Legislative Assembly of Ontario

Assemblée législative de l'Ontario

STANDING COMMITTEE ON PUBLIC ACCOUNTS

UNIVERSITY INTELLECTUAL PROPERTY

(Section 3.14, 2015 Annual Report of the Office of the Auditor General of Ontario)

2nd Session, 41st Parliament
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The Honourable Dave Levac, MPP
Speaker of the Legislative Assembly

Sir,

Your Standing Committee on Public Accounts has the honour to present its Report and commends it to the House.

Ernie Hardeman, MPP
Chair of the Committee

Queen's Park
April 2017

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2nd Session, 41st Parliament

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PREAMBLE

On November 23, 2016 the Standing Committee on Public Accounts held public hearings on the audit (Section 3.14 of the Auditor General's 2015 Annual Report) of University Intellectual Property as funded, in part, by the Ministry of Research, Innovation and Science.

The Committee endorses the Auditor's findings and recommendations, and presents its own findings, views, and recommendations in this report. The Committee requests that the Ministry of Research, Innovation and Science provide the Clerk of the Committee with written responses to the recommendations within 120 calendar days of the tabling of this report with the Speaker of the Legislative Assembly, unless otherwise specified.

ACKNOWLEDGEMENTS

The Committee extends its appreciation to officials from the Ministry of Research, Innovation and Science and the Ministry of Economic Development and Growth, as well as representatives of the University of Toronto, McMaster University, and the University of Waterloo. The Committee also acknowledges the assistance provided during the hearings and report writing deliberations by the Office of the Auditor General, the Clerk of the Committee, and staff in the Legislative Research Service.

BACKGROUND

Ontario has 21 publicly-supported universities (including the federally-funded Royal Military College of Canada). Universities conduct research independently, collaboratively with other organizations, or in contractual partnerships with industry. Research funding for universities is supported by government grants as well as corporate and individual donations, and university investment and endowment income. Over the five years preceding the audit, Ontario universities received approximately 15% of their total research funding from the Province, 48% from the federal government, 26% from private non-government sources, and 11% from other income such as donations and investments.

The audit focused specifically on the management of inventions and scientific discoveries generated from university research activities that can potentially be protected as intellectual property and brought to market. (Only a small proportion of all university research activity results in intellectual property with potential for commercialization.)

Intellectual property (IP) refers to creations of the mind such as a discovery or invention ("a new and useful art, process, machine, manufacture or composition of matter"), research data or tool, technology, process, proprietary information, know-how, or trademark related to any of these. **Commercialization** refers to the set of activities bridging the gap between an idea or invention and the creation of a definable and marketable product or process.

Each university generally has a vice-president of research who is responsible for managing and coordinating the university's research and commercialization activities. The vice-president of research typically oversees three offices: the research office, the research ethics board, and the technology transfer office.

Technology transfer offices help faculty, and postdoctoral and graduate student researchers to commercialize their inventions and discoveries through various activities such as securing IP protection, evaluating IP for commercial potential, and acting as an agent to represent the interests of both the institution and the inventor. In exchange for this assistance, and in accordance with the university's policies, inventors often agree to give up some or all of their rights to ownership and/or future profits to the university.

The three universities selected for the audit each have a different model of IP ownership and profit-sharing:

- The University of Toronto has a joint ownership model, where IP is owned jointly by the university and the inventor at the time of creation, unless these rights have been given up (in whole or in part) to a third party under a prior written agreement. In the case of inventors who want university assistance and support with commercialization, ownership is assigned to the university. (In such cases, when the university commercializes, 60% of the resulting income goes to the inventor and 40% to the university.) Sole ownership is assigned to inventors who choose to commercialize through their own efforts.

- Under McMaster University's model, the university owns IP rights unless these rights have been assumed by a third party under a prior written agreement. The inventor (academic researchers only) must get approval from the IP board in order to get sole ownership. When the university commercializes, 50% of the resulting income goes to the university and 50% to the inventor or is reinvested in future research.

- The University of Waterloo gives sole ownership to the creator(s) unless rights have been ceded to a third party under a sponsorship agreement. When the university commercializes, generally 75% of the resulting income goes to the inventor and 25% goes to the university (with half of this amount flowing back to the originating faculty).

Innovation Agenda

The Province's efforts to catalyse innovation and commercialization are guided by the 2008 Innovation Agenda, which included an announcement of close to $3 billion in funding to be spent over eight years. The Ministry of Research, Innovation and Science (Ministry), known as the Ministry of Research and Innovation at the time of the audit, is the lead ministry responsible for advancing the Agenda.

The Ministry's commercialization programs are intended to provide services such as access to capital, business acceleration, mentoring, training, and networking

to researchers, companies, and entrepreneurs. The Ministry does not provide funding directly to universities to commercialize IP. Instead, the Ministry funds a network of organizations, including the Ontario Centres of Excellence (OCE), MaRS, regional innovation centres, and sector innovation centres (known collectively as the Ontario Network of Entrepreneurs or ONE program) that, in turn, funds and/or provides these services.

Research Funding

Federal Research Funding

Most federal research funding flows through what are known as the Tri-Council Agencies: the Canadian Institute for Health Research (CIHR), the National Science and Engineering Research Council (NSERC), and the Social Sciences and Humanities Research Council (SSHRC). Other significant funders include the Canada Foundation for Innovation and the Canada Excellence Research Chairs. In 2013/14 these agencies collectively provided universities with 80% of their total federal funding for research.

Provincial Research Funding

In the fiscal year 2013/14 fifteen provincial government ministries, agencies, and organizations delivering government services collectively provided $343 million in research funding to universities. The largest funding providers were the Ministries of Research and Innovation; Health and Long-Term Care; Agriculture, Food and Rural Affairs; and Training, Colleges and Universities (now the Ministry of Advanced Education and Skills Development).

In 2014/15 the Ministry of Research and Innovation provided $276 million in research grants. Universities received 48% of this funding, not-for-profit research organizations received 39%, research hospitals received 12%, and colleges received 1%. In addition, the OCE received $49 million and MaRS received $17.3 million to deliver various initiatives. Corporate income tax credits were also offered to businesses to invest in research and innovation in universities, other research institutions, and the private sector, costing the Province $193 million in refundable tax credits in 2014/15 and an estimated $170 million in forgone corporate income tax revenue in 2014.

AUDIT OBJECTIVES AND SCOPE

The audit objectives were to assess whether

- the Ministry of Research and Innovation has coordinated and put effective processes in place to provide research funding to universities, monitor the use of research funding, and assess the benefits to Ontarians; and

- select universities have effective processes in place to manage intellectual property generated from university research, including identifying, protecting, assessing, and commercializing intellectual property.

The audit was conducted primarily at the Ministry, and at the technology transfer offices of the University of Toronto, McMaster University (Hamilton), and the University of Waterloo (which collectively received nearly half of all university research funding from the Province in 2013/14).

MAIN POINTS OF AUDIT

In 2008 the Province decided that it needed to extract more value from all provincial investments in research, including from university research, and made the Ministry accountable for achieving this objective. Over the five years preceding the audit, universities received an estimated total of $1.9 billion in provincial research funding. (This amount excludes Ministry funding provided to service delivery agents like regional innovation centres for commercialization services and tax incentives to private companies that invest in university research.)

The Auditor found that the Ministry

- does not coordinate the Province's investments in research and innovation;
- did not know the total amount of provincial funding (across all ministries and agencies) provided annually, either directly or indirectly, for research and commercialization activities;
- lacks key information from other research-granting ministries and agencies;
- lacks key information from service delivery agents, such as the Ontario Centres of Excellence, which receive Ministry funding to provide commercialization support to universities;
- has not been attempting to measure the extent to which value has been created from provincial investments in research; and
- has not developed a strategy and action plans to monitor efforts to address previously identified barriers to commercialization.

In addition, the Auditor found that the provincial government has virtually no rights to intellectual property resulting from the research it funds.

The Auditor notes:

> Without knowing the payback from either benefits to society or economic benefits through commercialization activities, it is difficult for the government to determine whether it is getting value for money from its significant investment in university research.

With respect to universities, the Auditor found that

- while universities do track key commercialization indicators and results of their technology transfer offices, they do not yet

measure the socioeconomic impact of their research activities and commercialization efforts;

- patent protection may not always be taken out on a timely basis at the universities, increasing the risk that others may obtain a patent based on publicly communicated information about the invention;

- none of the technology transfer offices visited by the Auditor's staff highlighted revenue generation as a driving force (in most years they spent more on operating costs than they gained from IP holdings, before distribution to inventors and other parties; in a number of cases there were delays in the collection of revenues from IP revenue generating agreements); and

- in technology transfer offices, documentation was not available to confirm that formal processes were used to assess the feasibility of commercialization and track decisions made and actions taken.

ISSUES RAISED IN THE AUDIT AND BEFORE THE COMMITTEE

The Committee heard that the Province recognizes that Ontario's capacity to compete globally depends on how well it harnesses its research, innovation, and entrepreneurial strengths. Canada ranks sixth in the world in the quality and impact of research, with Ontario comprising nearly half of the national research enterprise.

Ministry officials noted that they are constantly reviewing and evolving their approach to research funding, including looking at what research is being funded, how to commercialize the research, and how to build an innovation system that helps entrepreneurs start companies, get financing, and bring products to market. They mentioned that provincial funding builds on, and leverages, federal research funding.

University representatives agreed that it is important to raise awareness of IP and commercialization among faculty researchers and graduate students. New faculty members and graduate students at the University of Waterloo, for example, are offered workshops about IP issues.

University representatives acknowledged that their institutions' IP policies do not make generating revenue for the university a priority.

While the University of Waterloo's model of creator-owned IP gives the owner an incentive to commercialize, the University believes that the economic gain for the creator is dwarfed by the economic benefits for the region and the broader economy.

McMaster University's IP policy focuses on helping inventions become commercially viable. While the University owns the IP, McMaster's representative explained, there is still a large component of shared IP with the inventor; in some cases the University will waive rights to the IP.

A University of Toronto representative explained why a strictly inventor-owned approach to IP is not always appropriate. For example, new drugs or medical devices can have a very long pathway to commercialization, involving regulatory approval, clinical trials, and patenting costs which altogether may cost millions of dollars. In such cases, faculty members would likely need financial and other assistance.

Tracking Total Funding for Research and Innovation

The Auditor recommended that as the lead ministry in ensuring that Ontario's efforts to strengthen its innovation culture are coordinated and comprehensive, the Ministry of Research, Innovation and Science should establish processes to track and monitor the total direct and indirect provincial funding for research and innovation and the new technologies and inventions resulting from that funding.

In response to these recommendations, the Ministry has designed a research inventory tool to track provincial funding of research activities across all government ministries province-wide. The tool identifies current research funding programs and captures the number of research projects supported, the nature of the scientific activity, the types of IP tracked by ministries, and the total funding amounts spent over the fiscal year, as well as the proportion of this total allocated towards the direct and indirect costs of research.

Committee Recommendation

The Standing Committee on Public Accounts endorses the Auditor's recommendation that:

1. **The Ministry of Research, Innovation and Science implement a process to regularly track and monitor total direct and indirect provincial funding for research and to track the new technologies and inventions resulting from provincial research funding across all ministries and agencies.**

Innovation Agenda

The Auditor recommended that the Ministry should develop and implement a multi-year plan covering the Innovation Agenda's strategic direction as well as provincial goals and initiatives on research and innovation. The plan should provide enough detail to clearly summarize the deliverables, and establish timelines and targets to deliver on key strategies, initiatives, and research and innovation programs.

The Auditor noted that the Province committed to developing a scorecard to measure and report on the progress of its investments in innovation and make comparisons with other jurisdictions. In 2010 the scorecard measured the Province's performance against 23 key indicators based on data available at the time but the results were not made public. In order to assess progress made on the Innovation Agenda and provide comparisons between Ontario and its peer jurisdictions, the Auditor recommended that the Ministry periodically conduct assessments against the indicators in the scorecard and report the results publicly.

The Committee asked about progress on the Innovation Agenda. Ministry representatives explained that although there is no multi-year plan stemming directly from the Agenda, the Ministry has been implementing strategies, policies, programs, services, and initiatives that are consistent with the direction laid out in the Agenda. For example, the Ministry is

- extracting value through supporting initiatives such as the Ontario Research Fund and the Ontario Centres of Excellence academic-industry programs;

- focusing on global market opportunities through supporting investments in research and development, innovation, and productivity including the Jobs and Prosperity Fund, the strategic investment framework, cluster legislation, clean technology innovation, and other targeted investments and partnerships with Ontario's globally competitive sectors;

- leveraging skills and knowledge through the Ministry's Early Researcher Award program and ongoing work across government to develop strategies for skills in the knowledge-based economy; enhancing supports provided to Ontario entrepreneurs; and

- working in close collaboration with ministries across government to create a business-friendly, competitive environment for businesses to grow in Ontario, including assessment of the business tax environment and the modernization of Ontario's regulatory system.

The Ministry elaborated that planning for programs and initiatives is guided by the development of annual plans, financial allocations, and performance metrics that are tailored to the specific objectives of each program. Under the new provincial Program Review, Renewal and Transformation process (announced in the 2016 budget), the Ministry is guided by key government priorities including five-year financial planning and the redesign of programs to focus on high-growth and high-impact innovative export-driven firms. This effort includes development of key performance indicators.

Recently, the Ministry has been working collaboratively across government and between ministries on key initiatives in strategic innovation areas including the Ontario Health Innovation Council, the climate change action plan, the Premier's Highly Skilled Workforce Expert Panel, and the digital infrastructure broadband strategy.

The Ministry will continue to develop strategies, policies, programs, and initiatives consistent with the Innovation Agenda. At the same time, the Ministry must continually adapt to a rapidly changing global economic environment that requires Ontario to invest in new areas of disruptive technology, scale-up firms, and innovation to ensure the Province's long-term competitiveness.

Committee Recommendation

The Standing Committee on Public Accounts endorses the Auditor's recommendation that:

2. **The Ministry of Research, Innovation and Science**

    a) **develop a multi-year implementation plan (including a timeline and deliverables) covering the Innovation Agenda's strategic direction as well as provincial goals and initiatives on research and innovation; and**

    b) **conduct periodic assessments against the indicators in the scorecard and report the results publicly.**

Commercialization Strategy

The Auditor recommended that the Ministry should consult again with stake-holders for a current review of barriers to the commercialization of IP, develop a strategy and action plan with a timeline for implementation, and monitor its progress on addressing those barriers.

Ministry representatives noted that commercialization is a multifaceted process involving connections between start-ups, small and medium-sized firms, large companies, research institutions, investors and intermediary organizations, and end-users. The Ministry continues to examine and assess barriers to the commercialization of IP and is working to improve the commercialization support ecosystem to ensure that IP is developed and is creating value in Ontario.

Regarding proposals to increase the level of government involvement in IP, Ministry officials expressed concerns that this would serve only to slow down the process of getting new inventions into the economy where they improve productivity and help to create jobs. They noted that government reaps employment and tax benefits from successful companies that are able to scale up quickly. University representatives echoed this concern, noting that their priority is to get new technologies into the marketplace where they can benefit Ontarians and Canadians.

The Auditor recommended that the Ministry take steps to ensure that it is getting value for money for its investment in research and commercialization activities. The Ministry agreed to continue to assess the merit of publishing an innovation scorecard or other comparative benchmark measures. The Ministry will also continue to refine and update its performance indicators, and evaluate Ontario's progress on research and innovation against peer jurisdictions.

The Ministry's new Business Growth Initiative strategy (announced in the 2016 budget) focuses on three areas: scaling up companies; developing Ontario's innovation ecosystem by fostering the development and marketing of new technologies such as nanotechnology and artificial intelligence; and regulatory modernization. (**Innovation ecosystem** is the term used to describe the large and diverse array of people and resources that contribute to and are necessary for ongoing innovation in a modern economy.)

In partnership with the Centre for International Governance Innovation, the Ministry convened a roundtable on IP to explore how Ontario can contribute to strengthened IP protection and strategic management strategies in Canada to support innovation and commercialization. As a next step the Ministry was planning to hold an IP round table in December 2016.

The Committee heard that the Ministry is seeking to accelerate the pace of technology creation, adoption, and commercialization through programs designed to create collaborative links between users and producers of innovation, such as the Strategic Partnerships Stream of the Jobs and Prosperity Fund, and programs under the auspices of the Ontario Centres for Excellence including On-Campus Entrepreneurial Activities, and the Industry-Academic Collaboration Program.

Committee Recommendation

The Standing Committee on Public Accounts recommends that:

3. **The Ministry of Research, Innovation and Science should evaluate and address any identified barriers to commercialization including those identified during the IP roundtable discussions in December 2016.**

Measuring and Reporting Research Impact

The Auditor found that several improvements are needed in measuring the impact of the Ministry's investments in research and commercialization. In order to ensure that the Ministry is getting value for money for its investment in research and commercialization activities, the Auditor recommended that the Ministry should

- track what portion of research funding goes to basic versus applied research, and develop appropriate indicators for each type of research;
- collaborate with stakeholders to develop collectively useful performance measures that assess the socioeconomic benefits to Ontarians;
- increase the reliability of performance results by implementing measures to increase the response rate from clients receiving commercialization supports and developing processes to eliminate duplicate reporting; and
- publicly report performance results on research funding and commercialization programs.

The Committee heard that the Ministry is continuously improving its data collection methodologies as well as its approaches to increasing client survey response rates. The Ministry has created performance reports on its major funding programs: the Ontario Research Fund–Research Excellence and Ontario Research Fund–Research Infrastructure, and is also exploring options for publicly reporting its program achievements.

The Auditor found that the Ministry does not distinguish between funding for basic and applied research. Basic research (also called pure research) advances scientific understanding but does not usually involve inventions or discoveries with commercial potential. Applied research builds on the knowledge acquired through basic research to solve practical problems, or develop new processes, inventions, or technology that may have commercial potential. Different performance indicators are needed for basic and applied research. The Ministry explained that a new tool to track the portion of research funding that goes to basic versus applied research is currently being piloted by the University of Toronto and McMaster University.

The Auditor found that, like many other jurisdictions, the Ministry lacks a mechanism for measuring the broader socioeconomic impact or benefits of research to Ontarians. Examples of such benefits include improvements in health care technology and treatments, and improvements in infrastructure technology or agricultural production.

Ministry representatives explained that an assessment of the potential socioeconomic impact of proposed research is part of the rigorous peer review process undertaken for every funding proposal. It was noted that while it can be very difficult to quantify the broader socioeconomic impact of university research, it is possible to assess the impact of research investments in specific areas such as health care. As an example, Ministry officials pointed to research conducted by the Ontario Institute for Cancer Research which produced best-practice surgical treatment recommendations that, once adopted, resulted in significant savings for the provincial health care system.

The Committee heard that while there is currently no gold standard method for measuring the socioeconomic impact of research, the Ministry has been working with stakeholders to better develop indicators for impact assessment. At the Ministry's request, the Council of Canadian Academies convened the Expert Panel on the Socioeconomic Impacts of Innovation Investments (Expert Panel) whose 2013 report addressed the complexities of, and made recommendations for, measuring the impacts of investments in innovation. The Ministry is currently conducting a jurisdictional scan to develop a framework for assessing socioeconomic impact.

University representatives emphasized the difficulty of tracking specific provincial investments into university research that may result in IP. They explained that a principal investigator usually works on a number of research projects, receives funding from a number of different agencies and generally has five or six graduate students and several postdoctoral researchers working on these projects over many years. Some of these projects will result in IP and some will not.

The Committee heard that through contract agreement reporting, the Ministry tracks the commercialization potential of projects during the time frame of the contract (for example, patents filed). However, because Ministry funding supports projects in the early stage of research, most innovations have not moved to the marketplace during the period covered by the research contract. Once the funding agreement ends, institutions are no longer under contractual obligation to report to the Ministry. Staff explained that it would be very difficult, time-consuming, and costly to try to track patents beyond this point given that a

project may receive funding from multiple sources and may take more than five years to reach a point where commercialization is viable.

However, in an effort to better understand how Ministry-funded innovation research evolves, the 2016 contract extensions include a requirement for its ONE tech-based entrepreneurial delivery partners to collect Canada Revenue Agency Business Numbers in order to

- track a client's success beyond their 5-10 years of provincial programming supports;
- compare clients who have received provincial supports to clients who have not in order to assess the impact of these supports on client success;
- understand the total number of various provincially-supported organizations a client has engaged with; and
- develop a model that removes double-counting of client impacts and economic outcomes.

Committee Recommendation

The Standing Committee on Public Accounts endorses the Auditor's recommendation that:

4. **The Ministry of Research, Innovation and Science work with universities to develop socioeconomic performance measures to be used in publicly reporting the outcomes of university research and commercialization efforts.**

IP Rights

The Auditor General recommended that the Ministry explore the pros and cons of including provisions in selected research funding agreements so that the government might share in the future sale or licensing of resulting IP and/or have the non-exclusive right to use the IP royalty-free for non-commercial internal purposes, where this may be of value. The Auditor General also recommended that universities and/or their technology transfer offices should ensure that faculty members and researchers are made aware of the importance of properly protecting IP.

The Committee asked whether the Province should look for a direct return on investments in IP. The Ministry's view is that Ontario's current approach to IP ownership is consistent with federal policy, academic and industry preference, as well as best jurisdictional practices elsewhere. Ontario's approach is based on the principle that government ownership of IP is costly and may be an impediment to commercialization and innovation.

At the same time, the Ministry recognizes that improvements in the current IP framework would attract capital to help Ontario companies scale up more rapidly and improve their global competitiveness. Rather than focusing on ownership, the Ministry is exploring ways to promote the availability of IP services for Ontario businesses and entrepreneurs.

Ministry officials also noted that the regulation and administration of IP law in Canada is a federal responsibility. For this reason, Ontario will engage in discussions with the federal government on potential collaboration and strengthening of IP in Ontario's innovation ecosystem.

In partnership with the Centre for International Governance Innovation the Ministry has convened two roundtables that brought together leading experts to explore whether the Province might play a more direct role in the IP protection and strategic management in order to support innovation and commercialization.

The Committee also asked how Ontario's IP regime compares to that in other jurisdictions. University representatives noted that under the Bayh-Dole Act in the United States, any university or institution sponsoring publicly-funded research has ownership of IP rights. However, Ministry representatives said they are not aware of any international jurisdiction where the government itself owns the IP for government-funded research inventions.

Committee Recommendations

The Standing Committee on Public Accounts endorses the Auditor's recommendations that:

5. **The Ministry of Research, Innovation and Science work with Ontario universities to ensure that**

   a) **university researchers are aware of the importance of protecting intellectual property; and**

   b) **technology transfer offices implement processes to ensure the timely implementation of commercialization assessments of intellectual property disclosures and patent protections.**

6. **The Province should revisit and assess the pros and cons of including provisions in selective research funding agreements that would allow it to share in future income from the sale or licensing of resulting intellectual property, and/or to have the non-exclusive right to use the intellectual property royalty-free for non-commercial internal purposes, where there may be value to doing so.**

Performance Measures

The Auditor General recommended that, in conjunction with government sponsors, universities should develop socioeconomic performance measures to better communicate the outcomes of their research and commercialization efforts.

The Committee heard that the Ministry consults reports by government-funded independent research bodies that measure and report on Ontario's economic performance, competitiveness, productivity, and innovation in comparison to peer jurisdictions.

The Ministry regularly monitors the progress of Ontario's innovation performance by tracking performance measurements such as patents, private-sector and public-sector research and development personnel, and research infrastructure investment using publicly available sources that include Statistics Canada, Thomson Reuters, the Canadian Foundation for Innovation, and Tri-Council publications.

The universities generally agreed to continue identifying and developing performance metrics.

Committee Recommendation

The Standing Committee on Public Accounts recommends that:

7. **The Ministry of Research, Innovation and Science work with Ontario universities to regularly and publicly report performance results on research funding and commercialization programs.**

Commercialization Activities at Universities

The Auditor recommended that universities

- ensure that all IP created with university resources is disclosed;
- develop a formal process to reassess decisions on the commercial potential of IP and permit efficient management review of commercialization decisions;
- help ensure that commercialization assessments are completed within a reasonable timeframe to avoid delays in patent filings and to ensure that IP is properly protected; and
- manage costs incurred in the effort to commercialize IP; and help ensure the timely and accurate collection of revenue owing.

University representatives described the steps they have taken, and plan to take in the future, in response to these recommendations. The universities agreed that it is important that all IP created with university resources is disclosed. They noted that while early patenting may be desirable, there are complex factors which may inform an IP protection strategy and the optimal timing of various steps. The universities endorsed the value of reviewing commercialization decisions and agreed with the Auditor's recommendations regarding management of costs.

The Committee heard that the Ministry is seeking the advice of an international review panel in evaluating the effectiveness of ONE, Ontario's key commercialization support system. ONE comprises 18 regional innovation centres that strengthen the relationship between entrepreneurs and investors. Perhaps the best known of these centres are MaRS in Toronto, Communitech in Waterloo, and Invest Ottawa in Ottawa. This evaluation will include an assessment of any barriers to commercialization.

Committee Recommendation

The Standing Committee on Public Accounts endorses the Auditor's recommendation that:

8. **The Ministry of Research, Innovation and Science work with Ontario universities to ensure that**

    a) **all intellectual property created using university resources is disclosed to the appropriate university office;**

    b) **commercialization assessments are completed within a reasonable timeframe;**

    c) **there are no unnecessary delays in patent filings; and**

    d) **there is a process to manage costs incurred in the effort to commercialize intellectual property and for the timely and accurate collection of revenue owing.**

CONSOLIDATED LIST OF COMMITTEE RECOMMENDATIONS

The Standing Committee on Public Accounts recommends that:

1. **The Ministry of Research, Innovation and Science implement a process to regularly track and monitor total direct and indirect provincial funding for research and to track the new technologies and inventions resulting from provincial research funding across all ministries and agencies.**

2. **The Ministry of Research, Innovation and Science**

   a) **develop a multi-year implementation plan (including a timeline and deliverables) covering the Innovation Agenda's strategic direction as well as provincial goals and initiatives on research and innovation; and**

   b) **conduct periodic assessments against the indicators in the scorecard and report the results publicly.**

3. **The Ministry of Research, Innovation and Science should evaluate and address any identified barriers to commercialization including those identified during the IP roundtable discussions in December 2016.**

4. **The Ministry of Research, Innovation and Science work with universities to develop socioeconomic performance measures to be used in publicly reporting the outcomes of university research and commercialization efforts.**

5. **The Ministry of Research, Innovation and Science work with Ontario universities to ensure that**

   a) **university researchers are aware of the importance of protecting intellectual property; and**

   b) **technology transfer offices implement processes to ensure the timely implementation of commercialization assessments of intellectual property disclosures and patent protections.**

6. **The Province should revisit and assess the pros and cons of including provisions in selective research funding agreements that would allow it to share in future income from the sale or licensing of resulting intellectual property, and/or to have the non-exclusive right to use the intellectual property royalty-free for non-commercial internal purposes, where there may be value to doing so.**

7. **The Ministry of Research, Innovation and Science work with Ontario universities to regularly and publicly report performance results on research funding and commercialization programs.**

8. The Ministry of Research, Innovation and Science work with Ontario universities to ensure that

a) all intellectual property created using university resources is disclosed to the appropriate university office;

b) commercialization assessments are completed within a reasonable timeframe;

c) there are no unnecessary delays in patent filings; and

d) there is a process to manage costs incurred in the effort to commercialize intellectual property and for the timely and accurate collection of revenue owing.