Transportation Association of Canada

Funded Projects in Development

August 2017

Introduction

The Transportation Association of Canada provides a fertile environment for the development and conduct of cooperative projects by providing:

- a variety of fora for transportation professionals to share perspectives and identify projects or issues of mutual interest,
- a network of leading experts in the transportation sector to contribute to or validate projects,
- an institutional mechanism for pooling resources, contracting and managing collaborative initiatives,
- professional staff to manage or undertake projects, and
- a recognized, credible "name" in the Canadian and international transportation community.

At any one point in time, TAC has numerous projects in process covering a broad range of topics. Projects are considered to be in development if they have received support in principle from relevant council(s) and are considered by the TAC Board of Directors or its Executive Committee to conform to TAC policies. While in development, stakeholders are invited to consider the proposed projects and indicate to the TAC secretariat if they are interested in funding any of the initiatives.

The projects listed below are currently in development and funding partners are being sought. More information about each project is provided on the following pages. To make a financial contribution to a project and have a representative participate on its steering committee, please contact the staff member identified in the project description.

Committed Funding Partners

As of August 2017

	Canadian Road Safety Handbook Scoping Study	Performance Based Decision Making-Lessons Learned and Practitioner Toolkit	Cross-Asset Optimization Practices in Transp.Asset Management	Best Practices for Evaluating Soil and Material Stabilization Products	Best Practices for Pothole Repairs in Canada
Originally Proposed:	Spring 2017	Spring 2017	Fall 2016	Spring 2016	Spring 2016
TAC Members (Federal/Prov./Terr.)					
Alberta					
Bristish Columbia					
Manitoba					
New Brunswick					
Newoundland and Labrador					
Prince Edward Island					
Ontario					
Quebec					
Saskatchewan					
Yukon					
TAC Members (Municipal)					
Calgary					
Montréal					
Saskatoon					
TAC Members (Other)					
Cement Association of Canada					
Funds Committed	**$**	**$**	**$70,000**	**$90,000**	**$80,000**
Funds Required	**$115,000**	**$120,000**	**$170,000**	**$130,000**	**$130,000**
Percent Committed	**%**	**%**	**41%**	**69%**	**62%**

Canadian Road Safety Engineering Handbook Scoping Study

Recommended Spring 2017

Research Area: Road Safety
Responsible Committee: Road Safety Standing Committee
Responsible Council: Chief Engineers'

In absence of a comprehensive Canadian reference document, Canadian practitioners have been using road safety engineering guideline documents published by various international organizations, developed to suit their respective environments and operating conditions. Despite the best efforts to adopt or adjust those guidelines to the Canadian context, there appear to be inconsistencies in application and road safety engineering practices that may cause inappropriate decision making on road safety matters and thus, result in undue costs and unintended operational issues.

There is a need for a comprehensive road safety engineering reference document to address unique Canadian climate conditions, roadway network characteristics, vehicle fleet and road users' expectations as well as to complement geometric design and traffic operation practices recommended in the *Geometric Design Guide for Canadian Roads* and the *Manual of Uniform Traffic Control Devices for Canada.*

Largely through volunteer efforts, the Canadian Road Safety Engineering Handbook is being developed as the primary reference for road safety engineering in Canada. It is intended to identify, define and share good practices in road safety engineering in order to assist Canadian road authorities and road safety engineering practitioners in providing service to the public and addressing road safety issues at the local level. The Handbook is envisioned as a series of publications to address specific subjects as follows:

No.	Subject/Publication	Status
1	Road Safety Engineering Management Guide	Published (2009)
2	Canadian Road Safety Audit Guide	Published (2001)
3	Canadian Guide to In-Service Road Safety Reviews	Published (2004)
4	Rural Road Safety Engineering	In development (volunteer project)
5	Urban Road Safety Engineering	In development (volunteer project)
6	Speed Management Guide	Published (2016)
7	Access Management	To be developed
8	Road Safety Engineering in Transportation Planning	To be developed
9	Applied Human Factors in Road Safety Guide	Published (2013)
10	Guidelines for Network Screening of Crash Prone Locations	Published (2011)

Development of components of the Canadian Road Safety Engineering Handbook has been ongoing for almost two decades and a few outstanding major topics must be addressed to ensure comprehensive guidance is provided. Furthermore, some of the earliest publications in the Handbook series are over ten years old and require updating to recognize rapidly advancing industry research and the state-of-practice tools.

To that end, a scoping study is proposed to determine the extent of work that is required to update and complete the Handbook. As part of the study, a strategy regarding implementation of the completed Handbook will be recommended.

Key tasks to accomplish the project will include:

- Review of existing Handbook publications, other TAC road safety related publications and work in progress to identify content that needs to be updated, refreshed or included in the Handbook.
- Review of other road safety reference documents used by Canadian practitioners (e.g., AASHTO *Highway Safety Manual)*.
- Identify the impact of emerging technologies and other potential uncertainties, risks, challenges or issues which will need to be resolved to complete and establish the Handbook as the primary reference for road safety engineering in Canada.
- Identify means to ensure the Handbook complements existing content and ongoing or future updates to the *Geometric Design Guide for Canadian Roads* and the *Manual of Uniform Traffic Control Devices for Canada*.

The major deliverable will be a report documenting the work with recommendations for the extent of effort and suggested methodology to complete the Canadian Road Safety Engineering Handbook in the most efficient and cost-effective manner.

Total Funding Estimate: $115,000
Staff Contact: Sandra Majkic

Performance-Based Decision Making – Lessons Learned and Practitioner Toolkit

Recommended Spring 2017

Research Area: Transportation Financing
Responsible Committee: Transportation Finance Standing Committee
Responsible Council: Urban Transportation

Public agencies across Canada are developing processes and methodologies to evaluate and prioritize investments and optimize performance outcomes with available funds. There has been a convergent evolution of practices in performance-based decision making across Canada, with a number of agencies developing different approaches to address the need for transparent, outcome-driven processes for allocating capital and operating budgets. A summary of the state of practice and lessons learned as well as a toolkit for performance-based decision making will provide valuable resources for practice and experience sharing amongst transportation agencies.

The major project objectives are to:

- Synthesize practice in performance-based evaluation and decision processes and techniques.
- Identify lessons learned, provide recommendations and considerations for public agencies to improve evaluation and decision making practices.
- Provide practical tools for agencies to share and improve evaluation processes and techniques.

It is expected that the following key questions will need to be answered to accomplish the project objectives:

- Why performance based tools were developed; what issues were they intended to resolve?
- What challenges are public agencies facing in allocating investment funds?
- What are the key objectives for performance-based decision processes? How do they compare?
- What was implemented? What were the results or barriers? What are the examples of substantially different outcomes?
- What lessons were learned? What processes and methods were used?
- What are the recommendations for improving performance-based decision making initiatives?

The major deliverable will be a report on current practices and lessons learned as well as a toolkit with examples of key elements of performance-based processes. The report will consist of:

- Key findings from past research and analysis on performance-based processes, including typical objectives.
- Summary of interviews with key agencies and practitioners using/developing performance. frameworks considering lessons learned, challenges, and opportunities.
- Consideration of life cycle issues, operating and capital issues or priority setting between different program elements (e.g. modes, capital vs. operating projects, transportation vs. non-transportation projects etc.).

The toolkit will include:

- Decision making processes (how decisions are made, who governs, how dialogue is managed etc.)
- Evaluation techniques and methodologies (including scoring, weighting, data management challenges/quantitative factors, etc.)

- Evaluation tools (e.g. available products, agencies' custom made tools etc.)
- Visualization of results and communications for trade-off dialogue.

Total Funding Estimate: $120,000
Staff Contact: Sandra Majkic

Synthesis of Cross-Asset Optimization Practices in Transportation Asset Management

Recommended Fall 2016

Research Area: Asset Optimization
Responsible Committee: Asset Management Task Force
Responsible Council: Chief Engineers'

Deteriorating transportation infrastructure and maintenance requirements continue to exceed available funding in most jurisdictions. As a result, choosing between potential projects becomes necessary and it can be a challenging process.

Several methodologies exist in practice today that can assist agencies in prioritizing capital and maintenance work to optimize their infrastructure investments and meet organizational goals. Common prioritization methods used in asset management systems include: analyses (financial, benefit-cost, risk-based, multi-criteria or life-cycle cost), analytical hierarchy process, multi-attribute utility theory, probabilistic/deterministic based models or combination of these methods. Transportation organizations are increasingly looking to cross-asset trade-offs and optimization as the next innovation to improve transparency, credibility, and decision-making for project planning and delivery.

The project objective is to synthesize best practices, tools and techniques for optimizing transportation asset management programs. The intention is to provide guidance to agencies, regardless of size, budget or asset management maturity, that wish to shift from optimizing projects and individual asset management systems to optimizing across systems. The project will include a review of the full range of available methods, including case studies and advantages and disadvantages of each method, with the goal of providing a set of tools, techniques and recommended practices for cross-asset optimization.

Key tasks to accomplish the project objective will include:

- Review available and proven optimization techniques used in asset management programs from local, provincial, national and international perspectives as well as new methods and techniques that may be in early stages of development.
- Identify best practices with guidance for proposed optimization techniques and examples from organizations leading in cross-management practices.
- Develop examples that demonstrate application of proposed optimization methods.

The work will culminate in a synthesis of best practices for optimizing program decisions in relation to asset condition, performance goals, risk management and financial considerations within asset management systems.

Total Funding Estimate: $170,000
Staff Contact: Sandra Majkic

Best Practices for Evaluating Soil and Material Stabilization Products

Recommended Spring 2016

Research Area: Soil Stabilization
Responsible Committee: Soils and Materials
Responsible Council: Chief Engineers'

Stabilization of poor soils is a common practice used by many Canadian agencies during road construction. There are numerous stabilization products available on the market, typically divided into three categories: physical, chemical, and biological products. As new products enter the market, Canadian agencies often struggle to obtain information about the products, installation procedures, and the long-term performance of these products.

Since most of the products are proprietary in nature, there can be significant issues with ultimate lines of responsibility if problems or failures occur. Product evaluation in a field setting is expensive and time consuming. As a result, agencies experience difficulties in assessing products and their applications to local conditions.

The major project objectives are to:

- Identify procedures used by Canadian agencies to evaluate and select products to implement on their road construction projects.
- Identify available material and performance testing.
- Summarize agencies' experiences with using soil stabilization products.
- Summarize long-term performance results.
- Compile a synthesis of best practices for soil stabilization across Canada and determine best approaches for evaluating stabilization products for inclusion in agencies' treatment toolbox.

Key tasks to accomplish the project objectives will include:

- A literature review of typical soil stabilization practices, including an overview of stabilization products available on the Canadian market.
- Survey of Canadian agencies, industry, product suppliers, contractors and geotechnical experts to determine the most pertinent issues related to stabilization practices and treatments.
- A review of research on available soil stabilization treatments and associated performance throughout North America, and internationally.

The work will culminate in a synthesis of best practices for evaluating soil and material stabilization treatments in Canada as well as recommended guidelines to assist Canadian agencies in evaluating and selecting appropriate stabilization products that will lead to long-term performance of roadways.

Total Funding Estimate: $130,000
Staff Contact: Sandra Majkic

Best Practices for Pothole Repairs in Canada

Recommended Spring 2016

Research Area: Road Maintenance, Pavements
Responsible Committee: Soils and Materials
Responsible Council: Chief Engineers'

The repair of potholes throughout a road network is one of the most challenging operations for Canadian agencies. Pavements often develop potholes during winter and spring thaw conditions, when it is often difficult to obtain quality patching materials. Repair strategies applied by most Canadian agencies are typically reactive, with the patching of distress locations temporary, until more favourable weather conditions occur and permit a more permanent solution.

In recent years, there have been a number of patching products offered to agencies, with many Canadian agencies struggling to obtain appropriate information about the products, installation procedures, and the long-term performance that can be expected. Since most of the products are proprietary in nature, there can be significant issues with ultimate lines of responsibility, if problems or failures occur.

The major project objectives are to:

- Review patching products available on the Canadian market.
- Review procedures used by Canadian agencies to complete temporary and long-term pothole repair strategies.
- Summarize agencies' experiences with current practices of pothole repairs.
- Provide recommended strategies for appropriate temporary and long-term pothole repairs, as well as prevention and mitigation techniques.
- Prepare recommended guidelines for the evaluation of new patching products.

Key tasks to accomplish the project objectives will include:

- A literature and research review of the typical causes of pothole occurrences and appropriate repair strategies.
- Survey of Canadian agencies, industry, product suppliers, and contractors to determine the pertinent issues related to pothole repairs practices.
- Development of a synthesis of best practices.

The work will culminate in a synthesis of best practices for pothole repairs in Canada, with recommendations for appropriate temporary and long-term patching strategies and for evaluating and selecting appropriate patching products that will lead to long-term performance of roadways.

Total Funding Estimate: $130,000
Staff Contact: Sandra Majkic