



Model for collaborative research among international transport researchers



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ABSTRACT

This paper examines the nature of collaborative international research in transportation. A comparison is made between research themes, problems, and challenges identified by the European Union and the U.S. Department of Transportation, and similarities among the research themes is highlighted. A definition of collaboration is next offered and the implications of this definition on collaborative approaches to research are explored. Different models of collaborative research are identified from health and education research, and the lessons learned from these models are applied to international transportation research. A hybrid model of collaborative research that highlights institutional partnerships, research team collaborations, and individual researcher interactions is offered as a point of departure for understanding necessary characteristics of successful collaborative research efforts. The paper then recommends actions and strategies for fostering such research. These recommendations focus on actions at the institutional, research team and individual researcher levels.

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1. Introduction

The study of transportation systems and of the interaction between transportation and society is not constrained by international borders. Many of the mobility and accessibility challenges facing countries and metropolitan areas around the world are similar, as are many of the solutions considered by transportation officials. For example, the potential impact of climate change on transportation system condition and performance is an issue being faced in all parts of the globe, and the types of strategies being considered in Australia might be very relevant to the challenges being faced in Canada, the United States or Europe. At the same time, it is important to acknowledge that all international collaborative research has to address different contexts, particularly social and political.

This paper examines the important role of collaborative research among international researchers. The paper begins by examining some of the research themes and issues that are common to different countries. The paper next discusses the different characteristics of a successful collaboration, and some of the key barriers in developing working models of such research efforts. These characteristics are then used to suggest different ways of successfully conducting collaborative research. The paper

ends by recommending steps that can be taken by research organizations and funding agencies to foster more collaborative research on those issues of mutual concern to researchers around the world.

2. Common research themes as a basis for collaborative action

One of the most important elements of successful collaborative research is an interest among researchers on common issues. By its very nature, the transportation research process consists of groups of individual researchers, each having a particular set of skills and expertise, focusing on problems and issues of concern to the transportation sector. Thus, international research collaboration will depend on the degree of requisites of the funding or commissioning entities. It is beyond the scope of this paper to examine in great detail the similarities (or dis-similarities) among national and international research agendas. However, a brief comparison of the research program for the European Union (EU) and for the United States (US) will provide some sense of the similarities of transportation research issues between the two. At a strategic level, is it not surprising that there are similarities between the EU and the US and others; differences in priorities and approach will most likely occur at lower levels.

European Union Horizon Program: Horizon 2020 is the biggest research and innovation program ever funded by the European Union, with close to €80 billion (\$90 billion in 2016) of funding

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available between 2014 and 2020. (European Commission, 2014) The four main priorities for transportation research in this program include:

- Making transport more sustainable: resource-efficient transport that respects the environment.
- Making transport and transport systems seamless: better mobility, less congestion, greater safety and security.
- Keeping transport competitive: European transport industry as a global leader.
- Making transport research responsive: socio-economic research and forward-looking activities for policy-making (European Commission, 2014).

The work program for 2016–2017 provides a better sense of the types of transport research that is to be funded in the Horizon program. (European Commission, 2016) The program was divided into three major topic areas: mobility for mode-specific challenges, cross modal integration, and cross-cutting issues. The research topics included:

Areas addressing mode-specific challenges (technical and socio-economic)

1. Aviation
2. Waterborne

Areas addressing cross-modal and/or transport integration specific challenges (technical and socio-economic)

3. Safety
4. Urban
5. Logistics
6. Intelligent Transport Systems
7. Infrastructure

Cross-cutting issues

8. Socio-economic and behavioral research and forward looking activities for policy making

See <https://openspending.org/eu-commission-fts> for the breakdown of research spending for the European Commission.

ERA-NET Transport is another interesting example of European collaborative research. As noted in the program description, “To increase and ease up cooperation between regional and national program owners (PO) and program managers (PM) the web-based ENT-platform aims to collect calls and funding schemes, enabling the respective authorities to recognize possible common aspects and join their activities together. In this way cooperation across regions and nations can be encouraged in a very early stage, turning redundancy to synergy.” (Era-net Transport, 2016a) This collaborative initiative provides toolkits with comprehensive guidelines, examples of experiences and best practices, and suggested steps to foster collaborative transnational research. In addition, the program has established “ambassadors” that function as links between current research programs to “deepen and intensify collaboration in specific activities and calls.”

United States Department of Transportation (DOT) Research Agenda: The U.S. DOT is required by law to produce a strategic plan for research, development, and technology (RD&T). Although this strategic plan represents the overall agency’s strategy for transportation research, several of the modal agencies within the U.S. DOT also have very detailed research agendas (e.g., the Federal Highway Administration has its own strategic research plan focusing on advances in highway practice). The current strategic plan, covering 2013 to 2018, identified five major priority areas:

- Promoting Safety
- State of Good Repair – Preserving the Existing and Extending the Life of Future Transportation Systems

- Economic Competitiveness and Improving Goods Movements
- Livable Communities – Reducing Congestion and Improving Mobility
- Environmental Sustainability – Preserving the Environment (U.S. DOT, 2013)

Interestingly, one of the key responsibilities of the federal transportation research, development and technology program was to create incentives for collaborative cross-modal research, focusing on the topics common to multiple modes. This collaboration was focused on efforts among different federal agencies, state and local transportation agencies, private transportation firms and technology vendors, and other stakeholders that could have an important role in contributing new ideas and innovation to the transportation sector. The strategic plan identified many topics that were cross-cutting to individual modal agency interests, such as alternative fuels, human factors, simulation, pavement, and structures.

The approach adopted by the U.S. DOT in fostering a collaborative process was to establish performance-based outcome measures and to conduct retrospective assessments of research, development and technology projects. As noted in the plan, “by including cross-cutting RD&T priority areas, the strategic plan supports an approach to research that encourages collaboration across operating administrations and government agencies and promotes consultation and partnership with stakeholders in industry and academia.” (U.S. DOT, 2013)

To encourage collaborative research, the U.S. DOT created an online searchable database of transportation RD&T activities. The database’ allows policymakers, program managers, researchers, partners, stakeholders, Congress, and the public to search for RD&T information by research topic, funding level, research description, contractor or grantee, state, and more.”

Comparing the Horizon 2020 and U.S. DOT’s Strategic Plan, one sees very similar topics with respect to research focus areas. This is not surprising given the relative state of development of both the European Union and the United States. An examination of a few non-western countries’ transportation agency research portfolios as well as those of international organizations (e.g., the United Nations and World Bank) showed that these issues are similar to those focused on in other parts of the world as well. It also became apparent in this examination that the United States and European Union are two of the few entities in the world that systematically and periodically produce transportation research programs with dedicated funds aimed at program implementation. Thus, it seems likely that long-term collaborative research based on mutual interests and dedicated funding will most likely occur between the European Union and the United States, with Australia, Canada and New Zealand offering potential partners.

3. What is meant by collaboration?

An important point of departure for any discussion on models for collaborative international research efforts needs to start with the definition of what is meant by collaboration. Very few studies have been conducted in the transportation sector on the characteristics of successful collaborative actions, particularly for transportation research. One study that examined such characteristics defined collaboration as, “a purposeful process of working together to plan, create, and solve problems and/or manage activities.” (Campbell et al., 2005) This study identified several characteristics of a collaborative process that need to be present for successful outcomes:

- Successful collaboration must be serving a clearly articulated need. Thus, in the early stages of a collaborative effort, goals must

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