Faculty of Engineering and Applied Science
Post–Secondary Education Review

Background
Starting in 2012, and reiterated by the NL Government in its 2016-17 provincial budget, the Province made a commitment to an 8-year engineering expansion strategic initiative. Over a period of 8 years, this growth plan called for an increase of undergraduates from 155 to 250 graduates per year (+12 per year); graduate students from 360 (+36 per year) to 650; faculty complement from 61.5 to approximately 100 (+5 per year); and 24 staff positions (+3 per year).

The government has funded up to Year 4 (i.e., 4 of 8 years) but then “paused” since the 2016-17 budget. This became very problematic because larger cohorts of students were already admitted on the basis of the Province’s commitment to the full 8 years of growth funding. Essentially the students were admitted, without sufficient resources for those enrolments, yet students could not be released from the programs. At a time when there was a significantly growing demand for more engineering graduates, shrinking resources have required the Faculty to contract, delete faculty and staff positions, close courses, and reduce student admissions.

Diversifying the Economy to Support Job Creation and Economic Growth
Going forward, it is important to finish the Province’s original commitment by supporting Years 5 – 8 of the engineering expansion. This expansion is well aligned with the Province’s strategic plan, the Way Forward, and labour-market needs. Continuation of the growth plan would provide the necessary resources to increase the undergraduate enrolments in key areas of high demand by employers in the knowledge economy, such as Computer Engineering. It would also support growth of other key sectors in the province, for example, energy, ocean technology and mining. This specialized expertise is a key enabler of new offshore projects in a low oil price environment, such as the Bay du Nord, which involves significant engineering and logistics challenges of harsh ocean environments, ice management, offshore structures and remote distances.

The engineering expansion has also enabled other new interdisciplinary initiatives and partnerships across the university and externally that have wider benefits to diversify the economy and support job creation. In 2014, a new Memorial Centre for Entrepreneurship (MCE) was significantly enabled by growth funding to engineering. New joint initiatives and curriculum offerings in biomedical engineering (with the Faculty of Medicine) have led to a number of innovative health technology solutions. The Faculty of Engineering and Applied Science aims to expand these cross-disciplinary opportunities, for example, Artificial Intelligence, in partnership with other faculties / schools including, but not limited to, Science and Humanities and Social Science.

Supporting Growth in the Technology Sector
The Faculty of Engineering and Applied Science is a hub of vibrant student activity which is creating many new technology startup companies, e.g., Verafin, CoLab Software, Mysa,
BreathSuite, Solace Power, etc. Engineering expansion is a cornerstone in the Premier’s mandate letter objective of “creating an environment that captures the full potential of our province’s many riches, through diversification, job creation and growth” and “growing a culture of entrepreneurship and innovation (that) presents tremendous economic potential for our province.”

The Memorial Centre for Entrepreneurship (MCE) was recently named one of the top five emerging entrepreneurship centres in the world by the Global Consortium of Entrepreneurship Centers. Mysa is a recent technology startup company co-founded by Zachary Green (Mechanical '16), and his brother Josh, which produces smart thermostat products. Their company was recently selected as one of Canada’s top 20 early stage companies. Brett Vokey (Mechanical ’19), Founder and CEO of BreathSuite, recently secured $550K of venture capital investment from Pelorus Venture for developing digital health solutions and medical inhaler devices. Co-founders of CoLab Software, Adam Keating (Mechanical ‘17) and Jeremy Andrews (Mechanical ‘17), received $2.7 million in financing for their startup company which is setting a new global standard for design software.

Investing in the Workforce

There will be a large and growing need for more engineers across Canada over the next decade. A 2015 labour market study by Engineers Canada projected over 12,000 new job openings annually to 2025 due to growth in traditional and emerging new industries that employ engineers and replacement of retiring engineers. According to a past study by the NL Department of Advanced Education and Skills, about 90 per cent of MUN’s engineering graduates secure engineering employment within six months of graduation (remainder afterwards or graduate studies) with 84 per cent of the graduates remaining in the province.

There is a growing need for more engineers with specialized expertise in emerging technologies of strategic importance to NL industry and the province. Major engineering challenges need to be overcome for new projects to be developed such as Bay du Nord (i.e., deep waters, icebergs, 25-30 m waves) since complex offshore structures have never been designed or built in such harsh environments. Software, communications and subsea fibre-optic cable systems are significant drivers of these projects. Engineering R&D growth at Memorial is essential to be able to develop the highly qualified personnel that can move the "factory" to the seafloor in future projects such as Hibernia and West White Rose subsea extensions.

The Engineering Expansion Strategic Initiative has successfully completed up to Year 4 of 8 but then was paused by the NL Government in 2016-17. It is important to complete this Government commitment for Years 5 – 8. The continued expansion of engineering would bring many significant contributions and benefits to the Province. In today’s global economy, engineering innovation is key for the province to compete and export technologies to other countries. With global problems like climate change, declining resources and water shortages, the need for continuous engineering innovation has never been more critical. “To compete globally, you need to stay ahead. The secret to building an innovative economy – in a word: engineers” (Maclean’s magazine, September 2013).