



MEMORANDUM

To: Executive Committee of Faculty Council

From: Professor Eric J. Miller, Research Director
University of Toronto Transportation Research Institute

Date: January 22, 2014 for February 25, 2014 Faculty Council Meeting

Re: **Establishment of the University of Toronto Transportation Research Institute as an Extra-Departmental Unit:C (EDU:C)**

REPORT CLASSIFICATION

This is a major policy matter that will be considered by the Executive Committee for endorsing and forwarding to Faculty Council for vote as a special motion (requiring a 2/3 majority of members present and voting to carry and circulated to Faculty Council at least 14 days in advance).

MOTION

THAT the Faculty establish the University of Toronto Transportation Research Institute (UTTRI) as an Extra-Departmental Unit:C (EDU:C) effective immediately, with the mandate to engage in research projects with industry and government, provide research-based evidence to address practical problems in transportation policy analysis and decision-making, enhance the training of highly qualified transportation-related personnel, and increase the external profile of the Department of Civil Engineering, the Faculty of Applied Science and Engineering and the University of Toronto.

1. INTRODUCTION

The University of Toronto Transportation Research Institute (UTTRI) was founded in 2013 within the Department of Civil Engineering (DCE), by a one-year grant from the Dean of the Faculty of Applied Science and Engineering's (FASE) Strategic Fund. Although currently housed in Civil Engineering, UTTRI involves faculty from across FASE and the University in inter-disciplinary transportation-related research. This proposal provides the case for establishing UTTRI as an Extra-Departmental Unit:C with the mandate to engage in research projects with industry and government, provide research-based evidence to address practical problems in transportation policy analysis and decision-making, enhance the training of highly qualified transportation-related personnel, and increase the external

profile of the Department of Civil Engineering, the Faculty of Applied Science and Engineering and the University of Toronto.

In subsequent sections of this proposal, the mission, positioning, academic rationale (goals), objectives and benchmarks, structure, resources, consultation, and governance of the proposed EDU:C are described in detail.

2. MISSION

How we design, build and operate our cities will directly determine our economic prosperity, environmental sustainability, health and social well-being. Infrastructure systems are the fundamental building blocks of cities: they give cities shape and functionality; they are also major industries in their own right. Transportation is particularly critical given its widespread impact on daily life and economic activity, primary role in shaping urban form, significant environmental and social impacts, large capital and operating costs, the very long-term nature of investments, and the political nature of investment decision-making. How to best design, finance, build and operate their transportation systems are first-order problems facing engineers, planners and decision-makers world-wide.

Nowhere is this more true than in the Greater Toronto and Hamilton Area (GTHA). Decades of inadequate investment in transportation combined with extensive population growth have resulted in a very challenging situation in which investment needs have outstripped allocated resources. The City of Toronto is now the fourth largest city in North America. The GTHA is among the world's most diverse, vibrant and economically successful urban regions. Each year it attracts approximately 100,000 new residents from around the world. However, the very significant advantages that the GTHA possesses relative to many of its peer urban regions are increasingly being compromised by our failure to provide the transportation systems necessary to sustain the region's continuing evolution and prosperity.

Engineers have a long tradition of working closely with government and industry on the design of better products, tools and processes. Cities too are "engineered" artifacts, albeit often haphazardly designed. Both locally and globally they are in desperate need of objective, expert advice on transportation technology options, network design, operational control methods, the benefits, costs and other impacts of alternative system designs, etc. City and provincial planning departments too often lack the internal resources to adequately address these questions, and often face political constraints that limit their ability to think freely and innovate. Just as the University is the place for technological innovation, so too should it be the place for urban innovation – where new ideas for city design are invented, tested and offered to the public and private "markets" for implementation.

3. POSITIONING

UTTRI was founded in 2013 with the support of Professor Brent Sleep, Chair of the Department of Civil Engineering (DCE), and FASE Dean Cristina Amon's Strategic Fund. It evolved from the Joint Program in Transportation and its successor, the Urban

Transportation Research and Advancement Centre (UTRAC), which together have a history of over 40 years of conducting research on issues of significance in Canadian transportation.

From the outset, UTTRI has included members from departments across FASE, including Mechanical and Industrial Engineering, Chemical Engineering and Applied Chemistry, and Electrical and Computer Engineering, as well as Civil Engineering. UTTRI researchers also have a history of collaboration with members of the Department of Geography and Program in Planning, the Department of Computer Science, the Martin Prosperity Institute, the Munk School of Global Affairs, and the School of Public Policy and Governance. Considerable expertise exists across UofT's three campuses with respect to transportation, urban planning and design, urban economics and finances, etc. This expertise will be tapped as UTTRI becomes an EDU:C and expands beyond DCE and FASE to become a university-wide research centre.

Considerable resources already exist within DCE to support world-class transportation research, including:

- The Data Management Group (DMG), which provides transportation data management services to GTHA transportation planning agencies as well as to university transportation researchers. In particular, it manages the Transportation Tomorrow Survey (TTS), the largest on-going urban travel survey in the worldⁱ
- The Travel Modelling Group (TMG), which undertakes applied research and development work to support on-going improvement in regional travel demand forecasting by GTHA transportation planning agenciesⁱⁱ
- The Intelligent Transportation Systems (ITS) Centre and Testbed, an existing EDU:D, which is a major computer lab within the DCE supporting advanced transportation system analysis and modellingⁱⁱⁱ

The DMG, TMG and ITS Centre and Testbed will be brought under the umbrella of UTTRI, which will more efficiently coordinate their activities, make better use of available complementary resources and expertise, and provide the foundation for a comprehensive central hub for transportation-related research within FASE and UofT as a whole.

Professors in DCE's Transportation Engineering and Planning Section are currently responsible for delivering the transportation specialization within DCE's undergraduate and graduate programs, and within the Division of Engineering Science's Infrastructure Engineering Option. UTTRI professors are also actively involved in FASE's new Master of Engineering in Cities Engineering and Management (MEngCEM) program.^{iv} Currently, 24 PhD and 17 MASc students are enrolled in the field of Transportation Engineering within the PhD, MASc and MEng programs in Civil Engineering, and since 2010, ten MEng students have completed this field.

An invitation to join UTTRI as non-budgetary, cross-appointed faculty (conditional upon approval of proposal) was sent to 30 faculty members from four faculties, listed in Appendix I. As of January 6, 2014, 23 have accepted. Many more graduate students are engaged in transportation-related research supervised by UTTRI faculty associates in DCE's Environmental Engineering Research Section; within FASE's Mechanical and Industrial Engineering, Electrical and Computer Engineering, and Chemical Engineering

and Applied Chemistry departments; and within the Department of Geography and Planning in the Faculty of Arts & Science.

4. GOALS: ACADEMIC RATIONALE

DCE, FASE and UofT aspire to take a lead role in contributing to the development of livable, sustainable, healthy and prosperous city regions. UTTRI directly addresses UofT strategic priorities^v relating to:

- ADVANCE: Institutions, Peace and Prosperity (the knowledge economy, development and social innovation)
- BUILD: Community and Liveable Societies (liveable cities)
- ENABLE: Technologies for the 21st Century (innovation and computation; simulation and imaging)
- PROMOTE: Healthy People, Healthy Communities, Healthy World (human development and health through the lifespan)
- SUSTAIN: Humanity and the Environment (global climate change; sustainable energy)

Similarly, FASE strategic research goals as stated in the *2011-16 Academic Plan*^{vi}, are to:

“ ... leverage our strengths to develop multi-disciplinary research programs, enable our researchers to make significant impacts, advance engineering knowledge and innovation, and promote the Faculty’s profile.

We will increase government research funding and seek alternative financial support mechanismsOur plans include ways to broaden our reach, engaging with policy makers, granting agencies and all levels of government.

This Academic Plan establishes priorities to broaden *outreach*, encourage *collaboration*, and enhance Engineering’s *influence*.”

(*2011-16 Academic Plan*, page 5, emphasis in original)

DCE views advancement of its transportation research capabilities and impact on the global stage as a first-order priority for the Department as a means of advancing its strategic objective of being a world leader in urban engineering research and applications.

The goals of UTTRI directly align with these FASE and DCE strategic research goals in that, as is discussed in the following sub-sections, they are to:

- Support large-scale, high-impact research
- Transfer research into practice in local, regional and global communities
- Engage and educate the next generation of highly qualified personnel
- Increase the external profile of DCE, FASE and UofT

4.1 Support for large-scale, high-impact research

UTTRI members are internationally renowned for high quality research on an individual level. However, major transportation challenges can be solved and major new opportunities can be exploited only through coordination and integration of multiple areas of research. The *raison d'être* of UTTRI is to provide this coordination and integration, to provide the technical and administrative resources needed to support large-scale, high-impact research, and to provide the foundation for a comprehensive central hub for transportation-related research within FASE and UofT as a whole.

Establishment of UTTRI as an EDU:C will provide the institutional and administrative framework needed to help establish UofT as a preeminent global centre for transportation research and a valuable source of transportation innovation and solutions locally, nationally and internationally. UTTRI will also provide strong and tangible collaborative support for numerous existing UofT urban initiatives including:

- The UofT-USP Global Cities collaborative agreement^{vii}
- Urban informatics (iCity^{viii} and CUSP^{ix})
- Blusson Visualization Facility in the Centre for Engineering Innovation & Entrepreneurship^x
- FASE's new Master of Engineering in Cities Engineering and Management (MEngCEM)^{xi}
- High Performance Computing (HPC) initiatives, notably the Southern Ontario Smart Computing Innovation Platform (SOSCIP)^{xii}
- President Gertler's oft-stated emphasis on increasing the University's presence and impact in the urban field^{xiii}

No other university in Canada has comparable capabilities and facilities to support world-leading research in the transportation field, nor does any other Canadian city provide a better or more challenging "urban laboratory" within which to apply and hone transportation-related research skills. The opportunity exists to build upon these current strengths to establish the University of Toronto as the dominant transportation research centre in Canada and as one of the leading such centres worldwide.

An example of such an opportunity is a Letter of Intent (LOI) UTTRI submitted to the Connaught Global Challenge Fund to support a major two-year project titled "The Toronto Sustainable Solutions Lab (TS²Lab): Building the 21st Century Metropolis." The intent of this project was to bring together leading researchers from across all three UofT campuses (through FASE, FAS, Martin Prosperity Institute, Munk School of Global Affairs, and the School for Public Policy and Governance) and leading urbanists from the US and Europe to address the problem of redesigning our urban regions (in particular, our suburbs) to meet 21st Century sustainability goals, and is indicative of the multi-disciplinary, high impact research challenges that UTTRI is looking to take on. Unfortunately the LOI was not accepted to go forward to full proposal in this competition round, but we expect to pursue this initiative in other ways.^{xiv}

4.2 Transferring research into practice

Building upon our research expertise and working relationships with both the public and private sectors, the EDU:C will seek solutions to pressing problems facing our cities, such as: cost-effective suburban transit systems; politically acceptable road pricing systems for network performance optimization; dynamic real-time control of road and transit systems for capacity maximization; improved urban logistics systems for goods movements; improved urban and street design for walking and cycling; etc.

Faculty members of UTTRI connect with industry and government partners by staging numerous outreach activities. For example, 50 policy makers and industry professionals attended UTTRI's annual Transportation Research Day on November 25, 2013, with the theme of Advances in Modelling Methods. On January 17, 2014 UTTRI will host 80 academics, policy makers and industry professionals at its third annual Freight Day symposium and each spring UTTRI faculty offer a short course in Public Transit Planning and Intelligent Transportation Systems.

As noted above, UTTRI hosts the Data Management Group (DMG) which works closely with GTHA and provincial transportation agencies to undertake the world's largest on-going urban transportation survey – the TTS. The DMG maintains the TTS data for the use of public sector agencies, private transportation consultants and university researchers, thereby providing an unparalleled factual base for transportation research, planning, policy analysis and decision-making within the region. The Travel Modelling Group (TMG), also hosted within UTTRI, similarly works with regional and provincial agencies to improve their operational travel demand forecasting methods. In particular, the travel demand models currently in operational use within the GTHA have either been directly built by TMG (or by Professor Miller's research group prior to the formal institutionalization of this group's work within TMG) or have been based on TMG model designs. TMG is currently in the process of implementing the TASHA (Travel/Activity Scheduler for Household Agents) agent-based microsimulation model system which is a state-of-the-art model system that has been under development at UofT for the past decade as the operational travel demand forecasting system for the City of Toronto. This will be the first such microsimulation modelling system implemented in Canada and will also be one of the most advanced operational systems in the world.

4.3 Engaging and educating the next generation of highly qualified personnel

It is now commonly understood that the 21st Century is the first urban century: more than 50% of the world's population now live in urbanized regions, with this percentage projected to grow to 70% by 2050.^{xv} This simple demographic fact means our economic, environmental and social sustainability are inextricably intertwined with the design and functioning of our metropolitan areas. There is a world-wide need for professionals with a holistic understanding of these challenges and with the sophisticated technical expertise to evaluate the needs and implement the solutions to the complex and cross-disciplinary issues facing cities. Transportation is at the nexus of these issues.

Graduate students, postdoctoral fellows and research associates of UTTRI faculty members will benefit from research and studies both tightly focused on transportation and more broadly addressing the impact of transportation on urban systems. They will also benefit from introductions to industry and national and international networks of transportation researchers. UTTRI graduates will serve as effective agents to transfer research into practice.

As noted above, UTTRI faculty are already heavily invested in the delivery of transportation courses at the undergraduate (BASc degree programs in Civil Engineering and Engineering Science) and graduate levels (MEng, MASc, PhD and MEngCEM). Undergraduate and graduate students have considerable opportunities to interact with industry and government through involvement in DMG and TMG activities, PEY, NSERC Industrial Postgraduate Scholarships, NSERC Engage grants and other on-going research projects within the Institute. The student experience is also enhanced by a long-established Friday morning seminar series, managed by the student chapter of the Institute of Transportation Engineers, with presentations by industry representatives. In the summer, undergraduates have opportunities to engage in transportation research. Given the considerable undergraduate and graduate instruction currently offered, it is not expected that a new specialization in transportation will be offered within the foreseeable future. Opportunities to fine-tune existing courses and to introduce new transportation courses as needed and as resources permit, however, will continuously be explored.

4.4 Increasing the external profile of DCE, FASE and UofT

As an EDU:C, UTTRI will become a resource for events and opportunities (seminars, news, collaboration and employment opportunities, etc.) of interest to a community that will grow as UTTRI succeeds in transferring leading-edge research to practice. As soon as funding permits, a Communications & Events Coordinator will be hired to assist the Program Director develop and implement outreach, marketing and technology transfer activities. Where beneficial, UTTRI will collaborate with other centres and institutes inside and outside of UofT, work with the Advancement office to identify funding opportunities, and work within the FASE Working Group for Multidisciplinary Centres and Institutes to share best practices and find efficiencies for sharing resources and leverage collective strengths to attract donors and grants.

5. OBJECTIVES, BENCHMARKS AND MEASURES OF SUCCESS

The following objectives and benchmarks will allow UTTRI to demonstrate the achievement of the goals outlined in the preceding section.

5.1 The objectives in support of satisfying the goal of producing large-scale, high-impact research are:

- Reinforce UofT as the leading transportation research centre in Canada and in the top 10 worldwide
- Lead inter-department and inter-Faculty research collaboration across FASE and the University

- Lead major multidisciplinary, multi-university projects and network activities

Success against these objectives can be measured by:

- International recognition for the research of UTTRI members as quantified through the quantity and quality of publications produced, collective citation metrics, and the value and number of group/individual research awards
- Extent and value of research collaborations across FASE and UofT and with other universities

5.2 The objectives in support of satisfying the goal of transferring research into practice are:

- Establish UTTRI as a premier independent think-tank on multimodal transportation issues
- Develop solutions to major transportation questions facing the GTHA and urban regions globally
- Engage with industry and government in knowledge transfer and commercialization activities

Success against these objectives can be measured by:

- Number and value of the initiatives funded, collaborations created, collaborative grants/contracts obtained, value of grants/contracts obtained, products and services commercialized and spin-off companies produced

5.3 The objective in support of satisfying the goal of engaging and educating the next generation of highly qualified personnel is:

- Build capacity in the training of highly qualified personnel

Success against this objective can be measured by:

- Number of trainees produced, new courses and new or enhanced graduate programs developed, enrolment in graduate courses, research accomplishments of trainees and subsequent alumni career success

5.4 The objective in support of satisfying the goal of increasing the external profile of DCE, FASE and UofT is:

- Establish a powerful physical and virtual presence on campus

Success against this objective can be measured by:

- Number of outreach activities staged and numbers in attendance, subscriptions to information updates, and coverage by the media

6. STRUCTURE

6.1 Naming

As an EDU:C, UTTRI will be appropriately named as an institute because of its multidisciplinary and multi-departmental nature. The name can be adapted if UTTRI successfully identifies a donor willing to contribute at the level appropriate for naming rights.

6.2 Research Director

UTTRI is under the direction of Research Director, Professor Eric Miller. As an EDU:C, the Research Director will report to the Dean, and future appointments of the Research Director will be made at the Faculty level according to standard Faculty practice (see Section 10 below).

The Research Director is responsible for all policy development as well as administrative and financial decision-making. However, the proposed UTTRI is an EDU:C and as such, the Research Director is not appointed under the Policy on Academic Administrative Appointments. As a consequence, an EDU:C may not administer research funds or enter directly and on its own authority into commitments / agreements / contracts. All monies and research funding will flow through the Department of Civil Engineering or through the Dean's Office in line with the Faculty's normal practice. Any research contracts or agreements similarly require approval and the signature of the Chair.

The focus of the Research Director is to promote the goals of UTTRI to the external community, to liaise with senior university administrators, and to recruit new student and faculty members. More specifically, the role of the Research Director is to:

- Coordinate with the Dean and Vice-Dean, Research on Faculty-level strategic vision
- Advise the Dean on appointment of Advisory Board members
- Select Steering Committee Members
- Chair Steering Committee and Advisory Board meetings
- Manage the input of the Steering Committee and Advisory Board in shaping the strategic vision of the Unit
- Liaise with Undergraduate and Graduate Coordinators regarding transportation-related minors and certificates, including new course proposals, to provide insight on complementarities across the Faculty

6.3 Program Director and Administrative Staff

Reporting to the Research Director and working closely with the FASE Advancement Team and UofT Innovations and Partnership Office (IPO), the UTTRI Program Director is responsible for maintaining and attracting industrial partnerships, seeking funding from donors and industrial partners, and managing UTTRI's operations and technical and administrative staff on a daily basis. The Program Director will also play a leading role in

the solicitation of funds to support UTTRI operations on an on-going, sustainable basis. This includes:

- Helping to inform the Institute's academic direction and develop its strategic plan.
- Playing a major role in writing proposals to a wide variety of potential funders, including granting councils, foundations, public sector agencies and the private sector
- Working with FASE Advancement Team and IPO on seeking out and developing relationships with potential donors
- Leading UTTRI communications and outreach activities, including coordination of major UTTRI events
- Overseeing UTTRI contracts and accounts

In September 2013, Dr. Judy Farvolden joined UTTRI as its full-time Program Director. Funding from the Dean's Strategic Fund (DSF) was used to cover her salary for one year. The daily operation of UTTRI is enabled by this support, which is critical to its success. When it reaches funding self-sufficiency, UTTRI will hire administrative staff to coordinate communications and events, administer budgets and contracts, and maintain the hardware and software in the UTTRI computing facilities. With the exception of the current DSF support, support for UTTRI staff will be the responsibility of UTTRI and the hiring and management of UTTRI staff will be the responsibility of the Research Director.

6.4 Academic Steering Committee

The Research Director and Program Director will work with an Academic Steering Committee (ASC) to help inform the institute's academic direction. The ASC will consist of:

- The Research Director and Program Director. The Research Director will chair the committee
- Faculty representatives from the academic units most directly involved in UTTRI activities. These will likely include the FASE departments of Civil Engineering, Electrical and Computer Engineering, Mechanical and Industrial Engineering, and Chemical Engineering and Applied Chemistry; the Faculty of Arts & Science's Department of Geography and Urban Planning Program, and the School of Public Policy and Governance; the Martin Prosperity Institute; and the Munk School of Global Affairs
- The Chair of the Advisory Board
- The FASE Vice-Dean, Research
- Graduate student representatives, one nominated by the UofT student ITE chapter and one representing the MEngCEM student body

ASC members will be appointed on a two-year, rotating basis. The ASC is expected to meet 2-3 times a year.

6.5 Advisory Board

UTTRI will establish an Advisory Board, consisting of senior industry and government representatives from the local and national transportation sector, to provide non-binding advice. Board members will fill one or more of three primary roles: (1) providing strategic connections between researchers and industry/government leaders in their sector; (2) funding research within the Unit through industry research contracts and partnership programs; and (3) raising philanthropic funds for the Unit. Continued service on the Board will require tangible contributions in one or more of these three areas. The value proposition for Board Members will include access to leading edge research and, importantly, access to personnel for recruitment.

UTTRI is currently identifying Advisory Board candidates in consultation with the Vice-Dean Research and the Advancement Office for recommendation to the Dean for appointment to the Board.

6.6 Faculty and Student Membership

As an EDU:C UTTRI is intended to be the hub of transportation-related research in the FASE. Numerous faculty across UofT having research interests in transportation have been invited to join UTTRI (see Appendix I). Graduate students and postdoctoral fellows of associated faculty can become members on the recommendation of their advisor.

7. RESOURCES

The success of UTTRI as an EDU:C hinges upon securing stable, ongoing funding sufficient to cover its operating costs. Longer term, it is expected that overhead from research and consulting contracts will provide sustainable base operational support. As noted above, in its short existence UTTRI has already taken the lead in submitting Letters of Intent to the NCE program and the Connaught Global Challenge Fund, and is in the process of preparing an OREF-RE Round 7 submission.^{xvi} UTTRI is also exploring how it can satisfy the Metrolinx stated objective to “Establish a Centre of Excellence for Transportation in the GTHA”.^{xvii} In addition to government funding opportunities, UTTRI researchers have long-established and productive working relationships with both the public and private sectors which, with strong Advancement support, it plans to evolve into revenue opportunities.

Support for the day-to-day functions of UTTRI is critical to its success. If other funding is not secured in the near future, funding for Years 2 and 3 will be requested from the Dean’s Strategic Fund. This funding will be contingent on plans for collaboration with existing initiatives and a financial plan that demonstrates how UTTRI will become self-sustaining within three years. This proposal describes our plans to satisfy those stipulations.

8. CONSULTATION

To date, 30 faculty members from four Faculties have been consulted and invited to join UTTRI as non-budgetary, cross-appointed faculty. They are listed in Appendix I. As of January 6, 2014, 23 have accepted.

Appendix II lists the department chairs, Faculty deans and research centre directors who have been consulted to date concerning UTTRI and its establishment as an EDU:C within FASE. The response has been overwhelmingly supportive, and letters of support received to date are included in Appendix III.

9. GOVERNANCE AND REVIEWS

The governance and periodic reviews of the EDU:C will be conducted in accordance with the guidelines established by the University of Toronto Governing Council's *Guidelines for Administrative Functions and Protocols for Extra-Departmental Units* (February 26, 2007) and the Faculty's *Framework for Review of Institutes and Centres* (September 2013).

In line with normal practice, an EDU:C is subject to periodic review (normally every five years) by the lead Dean. Any review would normally assess the EDU's sustainability, performance and achievements relative to the goals set out at its establishment. Possible outcomes of the review could include closure.

¹ <http://www.dmg.utoronto.ca/> and <http://www.dmg.utoronto.ca/transportationtomorrowsurvey/index.html>.

¹ <http://tmg.utoronto.ca/>.

¹ <http://www.civil.engineering.utoronto.ca/research/transport/its.htm>. The ITS Lab is currently designated an EDU:D within FASE. For the short run at least this designation will be maintained, but the Lab will also be an integral component of UTTRI operations, and the Lab's Director, Prof. Baher Abdulhai, is an active Faculty Associate within UTTRI.

¹ <http://www.civil.engineering.utoronto.ca/programs/graduate/mengcem.htm>. The program admitted its first cohort of students in September, 2013.

¹ <http://www.research.utoronto.ca/wp-content/uploads/2012/10/SRP-2012-web.pdf>.

¹ <http://www.engineering.utoronto.ca/Assets/AppSci+Digital+Assets/pdf/Publications/academicplan.pdf>.

¹ UofT and the University of Sao Paulo (USP) signed a collaborative research agreement in 2012. One of the primary areas of proposed future research collaboration is in "global cities". See: <http://news.utoronto.ca/university-toronto-and-university-sao-paolo-establish-strong-partnership>. Prof. Miller, UTTRI's Research Director, is leading the development of the global cities component of this initiative on behalf of UofT. It is expected that transportation infrastructure and urban design will be a key theme within this program.

¹ On August 1, 2013, UofT submitted a Letter of Intent (LOI) to host a Network of Centres of Excellence (NCE) in the field of urban informatics: iCity: Urban Informatics for Sustainable Cities. This initiative was led by the UTTRI Research Director, Prof. Eric Miller. The LOI can be downloaded from: http://www.ecf.utoronto.ca/~miller/iCity_LOI-Final_Aug-01-13.pdf. Unfortunately, the LOI was not accepted to proceed to full proposal stage, but it is expected that the iCity initiative will continue by various other means. In particular, UTTRI will be submitting a proposal to the just-announced ORF-RE Round 7 competition that builds on the iCity LOI and that will link Civil Engineering and Computer Science researchers (among perhaps others) together.

¹ UofT is a network partner in the Center for Urban Science and Progress (CUSP), hosted at New York University. Recently launched, CUSP is an emerging major research cluster in the field of urban informatics. See: <http://cusp.nyu.edu/>. UTTRI's urban informatics initiatives will be generally supportive of the CUSP initiative. Explicit opportunities to interact with CUSP-NYU will be explored, building on existing contacts that Prof. Miller has with Dr. Steve Koonin, CUSP Director and Dr. Ari Patrinos, CUSP Deputy Research Director.

¹ The Stuart Blusson Visualization Facility within the Civil and Mineral programs is planned to be built within FASE's new CEIE building. UTTRI is expecting to tie the ITS Lab software and data to the Blusson facility to develop and apply advanced visualizations of transportation network and other urban spatial behaviour in support of our research and policy analysis activities. Initial discussions with Prof. Ron Venter (who is leading the CEIE project) concerning UTTRI involvement in the Blusson Facility have occurred and Prof. Venter is very supportive of UTTRI involvement in the facility.

¹ <http://www.civil.engineering.utoronto.ca/programs/graduate/mengcem.htm>. Prof. Miller is teaching a course in the new program. It is expected that MEngCEM students will become involved in UTTRI projects as the program matures.

¹ <http://soscip.org/>. Prof. Miller currently holds a SOSCIP project. UTTRI has a close working relationship with IBM Canada and the SOSCIP project and is expecting to expand direct research collaborations going forward. The ORF-RE Round 7 proposal mentioned in footnote 8, for example, will certainly involve a HPC component.

¹ "[T]he biggest challenges [in Toronto] are ... in areas of infrastructure, particularly transportation. It's pretty obvious that we have underinvested in all forms of transportation structure for a long time, ... If there is anything the university could do to inform those debates, I think it would be a great service to the city region." President-elect Gertler, quoted in the *Toronto Star*, March 5, 2013, page GT2. Also see: Bredin, Simon, 2013, "Gertler appointed UofT president", *The Varsity*, Vol. CXXXIII, No. 19. March 11, 2013 <http://thevarsity.ca/2013/03/11/gertler-appointed-u-of-t-president/>, and President Gertler's inaugural address: <http://www.news.utoronto.ca/multimedia-centre?id=mismWvhgUPE>.

¹ The Connaught Global Challenge Fund LOI can be downloaded from:

http://www.ecf.utoronto.ca/~miller/LOI_GC_2013-14_Transport_Final_Oct-16-13.pdf

¹ United Nations, <http://www.un.org/apps/news/story.asp?NewsID=25762>. World Health Organization, http://www.who.int/gho/urban_health/situation_trends/urban_population_growth_text/en/.

¹ See discussion above and footnote 12.

¹ In its regional transportation plan ("The Big Move"), Metrolinx identifies the need to establish a Centre of Excellence for Transportation in the GTHA. See: "The Big Move: Transforming Transportation in the Greater Toronto and Hamilton Area", Greater Toronto Transportation Authority, 2008, http://www.metrolinx.com/thebigmove/Docs/big_move/TheBigMove_020109.pdf

ⁱ <http://www.dmg.utoronto.ca/> and <http://www.dmg.utoronto.ca/transportationtomorrowsurvey/index.html>.

ⁱⁱ <http://tmg.utoronto.ca/>.

ⁱⁱⁱ <http://www.civil.engineering.utoronto.ca/research/transport/its.htm>. The ITS Lab is currently designated an EDU:D within FASE. For the short run at least this designation will be maintained, but the Lab will also be an integral component of UTTRI operations, and the Lab's Director, Prof. Baher Abdulhai, is an active Faculty Associate within UTTRI.

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^v <http://www.research.utoronto.ca/wp-content/uploads/2012/10/SRP-2012-web.pdf>.

^{vi} <http://www.engineering.utoronto.ca/Assets/AppSci+Digital+Assets/pdf/Publications/academicplan.pdf>.

^{vii} UofT and the University of Sao Paulo (USP) signed a collaborative research agreement in 2012. One of the primary areas of proposed future research collaboration is in "global cities". See: <http://news.utoronto.ca/university-toronto-and-university-sao-paulo-establish-strong-partnership>. Prof. Miller, UTTRI's Research Director, is leading the development of the global cities component of this initiative on behalf of UofT. It is expected that transportation infrastructure and urban design will be a key theme within this program.

^{viii} On August 1, 2013, UofT submitted a Letter of Intent (LOI) to host a Network of Centres of Excellence (NCE) in the field of urban informatics: iCity: Urban Informatics for Sustainable Cities. This initiative was led by the UTTRI Research Director, Prof. Eric Miller. The LOI can be downloaded from: http://www.ecf.utoronto.ca/~miller/iCity_LOI-Final_Aug-01-13.pdf. Unfortunately, the LOI was not accepted to proceed to full proposal stage, but it is expected that the iCity initiative will continue by various other means. In particular, UTTRI will be submitting a proposal to the just-announced ORF-RE Round 7 competition that builds on the iCity LOI and that will link Civil Engineering and Computer Science researchers (among perhaps others) together.

^{ix} UofT is a network partner in the Center for Urban Science and Progress (CUSP), hosted at New York University. Recently launched, CUSP is an emerging major research cluster in the field of urban informatics. See: <http://cusp.nyu.edu/>. UTTRI's urban informatics initiatives will be generally supportive of the CUSP initiative. Explicit opportunities to interact with CUSP-NYU will be explored, building on existing contacts that Prof. Miller has with Dr. Steve Koonin, CUSP Director and Dr. Ari Patrinos, CUSP Deputy Research Director.

^x The Stuart Blusson Visualization Facility within the Civil and Mineral programs is planned to be built within FASE's new CEIE building. UTTRI is expecting to tie the ITS Lab software and data to the Blusson facility to develop and apply advanced visualizations of transportation network and other urban spatial behaviour in support of our research and policy analysis activities. Initial discussions with Prof. Ron Venter (who is leading the CEIE project) concerning UTTRI involvement in the Blusson Facility have occurred and Prof. Venter is very supportive of UTTRI involvement in the facility.

^{xi} <http://www.civil.engineering.utoronto.ca/programs/graduate/mengcem.htm>. Prof. Miller is teaching a course in the new program. It is expected that MEngCEM students will become involved in UTTRI projects as the program matures.

^{xii} <http://soscip.org/>. Prof. Miller currently holds a SOSCIP project. UTTRI has a close working relationship with IBM Canada and the SOSCIP project and is expecting to expand direct research collaborations going forward. The ORF-RE Round 7 proposal mentioned in footnote 8, for example, will certainly involve a HPC component.

^{xiii} "[T]he biggest challenges [in Toronto] are ... in areas of infrastructure, particularly transportation. It's pretty obvious that we have underinvested in all forms of transportation structure for a long time, ... If there is anything the university could do to inform those debates, I think it would be a great service to the city region." President-elect Gertler, quoted in the *Toronto Star*, March 5, 2013, page GT2. Also see: Bredin, Simon, 2013, "Gertler appointed UofT president", *The Varsity*, Vol. CXXXIII, No. 19. March 11, 2013 <http://thevarsity.ca/2013/03/11/gertler-appointed-u-of-t-president/>, and President Gertler's inaugural address: <http://www.news.utoronto.ca/multimedia-centre?id=mismWvhgUPE>.

^{xiv} The Connaught Global Challenge Fund LOI can be downloaded from:

http://www.ecf.utoronto.ca/~miller/LOI_GC_2013-14_Transport_Final_Oct-16-13.pdf

^{xv} United Nations, <http://www.un.org/apps/news/story.asp?NewsID=25762>. World Health Organization, http://www.who.int/gho/urban_health/situation_trends/urban_population_growth_text/en/.

^{xvi} See discussion above and footnote 12.

^{xvii} In its regional transportation plan ("The Big Move"), Metrolinx identifies the need to establish a Centre of Excellence for Transportation in the GTHA. See: "The Big Move: Transforming Transportation in the Greater Toronto and Hamilton Area", Greater Toronto Transportation Authority, 2008, http://www.metrolinx.com/thebigmove/Docs/big_move/TheBigMove_020109.pdf

APPENDIX I: CROSS-APPOINTED FACULTY

As indicated in the table below, as of January 6, 2014, 30 UofT faculty members from four faculties (FASE, Faculty of Arts & Science, Faculty of Information, and Rotman School of Management) have been invited to become UTTRI non-budgetary, cross-appointed faculty (conditional upon approval of the proposal), with 23 accepting to date.

Name	Department/School	Agreed
Alan Walks	Geography/Planning	Yes
Alberto Leon-Garcia	Electrical & Computer Engineering	
Amer Shalaby	Civil Engineering	Yes
Andre Sorensen	Geography/Planning	Yes
Baher Abdulahi	Civil Engineering	Yes
Barry Wellman	iSchool	Yes
Birsen Donmez	Mechanical & Industrial Engineering	Yes
Chi-Guhn Lee	Mechanical & Industrial Engineering	Yes
Christopher Kennedy	Civil Engineering	Yes
David Wolfe	PROGRIS, Munk School of Global Affairs	Yes
Enid Slack	IMFG, Munk School of Global Affairs	
Eric J. Miller	Civil Engineering	Yes
Gerald Steuart	Civil Engineering	Yes
Greg Evans	Chemical Engineering	
Hans-Arno Jacobsen	Electrical & Computer Engineering	
Heather MacLean	Civil Engineering	Yes
Kevin Stolarick	Martin Prosperity Institute	Yes
Khandker Nurul Habib	Civil Engineering	Yes
Mark Fox	Mechanical & Industrial Engineering	Yes
Mark Stabile	School of Public Policy & Governance	
Matthew Roorda	Civil Engineering	Yes
Matthew Turner	Economics	Yes
Matti Siemiatycki	Geography/Planning	Yes
Oded Berman	Rotman School of Management	
Paul Hess	Geography/Planning	Yes
Richard Florida	Martin Prosperity Institute	Yes
Ron Buliung	Geography/Planning	Yes
Steve Easterbrook	Computer Science	
Tamer El-Dirabhy	Civil Engineering	Yes
Timothy Chan	Mechanical & Industrial Engineering	Yes

APPENDIX II: SUPPORTING DEPARTMENTS

The table below shows the UofT departments, faculties and research centres that have been consulted concerning the establishment of UTTRI as an EDU:C as of January 6, 2014. Letters of support that have been received to date are attached.

Faculty of Applied Science & Engineering (FASE) Departments	
Grant Allen	Chemical Engineering
Brent Sleep	Civil Engineering
Farid N. Najm	Electrical & Computer Engineering
Jean Zu	Mechanical & Industrial Engineering
Faculty of Arts & Science (FAS) Departments	
Sven Dickenson	Computer Science
Arthur J. Hosios	Economics
Virginia Maclaren	Geography/Planning
Stephen Kudla (Acting Chair)	Mathematics
Jamie Stafford	Statistical Science
Deans & Vice Deans Research	
Cristina Amon	FASE
David Cameron (Interim Dean)	FAS
Howard Hu	Dalla Lana School of Public Health
Peter Pauly (Interim Dean)	Rotman School of Management
Jay Pratt (Vice Dean Research)	FAS
Seamus Ross	iSchool
Edward Sargent (Vice Dean Res.)	FASE
Research Centres & Schools	
Richard Florida (Director)	Martin Prosperity Institute
Enid Slack (Director)	IMFG, Munk School of Global Affairs
Mark Stabile (Director)	School of Public Policy & Governance
Janice Stein (Director)	Munk School of Global Affairs
David Wolfe (Director)	PROGRIS, Munk School of Global Affairs

LETTER SENT TO HEADS OF DEPARTMENTS, FACULTIES AND RESEARCH CENTRES

From: Judy Farvolden
Sent: December-04-13 12:56 PM
To:
Cc: Eric J Miller (miller@ecf.utoronto.ca)
Subject: Letter from Eric Miller requesting your support

Dear Colleague,

Over the past few months we have been building a new research centre focussing on transportation planning, design and policy analysis and related issues in urban design: the University of Toronto Transportation Research Institute (UTTRI). Eric Miller, the Research Director, would like your Department's support for the designation of UTTRI as an EDU:C research centre within the Faculty of Applied Science and Engineering. While currently housed in Civil Engineering, our intent is for UTTRI to be a FASE-wide and University-wide research collaborative.

You'll find information on UTTRI plans and progress to date in the attached letter from Eric. Also attached are the four attachments to his letter.

Sincerely,
Judy Farvolden

Judy Farvolden | Ph.D., P.Eng.,
Program Director | University of Toronto Transportation Research Institute
SF3001A-35 St George Street | O: 416-978-3357 | judy.farvolden@utoronto.ca

REPLIES FROM CHAIRS IN THE FACULTY OF ENGINEERING AND APPLIED SCIENCE

From: Farid N. Najm [mailto:f.najm@utoronto.ca]
Sent: December-04-13 6:24 AM
To: Judy Farvolden
Subject: Re: Letter from Eric Miller requesting your support

Judy;

I am very supportive. How exactly do I express my support. Will the Dean be asking the dept chairs for comment on this? Do you require a letter from me? Etc?

Thanks,
Farid.

From: Grant Allen [mailto:allendg@ecf.utoronto.ca]
Sent: December-04-13 8:17 AM
To: Judy Farvolden
Cc: Eric Miller (at ecf); Ramin Farnood
Subject: Re: Letter from Eric Miller requesting your support

Eric

Thanks for letting me know about your plans for UTTRI as an EDU:C. Sounds very exciting and I'm very impressed what you have already done. Happy to be supportive of the initiative.
I wonder if at some point it would be useful meet with Ramin Farnood, our Associate Chair (Research) (cc'd) to see where there may be opportunities for faculty in CHE to be involved with the Institute. I can see potential linkages around things like the environment (air pollution in particular), perhaps renewable fuels but there maybe others now or in the future.
Thanks again for leading this. Looking forward to seeing it continue to evolve.
Grant

D. Grant Allen, Ph.D. P.Eng.,
Professor and Chair
Department of Chemical Engineering and Applied Chemistry University of Toronto Toronto, ON, Canada
Phone: (416) 978-8517
Email: dgrant.allen@utoronto.ca
website: <http://www.labs.chem-eng.utoronto.ca/allen/>

From: zu@mie.utoronto.ca [mailto:zu@mie.utoronto.ca]
Sent: December-04-13 9:27 PM
To: Judy Farvolden
Cc: Eric Miller (at ecf)
Subject: RE: Letter from Eric Miller requesting your support

Dear Judy,

Thank you for sending me the information. MIE will be happy to support the initiative.

Best wishes,

Jean

Jean Zu | Professor and Chair

Department of Mechanical & Industrial Engineering
Faculty of Applied Science & Engineering | University of Toronto
5 King's College Rd. | Toronto | Ontario | M5S 3G8 | Office: MC136
zu@mie.utoronto.ca | www.mie.utoronto.ca/labs/cvdl/zu.html
Tel 416.978.7198 | Fax 416.978.7753



UNIVERSITY OF TORONTO
FACULTY OF ARTS & SCIENCE

Office of the Dean

January 6, 2014

Professor Judy Farvolden
Program Director
University of Toronto Transportation Research Institute
35 St George Street (SF3001A)
University of Toronto
Toronto, ON M5S 1A7

Dear Professor Farvolden,

Further to our recent discussions, I am pleased to support on behalf of FAS, your proposal for the designation of UTTRI as an EDU:C research centre. We have been in contact with the Directors and Chairs of those FAS Departments and Units who will be working with this new research centre and all have endorsed its creation.

We wish you success with this University-wide research collaborative.

Sincerely,

Jay Pratt
Vice Dean, Research and Infrastructure
Faculty of Arts & Science
Professor, Psychology
University of Toronto

cc. Office of the Dean, FAS
Helen Lasthiotakis, Assistant Dean and Director, Office of the Dean, FAS
Sven Dickinson, Chair, Computer Science
Janice Stein, Director, Munk School of Global Affairs
Mark Stabile, Director, School of Public Policy and Governance
Virginia Maclaren, Chair and Graduate Chair, Geography
Eric Miller, Civil Engineering

Sidney Smith Hall, 100 St George Street, Suite 2005, Toronto, ON M5S 3G3 Canada

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Computer Science
UNIVERSITY OF TORONTO

OFFICE OF THE CHAIR

December 10, 2013

Professor Eric Miller
Department of Civil Engineering
Faculty of Applied Science and Engineering
University of Toronto
35 St. George Street
Toronto, Ontario, M5S1A4

Dear Professor Miller,

I am writing in support of your proposal for the University of Toronto Transportation Research Institute (UTTRI), a new research centre focusing on transportation planning, design and policy analysis and related issues in urban design. It's always exciting to develop new multi-disciplinary initiatives that encourage the research collaborations between departments.

I wish you every success in this endeavor and, on behalf of the Department of Computer Science, offer my enthusiastic support for this program.

Yours sincerely,

A handwritten signature in blue ink, appearing to read 'SD'.

Sven Dickinson
Professor and Chair



Geography & Program in Planning
UNIVERSITY OF TORONTO

December 11 2013

Professor Eric J. Miller
Department of Civil Engineering
Research Director
University of Toronto Transportation Research Institute (UTTRI)
University of Toronto
35 St. George Street, Room GB305A
Toronto, Ontario, Canada M5S 1A4

Dear Eric:

I am writing to express my support on behalf of the Department of Geography and Program in Planning for the proposed University of Toronto Transportation Research Institute. This is an excellent proposal and I anticipate that at least three or four of our faculty members will want to become associates. There is currently no other venue at the University of Toronto for them to conduct multi-disciplinary research on transportation.

Sincerely,

A handwritten signature in black ink, appearing to read 'V. Maclaren', with a long horizontal flourish extending to the right.

Virginia W. Maclaren
Associate Professor and Chair



School of Public Policy & Governance
UNIVERSITY OF TORONTO

Mark Stabile
Professor and Director

December 11, 2013

Professor Eric Miller
Research Director
University of Toronto Transportation Research Institute (UTTRI)

Dear Eric,

Congratulations on your excellent work with the University of Toronto Transportation Research Institute. This is an important interdisciplinary initiative that I believe is both needed and welcome at the University of Toronto.

I would like to express the School of Public Policy and Governance's support for this initiative and to reiterate that we would like to participate in it.

I look forward to working with you on this in coming months.

Sincerely,

Mark Stabile
Director and Professor