

Supporting Knowledge Mobilization And Research Impact Strategies In Grant Applications

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Abstract: *Each application to the National Science Foundation (NSF) must contain a Broader Impact (BI) strategy. Similarly, grant applications for most research funders in Canada and the UK require strategies to support the translation of research into impacts on society; however, the guidance provided to researchers is too general to inform the specific impact strategies required by funding agencies and peer review panels. Furthermore, there is almost no training and few tools provided to research managers and administrators to support the development of these strategies. To fill this gap, university based knowledge mobilization professionals in Canada have developed specific tools and services to support research impact strategies in grant applications. Over the last 10 years the Knowledge Mobilization Unit at York University (Toronto, Canada) has used planning tools and standard approaches to support knowledge mobilization strategies in 137 grant applications resulting in 42 funded research projects attracting over \$47M in research funding. The Knowledge Translation (KT) Core facility of the pan-Canadian research network, NeuroDevNet, has supported knowledge translation strategies in 11 grant applications resulting in 2 research projects attracting \$2.9M in the last 2.5 years. The tools and processes used to develop these strategies have supported grant applications in a range of disciplines and are presented to help research managers and administrators support impact strategies in grant applications.*

Keywords: *knowledge mobilization, research impact, pathway to impact, research administration, research grant application*

Background

The academic research enterprise has always been measured on inputs (such as external funding, dedicated research space, infrastructure) and more recently on outputs (international databases ranking publication performance and citation indices), but what about the impacts of research? Publication citations are a proxy for scholarly impact, albeit a contentious proxy (Archambault

& Gagné, 2004), especially for the humanities and creative arts. But what about beyond the academy, such as impacts of research on the economy, health and wellbeing, society, culture and the environment? The Canadian Federation of Humanities and Social Sciences (2014) has articulated that humanities and social science research can have impacts not only on scholarship and training but also on the economy, society/culture and on public policy. All UK universities are assessed through the Research Excellence Framework [www.ref.ac.uk] in which universities are scored on their ability to articulate their research excellence (80%) and impact of research beyond the academy (20%) such as positive changes in society, economy, culture, health and the environment.

In Canada, the impacts of research are a feature of most research funding programs. Every grant application submitted to the Social Sciences and Humanities Research Council (SSHRC) (2015) requires an outcomes statement (what impacts are anticipated) and a knowledge mobilization strategy (how those impacts will be achieved). The Canadian Institutes of Health Research (CIHR) (2012) and most Canadian health charities require grant applicants to articulate a knowledge translation strategy that articulates what impacts will occur and what efforts will be made to achieve them. The Natural Sciences and Engineering Research Council (NSERC) requires a commercialization plan for grant applications that involve collaboration with industry.

Canada's Networks of Centres of Excellence (NCE) [<http://www.nce-rce.gc.ca/>] are uniquely designed to achieve socioeconomic impacts arising from academic research and training. Traditional NCE networks receive \$4-5M per year for five years with an option to apply for renewal for an additional two five-year cycles. This results in a potential investment of up to \$75M over 15 years. The plans for Knowledge and Technology Exchange and Exploitation (KTEE) and the involvement of Networks and Partnerships are two of five evaluation criteria.

Similar strategies are required by applicants to the seven funders that comprise the Research Councils UK (RCUK). For example, the Economic and Social Research Council requires considerations of impact in all grant applications:

In line with the common position on Excellence with Impact adopted by RCUK, the Economic and Social Research Council (ESRC) expects that the researchers it funds will have considered the potential scientific, societal and economic impacts of their research... Applicants should actively consider how these can be maximised and developed through the Pathways to Impact document (formerly known as Impact Plan) in their application. (Economic and Social Research Council, 2016c, para. 2)

The RCUK has made it a requirement for funding to include a satisfactory impact strategy, confirming the importance of these impact strategies to the application for funding. In their response to recommendations arising from a review of pathways to impact the RCUK stated:

Recommendation 3: RCUK should emphasise the need throughout the application process and the importance of a carefully considered Pathways to Impact as part of the good research proposal.

RCUK Response: A clearly thought through and acceptable Pathways to Impact statement is an essential component of research proposals and a condition of funding. Grants will

not be allowed to start until a clearly thought through and acceptable Pathways to Impact statement is received. Research Councils have agreed that if an application is considered excellent for research in terms of the proposed research but has a poor Pathways to Impact statement, funding will be withheld until a clearly thought through and acceptable Pathways to Impact statement has been received. (Research Councils UK, 2015, p. 1-2)

Similarly, The National Science Foundation (US) assesses the strategy for Broader Impacts (BI) alongside the intellectual merit of the grant application (National Science Foundation, n.d.). The NSF provides direction regarding the BI section of the application:

The Project Description must contain, as a separate section within the narrative, a discussion of the broader impacts of the proposed activities.... Such outcomes include, but are not limited to: full participation of women, persons with disabilities, and underrepresented minorities in science, technology, engineering, and mathematics (STEM); improved STEM education and educator development at any level; increased public scientific literacy and public engagement with science and technology; improved well-being of individuals in society; development of a diverse, globally competitive STEM workforce; increased partnerships between academia, industry, and others; improved national security; increased economic competitiveness of the United States; and enhanced infrastructure for research and education. (National Science Foundation, 2013)

To help meet the requirement for a pathway to impact statement in UK grant applications, ESRC provides applicants with an Impact Tool Kit (2016a) and guidance for knowledge exchange (2016b) in grant applications but has no guidance specifically for staff who are supporting the grant application process. In order to assist Canadian researchers, SSHRC (2015) has provided directions on what comprises an effective knowledge mobilization strategy and CIHR (2012) has produced a guide for researchers to integrated (i.e. collaborative research involving non-academic research partners) and end of grant (i.e. dissemination) knowledge mobilization. Yet there is little, if any, guidance for research support staff seeking to assist researchers crafting these impact strategies in their grant applications.

A review of the websites of the Canadian Association of Research Administrators (CARA) [<https://cara-acaar.ca/home>], Society for Research Administrators International (SRA) [<http://srainternational.org/>] and the Australasian Research Management Society (ARMS) [<https://researchmanagement.org.au/>] failed to identify any guidance or tools for research support staff helping researchers develop impact strategies in grant applications although webinars (Canadian Association of Research Administrators, 2016) on enhancing research impact have been offered. The UK Association of Research Managers and Administrators (ARMA) [<https://www.arma.ac.uk/>] provides links to impact related resources from funders but nothing specific to the preparation of either a grant application or its support by research grant professionals. The advice that is provided is tailored to the Research Excellence Framework (REF), not for supporting development of the impact strategies in grant applications.

The need for specific knowledge mobilization planning is underscored by research on research impact. A review (King's College London & Digital Science, 2015) of the 6,679 REF impact case

studies demonstrated there were 3,709 unique pathways to impact. With this degree of uniqueness of impact pathways the generic advice available from Canadian and UK funding agencies can only begin the process of planning for impact. Researchers and their partners need tools, training and support by research grants professionals to craft specific knowledge mobilization strategies that will enhance their success at peer review and create the conditions that will maximize impact of their research.

Problem Statement

Technology transfer/commercialization offices routinely support the development of commercialization strategies for grant applications such as those funded by the NSERC “Idea To Innovation” (I2I) competition in Canada. To be eligible for this competition the university’s Technology Transfer Office “*must endorse and work on each new proposal*” (Natural Sciences and Engineering Research Council of Canada, 2016). However obtaining institutional supports for impact strategies is not a requirement in other grant programs. In an environment where the majority of grant applications require specific strategies to support impacts, how can research managers and administrators support knowledge mobilization strategies which create the conditions that will maximize impacts of university research? This support is present for commercialization and industry engagement so why not for other sectors and other impacts?

Writing for the ESRC on a joint ESRC-DFID (Department for International Development) program, Louise Shaxon (2016b) has called for more effort to be made by institutions seeking to maximize the impacts of research. However, her advice (Shaxon, 2016a) to institutions is predicated solely on a communications/dissemination paradigm. While this is not wrong, it is not complete. Dissemination is necessary but not sufficient to maximize impact. Evidence shows (Bowen & Graham, 2013) that failure to bridge the gap between knowledge and action is not a failure of dissemination but a failure of knowledge production. Indeed Bennet and Bennet (2008) describe effective knowledge mobilization as “collaborative entanglement”. In designing support services to support collaboration and integrated methods of knowledge mobilization, Alison Powell and colleagues (2016) have called on research organizations to better use evidence informed methods of knowledge mobilization including: 1) better use of frameworks; 2) better evaluation; and 3) reduced reliance on push (i.e. dissemination) methods. Addressing the call of Powell and colleagues, this paper presents one approach to this problem that adapts an evidence informed tool (Barwick, 2008, 2013) to support knowledge mobilization strategies including, but not limited to dissemination, that have identified indicators for evaluating progress from research to impact.

Approaches to the Problem

Research offices and other units at Canadian universities in the ResearchImpact network [www.researchimpact.ca] are developing knowledge mobilization services designed to create grant applications that provide specific knowledge mobilization strategies to enable future impact. Research managers and administrators have a long history of supporting application development including grant applications for translational research (Boynnton & Elster, 2012) that seek to

create an impact on real world problems. Many research managers and administrators also provide training for grant writing (Porter, 2004). Since the need for impact planning in grant applications is ubiquitous across funders in Canada, the US and the UK, more can be done.

York University's Knowledge Mobilization Unit in Toronto, Canada has been supporting knowledge mobilization and impact strategies in grant applications for over ten years. The Knowledge Mobilization Unit has developed standardized processes using tools for knowledge mobilization planning that structure knowledge mobilization plans around four key elements: audience/end users; goals of the knowledge mobilization strategy; knowledge mobilization activities; evaluation and accountability. The Knowledge Translation (KT) Core facility has been providing services to NeuroDevNet, a national Network of Centres of Excellence, since August 2013. The KT Core is housed within York University's Knowledge Mobilization Unit and has adapted their method for planning for use at the beginning of research programs for Autism Spectrum Disorders (ASD), Cerebral Palsy (CP) and Fetal Alcohol Spectrum Disorders (FASD). Each of these processes is described below followed by comparative analysis, reflections and recommendations.

York University's Knowledge Mobilization Unit

Working under the auspices of the VP Research & Innovation, York University opened its Knowledge Mobilization Unit in 2006 to connect university research to organizations beyond the academy in order to maximize the economic and social impacts of research. These activities are captured under York University's Academic Plan (York University, 2016) under: Priority 2 - *Advancing Exploration, Innovation and Achievement in Scholarship, Research and related Creative Activities*; and, Priority 6 - *Enhanced Community Engagement*. They are also anticipated under the Strategic Research Plan (York University, 2013).

The service model at York University includes support for specific knowledge mobilization strategies in grant applications. In order to meet the growing demand for grant support, the two full time Knowledge Mobilization Unit staff (called knowledge brokers) adapted a Knowledge Translation Planning Template developed by researcher Melanie Barwick (Barwick, 2008, 2013) to support knowledge mobilization strategies in grant applications. This template uses a sequential 13-step planning process which leads participants through the elements of knowledge mobilization planning. To manage the complexity of the Knowledge Translation Planning Template while maintaining its rigour and integrity, York knowledge brokers clustered Barwick's 13 steps to four basic elements: engagement (i.e. audiences); objectives/goals; activity; and, impact/evaluation (see Table 1). Experience has shown that teams are very strong at articulating their objectives and activities, however, engagement and impact are frequently poorly identified and articulated.

¹ A note on terminology: In this article knowledge mobilization = knowledge translation. The difference is one of organizational structures not one of function. In Canada knowledge translation is used predominantly in health disciplines while knowledge mobilization is used primarily in the social sciences and humanities. Their strategies, activities, underlying theories and evaluation are similar enough to allow these terms to be synonymous from a practice perspective. They are maintained as distinct terms as they reflect the names used by the organizations described in this article.

Table 1. Four core elements of knowledge mobilization planning

Element	Description
Engagement/ Audiences	Before Principal Investigators think about what they want to do they need to start with the partnerships and forms of engagement with identified audiences. This speaks to the purposefulness of Knowledge Mobilization/KT and involves end users in the development of the rest of the strategy.
Goals/Objectives	Frame the project in terms what you want to achieve and how you plan to achieve it. <ul style="list-style-type: none"> • Overall Objective: high level, long horizon • Specific Goals: more granular, measurable; achieving goals by undertaking activities (below) allows you to fulfill your overall objective
Activities	Articulated on the Knowledge Mobilization Planning Chart (Appendix A). Activities need to be mapped to specific audiences and correlated to goals and objective. Activities need to speak to academic and non-academic audiences. Identify metrics and key performance indicators.
Impact, Indicators & Accountability	A longitudinal look at the results of the knowledge mobilization plan. Impacts are measured at level of end user/receptor/partner by measuring indicators specific to the activities.

The knowledge broker meets with the researcher(s) requesting the service. If possible the non-academic research partner(s) also attends these early conversations. The goals of this early engagement are to explain the process, learn about the research and coach the research team on developing approaches to these four elements. The knowledge broker works with the research team in an iterative fashion to refine the approaches and when these four elements are fully described and cohesive with the research plan, the research team completes a knowledge mobilization planning chart as described in Appendix A which organizes these four elements in a logic model-based template. Appendix A includes an example of one completed row using a research forum called KM in the AM as an example (Phipps, 2011). The core of the knowledge mobilization plan is complete when all knowledge mobilization activities are described on this chart.

The knowledge mobilization plan written in the grant application varies according to the requirements of the funding program. For example the knowledge mobilization plan for a SSHRC Connections Grant application (max \$50K) is one page whereas the knowledge mobilization plan for a SSHRC Partnership Grant (max \$2.5M) is four pages. York's knowledge brokers have used this process for both of these competitions demonstrating its ability to scale across different grant programs. Finally, the activities described in the knowledge mobilization plan (including the collection of data for evaluation) are fully budgeted and described in the budget and budget justification. The knowledge broker reviews and edits the final knowledge mobilization plan, budget and budget justification in advance of submission of the application.

Since the beginning of operations in 2006, the Knowledge Mobilization Unit at York University has provided tailored knowledge mobilization services supporting 137 grant applications, the

majority of which have been in the social sciences with population health and health policy forming the bulk of the remainder of the applications supported. This is in contrast to the primarily clinical health research supported by NeuroDevNet (see below). As a result of this support, 42 research teams have been successful in receiving research funding, which amounts to over \$47M in research funding to York University.

NeuroDevNet

NeuroDevNet is a federally funded Network of Centres of Excellence (NCE), comprised of 19 research projects and three service ‘Cores’—NeuroInformatics, NeuroEthics, and Knowledge Translation (KT) all working to ensure that children with neurodevelopmental disorders (ASD, CP, FASD): 1) get diagnosed sooner; 2) receive validated interventions; and, 3) are provided with family services to maximize their potential. Funded at approximately \$4M/year the Network is in its seventh year of 10 years. The KT Core has been in operation since August 2013 and comprises 1.5 full time staff who offer a suite of services (NeuroDevNet, 2016) including KT planning.

The KT Core provides all researchers with a KT Planning Guide that is an annotated bibliography of KT planning guides (Poetz, Jensen, Johnny, & Ross, 2015). This guide complements tips provided on the KT Core’s blog as well as individualized support for KT planning for one of their own projects which may include support for KT planning for grant applications. Unlike the Knowledge Mobilization Unit the KT Core does not rely on in person support due to the geographically distributed nature of the pan-Canadian network.

The process for KT planning support in grant applications involves the following steps:

1. Receive request for support for KT planning and provide KT Planning Guide
2. Request full proposal and information on funding opportunity
3. Review proposal and provide edits/comments toward weaving KT planning / impact / evaluation throughout the proposal (not just in the KT section) so the KT planning section fits within the application and not as an ‘add on’
4. If KT planning section is blank, write a draft of a KT section including KT goals and activities that fit within the goals and activities of the research plan, audiences/partners and evaluation/indicators. If there is a draft KT plan, provide edits and comments regarding suggested improvements
5. Send document(s) for review by researcher
6. Invite researcher to participate in a meeting (usually telephone consult since NeuroDevNet is a distributed network not located on a single campus) to explain comments and suggestions, hear their feedback and refine draft accordingly

It is necessary to review the entire research proposal before providing advice on KT strategy because each KT plan depends on the research project’s goals, methods and anticipated outcomes. In 2.5 years of operations the KT Core has supported 9 grant applications, 4 of which were successful attracting \$2.9M in external research grant funding. The planning approaches of the Knowledge Mobilization Unit and the KT Core are illustrated in Figure 1.

Figure 1 presents a process diagram for knowledge mobilization/translation planning services synthesized from the York University (primarily in person support) and NeuroDevNet (primarily remote support) processes. This can serve as a process tool for research grant support professionals considering supporting research impact strategies in grant applications.

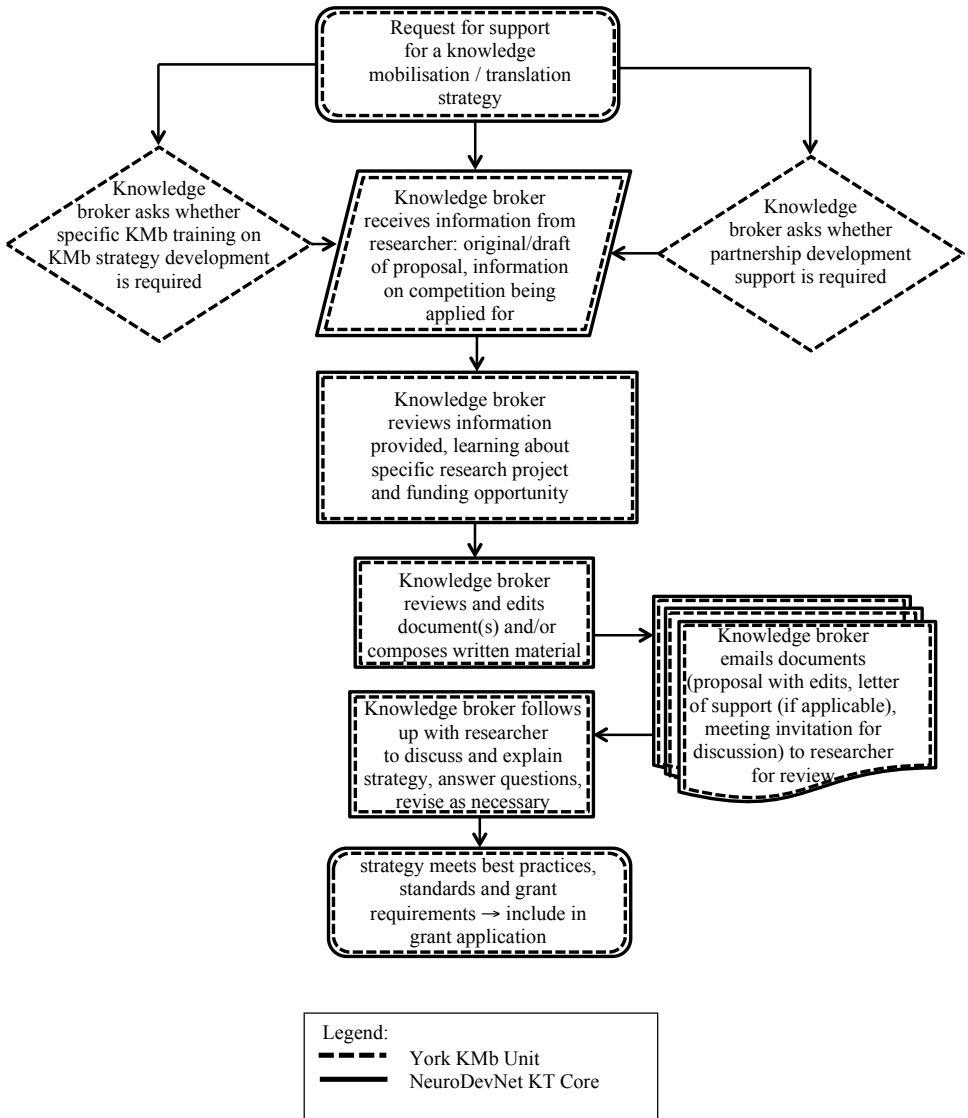


Figure 1. Process flow for knowledge mobilization grant support

Evaluation and Analysis of Approaches

Working on knowledge mobilization/translation strategies in a combined total of 53 grant applications has allowed the knowledge brokers at York and NeuroDevNet to identify those characteristics common to weak or strong plans to maximize the potential for research impact (Table 2).

Table 2. Four core elements of knowledge mobilization planning

Strong KT/Knowledge Mobilization plan	Weak KT/Knowledge Mobilization plan
Balances end-of-grant and integrated KT strategies (stakeholder engagement) and has effective engagement of end users throughout the research	Only focuses on end-of-grant (dissemination) products and activities, poor engagement of end users in the research
Demonstrates understanding of impact being change in policy, practice, behaviour, measured at the level of the end user, not the researcher	Conflates impact with outputs such as # of website page views, # of video views, # of document downloads, # of conference presentations which are measures of reach and dissemination of research, not of change for the non-academic research partners/audiences
Focuses on what the project team will do (i.e. activities)	Literature review about knowledge translation with no link to activities
Includes: KT goals/objectives, activities that support the achievement of those goals/objectives, budget for activities, accountability	Unfocused, list of activities and stakeholder groups with no unifying goals/objectives, no budget or accountability for KT activities
Stated evaluation framework with specific indicators	Poor or no evaluation plan, no indicators

In preparing for this article the authors turned to the ResearchImpact LinkedIn group [<https://www.linkedin.com/groups/1969705>] for perspectives from knowledge brokers. A LinkedIn Discussion with the title, “*Seeking your thoughts about knowledge mobilization planning: grant application vs. research project*” asked the question, “Are we doing anything different than when researchers and brokers plan knowledge mobilization strategies for already funded projects?” Responses suggest that knowledge mobilization planning for grant applications is different from knowledge mobilization during the conduct of the research project:

I think it is different. Assistance once the research application is funded is about maximising the processes and procedures, activities and actions that will help to deliver the research objectives.

-research communications professional (UK)

I see two differences: 1) Discussing knowledge mobilization pre-grant makes it possible to discuss potential impact with researchers. This may make them rethink details about their research questions in order to make them as relevant as possible for users/stakeholders. 2) When knowledge mobilization is discussed pre-grant, there is more likely to be resources for knowledge mobilization activities in the project, and knowledge mobilization activities can be developed from the outset, instead of being regular dissemination of products.

-management consultant in social research (Denmark)

In the recent projects pre-grant I've reviewed, I was able to help researchers - although most of the time I had no expertise in their research fields...Having expertise in knowledge mobilization practices and methods, brokers can give a wider view of what researchers do/could do. Also, as it is relatively new that grant agencies are asking for explicit knowledge mobilization strategies, some researchers are still a bit lost about what it means...I see brokers' position as an opportunity to explain them [sic] what knowledge mobilization allows...

-university based knowledge mobilization professional (Canada)

Furthermore researchers find this individualized support to be of value. Below is a quote from a NeuroDevNet-funded researcher who benefitted from the KT Core's input on her grant application, as well as services for informing her integrated KT approach which began with an in-person stakeholder consultation after her funding application was successful securing over \$1M in research funding:

Anneliese helped advise on a KT strategy for the grant, and has been working with my team ever since to put together a stakeholders' meeting. This is completely new to me and her support has been invaluable with planning, selecting invitees, setting the agenda, determining what data to gather, etc. We had our stakeholder meeting on Monday, and it was very well received by our stakeholders. We are still awaiting the report, but the information we gained is going to be extremely useful as we try to move our research forward and ensure it has the maximum possible impact on children.

So again, thank you to NeuroDevNet and the KT team, and Anneliese in particular. I wouldn't have come up with the idea without her, let alone been able to execute it and produce useful results.

– Dr. Catherine Lebel, University of Calgary and NeuroDevNet researcher

Knowledge mobilization professionals in the UK, Denmark and Canada have identified the value of planning knowledge mobilization strategies early in the grant application which is appreciated by researchers receiving the support. Most tools, theories and guidelines are too general to inform a specific knowledge mobilization plan (Nilsen, 2015) as required by research funders (Research Councils UK, 2014). The need for specific guidance to develop specific knowledge mobilization strategies creates a new role for research support staff and creates new training opportunities for research administration associations such as ARMA, ARMS, SRA and CARA.

Reflections & Recommendations

York University's Knowledge Mobilization Unit delivers services in person, on campus, while the KT Core of NeuroDevNet delivers services remotely to researchers across Canada. Despite this geographical difference, the processes are similar as illustrated in the process diagram in Figure 1. These similarities and some differences are also illustrated in Table 3 which compares the grant support strategies of NeuroDevNet and York's Knowledge Mobilization Unit. Despite being in

Table 3. Comparison of knowledge mobilization/translation planning services

	York Knowledge Mobilization Unit	NeuroDevNet KT Core
Different	Emphasis on building partnerships between community-university collaborators for knowledge mobilization planning	Emphasis on providing services to support the research team to conduct stakeholder engagement which supports integrated knowledge translation planning
Different	Create and provide numerous in-person workshops and training events for capacity building for knowledge mobilization planning	Create and provide reference documents (e.g. guides, blog) for capacity building for KT planning in addition to one workshop and four webinars on other KT topics
Different	Provide front-end support for knowledge mobilization planning but not ongoing support for knowledge mobilization throughout the project	Provide front-end support for KT planning as well as ongoing services toward operationalizing the plan
Similar	137 projects supported attracting \$47M (= \$310,236/request)	9 projects supported attracting \$2.9M (= \$253,636/request)
Similar	Provide review and advice on knowledge mobilization plans for grant applications	Provide review and advice on KT plans for grant applications
Similar	Engagement and impact often poorly articulated in proposals reviewed	Engagement and impact often poorly articulated in proposals reviewed
Similar	Use existing tools (Barwick's 13-steps) customized to York's knowledge mobilization context	Use existing tools (existing KT guides, Barwick's 13-steps & Ontario Centre of Excellence for Child/Youth Mental Health KT planning toolkit) customized to NeuroDevNet context
Similar	Review knowledge mobilization strategies for: engagement, objectives, activities, desired impact, accountability/evaluation	Review KT strategies for: engagement, objectives, activities, desired impact, accountability/evaluation
Similar	Demand driven, responsive to requests for service	Demand driven, responsive to requests for service
Similar	Optimally will have 2-3 months to support knowledge mobilization strategy, often get requests for support days before the application deadline	Optimally will have 2-3 months to support knowledge mobilization strategy, often get requests for support days before the application deadline

very different organizational constructs, the campus based Knowledge Mobilization Unit at York University and the KT Core of the distributed NeuroDevNet network provide similar services to support knowledge mobilization/translation strategies in grant applications (see Figure 1).

Knowledge brokers at York and NeuroDevNet have supported knowledge mobilization strategies in applications for the research funders shown in Table 4. Since this process has been successful across a variety of research funders including federal and provincial research granting agencies, federal and provincial ministries and foundations we believe these strategies are transferable to grant programs from a variety of funders including NSF granting agencies from the RCUK.

Table 4. Grant programs supported by York and NeuroDevNet knowledge brokers

Type of Funder	Details
Research granting agency	Social Sciences & Humanities Research Council; Canadian Institutes of Health Research; Canada Foundation for Innovation; Ontario Centres of Excellence; Networks of Centres of Excellence; International Development Research Centre
Ontario Ministries	Ministry of Municipal Affairs and Housing; Ministry of Child & Youth Services; Ministry of Agriculture, Food and Rural Affairs; Ministry of Education
Federal Government Ministries	Canadian International Development Agency (now Global Affairs Canada)
Foundations	McConnell Family Foundation; Ontario Trillium Foundation; Carswell Family Foundation

This experience allows reflections on the benefits of using professional knowledge brokers or to build capacity in research support professionals to support knowledge mobilization strategies in research grant applications.

1. *Allows for peer review of the knowledge mobilization strategy.* Now that strategies for knowledge mobilization and broader impacts are part of most grant funding schemes, applicants can receive feedback from reviewers who provide a critical review of the proposed strategy. This assumes a well-trained and impact-literate review panel. But this assumption has not been demonstrated in practice. Surveys showed that most peer reviewers of NSF grants lacked understanding of the broader impacts criteria (Rothenberg, 2010).
2. *Enables more effective evaluation of research impact* since the knowledge mobilization strategy has already been rigorously developed. Evaluation is enabled with planned: 1) goals to measure against; 2) stakeholders who are not only research partners but sources of impact narratives and data describing the evidence of impact; and 3) indicators at each stage.

3. *Ensures resources are allocated to fund the plan.* Funding for knowledge mobilization activities will not be available if the desired activities are not part of the grant application budget. This potentially results in a focus on dissemination and end of grant methods of knowledge mobilization since it is often cheaper to produce knowledge products such as clear language research summaries and develop a social media strategy than it is to pay the expenses of engaging end users in the research process (integrated knowledge mobilization).
4. *Supports integrated knowledge mobilization* to balance the predominance of end of grant (dissemination-based) knowledge mobilization strategies produced without specialized supports provided by knowledge brokers. Integrated knowledge mobilization methods are known to be more effective than dissemination/end of grant methods (Powell et al., 2016).

Recommendations for research support professionals and institutions:

1. Use the planning tool of Appendix A and the process flow of Figure 1 to develop an institutional approach to supporting specific impact strategies in grant applications.
2. Provide dedicated supports for knowledge mobilization planning as institutions do for commercialization. This can be either a specific knowledge broker or could be part of the skill set of a research support professional. In either case, seek opportunities to build staff skills such as the Canadian Knowledge Mobilization Forum, the UK Knowledge Mobilization Forum and the Annual Summit of the National Alliance for Broader Impacts (US) or specific courses such as those offered by Melanie Barwick (Barwick, 2008, 2013).
3. Advocate for non-academic research impacts to be part of an explicit institutional priority for the research enterprise similar to York University's Academic Plan and Strategic Research Plan. If these priorities are not in the institutional planning documents it will be difficult to secure resources.
4. Build in follow up beyond the conduct of the research to collect the evidence of impact. As previously described (Phipps, Johnny, & Wedlock, 2015) impact is measured at the level of the non-academic partner. Knowledge brokers should reach out to non-academic partners on an annual basis after the end of the research project, to collect the evidence of impact that will inform development of impact case studies.
5. Use existing examples of successful impact to create the case for supporting knowledge mobilization strategies. Many universities have researchers who are collaborating with non-academic research partners to create impacts on products, policies and services. Building on existing success will facilitate implementation of a program to further enhance impact of a university's research.
6. Build in enough time to adequately plan for knowledge mobilization. The experience of York and NeuroDevNet knowledge brokers suggests that three months is optimal to engage in such an iterative process as described in Figure 1. However, experience has shown that requests for service often come in a much more compressed time frame.

Recommendation to research administration associations:

1. Recognize planning for impact is required in many grant programs and therefore is an emerging skill set for research support professionals. Develop training modules to build capacity for research offices to support all aspects of grant applications including impact strategies.

Recommendations to research funders:

1. Complement requirements for institutions to provide specific support for commercialization strategies by requiring institutions to also provide specific support for knowledge mobilization strategies otherwise researchers will be required to develop these specific strategies without tools, training or support.
2. Build capacity of peer reviewers to assess the impact strategies in grant applications. Consider including a knowledge mobilization expert on peer review panels, especially for programs that have a requirement for an impact strategy.

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Appendix A: Knowledge Mobilization Planning Chart

Activity	Targeted Audiences (engagement)	Details	Key Outcomes (goals)	Outcome Indicators	Desired Impacts (accountability)
KM in the AM	Community leaders, practitioners, researchers	Building trust, proven KMb activity	Brokered research and KMb relationships	# people, # meetings; sustained conversations; satisfaction/ usefulness survey	Community-university projects (1yr); Informed decisions (5yr)