

Chapter 3

Section 3.08

Ministry of Economic Development, Job Creation and Trade

University Intellectual Property

Standing Committee on Public Accounts Follow-Up on Section 3.14, 2015 Annual Report

The Committee held a public hearing on November 23, 2016, on our 2015 audit of University Intellectual Property. The Committee tabled a report on this hearing in the Legislature in April 2017. The report can be found at www.auditor.on.ca/en/content/standingcommittee/standingcommittee.html.

The Committee made eight recommendations and asked the then Ministry of Research, Innovation and Science, now the Ministry of Economic Development, Job Creation and Trade, (Ministry) to report back by mid-August 2017. The Ministry formally responded to the Committee on

August 8, 2017, and included responses from the three universities we audited in 2015: McMaster University, University of Toronto and University of Waterloo. A number of the issues raised by the Committee were similar to the audit observations in our 2015 audit. In February 2018, our Office asked the Ministry to provide an update on the status of actions taken to address the Committee's recommendations. The updated status of the Committee's recommended actions is shown in **Figure 1**.

We conducted assurance work between April 1, 2018, and June 22, 2018, and obtained written representation from the Ministry that, effective

Figure 1: Summary Status of Actions Recommended in April 2017 Committee Report

Prepared by the Office of the Auditor General of Ontario

	# of Actions Recommended	Status of Actions Recommended				
		Fully Implemented	In Process of Being Implemented	Little or No Progress	Will Not Be Implemented	No Longer Applicable
Recommendation 1	1		1			
Recommendation 2	2			1	1	
Recommendation 3	1			1		
Recommendation 4	1			1		
Recommendation 5	2	2				
Recommendation 6	1				1	
Recommendation 7	1		1			
Recommendation 8	4	2 1/3	1 2/3			
Total	13	4 1/3	3 2/3	3	2	0
%	100	33	28	23	16	0

October 31, 2108, it has provided us with a complete update of the status of the recommendations made by the Committee.

Overall Conclusion

As of June 22, 2018, the Ministry had either fully implemented or was in the process of implementing 61% of the Committee's recommended actions. However, there has been little or no progress on 23% of the recommended actions. For example, the Ministry had not developed a multi-year implementation plan for the strategic direction developed by the government or socio-economic performance measures to be used in publicly reporting the outcomes of university research and commercialization efforts. In addition, 16% of the recommended actions will not be implemented. For example, the Ministry does not intend to publicly

report the results of its key performance indicators, or to reconsider 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.

Detailed Status of Recommendations

Figure 2 shows the recommendations and the status details that are based on responses from the Ministry and the three universities we audited in 2015—McMaster University, University of Toronto and University of Waterloo—and our review of the information provided.

Figure 2: Committee Recommendations and Detailed Status of Actions Taken

Prepared by the Office of the Auditor General of Ontario

Committee Recommendation	Status Details
<p>Recommendation 1</p> <p>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.</p> <p>Status: In the process of being implemented by June 2019.</p>	<p>The Ministry has developed a research inventory questionnaire to be answered by ministries to track research investments and expenditures. The questionnaire is expected to capture information on research funding programs available; the number of research projects and areas of discipline supported; total funding in the year for each research activity; and whether each ministry tracks the intellectual property arising from the funded research activities—that is, invention disclosures, patents applied for and granted, copyrights and licenses. The questionnaire was made available to ministries in October 2017.</p> <p>However, the questionnaire is limited, as it does not request information on new technologies and innovations resulting from provincial research funding. Rather, it asks whether the individual ministries track the intellectual property arising from the funding they provide. The Ministry tracks commercialization potential of research projects for the period of the funding agreement. New technologies or innovations typically occur years after government funding has been provided for research and/or commercialization. Therefore, inventions arising after the contract reporting period ends would not be known.</p> <p>The Ministry expects to analyze the data collected from the initial questionnaire to determine the value of the data for the government and the appropriate custodian of any future collection of data. The Ministry expects to complete the data analysis by November 2018, and, at that time, determine when annual reporting is to begin. As well, the Ministry's Science Research Branch expects to decide upon an option for tracking research expenditures across all government ministries in 2019, with annual reporting to begin after an appropriate custodian of any future collection of data is determined.</p>

Committee Recommendation	Status Details
<p>Recommendation 2 The Ministry of Research, Innovation and Science:</p> <ul style="list-style-type: none"> 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; Status: Little or no progress. conduct periodic assessments against the indicators in the scorecard and report the results publicly. Status: Will not be implemented. 	<p>The Ministry indicated that it has revised its approach since the release of the Ontario Innovation Agenda almost a decade ago. The Business Growth Initiative, announced in the 2016 Budget, is a strategy to strengthen innovation and increase the province's global competitiveness. The initiative will focus on creating opportunities to make Ontario's economy more innovative, help scale up small businesses into medium-sized and large enterprises, and reduce the regulatory burden on businesses. During our 2017 follow-up, the Ministry informed us that, throughout the 2017/18 fiscal year, it would design and implement programs and more detailed action plans in alignment with the initiative's new framework with a key focus on measuring program performance.</p> <p>At the time of this follow-up on the Standing Committee's recommendations, the Ministry had not developed a detailed action plan with timelines and deliverables to track the status of the Business Growth initiative. Instead the Ministry referred us to funding commitments for various initiatives noted in the 2016 Budget. These funding commitments did not specify the responsible ministry, timelines for completion or expected outcomes.</p> <p>In our 2017 follow-up, the Ministry informed us that the innovation indicators developed in 2013 to help inform policy and program development were no longer appropriate. It stated that work was under way to revise these and develop a suite of high-level key performance innovation indicators to better measure program effectiveness that reflect both the 2008 Innovation Agenda and the 2016 Business Growth Initiative.</p> <p>In April 2018, the Ministry received approval from the Treasury Board for the following new key performance indicators to measure the effectiveness of its programs:</p> <ul style="list-style-type: none"> number of researchers engaged in research and development (per 1,000 employed); number of patents filed per million people in Ontario; business expenditure in research and development as percentage of GDP; high-growth firms as percentage of firms in Ontario (firms growing with annualized growth of at least 20% in revenue in a three-year period or firms with minimum annual revenue of \$10,000); dollar value of venture capital investments in Ontario; net reduction in administrative cost to business in Ontario; total U.S.-dollar value of foreign direct investment flowing into Ontario per year. <p>The Ministry informed us that it does not intend to publicly report the results of its key performance indicators because the indicators are macro-level and the data is from publicly available sources, such as the Conference Board of Canada. We believe the Ministry should publicly report the results of its key performance indicators.</p>

Committee Recommendation	Status Details
<p>Recommendation 3</p> <p>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.</p> <p>Status: Little or no progress.</p>	<p>During our 2017 follow-up, the Ministry stated that it was developing an intellectual property framework to strengthen the protection of intellectual property in order to ensure greater retention of benefits to Ontario. The Ministry was also developing a strategy for scale-up firms. A scale-up firm is the next stage in development for a start-up company. A scale-up firm is looking to grow in terms of market access, revenues and number of employees, adding value by identifying and realizing win-win opportunities for collaboration with established companies.</p> <p>At the time of this follow-up on the Standing Committee’s recommendations, the Ministry was still developing an Intellectual Property Framework and Scale-Up Strategy and could not provide us with expected dates for their completion and implementation.</p> <p>In addition, in January 2018, the Ministry completed an external review of the Ontario Network of Entrepreneurs—a group of organizations funded by the Ministry to provide commercialization activities to universities, colleges, other research institutions, start-ups and other companies. The report included recommendations to the Ministry, including strengthening head office functions to improve governance, program review and alignment with the Province’s strategic goals. At the time of this follow-up, the Ministry had not yet outlined how it expects to proceed on the report’s recommendations.</p> <p>As well, in July 2018 the Ministry updated its website where it provides information on intellectual property to educate entrepreneurs on the importance of protecting their intellectual property, grow their business and apply for trademark and copyright. A lack of awareness of the IP process was identified as a barrier to commercialization during the IP roundtable discussions.</p>
<p>Recommendation 4</p> <p>The Ministry of Research, Innovation and Science work with universities to develop socio-economic performance measures to be used in publicly reporting the outcomes of university research and commercialization efforts.</p> <p>Status: Little or no progress.</p>	<p>At the time of this follow-up, the Ministry had not yet developed specific performance measures that assess the socio-economic benefits to Ontarians. The Ministry stated that no “gold standard” method exists for measuring the socio-economic impact of research.</p> <p>In our 2017 follow-up report, we reported that the Ministry was conducting studies, including a jurisdictional scan, to support the development of a potential socio-economic impact framework. At the time of this follow-up on the Standing Committee’s recommendations, the Ministry informed us that work in this area was continuing and that it would have a more fulsome jurisdictional scan done by December 2018.</p>

Committee Recommendation	Status Details
<p>Recommendation 5</p> <p>The Ministry of Research, Innovation and Science work with Ontario universities to ensure that:</p> <ul style="list-style-type: none"> • university researchers are aware of the importance of protecting intellectual property; Status: Fully implemented. • technology transfer offices implement processes to ensure the timely implementation of commercialization assessments of intellectual property disclosures and patent protections. Status: Fully implemented. 	<p>In April 2018, the Ministry created a website page entitled “Trademarks, copyright and other intellectual property”, to provide advice to businesses and not-for-profit entities on how to protect their intellectual property.</p> <p>As well, at the time of this follow-up, all three universities were communicating invention disclosure requirements to staff and students through presentations made by their respective technology transfer offices. We noted that only two of the three universities warn faculty and students about public disclosures of discoveries—McMaster University has a formal policy on its website, and the University of Waterloo has incorporated the warning in its presentation (Intellectual Property 101) provided to staff and students. However, the University of Toronto normally has provisions for delaying publication until IP is protected, written into research contracts between the University and the sponsor in disciplines (such as engineering and science) in which commercializable IP is most likely to arise.</p> <p>All three universities have established time frames to complete commercialization assessments—ranging from about one month to 45 days.</p> <p>Since our follow-up in 2017, McMaster University has developed a report that tracks assessment completion times and the time taken to file a patent. It also documents the reason for assessments that took longer than 90 days and patent filings that took longer than 120 days since the date the invention was disclosed to the technology transfer office.</p> <p>The University of Toronto also tracks assessment completion times and identifies those that are pending. However, it does not document the reason when an assessment or patent filing takes longer.</p> <p>The University of Waterloo tracks the time taken to file a patent from date of disclosure, but it does not explicitly track the time taken to complete an initial commercialization assessment. Instead, this university tracks the date from when an invention is disclosed to the technology transfer office to the date researchers sign a contract with the technology transfer office to undertake commercialization efforts. Although not an exact substitute, this is a good proxy for the time taken to complete an assessment, because an initial assessment would have to be completed before a contract is signed with the researchers.</p> <p>All three universities noted that a completed assessment does not automatically mean a patent will be filed as there are many reasons a filing may be delayed.</p>

Committee Recommendation	Status Details
<p>Recommendation 6</p> <p>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.</p> <p>Status: Will not be implemented.</p>	<p>The Ministry informed us that it will not be implementing this recommendation. It stated that Ontario's approach to intellectual property ownership was consistent with best jurisdictional practices, federal policy and academic/industry preference, and was based on the assertion that government ownership of intellectual property is costly and may be an impediment to commercialization and innovation.</p> <p>These same points were made during the time of our audit in 2015, at which time we reported that intellectual property rights should not be viewed as an impediment to commercialization without further detailed analysis of the impact and potential value to Ontario. At the time of this follow-up, the Ministry had not done such an analysis.</p> <p>An article in <i>The Globe and Mail</i> in May 2018 reported that publicly funded universities and granting agencies are failing to generate and retain intellectual property for the benefit of Canada's economy. Intellectual property generated by publicly funded research is being transferred away to foreign companies that have the resources to advance early academic research into more valuable intellectual property.</p>
<p>Recommendation 7</p> <p>The Ministry of Research, Innovation and Science work with Ontario universities to regularly and publicly report performance results on research funding and commercialization programs.</p> <p>Status: In the process of being implemented by June 2019.</p>	<p>The Ministry reported on performance of its research and commercialization programs through the 2017/18 Estimates Briefing Book. The briefing book highlighted 2016/17 achievements of the Ministry's programs under seven overall objectives. Many of the reported achievements related to the amount of funding provided or committed to by the Ministry. However, it also reported on the amount of money leveraged from industry; the number of prototypes developed; the number of patents granted; the number of new products, services and process improvements brought to market; and the number of start-ups, business expansions and new jobs.</p> <p>The Ministry told us that it is exploring options under the government's Open Data Initiative for publicly reporting performance data related to its research and commercialization programs.</p>
<p>Recommendation 8</p> <p>The Ministry of Research, Innovation and Science work with Ontario universities to ensure that:</p> <ul style="list-style-type: none"> • all intellectual property created using university resources is disclosed to the appropriate university office; and <p>Status: Fully implemented.</p>	<p>At the time of this follow-up, all three universities were communicating invention disclosure requirements to staff and students through presentations made by their respective technology transfer offices.</p>

Committee Recommendation	Status Details
<ul style="list-style-type: none"> commercialization assessments are completed within a reasonable timeframe; Status: McMaster University: Fully implemented. University of Toronto and University of Waterloo: In process of being implemented. 	<p>McMaster University—40% of inventions disclosed in 2017 were assessed within the targeted 30 days. By 90 days, 69% of invention disclosures had been assessed. This university had documented the reason for all assessments taking longer than 90 days.</p> <p>University of Toronto—30% of inventions disclosed in 2017 had a commercialization assessment done within the targeted 45 days. By 60 days, 40% of disclosures had been assessed. The tracking sheet provided did not indicate the reason why other assessments were taking longer.</p> <p>Waterloo University—this university was not tracking the assessment completion date, but rather the date an agreement was signed between the technology transfer office and the researchers, which should occur after an assessment is completed and the university decides to pursue commercialization efforts with the researchers' approval. Using this time period as a proxy for the time taken to complete an assessment, we noted that only 13% of inventions disclosed in 2017 had agreements signed within 30 days, and 38% had agreements signed within 90 days of disclosure.</p>
<ul style="list-style-type: none"> there are no unnecessary delays in patent filings; Status: In process of being implemented. 	<p>All three universities informed us that they try to balance quick filing of patent protection with ensuring sufficient data has been compiled to support a strong patent application, thereby increasing the chances that a patent is granted. All three indicated that many factors have to be considered in determining when to file an application. However, none of the universities have done an analysis to compare the length of time taken to file a patent application with the success rate in obtaining a patent to support their assertions.</p> <p>We reviewed the time taken to file a patent in 2017 and noted that the average time taken to apply for patents from the time of disclosure was 169 days for the University of Waterloo and 104 days for McMaster University. However, both universities had a number of inventions where patents were not yet filed, in some cases for more than 600 days since disclosure. According to the universities, these were undergoing further technical development by the researchers. At the University of Toronto, more than 200 inventions were disclosed to the technology transfer office in 2017 and only 10 had patents filed by May 30, 2018.</p>
<ul style="list-style-type: none"> 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. Status: Fully implemented. 	<p>All three universities were tracking costs arising from commercialization activity such as legal, patent and marketing costs. McMaster University was also preparing quarterly cost projections; the University of Waterloo was working on estimating future patent costs. Furthermore, in our 2017 follow-up, we reported that all three universities had processes in place to track revenue coming due in order to bill one-time payments in advance and remind licensees to submit royalty payments on time. As well, they were obtaining revenue reports from licensees to support the amount of royalties remitted to them.</p>