MAINTAINING MOMENTUM

FINDING FOCUS

Strategic Research Plan and Strategic Mandate Agreement

Town Hall
February 14, 2017
# MAINTAINING MOMENTUM

## FINDING FOCUS

### STRATEGIC RESEARCH PLAN

Required by the Canada Research Chairs and Canada Foundation for Innovation (http://www.chairs-chaires.gc.ca/program-programme/instructions-eng.aspx)

Reflect the university’s strategic direction for scholarship and research for next 5-10 years

- Strengths we wish to maintain
- New directions in which we want to grow

Allocate scarce resources

### STRATEGIC PLAN 2016-2021

CHALLENGE, INNOVATE, CONNECT

- produce and inspire future leaders who have real-world skillsets.
- **Amplify our research reputation** through entrepreneurial scholarship, because ideas are our main export to the world

- create new approaches, partnerships, and solutions to improve society.
- Our faculty and **student researchers contribute to cultural, economic and scientific changes worldwide** through scholarship and discovery

- build lasting relationships to make UOIT a remarkable place for work and study.
- **Build research partnerships that fortify our university’s key strengths**, because our national and international collaborations open doors to new ideas and initiatives both locally and globally.

### STRATEGIC MANDATE AGREEMENT 2

Required by the Province of Ontario:

“Each institution [is expected] to provide a submission identifying three priority objectives, and a vision of how the institution plans to implement the objectives…”
### Why revise the SRP

- Canada Research Chairs Program/CFI requires universities to update their SRP on a regular basis.

- UOIT revised and updated the Strategic Plan in 2015-16.

- Each unit (Faculty, Department) is required to develop a unit plan/academic plan to inform the Academic Plan.

- UOIT is required to submit an updated Strategic Mandate Agreement (SMA) to the Province (Spring 2017)
  - Any focus on research should be informed by an up-to-date Strategic Research Plan.

### Process

- **September 2016 - April 2017**
  - Research Board reviews existing SRP and consults with Faculties on the philosophy, goals and objectives of the SRP.
  - Vice-President Research, Innovation & International consults with Faculty Councils.

- **April/May 2017**
  - Research Board submits revised SRP to Academic Council.

- **June 2017**
  - Vice-President Research, Innovation & International presents up-dated SRP to Board of Governors.
Our fundamental approach to research

Discovery Research is **CORE**; Applied Research is **encouraged**; Knowledge mobilization is **essential** (publications, trainees, conferences); Innovation & Technology Transfer **enabled**

All research activities are connected and inform each other

- **Innovation, Technology Transfer**
- **Knowledge Mobilization**
- **Applied Research**
- **Discovery Research**

**Investigator-led research**

**Collaborative Research** (e.g., U-I, International, Community-based)

**Targeted (Industry-directed research)**
Research Board affirmed that revisions to the Strategic Research Plan would be minor, with primary focus on the research priority areas.

Universities may wish to address the following questions:

- What are the objectives in cultivating a particular area or areas of research?

- What are the university's current research strengths? ..., what difference will a Canada Research Chair make [to those areas]? What measures will the university take to develop strengths in ...research it has designated as priorities ...

- To what extent will the university collaborate... with other institutions to ... develop or maintain excellence in its priority areas of research? ....

- To accomplish its objectives ...: how does the university propose to use its own resources, the Chairs program, other granting agency programs, CFI, and other outside sources?

- What are the expected observable outcomes of achieving the objectives? What will demonstrate that the university has met its goals and is achieving international status in given areas of research...
Vision for research and innovation at UOIT

– Emphasizes integration of research and scholarship for learning and teaching as well as discovery and knowledge mobilization

– Emphasizes research and scholarship is essential for our mission – undergraduate and graduate learning – and student engagement

– Emphasizes importance of collaborations – interdisciplinary, inter-Faculty, inter-institutional and international

– Emphasizes the importance of ALL research and scholarship from all disciplines and employing a full range of theoretical and methodological approaches

– No one discipline or methodology is privileged

– Acknowledges that Research Services will provide high quality information, advice, grant writing and post-award services to ALL faculty
Objectives

– Identify and invest in new strategic research priorities,
– Build on and strengthen existing research strengths,
– Foster excellence in targeted fields,
– Integrate research, entrepreneurship and innovation with undergraduate and graduate education and community engagement,
– Invest in infrastructure that enables excellence and promotes regional, national and international collaboration with academic, community and industry partners
– Invest in entrepreneurial capacity that enables the effective mobilization of UOIT-develop fundamental and applied knowledge and discoveries to private, not-for-profit, and public sector receptors.
Innovation in Research, Scholarship & Education

UOIT Strategic Research Plan 2013-2018

At the University of Ontario Institute of Technology, Research and Scholarly Excellence means

– Scholarly publishing that meets international peer review standards.

– Research that contributes to knowledge development in academic disciplines and leads to faculty members’ participation in high quality, peer review partnerships with international scientists and scholars.

– Research that fosters social innovation.

– Research that has a positive impact on societies and economies.

– Research that has a positive educational impact on students and curriculum, leading to more effective learning environments, engaged students, and knowledgeable and able graduates.
Innovation in Research, Scholarship & Education

UOIT Strategic Research Plan 2013-2018

• Partnerships
• Building Research Infrastructure
• Knowledge Mobilization
• International Collaborations

• Allocation process for Canada Research Chairs
  – Candidates who meet national and international standards for scholarship and leadership and who will be research leaders in their Faculty and the University, who will be catalysts for research collaborations internally and externally, and who will contribute to UOIT’s reputation as a leader in intellectual, social, cultural and economic development of the region, Ontario and Canada

  – 1 per Faculty (minimum)

  – Gender balance

  – Increased attention to candidates who are indigenous peoples, minority candidates, and/or persons with differing abilities
CANADA RESEARCH CHAIRS
and
PRIORITY RESEARCH AREAS
## Innovation in Research, Scholarship & Education

**Canada Research Chair Allocation (2016)**

<table>
<thead>
<tr>
<th>Chair</th>
<th>Faculty</th>
<th>Thematic Area</th>
<th>Agency</th>
<th>Tier</th>
<th>Gender</th>
<th>Start</th>
<th>End/renewal</th>
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<tr>
<td>Aquatic Toxicology</td>
<td>Science</td>
<td>Energy &amp; the Environment</td>
<td>NSERC</td>
<td>1</td>
<td>M</td>
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<td>2018</td>
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<tr>
<td>Linguistic Information Visualization</td>
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<td>NSERC</td>
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*Note: Table rows are sorted alphabetically by chair name.*
Innovation in Research, Scholarship & Education
UOIT Strategic Research Plan 2013-2018

PRIORITY RESEARCH AREAS

INTER-INSTITUTIONAL COMPARISONS
(CANADA)
Innovation in Research, Scholarship & Education

UOIT Strategic Research Plan 2013-2018

Research Priority Areas
2013-2018

- Advanced Manufacturing
- Education for 21st Century
- Energy & Environment
- Human Health and Community Wellbeing
- ICT & Informatics
- Life Sciences & Biotechnology
<table>
<thead>
<tr>
<th>University</th>
<th>Education for the 21st Century</th>
<th>ICT and Informatics</th>
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Strategic Research Plans: Undifferentiated?
## 2012-2017 Priority Research Foci

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<td>Life Sciences &amp; Biotechnology</td>
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2017-02-14
2018-2023

MAINTAINING MOMENTUM

FINDING FOCUS
Innovation in Research, Scholarship & Education

UOIT Strategic Research Plan 2013-2018

**Items that are missing**

- **DIVERSITY:**
  - **Aboriginal communities:** Where does collaboration with FNMI communities fit? Should it be a priority, if not a priority research area (future investments – faculty hires, CRCs …)?
  - **Inclusiveness:** Ensuring that the recruitment of Canada Research Chairs (CRC) proactively address gender equity and diversity, specifically for FNMI and persons with disabilities

- **FOCUS:**
  - **Current SRP tends toward shopping list** with all this as priority and hence no priorities

- **METRICS AND REPORTING ON OUR PROGRESS:**
  - How will we evaluate our progress toward our goals and objectives?
Proposed Focus
2018-2023

Smart Sustainable Communities:
connected, inclusive, democratic, prosperous
Research Capacities

Thematic Representation
UOIT’s Research Capabilities:

Three primary clusters
What connects UOIT’s capabilities?

Smart Sustainable Communities:
connected, inclusive, democratic, prosperous
What connects UOIT’s capabilities?

Smart Sustainable Communities:
connected, inclusive, democratic, prosperous

Discovery Research and Graduate Education

Digital/Information Sciences

Environment, Health and Sustainable Communities

Mobility & Connectivity
### 2018-2023 Research Clusters or Foci

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<th>FBIT</th>
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<th>Education</th>
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<tr>
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<td>Environment Health and Sustainable Communities</td>
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## 2018-2023 Research Clusters or Foci (DRAFT)

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<tr>
<th>Connect</th>
<th>Innovate</th>
<th>Challenge</th>
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<tr>
<td><strong>Mobility and Connectivity for Innovative Communities</strong></td>
<td><strong>Digital/Information Systems for Connected Communities</strong></td>
<td><strong>Environment, Health &amp; Sustainable Communities</strong></td>
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<tr>
<td>• Transportation systems (including electric, hybrid and autonomous vehicles)</td>
<td>• AI/Deep Thinking</td>
<td>• Human and Community Health</td>
</tr>
<tr>
<td>• Human mobility</td>
<td>• Cognitive Computing</td>
<td>• Mental Health and Psychology</td>
</tr>
<tr>
<td>• New communications technologies for teaching and research</td>
<td>• Mobile &amp; pervasive computing</td>
<td>• Criminology, Justice and Policy studies</td>
</tr>
<tr>
<td>• Mobile and Pervasive Computing</td>
<td>• E- and M-Learning</td>
<td>• Learning across the life-span</td>
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<tr>
<td>• Wearables</td>
<td>• Simulations and Immersive Technology in/for Learning/ Research (education, health, nuclear, automotive, gaming)</td>
<td>• Built &amp; Natural environments</td>
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<tr>
<td>• Material Sciences</td>
<td>• Cyber-Security and Privacy</td>
<td>• Ecosystem Health</td>
</tr>
<tr>
<td>• Manufacturing Engineering</td>
<td>• Communications</td>
<td>• Energy storage and systems</td>
</tr>
<tr>
<td>• Nanotechnology</td>
<td>• Mobile &amp; pervasive computing</td>
<td>• Natural Environments and Life Sciences</td>
</tr>
<tr>
<td>• Integrated energy systems</td>
<td>• Data visualization</td>
<td>• Nano-scale technologies &amp; Material Sciences</td>
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<tr>
<td>• Renewable Energy Systems and Clean Energy (Hydrogen, Solar, Battery)</td>
<td>• Communications &amp; Signal Processing</td>
<td>• Cyber-Security and Privacy</td>
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<td>• Mechatronics</td>
<td>• Big Data &amp; Data Mining</td>
<td>• Social Justice (Immigration, Social Integration)</td>
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<td>• Health Informatics &amp; Analytics</td>
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<td>• Forensic Psychology</td>
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<td>• Advanced Materials</td>
<td>• Robotics and Automation</td>
<td>• Health of vulnerable populations</td>
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<tr>
<td>• Robotics, Automation &amp; Controls</td>
<td>• Smart Grid/Micro Grid</td>
<td>• Rehabilitation</td>
</tr>
<tr>
<td>• Finance &amp; Marketing</td>
<td>• Coding in Classrooms</td>
<td>• Drug discovery, formulation &amp; delivery</td>
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<tr>
<td>• Technology management, innovation and entrepreneurship, Business performance</td>
<td>• Game Development</td>
<td>• Coding in classrooms</td>
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<td>• Wearable Technologies/Digital Life</td>
<td>• E- and mobile learning</td>
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<td>• Human Centred Computing</td>
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<td>• Computational Modelling</td>
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<td>• Autonomous &amp; Connected Vehicles</td>
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<td>• Internet of Things (IOT)</td>
<td>• Nuclear Safety</td>
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<td>• Innovation &amp; Entrepreneurship</td>
<td>• Nuclear Waste Management</td>
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2017-02-14
Smart Sustainable Communities: connected, inclusive, democratic, prosperous

UOIT Strategic Research Plan 2018-2023

UOIT research capacities and UN Sustainable Development Goals

3. Good Health and Well-being
4. Quality Education
6. Clean Water and Sanitation
7. Affordable and Clean Energy
8. Decent Work and Economic Growth
9. Industry, Innovation and Infrastructure
10. Reduced Inequalities
11. Sustainable Cities and Communities
13. Climate Action
2018-2023

ESTABLISHING RESEARCH FOCI

OR

HOW WILL WE ALLOCATE SCARCE RESOURCES?
Research Clusters or Foci

• Proposed Research Foci are “inclusive” of all Faculties and most (not all) researchers
• These Research Foci will help prioritize investments
• In 2018-2023, SHOULD UOIT
  – Invest in more targeted professorial hiring?
  – Invest in more research based graduate education across all Faculties?
  – Invest in new research facilities tied to approved SRP research foci?
  – Encourage the formation of research centres in each focus area?
  – Allocate CFI ONLY to larger scale projects (including inter-institutional), with fewer “individual” instrument requests?
  – Use CRCs to address and/or seed strategic research and scholarly lacunae in our research capacity, for example, on issues related to gender inequality, social diversity, indigenous issues?
  – Establish realistic, achievable and measurable objectives and report to the University community annually that would help direct resources to most successful Faculties/research areas?
Research Foci

• Represent cross-Faculty, inter-disciplinary capabilities and anticipated areas of research growth at UOIT
  – Reflect priorities identified in Faculty Academic Plans
    • Only two Faculty Unit Plans identify thematic research priorities
  – Not siloed in one Faculty

• Represent national and/or provincial priority areas

• Reflect international direction on research and scholarship
How will we measure our progress and success?

PERFORMANCE INDICATORS/METRICS
What are our metrics/indications of success?

“Researchers at Canada’s universities contribute to the economy, industry and business, public policy, culture, and society. But measuring the impact of much of the research being conducted at universities remains a challenge. Canada’s universities and Tri-Council Agencies are placing more emphasis on knowledge mobilization in order to generate research with a high social utility and get research into the hands of decision-makers, policy-makers, and practitioners.”

Conference Board of Canada (2016), Beyond Citations: Knowledge Mobilization, Research Impact, and the Changing Nature of Academic Work
Our fundamental approach to research

Discovery Research is PRIVILEGED; Applied Research is encouraged; Knowledge mobilization is essential (publications, trainees, conferences); Innovation & Technology Transfer enabled.

All research activities are connected and inform each other.

2017-02-14
Measuring progress and success: What are our metrics/indicators of success?

• % of faculty with terminal degrees (Ph.D.) Do we want as a goal 100%? How close are we?
• Research $/FTE What is reasonable minimum target? $90,000/FTE
• Number of prestigious, nationally competitive research awards (e.g., CFREF, CERC, etc.) Should our target be 1 by 2022?
• % of faculty who are PIs on nationally competitive grants What is our target – 75%? 100%?
• Number of Sponsored Grants and Contracts/FTE
• Percentage of faculty members with external, peer reviewed grant? What % do we want? Does this vary by Faculty?
• Number of inter-institutional grants and contracts (e.g., NCE) What is a target number? What is sustainable?
• Number of research Masters and Ph.D. students/FTE faculty Should every faculty member have the opportunity to supervise at least one Masters or at least one Ph.D. student per an? Should all Faculties have Ph.D. degrees?
• Number of publications in high impact journals or high quality academic presses per annum (e.g., UTP, Oxford UP, Johns Hopkins UP, etc.) What is a reasonable number for each discipline? Where do single authored/co-authored (not edited) academic books fit?
Measuring progress and success: What are our metrics/indicators of success? (2)

- Number of publications with international collaborators
- Number of publications with industry and community partners
- Number of Citations/FTE (excluding self citations) How does citation vary by discipline/sub-discipline? What is expected number by Faculty/discipline?
- Engagement of undergraduate students in research projects (beyond capstone) (measured annually) Should all undergraduate students be given an opportunity to participate in research activities? How would this impact on recruitment to Masters programs?
- Number of national and international awards to faculty members (FRSC, Fields, etc.)/an What should UOIT’s target be – minimum of three/an?
- Number of research centres (and stable funding for ...) Should Faculties and the University encourage the formation of research centres as vehicles for organizing research and graduate studies? How should these be funded (self-funded)?
- Number of sponsored (industry, individual, etc.) research chairs Should we aim for 1 sponsored chair per Faculty?
- Rankings: Where to we want to be position vis a vis other Canadian and international universities? Who are our competitions?
- Impact Measures (Knowledge Transfer; Research uptake; Spin out companies; licenses, etc.)
Research InfoSource
Research University of the Year

• Financial Indicators
  • Total Sponsored Research Income
  • Research Intensity ($/FFTE)

• Research Output Indicators
  • Total Number of Publications
  • Publication Intensity (#/FFTE)

• Research Impact Indicators
  • Publication Impact (measures each institution’s success in being cited in the peer-reviewed academic literature)
Do we care?
If so, which rankings (Canada only) or international?
Which universities should be our comparator universities (smaller Canadian or international science and technology universities)?

RANKINGS
Innovation in Research and Education

ASPIRATIONAL

Stretch goal:

UOIT strives to be ranked amongst the top 50 science and technology universities in the world, the Times Higher Education 100 under 50, and the top 35 research-intensive universities in Canada

By 2025, UOIT will be ranked amongst

- leading 50 science and technology
- *Times Higher Education* top 100 under 50 universities
- 35 research intensive universities in Canada
  - Currently ranked 45th
- Top 25 Research Universities of the Year (Canada)
  - Currently ranked 33rd
- Top 10 RUY (undergraduate)

- Research Impact
  - 10th amongst PUI
  - Currently ranked 7th in Canada
  - Toronto, McGill, UBC, SFU, Alberta, McMaster
Smart(er) & Sustainable Communities

- **National and International Rankings**
  - AWRU (Shanghai)
  - THE
  - Macleans
  - Research Infosource (Top 50 Research Universities)

- **International Rankings**
  - Our partners are in top 150 under 50
  - Nanyang Technological University #2
  - University of Konstanz #7
  - Karlsruhe Institute of Technology #8
  - University of Technology Sydney #21

- **UOIT**
  - Ranking Web of Universities 1264
  - UniRank 1584

### Research Funding and University of the Year Rankings

<table>
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### Macleans Rankings

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NEXT STEPS
# Strategic Research Plan revisions

## Why revise the SRP

Canada Research Chairs Program/CFI requires universities to update their SRP on a regular basis.

UOIT revised and updated the Strategic Plan in 2015-16.

Each unit (Faculty, Department) is required to develop a unit plan/academic plan to inform the Academic Plan.

UOIT is required to submit an updated Strategic Mandate Agreement (SMA) to the Province (Spring 2017)

- Any focus on research should be informed by an up-to-date Strategic Research Plan

## Process

### September 2016 - April 2017

- Research Board reviews existing SRP and consults with Faculties on the philosophy, goals and objectives of the SRP.
- Vice-President Research, Innovation & International consults with Faculty Councils

### April/May 2017

- Research Board submits revised SRP to Academic Council

### June 2017

- Vice-President Research, Innovation & International presents up-dated SRP to Board of Governors
COMMENTS AND QUESTIONS
Recovering momentum

![Bar chart showing disbursement amounts from 2004 to 2017 with categories for Provincial Governments, Other, Industry, and Canadian Federal Government. The chart illustrates an increasing trend in disbursement amounts over time.]