (Geotechnical);
- 6) MCE (Memorial Centre for Entrepreneurship): EN 3075 / 38, a new university-wide initiative that provides a common entrepreneurial space for students across campus in all faculties / schools;
- 7) Floors 1-2 of the Bruneau Centre for Research and Innovation: expansion of Process Engineering Department (see below);
- 8) Replacement of hydraulic systems supporting the wave tank and structures labs with modern facilities including an electrical wavemaker system;
- 9) Utilizing vacated space in Coughlan College and C-CORE, as well as additional off-campus space which may be required, to house over 120 full-time research thesis based graduate students without a desk space; and,
- 10) Others as the need may arise.

These renovations are at various stages, some are under construction, some at tender, some at the design stages and others are still conceptual.

#### **5.1.07 MarComm Marketing Office Relocation to Arts Building**

Renovations are in progress to facilitate MarComm's Marketing section staff to be relocated to the Arts Building adjacent to the other staff of the division, thereby freeing up space in the Facilities Management and Physical Education Buildings for other uses. This project was not included in the 2014-2020 Plan as it arose from operational requirements.

#### **5.1.08 School of Music – Linked Lighting Systems**

The D.F. Cook Recital Hall and Suncor Energy Hall together represent the primary performance and rehearsal spaces for the School of Music, and the 2 principle performance spaces for the St. John's campus. The lighting system in both halls features an obsolete linked system which must be replaced. Neither system can be repaired; should either system fail – the lights go out and they stay out indefinitely. The replacement of the lighting system is required on a priority basis.

This initiative does not appear in the 2014-2020 Plan. Detailed design for the initiative is complete.

#### **5.1.09 Animal Resource Centre**

Memorial's Animal Care Services currently operates out of three facilities on and near the St. John's campus: the Health Sciences Center animal facility, which services the Faculty of Medicine and School of Pharmacy; the Biotechnology building animal facility, which services the Faculty of Science; and the Vivarium on Mt. Scio Road, which houses Memorial's Yucatan swine herd which is used for research and teaching studies (Section 7.1.1.4 of the 2014-2020 Plan refers).

The existing Health Sciences animal facility, which was designed in the late 1960's and constructed in the early 1970's, has been in need of replacement for many years as it does not meet current building and accreditation standards for any of the primary purposes: animal surgeries, behavioural testing space, animal housing, bio-containment, and Specific Pathogen Free (SPF) spaces. Memorial's accreditation by the national regulatory body, the Canadian Council on Animal Care (CCAC), and the ensuing Certificate of Good Animal Practice were in question. As a result, a replacement facility, the Animal Resource Center (ARC) was approved as a strategic initiative in 2012.

Investigations of the Biotechnology Building, conducted in 2014, confirmed that there was a lack of required redundancy of mechanical systems and services to meet the standards required for regulatory status and for robust scientific research. Temperatures, humidity and fail-safe engineering systems all had a negative impact on animal well-being and quality of research. Costs for mechanical, electrical and architectural upgrades would have been significant, and would have necessitated the closure of the facility for at least 12 months. As these options were unworkable, the decision was made by the Memorial's senior administration to combine the operational requirements of the Biotechnology animal facility into the Animal Resource Centre project, with the result that Memorial's St. John's campus would house only one animal facility. The Faculties of Medicine and Science, along with the School of Pharmacy concur with this decision as it will increase opportunities for collaboration amongst faculty from the different

units. The decision also allows space on both the north and south sides of campus to be freed up for redevelopment.

A Steering Committee comprised of representatives from Animal Care Services, Facilities Management, the Faculty of Medicine, Faculty of Science, and Memorial's animal facility consultant has been formed. Extensive user and stakeholder consultation has occurred through all stages of the project. A consultant has been engaged and the project will soon be tendered. The federal government is contributing \$14.4 million through its Post-Secondary Institutions Strategic Investment Fund to assist with construction of the new facility to be completed in 2018.

The Vivarium on Mt. Scio Road is in need of mechanical and architectural upgrades. The building was constructed in the late 1960's and has undergone very little in the way of systems upgrades in spite of its decades of heavy use with many species of large animals and avian species. Animal Care Services has been working with Facilities Management to assess the needs.

#### **5.1.10 Faculty of Science/Faculty of Science and Humanities and Social Science – Co-op Space**

As the Faculties of Science and Humanities and Social Science grow their coop education programs, dedicated space for the Academic Staff Members – Co-operative Education, their administrative support and a dedicated interview room for Co-op students was sought. On closure of an administrative office in the Science building this space was allocated for a new use that meets an academic priority for the two of the largest faculties at Memorial University. The project will enhance the quality of undergraduate education, provide feedback to the Faculties' curriculum through the work experiences of students, and better connect the university to the communities it serves.

### **5.2 Marine Institute**

#### **5.2.01 Holyrood Marine Base – Phase IIA Breakwater and Marginal Wharf**

Work on Phase IIA (Sections 9.4.1; 9.4.3; and, 9.4.4 of the 2014-2020 Plan refers) of this project is underway and involves the construction of a breakwater and marginal wharf; the relocation of the davits (lifeboat launching system) from the Southside Marine Base, St. John's Harbour to Holyrood; and, the installation of a new remote operated vehicle (ROV) launching system.

#### **5.2.02 Southside Marine Base Transition**

In 2013, the Marine Institute started the process of transferring the at-sea component of its safety and survival training from the Southside Marine Base to the Holyrood Marine Base (Section 9.3 of the 2014-2020 Plan refers). This move has been very successful in reducing lost time due to weather because of the very sheltered area at Holyrood versus the open North Atlantic outside St John's Harbour. The conclusion to this project will see all activities occurring at the Southside Marine Base transferred to facilities in Holyrood.



## **6.0 PROJECTS IN PLANNING STAGES**

### **6.1 St. John's Campus**

#### **6.1.01 Faculty of Engineering and Applied Science – Mechanical High Bay Laboratory**

The need for this facility arises from the decision of the University and the Province to double the capacity and programs of the Faculty of Engineering and Applied Science from 2012 to 2020 (Section 6.1.6 of the 2014-2020 Plan refers) ; and, to increase research in ocean technology; energy and Arctic resources - key strategic areas for the University and the Province.

The location of the new construction for this facility (northward extension to the existing Engineering Building) has been selected to maintain and strengthen existing key synergies with the adjacent high-bay labs of Civil, Mechanical, Ocean and Naval Architectural Engineering. This location will retain the research and teaching synergies between those disciplines, structural heights and system complexities of the existing adjacent laboratories, i.e., Structures Laboratory, Ocean Engineering Research Centre (OERC), Thermal/Fluids Laboratory, Environmental Cold Chambers, and the Centre for Arctic Resource Development (CARD).

The preliminary design is complete and detailed design is underway; however, currently funding for the project has not been identified and the project will not advance until approved by the Board of Regents and the Government of Newfoundland and Labrador.

#### **6.1.02 Faculty of Engineering and Applied Science - Bruneau Centre Engineering Renovation**

Incremental new space in the Bruneau Centre for Research and Innovation has been committed to the Faculty of Engineering and Applied Science in support of the Engineering Expansion Strategic Initiative (Section 6.1.6 of the 2014-2020 Plan refers). The space will be reassigned primarily to Process Engineering, and other departments in the interim, until new construction of the Core Sciences Facility (CSF) is completed, in support of growing enrolments, research activities, curriculum offerings and industry project collaborations. Arrangements for renovations of this space to accommodate engineering growth needs of design labs, laboratories, and offices need to begin as soon as possible, so that work can begin immediately after the space is vacated in 2017 when units move off-campus to the Battery Facility. These vacated spaces include: IIC 1001-all, IIC 1004-all, IIC 1028-A/B, IIC 1029-all, IIC 1030, IIC 1034, IIC 1042, IIC 1044 through 1051, IIC 1053 through 1057, and 2015-all. The planned renovations for these spaces are summarized in a table as appearing in the project brief in Appendix 3.

The initial program scope for these renovations is complete and detailed design for the required renovations is underway.

#### **6.1.03 Faculty of Engineering and Applied Science –Relocation of Electrical and Computer Engineering to the Core Sciences Facility**

As stated in Section 6.1.6 of 2014-2020 Plan, space in the CSF has been allocated for Electrical and Computer Engineering. This project is in progress in accordance with the original concept with a few exceptions, such as the cancellation of wind energy lab facilities (to be moved to another location on campus).

#### **6.1.04 Faculty of Engineering and Applied Science – Petroleum Engineering Building**

The Petroleum Engineering Building was not specifically mentioned in the 2014-2020 Plan; however, its need arises as part of strategic doubling of Faculty of Engineering and Applied Science from 2012 to 2020 (see Section 6.1.6 of 2014-2020 Plan). In response to this initiative, a new co-operative Petroleum Engineering program is proposed. A Request for Proposal has been prepared (but not yet issued) for a new, stand alone, 30,000 gross sq. ft. building to be located between the QE II Library and Education buildings. It is anticipated the building would provide high-quality research and teaching spaces in support of program that would have about 15-20 undergraduate students per graduating year.

Development of an initial program scope is currently underway. It is intended that this project would be externally funded by industry partners.

#### **6.1.05 Faculty of Humanities and Social Sciences Research Archival Area**

The Faculty is concerned for the archives entrusted to its care and is struggling to have them better protected and located in a safe and accessible location. The situation with respect to the internationally recognized Maritime History Archive (MHA) is particularly urgent as it is currently very vulnerable to weather conditions and the threat of fire. As well, while there is insurance on the collections, the coverage does not properly reflect the value of the documents which, if lost, cannot be replaced. The Faculty would like to consolidate all of its collections (MHA, Memorial University of Newfoundland Folklore Archives (MUNFLA), English Language Resource Centre (ELRC), Linguistics, etc.) in a new purpose-built temperature and humidity controlled, fire protected facility. As well, the acquisition of and implementation of a new archival management system is also being explored. Section 6.1.4 of the 2014-2020 Plan continues to provide an accurate description of the situation.

The Faculty of Arts Research Archives Report and Recommendations completed in March 2013 looked at past practices, current practices as well as archival activities in other departments both internal and external to the University. The Archives Committee has updated the 2013 report; however, the project remains at the concept stage. When this project proceeds, consideration might also be given to including in the new archival facility space to meet the needs of the University Libraries (section 6.1.5 of the 2014-2020 Plan refers).

#### **6.1.06 Faculty of Medicine – Development of Family Medicine Clinics – Level 3 Janeway Hostel**

Section 7.1.4 of the 2014-2020 Plan acknowledged that construction of the new Faculty of Medicine building would not address the needs of Community Medicine. The Family Medicine space in the Health Sciences Centre was built in the 1970's and is no longer functional for contemporary health care delivery. A new, larger clinical space is required to accommodate the ever-increasing volume of patients.

As Eastern Health requires additional space for its Emergency Department; and has plans to expand into the space currently occupied by Family Medicine, it has been decided that the new Family Medicine Clinics would be developed in the Janeway Hostel. The project cost will be shared equally by Eastern Health and the Faculty of Medicine. Project funding has been approved by government.

Detailed design for the project has been completed. The new Family Medicine Clinic will include: (i) 18 examination rooms, with an improved layout for teaching and for the use of an Electronic Medical Records system; (ii) 2 larger, improved inter-professional team rooms; (iii) inter-professional areas (chiropractor, kinesiology); (iv) a procedure room and triage area; (v) a waiting room and reception area for privacy and security; and, (vi) wheelchair accessible doors.

#### **6.1.07 Deputy Provost (Students) - Ancillary Operations - UC Landing / CSF Pedway**

Detailed design has been completed for a renovation to the northwest corner of the University Centre to accommodate a pedway link to new Core Science Facility.

This initiative does not appear in the 2014-2020 Plan. It is a new initiative within the Deputy Provost Office in collaboration with Facilities Management and the CSF development.

#### **6.1.08 Deputy Provost (Students) - Student Wellness and Counseling Centre - 5th Floor, University Centre Integration**

The 5th Floor of the University Centre is to be renovated to relocate the Health Clinic adjacent to the existing Counselling Centre. A shared waiting room and reception area will allow full operational integration and enhanced inter-professional care of students.

This initiative does not appear in the 2014-2020 Plan. Preliminary Design for this initiative has been completed.

### **6.2 Marine Institute**

#### **6.2.01 Holyrood Marine Base – Phase IIB Ocean Research and Training Building**

Phase IIB of the project (section 9.4.2 of Plan 2014-2020 refers) is for construction of a new research and teaching building. The preliminary design of the facility includes: a large high bay workshop with 16 ft. overhead doors and wharf access, shops with overhead doors and wharf access; dry laboratories for electronic and computer activity; classroom facilities; meeting/conference rooms; office space; ancillary washroom; storage; and, mechanical spaces.

Class C estimates for Phase II B were prepared in 2012. It is expected that detailed design work for Phase IIB will be completed in early 2017.

#### **6.2.02 Main Campus, Ridge Road - Transfer of Ownership**

The Marine Institute (MI) Main Campus building is currently owned, maintained, and operated by the provincial Department of Transportation and Works (TW). MI is seeking to have the MI building and land, along with TW's budgetary allocations and capital funding for deferred maintenance, transferred from TW to Memorial. This transfer of ownership would allow MI to prioritize building maintenance based upon the strategic goals of the institute along with addressing the accessibility concerns outlined during a detailed space utilization assessment in 2007.

The initial program scope of this initiative has been developed (Section 9.2.1 of the 2014-2020 Plan refers).

### **6.2.03 Main Campus, Ridge Road - Expansion – Engineering Technology Centre (ETC) Building**

The Marine Institute (MI) building on Ridge Road has reached its utilization capacity. A detailed space utilization assessment of the MI building, completed in 2007 by Sheppard Case Architects Inc., concluded that MI requires an increase in floor area of 19% (53,883 sq. ft.) to meet the demand as it existed at that time. Demands from all activity areas have further increased since 2007. This is in part due to the loss of use of a 12,470 sq. ft. building on Mt. Scio Place, which was torn down by TW in 2009. In addition, MI continues to grow its student population, staff and research initiatives. Various options have been discussed with Government to address the space issues at the Ridge Road campus. The most attractive solution to all stakeholders is to transfer the adjacent 331,576 sq. ft. College of North Atlantic ETC building and land, which is also owned, operated, and maintained by TW, to the University along with an appropriate funding allocation.

The initial program scope of this initiative has been developed (Section 9.2.2 of the 2014-2020 Plan refers).

### **6.2.04 Offshore Safety and Survival Centre (OSSC), Foxtrap – Transfer of Ownership**

The Marine Institute's OSSC, located near Foxtrap, is also currently owned and maintained by TW. MI is seeking to have the OSSC facility and land along with TW's funding allocation transferred from TW to MUN. In addition to current deferred maintenance issues there are other improvements required to the facilities. The Fire Field Building along with many of the fire field components are in need of significant upgrade and repair. As well, the underground steel tank adjacent to the fire field, which has been in place since 1992, requires replacement. The transfer of ownership would allow MI to prioritize maintenance based upon the strategic goals of the institute.

The initial program scope of this initiative has been developed (Section 9.6.1 of the 2014-2020 Plan refers).

## **6.3 Grenfell Campus**

### **6.3.01 Fine Arts Building – Mechanical HVAC Systems Upgrade**

In December 2012, consultants completed an assessment of the ventilation systems at the Fine Arts Building. The scope of the assessment included: the four painting studios; photography processing suite; lithography studio; carpentry shop; and, sculpture studio. In March 2013, a report was produced and included a list of recommendations and probable costs. No major ventilation issues were identified in the painting studios and photography processing suite. Serious deficiencies were found in the lithography studio, carpentry shop and sculpture studio. It was also observed that there is no mechanical ventilation provided to any classrooms or offices located on the perimeter of the building. An engineering consultant has been engaged to complete the design work, which is ongoing. This initiative does not appear in the 2014-2020 Plan.

### **6.3.02 Fine Arts Building – Fire Alarm and Sprinkler Upgrades**

A new fire alarm system has been purchased and a tender will be issued for its installation. Subsequent to a deficiency identified in a fire safety inspection report, a consultant is currently

completing a sprinkler design for the Fine Arts Theatre. On completion of design, the installation of this system will be tendered. This initiative does not appear in the 2014-2020 Plan.

### **6.3.03 Arts and Science Building – Classroom Enhancement**

A classroom in the Arts and Science building was identified as requiring enhancements to increase the effectiveness and comfort level in this teaching and learning space. The room currently has large tables which consume significant space and reduce the student capacity of the room. The room is not tiered which creates visual challenges for students in the back rows. Renovations to this room will include tiered levels with new flooring and new tables installed on each tiered level. This initiative does not appear in the 2014-2020 Plan.

### **6.3.04 Chalet Residence – Roof Repairs**

The scope of work includes: repairs to the chalet roof systems including shingles; soffit; flashings; vents; and, adjoining deteriorated architectural components. In September 2016, a tender was issued to complete shingling and associated work on five chalet buildings. The bids came in over budget and all were rejected. In October 2016, a second tender was issued for labour only. This also came in over budget and all bids were rejected. Grenfell Campus is currently considering completing the work with its own maintenance staff. This initiative does not appear in the 2014-2020 Plan.

## **7.0 PROJECTS IN EARLY STAGES**

### **7.1 St. John's Campus**

#### **7.1.01 Faculty of Medicine – Redevelopment of Existing Space – Health Sciences Centre (HSC)**

##### **7.1.01.1 Upgrade of Medical Education Laboratories – Level 2 HSC**

The original anatomy labs of the Faculty of Medicine were constructed in the 1970's as per the building codes of the late 1960's to accommodate the training of medical students. Students from Pharmacy, Nursing, and Human Kinetics and Recreation, as well as members from various healthcare professions, also avail of the anatomy labs for their training.

As the anatomy labs lack appropriate ventilation systems, they can no longer be used for anatomy instruction using wet (embalmed) specimens and have been closed until a permanent solution can be achieved. This project will include the remodelling of existing anatomy labs to include a separate ventilation system(s) to bring the space up to code. Anatomy teaching methods including the use of embalmed cadavers, plastinated specimens, and other specialized teaching technologies will be employed in the renovated space. The project will allow for the continuation of anatomy teaching necessary for the complete teaching and training of physicians, nurses, pharmacists and allied health professionals in a safe and modern environment.

This project was not originally included in the 2014-2020 Plan. The initial program scope is currently being developed.

##### **7.1.01.2 Upgrade of Shared Research Equipment Rooms – Levels 4 and 5 HSC**

The shared equipment rooms (2 rooms each - levels 4 and 5 of the HSC in the Biomedical Sciences research area) within the Faculty of Medicine date back to the 1970's when the Health Sciences Centre was built. Since then, there have only been modest repairs/fixes to the space in the intervening years and researchers have been complaining for many years about the condition of the lab space. Pipes are exposed, flooring has deteriorated, floor tiles (asbestos containing) are broken, walls are damaged with peeling painted surfaces, and an old non-functioning sterilizer needs to be removed. The rooms need to be upgraded to meet standards and safety requirements. Additionally, two rooms which are used for liquid nitrogen storage lack monitoring systems or safety alarms and require that these be installed to meet current safety requirements.

This project was not specifically mentioned in the 2014-2020 Plan; however, the necessity for the work was a component of the overall needs of the Faculty of Medicine referred to in Section 7.1.4. Development of the initial program scope for this initiative is currently underway.

##### **7.1.01.3 Replace Glass-washing and Sterilization (Materials Processing) Suite**

The glass-washing and sterilization facility dates back to the 1970's when the Health Science Centre was built. It can no longer meet the needs of researchers; it is

undersized for current demands; the facility has deteriorated and no longer meets safety requirements; dirty glassware, instruments and lab coats are processed in the same room in which clean materials are handled; and, its location is no longer central to the expanded research facilities.

This initiative will result in the relocation of the glass-washing and sterilization unit to a larger, more centralized space. The move will enable the facility to provide the service capacity necessary to accommodate the newly expanded Faculty of Medicine research program. The design will also ensure separation of dirty and clean materials and provide redundancy in certain equipment such as sterilizers, washers, and dryers.

This project was not specifically included in the 2014-2020 Plan. Development of the initial program scope is currently underway.

#### **7.1.01.4 Upgrade of Environmental (cool and warm) Research Rooms**

The 10 environmental rooms within the Faculty of Medicine date back to the 1970's when the Health Sciences Centre was built. Since then, there have only been modest repairs/fixes to the rooms. Researchers have been complaining for many years about their availability and reliability.

A consultant report identified that, although the condition of the enclosures appear fair to good given their age, the refrigeration systems are poor with many not functioning at all. The current refrigeration systems are single source with no redundancy provided. The environmental room's controls and monitoring systems are not functioning properly and certain functions are not present. The refrigeration systems need to be replaced to be reliable and to restore the confidence of the researchers. The controls need full replacement in order to properly control temperature and humidity and to provide local alarming and remote alarming that can alert researchers to problems that could adversely impact the outcomes or reliability of their work.

This project was not specifically included in the 2014-2020 Plan. A preliminary design for the work has been completed.

### **7.1.02 Faculty of Medicine – Development of Existing Space – Faculty of Medicine Building**

#### **7.1.02.1 Development of Shelled-in Laboratory Space – Level 6 for Biomedical Sciences Research**

During the development of the new Faculty of Medicine building, an area on level six was shelled-in as part of the main construction (Section 5.1.3 of the 2014-2020 Plan refers); however, the funding agreement for the new building did not include finishing and equipping this space for shared biomedical research.

This project will see the completion of mechanical, electrical and interior finishes of approximately 6,200 sq. ft. of shelled in (undeveloped) space on level 6 of the Faculty of Medicine building. The design will be an open lab concept thus providing increased research capacity and greater flexibility of use. The work will also see the installment of

occupancy sensors and adjustable light levels, improving the overall energy efficiency of the building.

The development of a modern, well-equipped, laboratory space will provide additional space and infrastructure for the recruitment of specialized Biomedical Sciences researchers and Research Chairs (10-15) plus support staff and will also support the increased recruitment of graduate students.

This initiative is currently at the concept stage.

#### **7.1.02.2 Development of Shelled-in Laboratory Space – Level 3**

During the development of the Craig L. Dobbin Genetics Research Centre, an area on level three of the new Faculty of Medicine building was shelled-in as part of the main construction (Section 5.1.3 of the 2014-2020 Plan refers); however, the funding agreement for the new building did not include finishing and equipping this space for shared biomedical research.

The project will see the completion of mechanical, electrical and interior finishes of approximately 1,800 sq. ft. of shelled-in (undeveloped) space on level 3 of the Genetics Research Centre.

The development of this modern and functional laboratory space will result in increased research capacity and engage a wider research community within the Faculty of Medicine. The lab will integrate research findings to improve health care services and advance the health and well-being of the people of Newfoundland and Labrador.

This initiative is currently at the concept stage.

### **7.1.03 Faculty of Business Administration Building - Alterations and Expansion**

#### **7.1.03.1 Repurposing Gardiner Centre Space - Consolidation of Administrative Functions**

With the Gardiner Centre relocating to the Battery in 2018, the plan is to consolidate all administrative functions of the Faculty of Business Administration (FBA) in the vacated space. This will improve efficiencies in the general and academic administration of the Faculty and facilitate the streamlining of processes.

Subsequent to the move of the Dean's, General, Undergraduate and MBA Offices into the former Gardiner Centre, other spaces in the building will be vacated allowing for further redevelopment. The General and MBA Offices will be converted to an 80 seat classroom; the Co-op Offices will move into the Undergraduate Office space; the Dean's Office will house the FBA's research centres. The vacated Co-op offices, on the first floor, will become study rooms and informal learning spaces for students.

The Gardiner Centre space underwent extensive renovations in 2010, and its current configuration will require little modifications to make it the administrative hub for the FBA. Similarly, few modifications will be needed for the Co-op Office move or establishment of the FBA's research centres. The majority of funding has been secured for the General and MBA Offices conversion.



Although this project is not specifically mentioned in the 2014-2020 Plan, Section 7.1.3 of that Plan did identify a need for extensive renovations to the existing space. This initiative is currently at the concept stage.

#### **7.1.03.2 Classroom Upgrades**

The scope of this project is to upgrade two classroom, BN3008 and 3009 in the Faculty of Business Administration building, ideally during winter 2017. The Faculty recently renovated and upgraded BN1010 and BN1012 with funds provided from the Classroom Teaching Infrastructure Development Fund. Study room BN2004 was also completely refurbished and upgraded. Work continues on two additional study rooms as well as a seminar room.

Development of the initial program scope for this initiative is underway. This project is not specifically mentioned in the 2014-2020 Plan; however, in Section 7.1.3 of that Plan, the Faculty of Business Administration's space was "identified as insufficient in terms of both quantity and quality to support both current and planned enrolment and research activities growth and contemporary practices of Business pedagogy, learning, research, and scholarship." Ongoing classroom upgrades over the last 3 years improve the teaching and learning space but, the need for an extensive renovation of existing space and additional new construction remain a priority.

#### **7.1.03.3 Atrium and Informal Student Space Upgrades**

It is proposed to enhance the current Atrium into a learning commons area and connect it to refurbished and more flexible student society space. This project is not specifically mentioned in the 2014-2020 Plan; however, in Section 7.1.3 of that Plan, the Faculty of Business Administration's space was "identified as insufficient in both terms of quantity and quality to support both current and planned enrolment and research activities growth and contemporary practices of Business pedagogy, learning, research, and scholarship." The need for informal learning spaces and improved spaces for student activities is a high priority.

Development of the initial program scope for this initiative is underway. The Faculty of Business Administration currently has a portion of its operating monies allocated to this project and; as well, has access to additional donor funding.

#### **7.1.03.4 Pedway Construction**

A feasibility study and preliminary design is currently underway by a consultant to examine the possible connectivity of the FBA building with the Faculty of Engineering and Applied Science (FEAS) building. This is a cost shared study between the two faculties.

There are natural linkages between the two faculties and a pedway would be a concrete connection between the two buildings. The space is anticipated to have one through corridor with additional working space. This space could be a natural home to Memorial's Centre of Entrepreneurship which was recently launched by the two faculties. It could also house a learning commons or other collaborative space; would

enhance the interconnectivity for the campus; and, would be a natural fit with many of the Faculties' and University's strategic initiatives.

This initiative does not appear in the 2014-2020 Plan; however, it is a project that has often been contemplated. FBA has a private sector commitment from the DARE campaign for the project and additional funds could be leveraged from the public sector for the project.

#### **7.1.03.5 Functional Space Programming Analysis**

The Faculty of Business Administration undertook a functional space programming analysis in 2011. Section 7.1.3 of the 2014-2020 Plan was thus in error when it stated, "In the meantime, a functional space programming analysis is being contemplated." The analysis was performed by RPG Resource Planning Group Incorporated in conjunction with AW Consultants and WHW Architects. It is now appropriate to update the previous analysis given the numerous changes in the landscape. This initiative is currently at the concept stage.

#### **7.1.04 School of Kinetics – Lab Teaching and Research Space**

Lab space is required for teaching undergraduate and graduate students; as well as, for conducting faculty research. A recent Academic Unit Planning external review highlighted the inadequacy of the current facilities and indicated that a safety review of the current labs is required.

Sections 6.1.7 and 6.1.8 of the 2014-2020 Plan describe the space shortcomings of Kinetics and Athletics. There has been minimal improvement in the situation. Some existing space (previously used by Athletics and for storage) has been renovated to create some lab space for several faculty members who did not previously have access to any lab space. In addition, the anatomy teaching lab was made portable and is now set up in regular classroom space as needed in order to create secure research space to protect expensive and fragile equipment for the neuromotor control research lab. Also, a seminar room has been fitted with storage units to allow for the space to dual task as temporary lab space for projects when not being used as a classroom. All current research lab space is shared and is allocated as required on a central booking system.

This project is still at the concept stage.

#### **7.1.05 Campus Master Plan**

Grenfell and the Marine Institute have developed their own Campus Master Plans; however, Memorial lacks a current Campus Master Plan; the existing *Memorial University of Newfoundland St. John's Campus Plan* is dated January 2007. The completion of the Battery and Core Science Facilities, among others will result in a significant re-arrangement of a number of functions on campus and lead to vacancies in existing buildings and a further round of relocations as these assets become repurposed – an updated Campus Master Plan could help with the planning of how this will occur. This Strategic Infrastructure Plan provides a comprehensive listing of the needs/wants of the Faculties, Schools and Departments but, does not truly establish how the various projects fit together – where new facilities should be placed and how they should be integrated/connected (physically or via information technology) into

existing facilities to provide the efficient flow of students, faculty and staff to best serve the University's needs not only in the short term; but also, for the long term. As such, consideration would extend beyond buildings and include the requirements for roadways, walkways, parking, and green spaces, etc. As well, an overall Master Plan could consider the inter-relationship of the University's various campuses and off-campus sites. In a sense, the Strategic Infrastructure Plan would become a sub-set of the Campus Master Plan. This initiative is at the concept stage (Section 6.1.11 of the 2014-2020 Plan refers).

#### **7.1.06 Redevelopment of Chemistry-Physics; Science; and, Biotechnology Buildings**

On completion of the Core Science Facility (CSF) there will be a substantial exodus of many of the current users of the buildings as the departments of Chemistry, Biology, and Biochemistry relocate to the CSF. Additionally, it is anticipated that the Biotechnology building animal care facility will be vacated on completion of the new Animal Resource Centre. As outlined in Section 7.1.2 of the 2014-2020 Plan, there are notional concept plans in place that will see the vacated facilities repurposed. A study of the issue is underway which envisions the Faculty of Humanities and Social Sciences and the Faculty of Science as the primary users. The repurposing will likely involve significant upgrade and renovation of the existing buildings. Potential functions to be relocated to these facilities are as follows:

##### **7.1.06.1 Faculty of Humanities and Social Sciences - Redevelopment of the Existing Science Building**

Currently, HSS is widely dispersed throughout the University, a configuration which is not conducive to building a sense of community within the Faculty. HSS views the upcoming availability of space in the Science building as an opportunity to consolidate and is currently working on the realignment of its departmental units.

##### **7.1.06.2 Faculty of Science - Relocation of the Department of Computer Science**

The Department of Computer Science current occupies space within the S. J. Carew building. This department needs to be moved to facilitate the expansion of the Faculty of Engineering. The Faculty of Science has identified potential relocation spaces to include: developing shell space within the Core Science Facility; space in the existing Science; Chemistry-Physics; or, Biotechnology buildings. The 2014-2020 Plan identified the Chemistry-Physics building as the likely location.

##### **7.1.06.3 Faculty of Science - Relocation of the Department of Mathematics and Statistics**

The Department of Mathematics and Statistics has occupied the Henrietta Harvey Building for many years but has clearly outgrown its space. Issues with the existing location include: insufficient space for graduate students - graduate students share desks, and some students are located in 4 Clark Place; asbestos issues within that building compromise undertaking renovations at a reasonable cost; and, insufficient space to provide an appropriately sized Math Help Centre for undergraduate courses.

The Faculty of Science has identified potential relocation spaces to include: developing shell space within the Core Science Facility; space in the existing Science; Chemistry-

Physics; or, Biotechnology buildings. The 2014-2020 Plan identified the Chemistry-Physics building as the likely location.

#### **7.1.06.4 Faculty of Science - Space allocation for the Department of Physics and Physical Oceanography within the Chemistry-Physics Building**

To assist the department in responding to recommendations of the Academic Program Review which note that research opportunities are constrained by available lab space, the Faculty is requesting to expand the space for the Department of Physics and Physical Oceanography within the Chemistry-Physics Building.

#### **7.1.06.5 Faculty of Science - Relocation of the Department of Psychology**

Following the completion of the CSF and the relocation of the Departments of Biology and Biochemistry, the Psychology Department will be the last remaining academic unit within the Faculty of Science to be housed within the Science building. Much of the research within the Psychology Department is laboratory based, and the mechanical systems within the Science building are no longer capable of supporting this function. The Psychology Department needs to be moved to a building that can properly support its operations. As well, the development of the new Psy.D. program obligates the provision of appropriate clinical space for the development and accreditation of this program. The existing footprint of the Psychology Department is approximately 2400 nm<sup>2</sup> but, is recognized as not meeting the department's laboratory requirements. Additional functional space planning analysis is needed to determine appropriate space requirements.

The Faculty recognizes possible options for department relocation to include the Chemistry-Physics building, Biotechnology building, or completion of shell space within the Core Science Facility. It notes that, the latter option provides the benefits of adjacencies with the Departments of Biology and Biochemistry, and proximity to the Faculty of Medicine and the planned Animal Resource Centre (ARC). The 2014-20 Plan had suggested that lab space for Psychology might be relocated to the Biotechnology building, with the non-lab component remaining in the Science Building.

#### **7.1.07 Faculty of Science - Ocean Frontier Institute**

The Faculty of Science has identified excellence in ocean research as a key component of its strategic plan. Funding for this initiative has been awarded through the Canada First Research Excellence Fund. The funding will enable the completion of the shell space on the entire ground floor of the west pavilion of the Core Science Facility and will generate 147 fully funded postdoctoral fellow and graduate student positions throughout the university. The project includes 8 international partners in Europe (6) and the USA (2) which will promote exchange of researchers and students. The outcome of this project is that Memorial University should move from a world-class institution to world leading in the area of oceans research and sustainable development.

This initiative did not appear in the 2014-2020 Plan. It is currently at the concept stage.

### **7.1.08 Sedna Centre**

Based on its record of success in large-scale, long-term R&D projects, C-CORE was engaged to conduct a scoping study for an Oil Spill Response Centre of Excellence. The study outlines infrastructure requirements and capital cost, organization and governance structures, operational considerations, staffing, location, synergies with existing organizations provincially, nationally and internationally, and the R&D program itself for a unique-in-the-world oils spill response R&D facility.

The Centre will provide year-round capability to create real-world offshore conditions, from the calmest Pacific coast in summer to a wild North Atlantic storm, enabling controlled testing of technology and training of people to respond to oil spills in our oceans. The Sedna Centre will be dedicated to: the protection of Arctic and coastal environment; helping to protect sensitive environment; and, ensuring the sustainability of communities that depend upon them.

The facility is designed to grow saline ice sheets and replicate all of Canada's ocean and coastline environments. Its unique capabilities will complement current initiatives, enhance Canada's Arctic and ocean knowledge and technology capacity, and support marine habitat protection strategies. Further, the research program will provide opportunity for collaboration with a number of Canadian and international universities and research centres.

The Centre will conduct research in specific areas, particularly remote detection of oil in challenging ocean conditions, as well as on, in, and under snow and sea ice; spill behaviour and fate prediction; human factors under extreme conditions; well control and containment equipment; and oil recovery and coastline cleanup. It will also provide response technology development and testing in priority areas, including mechanical recovery equipment; chemical herders, dispersants and sorbents; and in situ burning.

The Sedna Centre will become a significant component of the Newfoundland and Labrador Ocean Technology Cluster. It will develop a strong evidence base to inform government policy and regulations. Its addition to existing infrastructure in the region will establish Newfoundland and Labrador as the world's foremost oil spill response R&D and training location, attracting an international clientele to the province, and helping to grow and diversify the provincial economy. It will provide direct employment in high-quality environmental science and engineering jobs, and foster indirect employment in the region, supporting our knowledge economy. Additionally, it will bring 250-500 visitors annually to Newfoundland and Labrador for extensive spill response training programs, providing induced business opportunity and employment in surrounding communities.

This initiative did not appear in the 2014-2020 Plan. The initial program scope for this project has been developed and a Class "D" cost estimate has been developed. The original scoping study for the Sedna Centre was completed in August 2015. Recent efforts have been focused on marketing and promotional activities to secure interest in, and funding support for, the centre. These efforts are continuing. As well, programmatic efforts including expansion of market assessments, research and training programs and engineering studies are being planned.

### **7.1.09 Additional Space for Technical Services Shops**

Section 6.1.12 of the 2014-2020 Plan recommends the development of new space for Technical Services and construction of a 3,300 nm<sup>2</sup> (35,521 nsf) standalone pre-engineered structure in

order to facilitate the ability of Technical Services to keep up with the demand for services arising from the University's continued growth in research intensity.

Although a standalone facility will offer the greatest ease in addressing these challenges, identifying a location that does not impact access for the user groups may be difficult. To help strike an appropriate balance, an alternate approach may be to follow the traditional strategy of locating shops adjacent to the user groups. To accomplish this there may be opportunities to include a provision for Technical Services within upcoming development projects. For example, as the Core Science Facility comes on line, redevelopment of vacated space from the Science Building and the Chemistry-Physics Building could include plans that accommodate the current and future needs of Technical Services. Similarly, with approval of a new Animal Resource Centre, Animal Care Services will be vacating the Biotechnology Building and redevelopment of this vacated space could help to alleviate some of the significant challenges currently being experienced by Technical Services.

This project is still at the concept stage thus, consideration may be given to each option.

#### **7.1.10 Additional Space for School of Pharmacy**

In 2009, Strategic Initiatives funding was awarded to the School of Pharmacy by the provincial government for expansion. Although the School was able to increase its human resources (faculty & staff) to prepare for the expansion, space limitations did not permit the planned enrolment increase from 40 to 60. The School has since received approval from the Provincial Government to repurpose these funds for the new entry-to-practice PharmD curriculum. This new program will be a five-year program with 40 students admitted in each of the five years. This is one-year longer than the current four-year Bachelor of Pharmacy degree, thus necessitating additional and improved teaching, social and locker space for students.

The School currently operates from space in the Health Sciences Centre (HSC) and at Tiffany Court. The lease on the space at Tiffany Court is due to expire in March 2017. In 2014, the School received approximately 4000 square feet of space on the first floor of the HSC from the Faculty of Medicine. Although this helped to alleviate the most urgent space needs and repatriate some faculty and staff from off-campus, it only partially addressed the issue. The long term solution is a new Life Sciences Building (Section 8.1.1 of this Plan refers); however, a more immediate interim initiative is needed to bridge the School to a longer term solution.

Additional space is required for: (i) the repatriation of faculty and staff from Tiffany Court; (ii) a Medication Therapy Services (MTS) clinic; (iii) student space; and (iv) space for research assistants. The MTS Clinic will need to be accessible to the public, have accessible parking and meet the licensing requirements of the Newfoundland and Labrador Pharmacy Board (NLPB). Additionally, the existing HSC space requires renovations to increase capacity and functionality (i.e. enhanced practice labs and graduate student space) and to address laboratory health/safety upgrades.

Appropriate undergraduate student space is not only important for students and their success but for the School in attaining its accreditation with the Canadian Council of Accreditation of Pharmacy Programs (CCAPP). With the lease for the Tiffany Court location set to expire in March 2017, there is a sense of urgency to develop an interim plan to address space needs as previously identified. The School continues to work closely with Facilities Management to identify and explore options and ways to operationalize an interim plan.

### **7.1.11 Storage Facility, Mount Scio Road**

The need for a storage facility for the University is outlined in Section 6.1.9 of the 2014-2020 Plan and that need remains generally unchanged. During meetings with Deans and Department Heads in preparing this Infrastructure Plan Update, the need for additional storage was raised by several individuals; however, only the Faculty of Science submitted a Project Brief addressing the issue. Apart from the need for a facility, it was noted that the University also needs to have a system to insure that it is only storing items that are really needed and can be used to advance the research and teaching mission of the institution; otherwise storage space in existing locations; or, in the proposed new facility could be wasted.

## **7.2 Marine Institute**

The Marine Institute has decided not to currently pursue two of the projects as listed in the 2014-2020 Plan. These are the Human Elements Lab for Marine Safety (Section 9.2.9 of the 2014-2020 Plan) and the Offshore Multidisciplinary Research Ship (Section 9.9.1 of the 2014-2020 Plan). As well, the need for a Storage Building for the Offshore Safety and Survival Centre (OSSC), Foxtrap (Section 9.8.1 of the 2014-2020 Plan) has been temporarily addressed by the relocation of the Dynamic Air Shelter from Holyrood to Foxtrap. The following projects remain under active consideration:

### **7.2.01 Ridge Road Main Campus Enhancement**

The Marine Institute's main campus on Ridge Road is the dynamic central hub of the entire institute with continually changing needs. The initial scope has been developed for the following items which will address these needs and enhance the Marine Institute:

**Energy Audit:** The consultant firm MCW Maricor of Moncton, New Brunswick conducted Energy Audits of the Marine Institute (MI) Main Campus and College of North Atlantic Engineering Technology Centre (ETC) Building both located at Ridge Road, St. John's. The recommendations provided within the consultant reports identified multiple ways to create savings in energy consumption and in GHG emissions. MI aims to implement these recommendations to avail of these savings (Section 9.2.3 of the 2014-2020 Plan refers).

**Laboratory Health/Safety Upgrades:** A number of MI laboratories are equipped with fume hoods that no longer meet appropriate standards and need to be replaced (Section 9.2.5 of the 2014-2020 Plan refers).

**Lab/Shop Technology Renewal:** A number of MI laboratories are using technology that is out of date and does not meet the standards of a world class institution. MI is seeking to update these labs to reflect the quality of the programs taught in them and the research they facilitate (Section 9.2.6 of the 2014-2020 Plan refers).

**Cafeteria Enhancement:** MI is seeking to redevelop the current cafeteria spaces to better support the academic and social needs of the student body. The upgraded space will become an extension of the classroom, a place to do group work, socialize and re-energize while remaining flexible enough to accommodate catering (Section 9.2.7 of the 2014-2020 Plan refers).

**Parking Lot:** Parking has been identified by stakeholders as a concern for MI. Currently the Institute is exploring multiple options to increase the parking stalls available to MI staff and

students. One option being explored includes the possible expansion of the nearby Pippy Park Golf Driving Range parking area (Section 9.2.8 of the 2014-2020 Plan refers).

Centre for Fisheries Ecosystems Research (CFER Lab): To keep pace with the dramatic increase in samples that need to be analyzed for core research programs and student projects within CFER, a new lab is required. New equipment will help to accommodate the current complement of projects and students while allowing CFER to grow towards its potential (Section 9.2.10 of the 2014-2020 Plan refers).

### **7.2.02 Mt. Scio Parking Lot and Access Road**

The Bio-processing facility at Mt. Scio is accessed via a gravel roadway that is in a continuous state of disrepair. MI is seeking to pave the access roadway to improve utility of the area and thereby reduce long term maintenance costs (Section 9.5.1 of the 2014-2020 Plan refers). The initial program scope has been developed.

### **7.2.03 Offshore Safety and Survival Centre, Foxtrap - Enhancement**

The OSSC located near Foxtrap is continually growing and expanding its offerings. The initial scope has been developed for the following improvements which will help the OSSC continue to improve and grow:

Energy Audit: The consultant firm MCW Maricor of Moncton, New Brunswick conducted Energy Audits at a number of MI facilities, including the OSSC, Foxtrap. The recommendations include measures such as a lighting retrofit and replacement; a building automation system upgrade; and an air gap sealant program. MI is seeking to implement these recommendations to avail of operational savings (Section 9.6.2 of the 2014-2020 Plan refers).

Rig Structure Upgrade: The simulated rig structure is used by the OSSC for various Marine Emergency training courses. Currently, repairs on the rig structure are carried out on an as needed basis; however, in the near future a comprehensive refurbishing of the structure will be required. This is a new initiative which was not included in the 2014-2020 Plan.

Helicopter Refuelling Simulator: This simulator has been identified by the Offshore Petroleum industry as an important training aid for a very high risk activity which occurs daily on the offshore rigs. The improvement would include the purchase and install a Helicopter Refueling Simulator at the OSSC fire field in Foxtrap (Section 9.6.4 of the 2014-2020 Plan refers).

Command and Control: MI currently leases a complex of trailers for use with Command and Control Training. The complex is no longer adequate for the training program and is an impediment to obtaining additional training for White Rose and Terra Nova employees. MI is planning to purchase and install modular buildings designed specifically for the Command and Control training. The upgrade of the Command and Control facilities will also include virtual reality simulation equipment to aid in training (Section 9.6.7 of the 2014-2020 Plan refers).

### **7.2.04 Safety and Emergency Training (SERT) Centre, Stephenville – Facility Upgrade**

The SERT Centre in Stephenville is an important part of the safety training offerings that MI provides. The Centre provides Aircraft Rescue and Firefighting, Structural, Marine and Industrial Firefighting Training, as well as other safety training courses. The facility requires an upgrade in order for SERT to continue operating optimally.



MI currently leases two buildings from the Stephenville Airport Corporation to house SERTC employees, classrooms and equipment. The buildings, dating back to the 1940's, are generally in poor condition. There is also the very high likelihood of hazards such as asbestos and lead based paints. MI is looking to upgrade these facilities to reflect the high quality standards of the institute, and support the SERT Centre's goal of growing its suite of programs to include diploma and degree options (Section 9.7.2 of the 2014-2020 Plan refers). The initial program scope has been developed.

### **7.2.05 Vessel Fleet Improvements**

Memorial University utilizes a varied fleet of vessels to meet the diverse needs of its internal and external clients. The vessel fleet is primarily located at Pier 25 Southside, St. John's and Holyrood Marine Base.

The current research and project support fleet is comprised of a mixture of vessel-types, sizes and ages as follows:

- Gecho II - an 8 metre Fibreglass Reinforced Plastic (FRP) vessel equipped specifically for inshore acoustic surveys;
- Narwhal - a 14 year-old 11 metre Rigid Inflatable Boat (RIB) that services nearshore oceanographic buoys and project support;
- Inquisitor - a 41 year old 23 metre steel vessel specifically configured for offshore safety and survival training; and,
- Anne S. Pierce - an offshore capable but 40 year old 33 metre steel platform that is configured for sea bed mapping.

As well, for at-sea safety and emergency response training, the OSSC maintains six models of Fast Rescue Crafts (FRCs) and four models of Life Boats.

The most critical needs of the fleet moving forward are:

**Nearshore/Midshore Multi-Purpose Research Vessel:** Over the past decade the Marine Institute has used two vessels to address the majority of its research tasking, the M.V. Anne S. Pierce and to a lesser degree the M.V. Inquisitor, which was acquired from Fisheries and Oceans Canada in 2013.

The Anne S. Pierce is a converted fishing vessel that was constructed in 1982, and purchased by the Marine Institute in 2006. The ship was converted (i.e. addition of an instrument gondola) in summer 2013 for seabed mapping. Although well maintained, its age and original design as a fishing vessel is now severely limiting its utility. Major concerns are: hull integrity; the lack of accommodations and amenities for mixed gender research and training crews; and, inadequate propulsion and mechanical/electrical systems which prevent the simultaneous operation of winches, thrusters and scientific equipment.

A 40 metre ship is required to replace the now antiquated and deteriorating Anne S. Pierce so that Memorial can safely and comfortably meet mission critical needs of the St. John's and Marine Institute campuses in ocean based research, at-sea training for nautical and engineering cadets, seabed mapping, resource development and conservation, and collaborative research & support to other academic and private sector partners (Section 9.9.2 of the 2014-2020 Plan refers). Recent (2016) market inquiries/offers confirm that there are a substantial inventory of suitable vessels (2010 vintage) available for purchase within a reasonable price range.

**Small Inshore Research/Training Platforms:** The MI currently operates the Gecho II a highly sophisticated 8 metre inshore fisheries research vessel custom built in 2009 for the Centre for Fisheries Ecosystem Research (CFER). This vessel is utilized almost exclusively by CFER and MUN Biology researchers to conduct research in coastal bays with unique habitats, inshore spawning areas and nursery habitats. Its availability to other users and any reconfiguration is tightly controlled because of the sensitive and expensive scientific equipment carried.

An additional 8-10 metre small research/training vessel, with a workboat orientation is required to support activities of multiple users at the Holyrood Marine Base, particularly the significantly increased small vessel requirements of the School of Ocean Technology for sea bed mapping and AUV/ROV support/training (Section 9.9.4 of the 2014-2020 Plan refers).

**Specialized Training Boats:** At-sea survival training conducted by the Offshore Safety and Survival Centre requires a special class of Fast Rescue Craft and lifeboats that require more frequent maintenance and replacement given that most are used daily and subjected to mishaps of training inexperienced operators. Currently, two FRCs require replacement (Section 9.9.5 of the 2014-2020 Plan refers).

## **7.3 Grenfell Campus**

### **7.3.01 Child Care Centre**

The absence of on-campus child care has been a longstanding issue at the Grenfell Campus. Over the past fifteen years, there has been an ongoing advocacy effort by many faculty, staff and students to remedy this issue. A formal review was carried out with campus stakeholders to further explore the need for this important service. During previous negotiations with MUNFA, a proposed solution for child care services was a major issue. Specific language was agreed to by both parties indicating that the university will use its “best efforts to establish a facility on or in close proximity to the Grenfell Campus by December 31, 2015”.

The plan is to construct a purpose-built, single level facility on campus of approximately 4,500 sq. ft. to support placements for up to sixty children with a contractual arrangement involving a third-party to operate the facility on a cost-neutral basis. This project was approved by the Board of Regents at a meeting on December 4, 2014. A request was submitted to government on December 17, 2014, for approval to proceed with capital construction.

This initiative does not appear in the 2014-2020 Plan. The initial program scope has been developed; however, this project is currently on hold pending government approval.

### **7.3.02 Fine Arts Theatre – Life Safety Upgrades**

The Fine Arts Building, constructed 1987, is a four storey building of approximately 1,650 m<sup>2</sup>. In 2014, an engineering consultant conducted a visual observation of the building’s fire safety components to determine the degree of compliance with current Fire and Life Safety Codes.

The findings were categorized as: (i) classification I items - improvements that are recommended to be completed immediately; and, (ii) classification II items – improvements which require design, installation and involve significant costs.

Classification I items identified in this study include:

- Window in the box office does not maintain the required fire-resistance rating of the fire separation. A fire shutter should be installed.
- Non-fixed seating on upper gallery levels encroaches on the required egress widths. Maintaining an egress width as required by the National Building Code could be achieved by installing demarcation stops.
- Emergency lighting is required in the Theatre.
- The fire safety plan for the Fine Arts Building requires an update.

Classification II items identified in this study include:

- Limited portions of floor assemblies, loadbearing walls and mezzanines in the Theatre do not maintain the required fire-resistance rating. Destructive testing of floor assemblies, loadbearing walls and mezzanines should be completed and compared against ULC listed assemblies. Additional protection may be required.
- The required fire separation between Theatre and ancillary spaces is currently inadequate. Construction of floors and walls should be investigated and compared to ULC listed assemblies having the required fire-resistance rating as required by the National Building Code.
- The proscenium opening is currently not protected by an adequate fire separation. An approved deluge system, fire curtain or increased sprinkler density is required to achieve the required fire separation.
- No visual signaling devices are currently installed within the Theatre space. As part of the fire alarm upgrade, visual signaling devices are required to be installed such that at least one device is visible from any location within the floor area.
- Horns and strobes should be installed throughout the building.
- Travel distances from some portions of the mezzanines/catwalks exceed National Building Code requirements. Travel distances should be reviewed and enhanced smoke detection installed to facilitate earlier warning of fire conditions.
- Panic hardware on several egress doors outside the Theatre have been removed/disabled and need to be upgraded/reinstated.
- Guards on the catwalk and elevated seating areas are not at sufficient height, contain large openings and are orientated such that they facilitate climbing. All guards require a retrofit to meet the National Building Code requirements.
- The exit capacity of the two fire-rated stairs needs to be reviewed.
- The Theatre is not adequately protected by an automatic sprinkler system and there is no sprinkler coverage below the combustible stage. The current sprinkler protection systems need to be modified to meet NFPA 13.

This initiative does not appear in the 2014-2020 Plan. The initial program scope for the work has been developed.

### **7.3.03 Accessibility Audits**

In August 2014, the AccessAbility Advantage audit team assessed buildings and exterior areas of Grenfell Campus for improvements to accessibility for students, faculty, staff and visitors.

The following buildings and spaces were included in the audit:

- Forestry Centre and Greenhouse
- Fine Arts Building including Theatre and Art Gallery
- Library and Computing Building

- Arts and Science Building including sports facilities
- Bennett and Pittman Residence Wings
- The Portable
- Arts and Science Extension
- 8 Chalet Residences
- New Residence Complex
- 8 parking areas including near the Recplex
- Exterior routes and spaces

A detailed report was provided which highlights the findings and recommendations for each area. The most costly items typically associated with each building involve the installation of: (i) replacement handrails on stairwells; (ii) universal toilet rooms; (iii) comprehensive accessible signage; (iv) visual fire alarms; (v) power door operators; and, (vi) increased width of a percentage of doorways.

This initiative does not appear in the 2014-2020 Plan. The initial program scope for the work has been developed. Issues are being addressed on an item by item basis, as resources permit - for example: the replacement of stair treads on the staircase outside the library with contrast nosing on the leading edge is scheduled to be completed in the Fall of 2016.

## **8.0 PROJECTS FOR FUTURE CONSIDERATION**

### **8.1 St. John`s Campus**

#### **8.1.01 Life Sciences Building (Professional Health Sciences Building)**

This building as described in Section 7.1 of the 2014-2020 Plan was envisaged to house the Faculty of Nursing, School of Pharmacy, School of Social Work and; as well, possibly an Animal Research Centre (animal care facility). Since then, it has been decided that the animal care function would proceed on an independent basis (Section 6.1.6 above refers); however, the Life Sciences Building remains at the concept stage.

##### **8.1.01.1 Faculty of Nursing Consolidation**

The plan is for Memorial`s School of Nursing (MUNSON) and the Centre for Nursing Studies (CNS) to consolidate to form a Faculty of Nursing in St. John`s, and for the Western Regional School of Nursing (WRSON) to be a School of Nursing on Grenfell campus.

It is feasible that nursing consolidation in St. John`s begin with the faculty and students at the Centre for Nursing Studies physically remaining at its current location, the Miller Centre. In this case, Memorial University would need to have a rental agreement with Eastern Health. Alternatively, office space for CNS faculty and classroom space for CNS students could be found on the St. John`s campus – this may be a challenge, especially in the short term. The ideal solution would be for the new Faculty of Nursing to be located in a Life Sciences Building. Section 7.1.1.1 of the 2014-2020 Plan describes the long term space needs of the School of Nursing and continues to be accurate.

##### **8.1.01.2 School of Pharmacy Expansion**

The School of Pharmacy currently occupies approximately 15,000 sq. ft. of space in the Health Sciences Centre and 5,000 sq. ft. of leased space at Tiffany Court. Section 7.1.1.2 of the 2014-2020 Plan indicates that, to fully support the School`s new curriculum and to effectively address new and enhanced academic and research priorities, the School of Pharmacy would require a space allocation of 40,000 sq. ft. in the proposed Life Sciences Building. Accordingly, the School is seeking an additional 20,000 sq. ft. of space. The proposed new building represents the long term plan to address the space deficiency; however, in the interim, the current situation also requires improvement. Section 7.1.8 of this Plan describes the needs in this regard.

##### **8.1.01.3 School of Social Work Expansion**

The Expansion of the School of Social Work has proceeded with additional students enrolled; additional faculty and staff hired; and, relocation from Tiffany Towers to interim space at St. John`s College and Coughlan College. Section 7.1.1.3 of the 2014-2020 Plan describes the long term space needs of the School of Social Work and continues to be accurate. A facility program analysis for the School of Social Work was completed in 2012.

### **8.1.02 Faculty of Law - New Building**

A proposal has been circulated for the creation of a Faculty of Law at Memorial. A concept design and a potential location have been identified for a new building proposed to house the Faculty. It would be a research oriented law school with 80 students a year to be admitted.

This initiative did not appear in the 2014-2020 Plan. The proposal has gone through some consultation stages but, requires approval by Senate and the Board of Regents in order to proceed.

### **8.1.03 Faculty of Science - Facility Issues at Ocean Science Centre**

The Department of Ocean Science is made up of a series of buildings that include the main building, annex, Joe Brown Aquaculture Research Building, the Cold Ocean Deep Sea Research Facility, and storage building/generator facility. The first two buildings house faculty research laboratories and are approximately 50 years old. It is also important to note that the unique location means these buildings can be subject to intense storms that expose them to considerable wind, snow accumulation and sea spray. The combination of age and the harsh environment means that the condition of these buildings needs to be assessed.

The facility also lacks amenities taken for granted at other MUN facilities. It is not connected to city water and sewer service and it lacks potable water. Although drinking water is shipped to the facility, the absence of potable water presents a challenge for the operation of drench showers and eyewash stations. Recently this facility became an academic department with an obligation to offer both graduate and undergraduate programs; however, currently, there are no teaching facilities (teaching laboratories or classrooms) to enable this role; the facility also lacks wireless access.

This facility requires an analysis of its space use to determine what space is required to operate that facility. Simultaneously, a review of the state of the infrastructure of the main building and the annex should be conducted. Consideration should be given as to how best to offer undergraduate courses (e.g., on site, on the main campus, video links to live lectures on campus, stack load courses outside the academic term, etc.).

The 2014-2020 Plan did not address the above noted issues. Section 5.1.5 of that Plan dealt with deficiencies with the seawater intake system.

### **8.1.04 School of Music – Expansion**

The School of Music has long since exceeded the physical capacity of the M.O. Morgan building, which was built in 1985 (Section 7.1.5 of the 2014-2020 Plan refers). Since then, the School has: (i) tripled student enrolment; (ii) tripled its faculty complement; (iii) instituted a full slate of graduate programs (M.Mus., M.A., PhD); (iv) established three research centres (Research Centre for Music Media and Place, Bruneau Centre for Excellence in Choral Music, International Institute for Critical Studies in Improvisation); (v) established the Memorial Electroacoustic Research Laboratory (MEARL); (vi) become a destination for postdoctoral fellows; and, (vii) grown a full-scale opera workshop program.

Additionally, as a case of best practice in public engagement the School: (i) runs 6 community youth programs (Chamber Music for Youth, Junior Band Week, Opera Road Show, MUN Song

Academy, Trumpet Fest, Wind Fest); (ii) hosts the laudable “lab band”, a program that weekly brings elementary school children to Memorial University to work with aspiring music educators; and (iii) plays host to more than 30,000 visitors and concert goers annually.

Having outgrown the M.O. Morgan building years ago, the School relies upon 279 m<sup>2</sup> (3,000 sq. ft.) of leased space in the Arts and Culture Centre, four faculty offices housed in the Science Building, and to maximize space engages in office sharing, limits graduate student office space to those on teaching assignments, and has forgone communal and collaborative spaces for graduate students and faculty. Without expansion, the School cannot accommodate growth in undergraduate or graduate student numbers; nor, can it achieve its goal of achieving a leading position as a truly international, professional school of music.

It is envisioned that an expansion to the School of Music would include: (i) collaborative workspace for interdisciplinary projects; (ii) new space for the MEARL; (iii) 20 new offices for faculty, postdoctoral fellows, staff, and graduate students; (iv) an opera atelier; (v) 20 new practice rooms; (vi) 2 chamber music studios; and, (vii) a large percussion rehearsal and storage facility.

This expansion would facilitate: (i) significantly expanded opportunities for professional development, interdisciplinary projects and entrepreneurial activities within the School’s programs; (ii) significantly expanded opportunities for music and technology applications and projects moving the School into the vanguard of applied music technology centres; (iii) the ability to expand composition and music research offerings to include recording, film music, music cognition, and innovations in music technology; (iv) significantly expanded opportunities for professional development, and high-end productions in Opera and Music Theatre; (v) the establishment of graduate programs in percussion studies and improvisation; (vi) the creation of much needed practice rooms for non-Music students, who are nonetheless serious musicians, to practice and develop their art; (vii) the creation of a world-class, interdisciplinary traditional music program (in cooperation with Arts) that would make Memorial a destination for advanced study and research on fiddle, accordion, folk singing, and other Newfoundland heritage music; (viii) the ability to expand applied music offerings to include jazz programming and attract a new range of undergraduate students; and, (ix) the development of a Preparatory School to build capacity in the community, to make a strong bridge for students preparing to audition, and to provide employment for Masters - prepared graduates of the School’s program.

This initiative remains at the concept stage.

#### **8.1.05 Faculty of Humanities and Social Sciences - Nexus Centre for Collaborative and Interdisciplinary Research**

This is a planned research centre for interdisciplinary research clusters and graduate diplomas for HSS faculty and students. Currently no collective research space exists for the Faculty. The plan is to re-purpose the “research centre” label of the English Language Research Centre for this purpose and locate it in space that is currently under-utilized in the Digital Learning Centre located in the existing Science building. The Centre would host brown bags, guest speakers, tutorials and workshops, and would provide social and resource-sharing space for HSS faculty and graduate students; and, be big enough to provide quiet space and active space (e.g., talks).

This initiative does not appear in the 2014-2020 Plan. It is at the concept stage.

### **8.1.06 Faculty of Humanities and Social Sciences - First Year Success (FYS)**

FYS is currently a pilot project to assist high school students in their transition to university. It involves the teaching of 3 specialized courses, with the addition of various supports (advising, library, tutoring, etc.). The pilot is scheduled to end in 2017.

The office is currently located in the Education Building. The space includes offices for the 2 Directors (one Academic and one Administrative) and a secretary and a small student lounge. A classroom adjacent to the secretary's office has been renovated as part of the FYS project.

The project is currently considering options for moving forward on a permanent basis post-pilot; however, it is understood the current space will need to be vacated and a permanent location located.

This initiative does not appear in the 2014-2020 Plan. It is at the concept stage.

### **8.1.07 Faculty of Education - Teaching Through the Arts Centre**

The Faculty of Education proposes to refit Room ED4013, G. A. Hickman building (Visual Arts Room) to update the learning space to a higher standard and to expand its use as a multi-purpose facility thereby making it accessible to other arts-and communications-based programs and courses.

The state-of-the-art flexible-concept space will provide technologies for teaching and learning (e.g., Smartboard™, lecture capture, etc.), multimedia support, a performance area for drama-in-education learning, appropriate lighting and audio technology, and wall display space for visual art. It will be a lively, engaging space with flexibility in design to accommodate student discussion, innovative projects and seminars. We would also welcome other University units as well as external stakeholders to partner on projects emanating from the Centre.

This initiative will provide a leading-edge learning space to support and house Faculty of Education courses and programs whose objectives relate to undergraduate and graduate-level visual arts education, teaching-through-the arts, drama-based pedagogy,

This initiative does not appear in the 2014-2020 Plan. It is currently at the concept stage.

### **8.1.08 Faculty of Education - Psychology Counselling Centre**

The proposed project involves restructuring the space and enhancing the technology available in four offices and two small classrooms on the third floor of the G.A. Hickman building. This involves installing one-way viewing windows in the walls of the offices so that Faculty and other qualified instructors can directly observe students enrolled in the M.Ed. in Counselling Psychology program as they engage in counselling and assessment activities that are essential components of their graduate training. This developed space will also assist with the development of the counselling focused PhD cohort. Video recording and monitoring equipment will be installed in each of the offices and classrooms spaces so that students can either be directly monitored while engaging in counselling and assessment activities or can record their work to review with their instructor at a later date. It is anticipated that the proposed changes will allow for the creation of a state-of-the-art training facility for students at Memorial University of Newfoundland.



This initiative does not appear in the 2014-2020 Plan. It is currently at the concept stage.

#### **8.1.09 Faculty of Education - Play Based Model Classroom**

The Faculty is seeking to develop a model classroom space to deliver an experiential learning program that is centered on play-based teaching methods. This has been absent from the Faculty's program and needs to be rectified to meet the changes to the Newfoundland and Labrador schooling system with the addition of full day kindergarten and other early years programming incoming over the next ten years.

This initiative does not appear in the 2014-2020 Plan. It is currently at the concept stage.

#### **8.1.10 Faculty of Medicine General Facilities Upgrades – Health Sciences Centre**

The current floor, ceiling, and wall finishes of the Faculty of Medicine space in the Health Sciences Centre are essentially from the original 1970's build. These finishes have significantly deteriorated over the years and need to be repaired or upgraded. Asbestos is present in certain finishes such as the floor tiles and will also need to be removed as a component of the work. There have not been adequate maintenance monies available to refresh the space.

The lack of updating to the Faculty's space in the HSC was identified in Section 7.1.4 of the 2014-2020 Plan; however, this initiative remains at the concept stage.

#### **8.1.11 Deputy Provost (Students) - Ancillary Operations - Emergency Power Improvements to R. Gushue Hall**

Limited emergency power is available at R Gushue Hall, Main Dining Hall, which serves as the primary food service location for residence dining. It is believed that emergency power supply was brought to the basement of the building but never connected. This should be explored further to tie into existing generator supply. Doing so would mitigate risk, align with business continuity planning and ensure critical services are maintained for the residence population.

This initiative does not appear in the 2014-2020 Plan. It is currently at the concept stage.

#### **8.1.12 Deputy Provost (Students) - Ancillary Operations - R. Gushue Hall Renovation**

The R. Gushue Hall's existing "back of house" (receiving, production & prep, kitchen, etc.) is past its useful life and requires a major renovation. An engineering report completed by PHB Group in 2012 stated "it cannot be understated that the existing kitchen facilities at the Main Dining Hall have significantly exceeded their useful life and the entire kitchen and associated M&E infrastructure is in dire need for total replacement." Little to no work has been completed since the report in 2012. Additionally, "front of house" aspects of R. Gushue Hall need updates and improvements including the main seating area; second floor Senior and Junior Common Rooms; and, building envelope issues such as the roof, ceiling, asbestos abatement, lighting, elevator, etc.

This initiative does not appear in the 2014-2020 Plan. It is currently at the concept stage.

### **8.1.13 Deputy Provost (Students) - Ancillary Operations - Future Food Service/Retail Space**

The University Centre operates retail/food locations under a leasing structure; however, all other existing food retail locations across the St. John's campus (excluding at The Works), fall within the contracted food service model. Several of the locations, including the Education cafe, Science cafe, and QEII Library cafe have minimal space, which severely limits any strategic growth in retail service. Ancillary Operations, which has oversight of the food service contract, is keen to explore any and all opportunities to expand and/or relocate existing food retail operations which could result in additional seating, higher traffic, greater production/prep space and other related improvements.

Ancillary Operations cannot achieve this in isolation, and must rely on partnerships and collaboration with Facilities Management, faculties and senior administration. As well, it is suggested that during planning of new buildings; or, major renovations to existing buildings consideration should be given to Ancillary Operations and the overall campus retail environment.

This initiative does not appear in the 2014-2020 Plan.

### **8.1.14 School of Graduate Studies – Accommodations**

International graduate students are much more likely to be married and have children or other dependants than are undergraduate students. Their housing needs are significantly different from the undergraduate population and different from what is currently provided. There is a need to recognize these special needs, including family-friendly housing. A growing trend in university housing is the inclusion of so-called "Live and Learn" spaces that are embedded in the housing complex. These are spaces where students can integrate their classroom and out-of-classroom academic experiences and include such things as computer labs; spaces for seminars and classes; and, social events. Like family-friendly housing, provision of these amenities has been tied to student recruitment and retention. The School's medium to long term recommendations to accommodate further graduate enrolment growth are to: (i) retrofit St. John's or Coughlan College for large grad student dorms: 60-70 beds; (ii) expand the number of beds on campus for graduate students (targeting 400 in total); (iii) include family friendly spaces with kitchen facilities and Live and Learn spaces to include opportunities for teaching English as a Second Language and other academic course (first floor of Corte Real); and, (iv) explore opportunities for day care and other international student supports in the residence.

This initiative does not appear in the 2014-2020 Plan. It is currently at the concept stage.

### **8.1.15 School of Graduate Studies – Collaborative Work Space**

The School of Graduate Studies is actively looking for space that could be converted into a multipurpose study and professional development space for graduate students. As well, there is a need for further work to be undertaken to identify, improve and promote study areas on campus. This proposal stems from the recent findings of the Vice-Presidents' Space Committee which has acknowledged the need for more graduate student study space, the findings of the 2016 Canadian and Professional Graduate Student Survey which note student desire for more study space and opportunities for cross-interdisciplinary collaboration, and consultations with Memorial University Libraries from which we determined current study spaces for graduate and undergraduate honours students are at capacity. The Graduate Student Collaborative Work

Space would complement the general study spaces available to all graduate students in Memorial University Libraries and as well as offices and space made available within academic units.

This initiative does not appear in the 2014-2020 Plan. It is currently at the concept stage.

#### **8.1.16 MUN Botanical Garden – Conservatory**

Construction of a glass structure that will house tropical plants and have the capacity to host groups up to 200, undergraduate labs, school groups, and weddings is proposed. The building is intended to be a research facility that doubles as a public space for revenue generation and to transition the garden from a seasonal attraction to year-round. This initiative did not appear in the 2014-2020 Plan. It is currently at the concept stage.

#### **8.1.17 MUN Botanical Garden – Field Centre/Interpretation Centre**

It is proposed to replace the existing field centre with a new building which will house multiple labs and classrooms and all staff offices. The new facility is intended to be a teaching facility that doubles as a public space for events, programs, and revenue generation. This initiative did not appear in the 2014-2020 Plan. It is currently at the concept stage

#### **8.1.18 MUN Botanical Garden – Research Greenhouse**

A research greenhouse has been identified by multiple faculties at MUN as required infrastructure to expand research interests and grow teaching and learning opportunities. This greenhouse will consist of a number of individual climate controlled sections which will facilitate a variety of research studies to be carried out simultaneously. This initiative did not appear in the 2014-2020 Plan. It is currently at the concept stage

### **8.3 Grenfell Campus**

#### **8.3.01 Land Acquisition**

As Grenfell Campus moves to increase research and graduate programming in Agricultural research, it is expected that a parcel of land that can be developed as an experimental farm will be required. Ideally, the property would be located in the Humber Valley between Corner Brook and Deer Lake. The initial program scope of this initiative has been developed (Section 7.2.1 of the 2014-2020 Plan refers).

#### **8.3.02 Western Regional School of Nursing Consolidation**

A new governance model for nursing schools in the Province is being considered. Under this model, the Western Regional School of Nursing (WRSON) would consolidate with the Grenfell Campus of Memorial University to form a new School of Nursing (Grenfell). Construction of a new facility will be required to facilitate the consolidation and relocation of the WRSON to the Grenfell Campus. The Nursing program is currently located within the Western Regional Hospital which provides administrative space, teaching and clinical areas. In fall 2012, a functional space plan was developed to assess the future needs for Nursing, as well as any affiliated program requirements by Grenfell. The mid-range projection for space requirements predicted a facility of approximately 35,966 m<sup>2</sup> (118,000 sq. ft.) to support an expanded undergraduate class, Masters program, research growth and new outreach opportunities.

This initiative remains at the concept stage (Section 7.2.2 of the 2014-2020 Plan refers).

## 9.0 COMPLETED PROJECTS

This section provides a list of completed projects (generally without further description, except for the section on IT) which have been completed since 2013.

### 9.1 Current Capital Deferred Renewal Program

In 2014/15, 43 projects were undertaken. In 2015/16, 25 projects were undertaken.

### 9.2 Information Technology

Three to four years ago, the Memorial University of Newfoundland (MUN) data center could be characterized as the physical co-location of a number of individual discrete systems set up to enable optimization of operations, and efficiency in sharing as many resources as possible. This evolved instance was based on a legacy of application-driven development, which in turn drove the choice of the operating system and from this usually the hardware. The shift to small modular services supported from common resource pools in the cloud model literally turned this model upside down – a future direction which ITS has prepared for.

MUN's use of virtualization in its first round of adoption has provided a rationalization for this model by enabling different operating systems to be clustered together more efficiently on a single server (cluster of servers). Less servers, with better utilization of each, provides reductions in both direct and indirect (e.g. air-conditioning) power consumption which is generally accepted to be more than half of the overall data centre operating costs. Extending this model to create a 'pool' of servers amongst which these applications on their operating systems can be still further optimized, has been implemented in the MUN data centre using a super server Vcluster concept. This can be described as the start of a private cloud especially since 'virtual machines' can be readily created for new user-driven purposes.

Specific network Infrastructure improvements have been completed as follows:

- Consolidation of MI, Grenfell and St John's campus internet. The University procured a single internet link for all 3 campus locations, resulting in improved service and a cost savings.
- Core network upgrades. Delivering high capacity and improved reliability within MUNet allowed higher speed connections to be supported, and provided a significant increase in ability to move large data sets within the University environment.
- Network Distribution upgrades increased capacity and redundancy.
- Data Center Firewalls. The addition of enterprise firewall equipment to the data center provided a more secure and flexible environment for MUN's server infrastructure.
- Perimeter Firewall and Routing upgrades and Introduction of redundant link. The replacement of the campus firewall and perimeter routing hardware will occur in August/September 2016. This work significantly improves MUN's security posture, increases capacity and redundancy (via the addition of a second link). This improves MUN's ability to meet the needs of researchers, provides increased stability to MUNet, and puts in place the appropriate equipment to secure the network.
- Wireless Coverage increase. The addition of ~200 new wireless coverage access points enabled the upgrade of older existing technology, and growth of the overall campus coverage. These upgrades were carried out in strategic areas such as the University Center, Science Building, Education Building, and the Library. The deployment of newer technology generated significant improvements in speed and coverage for MUN's wireless network.

- Mobility Coverage within the Munnels. In conjunction with MUN's mobility provider cellular coverage was brought to the university tunnel system. This improved both the user experience and safety within these areas. This was delivered at no cost to Memorial.
- Faculty of Medicine Expansion and Genetics Center. ITS worked closely with the Faculty of Medicine expansion project staff to design and deploy a next generation network for the Faculty of Medicine building. This network has been critical in supporting the research and education requirements of this facility. In addition ITS also worked with the Faculty of Medicine to upgrade the network within the HSC areas supported by Memorial. These new additions and upgrades enabled the successful delivery VoIP services to those locations for Memorial faculty and staff. These upgrades have resulted in improved services and cost savings.
- Ocean Science expansion. ITS worked with Facilities to design and deploy network infrastructure to the new OSC building. This involved a significant reworking of existing infrastructure within other OSC buildings, to arrive at a more redundant and reliable network with increased capacity.
- Battery Facility. ITS staff worked closely with Facilities Management and the Office of Public Engagement to design a robust and flexible network for the Battery Facility. ITS has deployed infrastructure to the student residence area and are preparing to deploy further infrastructure to the remaining areas once construction has been completed.
- Macpherson College Network. In conjunction with Facilities Management, ITS worked to design and deploy a comprehensive network for the new student residence. This project resulted in an underlying infrastructure that more than meets the needs of the residence students, and is designed to deliver services for years to come.

### **9.3 St. John`s Campus**

**9.3.01 S.J. Carew Building Expansion (Suncor Energy Offshore Research and Development Centre)**

**9.3.02 Dr. Jack Clark Geotechnical Engineering Building Expansion (C-CORE)**

**9.3.03 New Residence Towers**

**9.3.04 Genetics Research Centre and Faculty of Medicine Expansion**

**9.3.05 Laboratory Life Safety Upgrades**

**9.3.06 Ocean Sciences Centre – Seawater Intake System Upgrade**

**9.1.07 School of Social Work - St. John's College Infrastructure Renewal Project**

**9.1.08 Residence Renovations**

**9.1.09 Upgrade of Underground Tunnel and Demolition of the East Pedway over Prince Phillip Drive**

**9.1.10 Renovation of St. John's College and Coughlan College for School of Social Work**

**9.1.11 Upgrade of Classrooms BN1010 and BN1012 and Study Room BN2004 – Faculty of Business**

**9.1.12 Upgrade of 11 Classrooms - Centre for Innovation in Teaching and Learning**

**9.1.13 Faculty of Humanities and Social Sciences – Student Lounge and Wet Lab**

## **9.4 Marine Institute**

**9.4.01 Campus Master Plan**

**9.4.02 Ridge Road Main Campus, Offshore Operations Simulator**

**9.4.03 Mt. Scio, Lab/office Renovations**

**9.4.04 OSSC, Ship Structure Upgrade**

**9.4.05 OSSC, Helideck Simulator**

**9.4.06 OSSC, Inventory Trailers**

**9.4.07 SERT Centre, Stephenville, Relocation of Launching System**

**9.4.08 Vessel Fleet, Nearshore Training Vessel**

## **9.5 Grenfell Campus**

**9.5.01 Energy Strategy**

**9.5.02 New Residence Building**

**9.5.03 Arts and Science Extension – Atrium**

**9.5.04 Environmental Sciences Research Laboratories**

**9.5.05 Arts and Science Building – Upgrades to Classroom Flooring (Teaching and Learning Fund)**

**9.5.06 Arts and Science Building – Exterior Lighting Upgrade**

**9.5.07 Arts and Science Building – Mechanical HVAC Replacement (Gymnasium)**

**9.5.08 Arts and Science Building – Food Court Upgrade Including Mechanical and Electrical Upgrades**

**9.5.09 Forest Centre – Windows and Glulam Beam Repair and Upgrades**

**9.5.10 Forest Centre – Danger Tree Project and Courtyard Upgrades**

**9.5.11 Forest Centre – HVAC Upgrades**

**9.5.12 Chalet Siding Repairs**

## **10.0 List of Appendices**

**Appendix 1 - Blank Project Brief Template**

**Appendix 2 - Project List**

**Appendix 3 – Project Brief Submissions**

**Appendix 4 - Multi-Year Infrastructure Template**

**Appendix 5 – Deferred Maintenance 5 Year Plan**