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Access Management: Synthesis of Practice

PTM-AMSP-E

This report includes the findings of an in-depth literature review of technical and local resources from across Canada, a case study review, a series of interviews with agencies and municipalities, and a survey of practitioners. While the foundations of many locally used resources are rooted in the Transportation Association of Canada (TAC) *Geometric Design Guide for Canadian Roads*(GDG) Chapter 8 principles, adaptations are commonly made to align access management practices to local contexts. While the review confirmed that the guidance in Chapter 8 was generally comprehensive, there were several emerging practices that warrant further consideration in a future update to Chapter 8. These practices include the following topics, discussed in more detail in this report:

Intersection functional area (interchanges and roundabouts)

Access spacing by classification and context

Strategies to reduce or consolidate accesses

Multimodal integration

Safety evaluation of access management strategies

In addition, the results of the surveys and interviews identified several additional areas of potential updates to Chapter 8, including a number of overlapping areas:

Safety considerations

Type of context and locational attributes

Multimodal integration

Operational requirements

Navigation

Rationale

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Emerging Practice Briefing: Continuous Sidewalks and Bike Paths

EPB-CSBP-E

Continuous sidewalks and bike paths prioritize pedestrians and cyclists over turning motor vehicles at crossings of local streets.

The designs of continuous sidewalk and bike path treatments in Canada have varied, and this briefing provides a synthesis of the techniques used and lessons learned. It also identifies several examples and references. It is important to note that continuous sidewalks and bike paths are already used widely at residential and commercial driveway crossings and laneways. However, the purpose of this document is to specifically address their use at the intersection of two public rights-of way, where at least one is a local street.

This briefing does not represent technical guidance.

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Vision Zero and the Safe System Approach: A Primer for Canada (2023)

PRM-VZSS-E

Road safety is receiving more global attention than ever, with the Second Decade of Action for Road Safety being declared in 2020 by the World Health Organization and the United Nations.

Canadian roads saw 1,745 fatalities and 7,868 serious injuries in 2020, or an average of five deaths and 22 serious injuries every day that impacted families and communities across the country. In response to this unacceptable toll, Canada's Road Safety Strategy 2025 adopts the Safe System Approach.3 Many provinces, territories and municipalities are also pursuing similar agendas. The objectives of this primer are to establish clear definitions and principles for Vision Zero and the Safe System Approach, to promote greater understanding of these concepts, and to support the development, identification and sharing of Canadian best practices.

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Developing Highly Qualified Personnel for an Era of Connected and Automated Vehicles

PTM-DHQP-E

Developing Highly Qualified Personnel for an Era of Connected and Automated Vehicles identifies key trends in technology and mobility over the coming 20 years and suggests skillsets that road authorities will need to develop. It examines current measures to educate and train HQP in Canada, inventories key gaps, and recommends a comprehensive action plan that focuses on educating the future transportation workforce, training the existing transportation workforce, and improving human resources practices and agency governance.

The publication will be of interest to organizations including road authorities, post-secondary institutions and instructors, professional and engineering licensing bodies, workforce development agencies, research bodies, and private companies.

The report is supplemented by **two technical appendices (combined) under separate cover**. Appendix A details the literature review discussed in Chapter 2, and Appendix B details the engagement process with road authorities discussed in Chapter 3.

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A French version of this title is expected later in 2022.

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TAC Publication Primer: Evaluating Soil and Material Stabilization Products

PRM-ESMSP-E

The Transportation Association of Canada (TAC) has released a Publication Primer on Evaluating Soil and Material Stabilization Products. For more information on the subject, refer to the recently-released national guideline Guide to Evaluating Soil and Material Stabilization Products, which is available for purchase in the TAC Bookstore.

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Connected and Automated Vehicles: A Primer for Canadian Municipalities (2022 update)

PRM-CAV-E

Connected and Automated Vehicles: A Primer for Canadian Municipalities **was originally published in January 2021.** It provides a high-level overview of connected and automated vehicles (CAVs), addresses myths and offers guidance to help municipal stakeholders make informed decisions.

From making transportation safer to transforming transportation networks, development patterns, businesses and our daily lives, CAVs will have far-reaching impacts. Despite the many claims that have been made, there is still much uncertainty surrounding CAVs, including how and when this technology will be commercially deployed, and the benefits and drawbacks of CAVs for a city's transportation network, economy and society as a whole.

Ce document est disponible en français.

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Guide to Utility Coordination on Public-Private Partnership (P3) Projects (2021)

PTM-UCP3P-E

As road rights-of-way have become more crowded and complex, the lack of effective utility coordination can quickly lead to increased costs and decreased efficiency. ***Guide to Utility Coordination on Public-Private Partnership (P3) Projects*** aims to improve utility coordination on P3 projects by helping project stakeholders create efficient and consistent processes for utility relocations. Public and private agencies with an existing coordination process can use the guide to ensure quality and consistency. For agencies without an existing process, it offers a template that they can customize.

The guide describes the step-by-step coordination of utilities through the five phases of Planning, Request for Proposal (RFP) Documentation Preparation, In-Market Design, Project Implementation, and Post-Construction. An accompanying flow chart summarizes the five phases presented in the guide.

View the Table of Contents

Guide to Utility Coordination on Public-Private Partnership (P3) Projects was developed by a team of 12 volunteers from TAC's Public Utilities Management Subcommittee. Free distribution of the guide in PDF format has been made possible by the financial support of the following organizations:



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Performance-Based Decision Making for Asset Management: Lessons Learned and Practitioner Toolkit (2021)
PTM-PBDM-E
Transportation agencies are increasingly required to make investments using cross-asset trade-offs and optimization methods. These performance-based approaches to decision making can support desired outcomes while encouraging fiscal responsibility, accountability and transparency in governance.

There is still much to learn about performance-based decision making techniques, and many agencies seek examples and practical tools. This report helps close that gap by synthesizing lessons learned, presenting several case studies, and providing a toolkit to help practitioners optimize asset management decisions.

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This publication is available in French.

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Managing and Enhancing Terrestrial Road Ecology
PTM-MTRE-E
Road ecology has developed into an established research and applied science discipline that offers mitigative practices and management approaches to address impacts to natural ecosystems, as well as to public safety and adjacent land use.

This synthesis identifies Beneficial Management Practices to help avoid, minimize or compensate for the direct and indirect effects of roads, across Canada's diverse geographic environments and road systems.

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BRIEFING: Understanding Changes to the Fisheries Act, Impact Assessment Act and Canadian Navigable Waters Act
BRF-ENVLEG-E
In 2019, two Bills of Parliament came into force after a comprehensive review of federal environmental and regulatory processes. This briefing provides an overview of key changes associated with the *Fisheries Act*, *Impact Assessment Act* and *Canadian Navigable Waters Act*, focusing on aspects relevant to the transportation sector.

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Understanding Goods Movement in Canada: Trends and Best Practices (2021)
PTM-GOODSMVMT-E
Understanding Goods Movement in Canada is a comprehensive introduction to the subject for transportation practitioners and individuals working in other sectors. It provides an overview of the freight industry



including its structure and key stakeholders; explains important considerations in planning for goods movement; and describes major trends and disruptors with their benefits and risks. It also includes real-world case studies and self-directed exercises that encourage readers to apply what they've learned.

This title is also available in French.

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Safety Performance of Bicycle Infrastructure in Canada (2020)
PTM-SPBI-E
Safety Performance of Bicycle Infrastructure in Canada characterizes the safety performance of various bicycle facility types to help Canadian practitioners evaluate the potential safety performance of new bicycle infrastructure. The report is designed as a resource document and is based on a comprehensive literature review, a series of local and international case studies, and jurisdictional and end-user surveys. It contains a facility selection flowchart that identifies issues to consider when selecting bicycle facilities and intersection treatments, and is accompanied by **separate technical appendices**.

Rationale: The increasing popularity of bicycling as a mode of travel in Canada is leading many jurisdictions to develop new bicycle infrastructure that better meets the safety and mobility needs of bicyclists. However, there is an overall lack of understanding regarding the safety performance of different types of bicycle facilities in the Canadian context.

The Transportation Association of Canada (TAC) gratefully acknowledges the project funding partners of Safety Performance of Bicycle Infrastructure in Canada that provided financial support to both develop the report and distribute the final publication free of charge. These partners are listed in the document's Acknowledgments.

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Integrating Health and Transportation in Canada
PTM-IHTC-E
Traditionally, transportation systems have been designed for motorized vehicles to move people, goods and services efficiently. Excluding more active and sustainable modes of travel from these systems in meaningful ways has often influenced Canadians to use motorized vehicles.

The design of transportation systems and land use can help achieve public health goals such as increased physical activity, reduced chronic diseases, and reduced exposure to air and noise pollution. Good health can be facilitated or negatively impacted by transportation policies, plans, analyses, funding levels, and infrastructure design decisions – all of which impact the relative safety, efficiency, costs, and overall desirability and relative utility across modes of travel. As a result, the potential health consequences of transportation decisions and land use actions are a growing part of the fields' lexicons.

Integrating Health and Transportation in Canada

Provides a review of literature and best practices on the topic;

Describes input provided by practitioners about knowledge and resources needed;

Describes the methodology used to develop recommendations for improvement; and

Provides, for each recommendation, resources related to the champions, preliminary actions and challenges identified.

The Transportation Association of Canada (TAC) gratefully acknowledges the project funding partners of*Integrating Health and Transportation in Canada*that provided financial support to both develop the report and distribute the final publication. These partners are listed in the document's Acknowledgements.

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Primer on Best Practices for Pothole Repairs in Canada (2019)
PRM-BPPRC-E
For more information on this subject, refer to *Best Practices for Pothole Repairs in Canada* (2019)

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Canadian Model Rules of the Road (2018)
PTM-RULES18-E
The *Canadian Model Rules of the Road* presents a generic set of traffic rules that road users must know and observe while using the road system. This 2018 edition replaces the one from 1996.

The document is a reference guide for professionals responsible for preparing legislation which governs the use of Canadian roadway facilities as well as practitioners who are responsible for implementing traffic control devices. As such, this document may assist practitioners in understanding how road users are expected to respond to various elements, including traffic control devices, passing, use of roadway, lanes, headway, right of way, pedestrians, turns, driver signals, special stops, speed restrictions, parking, alternate vehicles, bicycles, transit and other provisions.

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Primer on Traffic Calming (2018)
PRM-TRAFCALM18-E
For more information on this subject, refer to the *Canadian Guide to Traffic Calming - Second Edition* (2018)

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Primer on Speed Display Devices (2017)
PRM-SDD-E
For more information on this subject, refer to *Application Guidelines for Speed Display Devices* (PTM-SDD-E).

Media type: PDF
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PRIMER: Mechanically Stabilized Earth Walls (2017)
PRM-MSEW-E
For more on this subject, refer to *Design, Construction, Maintenance and Inspection Guide for Mechanically Stabilized Earth Walls* (PTM-MSEW-E), available for purchase in the TAC Bookstore.

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Roundabouts in Canada (2017)
PRM-CRDG-E
For more on this subject, refer to Canadian Roundabouts Design Guide (PTM-CRDG-E), available for purchase in the TAC Bookstore.

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Primer on Work Zone Safety in Canada (2016)
PRM-WZS-E
For more on this subject, refer to *National Guidelines for Work Zone Safety in Canada* (PTM-WZS-E), available for purchase in the TAC Bookstore.

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Guidelines for the Coordination of Utility Relocations
RPT-CUR-E
These guidelines are designed as a template that public agencies can refer to for developing a process for the coordination of utility relocations. For those agencies with existing processes, it can be reviewed as a best practices document, ensuring that all key aspects are covered, and consistent practices are followed. For those without an existing process this can be a base document used to develop a manual for agency specific situations.

The document is divided into two main components – the flow chart and the write-up. The flow chart is intended as an overall summary of the processes used on a typical capital works design-bid-build project to coordinate all relocations required. It covers all major components of the project: preliminary design, detailed design, construction and post-construction.

The main body of the document complements the information in the flow chart providing additional detail on each of the various phases of the project.

The intent of the document is to advance the overall coordination of utility relocations across the country for the benefits of both, public agencies and utility companies. The key component of the success is use and implementation of the guidelines.

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Urban Transportation Indicators – Fifth Survey
RPT-UTIP5-E
The fifth Urban Transportation Indicators (UTI) Survey is the latest in a series of surveys that have, individually and collectively, provided an important picture of transportation behaviour and trends across Canada's 33 largest urban areas. In this fifth edition, the UTI was given a major update to account for changing issues and new data sources. Key changes include the introduction of new indicators on health and transportation, economic performance of transportation, and factors that influence mode choice. Readers are still able to make comparisons with 90+ sustainability indicators that were prepared in previous surveys.

The overall goal of this survey program was to build a consistent and reliable database about urban transportation and develop indicators for Canadian municipalities and transportation stakeholders. The UTI Survey Database, which integrates data from the fifth survey as well as previous surveys, is also available in conjunction with this technical report.

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PRIMER - Transportation Asset Management Best Practices for Canada
PRM-TAMBP-E
This primer provides an overview of the transportation asset management practices followed by Canadian provincial, regional, municipal and transit agencies across Canada.

http://tac-atc.ca/sites/tac-atc.ca/files/site/doc/Bookstore/sambp-primer-final-april2016.pdf

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Moving Smarter: Exploring energy and greenhouse gas emission reduction solutions for Canadian cities – TOOLBOX OF MEASURES

PTM-MS-E

In recognition of the significant impacts and risks of climate change, municipalities and regional agencies across Canada are working to reduce energy use and greenhouse gas (GHG) emissions across a broad range of sectors. Moving Smarter was developed to help municipal and regional agencies understand and assess available options for reducing GHG emissions from the urban transportation sector.

Moving Smarter aims to help municipalities and regional agencies understand the three main approaches to reducing urban transportation GHG emissions in urban areas. These are:

Reduce Vehicle Kilometres Travelled: Reducing distances travelled by passengers and goods by vehicle;

Improve Transportation System and Driver Efficiency: Improving the efficiency of the transportation system so that more vehicles travel under more optimal conditions in terms of speed and flow;

Encourage Alternative Vehicle and Fuel Technologies: Adopting and supporting vehicles that use alternative fuels and technologies which are more energy efficient or use less GHG-intensive energy sources for propulsion.

Moving Smarter presents a collection of 30 different measures (a variety of strategies, policies, programs, projects or actions) to address transportation-related GHG emissions, organized according to the three approaches. To help readers identify measures which are appropriate to their context, the applicability of measures by size of municipality, responsibility for implementation, timing of implementation, potential reductions in urban transportation GHG emissions, and timeframe when reductions might occur, are presented.

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Design and Implementation of Transit Services: Guidelines for smaller communities

PTM-DITS-E

Download the Primer

Design and Implementation of Transit Services provides advice and guidance to planning and transportation professionals in planning for transit services in small communities. The guidelines were developed to tailor to a wide range of different stages of transit service provision in the community:

starting a new service

expanding an existing service

maintaining a service in potential decline

The guidelines include planning directions and technical approaches to effectively plan and design services, as well as to develop transit policies that promote cost effectiveness, maximize ridership, and respond to the needs of small and rural communities. The document outlines specific transit planning activities and topics including: consultation; Service needs and objectives identification; service planning; demand forecasting; resource planning; governance; financial planning; service implementation; and service monitoring.

Background: Transit plays an essential role in improving the social, economic, and environmental conditions of Canada's cities and communities. While there is greater political attention to serving transit needs in larger urban areas, transit services are increasingly vital to improving the well-being of small communities. Providing transit services will become increasingly important in small communities as a result of an increasing aging population, the continued transition to a knowledge economy, the increasing cost of vehicle ownership, and the increasing environmental impacts from atmospheric pollutants.

There are unique challenges faced by small and rural Canadian communities in providing transit services, compared to large, more urban areas. The approaches to planning for transit and the range of solutions appropriate for providing transit is broader for small communities compared to larger urban centres.

A CD containing worksheets is included as part of these guidelines to support the design of fixed-route and demand response transit service. The development of service designs through these worksheets will help to identify the total service hours operated and the estimated operating costs of providing the services. Refer to Appendix B for directions on how to use the service design worksheets.

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PRIMER: Sustainability Considerations for Bridges

PRM-SCBG-E

For more information on this subject, refer to *Sustainability Considerations for Bridges Guide*(2015), PTM-SCBG-E, available for purchase in the TAC Bookstore.

Disponible en français : *NOTIONS ÉLÉMENTAIRES : Développement durable des ponts*

http://tac-atc.ca/sites/tac-atc.ca/files/site/doc/Bookstore/primer-scbg-e.pdf

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TAC Conference Proceedings - 2015

CPR-TAC2015-E

The TAC conference papers are posted online, organized by author, title and category. They are available to view or download in PDF format.

Disponible en français : *Compte rendu du congrès de l'ATC - 2015*

http://conf.tac-atc.ca/english/annualconference/tac2015/english/index.htm

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PRIMER: Digital and Projected Advertising Displays: Regulatory and Road Safety Assessment

PRM-DPAD-E

For more on this subject, refer to *Digital and Projected Advertising Displays: Regulatory and Road Safety Assessment Guidelines*(2015), PTM-DPAD-E, available for purchase in the TAC Bookstore.

Disponible en français : *NOTIONS ÉLÉMENTAIRES : L'affichage numérique et par projection de la publicité : Réglementation et évaluation de la sécurité routière*(2015)

http://tac-atc.ca/sites/tac-atc.ca/files/site/doc/resources/digitaldisplay-primer.pdf

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BRIEFING: Complete Streets: Policy and practice in Canada

BRF-CSPPC-E

This briefing reports on the status of complete streets in provincial and municipal transportation agencies across Canada, and accelerates the transfer of information and lessons learned from more experienced TAC members.

Disponible en français : *DOSSIER D'INFORMATION: Rues complètes : Politiques et pratiques au Canada*(2015)

http://tac-atc.ca/sites/tac-atc.ca/files/site/doc/Bookstore/briefing-final-e-jan2015.pdf

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The Evolution and Legacy of Transportation Education in Canada

RPT-ELTEC-E

The Evolution and Legacy of Transportation Education in Canada was written as a monograph project in honour of both the Transportation Association of Canada (TAC)'s centennial anniversary in 2014 and the transportation community.

Transportation has always been about moving people and goods, but with varying social, political, economic, technical and environmental considerations. The importance of skills in planning, building, operating and maintaining transportation systems has been long recognized.

Early in the twentieth century, at the time of formation of the Canadian Good Roads Association (CGRA) in 1914, training and education were primarily on-the-job. For long distance travel, rail was dominant at that time, but walking and cycling were the primary modes of transport for the everyday movement of people. Over the years it evolved to road and air travel being dominant, with other modes continuing as vital parts of the safe and efficient movement of goods and people.

The evolution of transportation education, as described in this Monograph recognizes the relative and changing impact of the modes. But it also recognizes that the fundamentals of science and engineering are invariant. There is a legacy of the outcomes of the training and education and the associated advances. The beneficiaries are not only today's professionals but also the leaders of tomorrow and the public at large.

http://tac-atc.ca/sites/tac-atc.ca/files/site/doc/resources/centennial_monograph_final_june_2014.pdf

Disponible en français : *L'évolution et l'héritage de l'enseignement dans le domaine des transports au Canada*(2014)

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Truck Lanes in Canadian Urban Areas

PTM-TLCUA-E

Truck Lanes in Canadian Urban Areas assists transportation professionals to make more informed decisions regarding the potential use of truck lanes as a tool for efficient sharing of facilities by all road users. Based on the findings of a literature review, stakeholder interviews, and analyses of various truck lane configurations in Canadian cities, contents are specific to the Canadian context as far as population, traffic volumes, urban roadway design, etc. Eight truck lane types are identified and case studies for six of these types are described to reveal new planning, design, operation, analysis, and evaluation considerations for urban truck lanes in Canada.

Supplementary information provided with this document includes the six detailed case studies and a Technical Report, which synthesizes the findings from an environmental scan about the potential for truck lanes in Canadian urban areas.

What are truck lanes? Truck lanes are those for preferential truck use where trucks are separated from other traffic either through physical or operational treatments. The purpose of these lanes is to reduce travel time, improve system reliability and safety, and reduce emissions in the movement of goods in urban areas. Truck lanes are a relatively new concept and there is little information about them, particularly for Canadian urban areas.

See also: *PRIMER: Truck Lanes in Canadian Urban Areas*(2014)

Disponible en français : *Voies pour camions en régions urbaines au Canada*(2014)

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Changing Practices in Data Collection on the Movement of People

PTM-DCMP-E

Changing Practices in Data Collection on the Movement of People provides a practical, comprehensive framework for the coordination, collection, processing and management of data on the movement of people by all modes in Canadian urban areas and addresses data needs across the range of Canadian transportation agencies.

This framework is based on several building blocks:

A review of survey and data collection literature, including population-based surveys, choice-based sample surveys, technology-based data collection methods. Each type of data collection is examined

A review of data integration/fusion/synthesis methods

An inventory and discussion of a variety of data sources pertaining to urban passenger travel

Results from an original survey of Canadian transportation agencies to identify current Canadian data collection practices, issues and needs

The fundamental proposition of the publication is that practices in Canadian urban passenger transportation data collection and management must evolve to meet changing needs, opportunities and challenges. Transport agencies should have a clear and comprehensive understanding of the technical options available to them, of the strengths and weaknesses, benefits and costs of these options, and clear guidance in terms of cost-effective data collection programs that will best fit their local needs and budgets.

Disponible en français : *Évolution des pratiques de collecte de données sur les déplacement des personnes*(2014)

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Transportation in Canada - Transforming the Fabric of Our Land

RPT-TICTFL-E

This publication highlights some of the major components in the development of Canadian transportation over the past century, and their impact on the lives of Canadians. Each chapter is written by a guest author widely acknowledged as a subject matter expert. Topics for the chapters include railroads, trucking, highways, bridges, public transportation and more.

Disponible en français : *Les transports au Canada : Transformer le tissu de notre pays (2014)*

http://tac-atc.ca/sites/tac-atc.ca/files/site/doc/Bookstore/t2014-ebook-e.pdf

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TAC Conference Proceedings - 2014
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The TAC conference papers are posted online, organized by author, title and category. They are available to view or download in PDF format.

Disponible en français : *Compte rendu du congrès de l'ATC - 2014*

http://conf.tac-atc.ca/english/annualconference/tac2014/english/index.htm
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PRIMER: Pavement Asset Design and Management Guide
PRM-PADMG-E
For more on this subject, refer to *Pavement Asset Design and Management Guide*(2013), PTM-PADMG-E, available for purchase in the TAC Bookstore.

http://tac-atc.ca/sites/tac-atc.ca/files/site/doc/resources/padmg_primer_for_publishing.pdf

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Best Practices Guide for the Use of Recycled Materials in Transportation Infrastructure
PTM-URMTI-E
Historically, the methods that have been used for evaluating the engineering and environmental suitability of new potentially recyclable materials have varied significantly across jurisdictions. As a consequence, both an 'applicant' (who might be an agency, constructor or supplier) who desires to use a recycled material, and a 'decision maker' (owners, specifiers or designers) who must determine the suitability of the application, in many cases do not have a clear or consistent approach (an evaluation framework) that can be used to proceed with such an evaluation.

The objective of this document is to provide a guide for use by agencies in identifying the various types of recycled materials and technologies which are available to them, along with their most practical/successful uses in transportation infrastructure applications.

The focus of the document is on waste and industrial by-product materials that are suitable as replacements for natural aggregates in transportation infrastructure projects. Twenty-two materials have been evaluated and grouped into six main categories: asphalt concrete, portland cement concrete, granular base and subbase materials, embankment and fill construction, stabilized bases and flowable fills.

Keywords: Aggregate, Bituminous mixture, By-product, Concrete, Evaluation (assessment), Fly ash, In service behaviour, In situ, Recycling (Mater), Road construction, Slag, Tyre

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Climate Change and Road Safety: Projections Within Urban Areas
PTM-CCRS-E
Climate Change and Road Safety

documents the ways in which climate change may affect road safety in Canada,

estimates the magnitude of associated risks and identifies which motor vehicle collision types could be most affected by climate change and where they will take place in the future.

Using police reports of road collisions that occurred from 2000-2009, quantitative estimates of collision risk during different weather conditions are provided. These risk estimates are combined with projections of climate change to provide insights into the magnitude and nature of the safety risks associated with climate change in the future.

This publication represents the most comprehensive assessment of itskind to date.

Keywords: Environment; Accident Statistics; accident; analysis (math); collision; forecast; risk; risk assessment; safety; statistics; urban area; variability; weather

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Guidelines for Underground Utility Installations Crossing Highway Rights-of-Way
PTM-UUICH-E
Guidelines for Underground Utility Installations Crossing Highway Rights-of-Way is intended to assist various road authorities in establishing and administering reasonably uniform criteria for the accommodation of utilities crossing highway (and freeway) rights-of-way. Ideally, existing utility accommodation guidelines should be updated in light of these guidelines, as appropriate.

These guidelines have been written for both the road industry and the utility industry. They are specifically aimed at: public and private sector managers; consulting engineers practicing in the highway/utility field; and individuals entering the highway/utility field, although they can be used by anyone interested in an overview of the complex series of highway/utility interactions.

Background
Utility companies provide essential services to the public. They often install their facilities within the rights-of-way of public roads. If the utilities were not allowed to use the rights-of-way, they could be required to purchase their own land, which would drive up the overall cost to the utility company. This could significantly increase the cost to the public. The responsibility of road authorities includes operating the highway rights-of-way in a manner that ensures the safety, traffic-carrying ability and physical integrity of their installations. The presence of a utility within the right-of-way can affect these characteristics, so it is necessary for road authorities to reasonably regulate the presence of utilities.

Keywords: Planning of Transport Infrastructure, Administration, Cable, Carriageway, Corridor (Transp), Crossing the Road, Electricity, Fuel, Maintenance, Pipe, Risk Assessment, Safety, Subterranean

http://tac-atc.ca/sites/tac-atc.ca/files/site/doc/resources/ptm-uuich-e-finalpub.pdf

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Syntheses of Best Practices - Road Salt Management (2013): 10.0 – Salt use of Private Roads, Parking Lots and Walkways
BP-RSM10-E



Disponible en français : *Synthèses des meilleures pratiques : Gestion des sels de voirie (2013) - 10.0 – Utilisation des sels sur les routes privées, les stationnements et les allées*

https://tac-atc.ca/sites/tac-atc.ca/files/site/doc/resources/roadsalt-10.pdf

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Syntheses of Best Practices - Road Salt Management (2013): 11.0 – Successes in Road Salt Management - Case Studies
BP-RSM11-E
Disponible en français : *Synthèses des meilleures pratiques : Gestion des sels de voirie (2013) - 11.0 – Réussite en matière de la gestion des sels de voirie : Études de cas*

http://tac-atc.ca/sites/tac-atc.ca/files/site/salt-11-successesinroadsalt.pdf

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Syntheses of Best Practices - Road Salt Management (2013): 7.0 Design and Operation of Maintenance Yards
BP-RSM7-E
Disponible en français : *Synthèses des meilleures pratiques : Gestion des sels de voirie (2013) - 7.0 – Conception et exploitation des centres d'entretien*

https://www.tac-atc.ca/sites/tac-atc.ca/files/site/doc/resources/roadsalt-7.pdf

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Syntheses of Best Practices - Road Salt Management (2013): 8.0 – Snow Storage and Disposal
BP-RSM8-E
Disponible en français : *Synthèses des meilleures pratiques : Gestion des sels de voirie (2003) - 8.0 – Stockage et élimination de la neige*

http://tac-atc.ca/sites/tac-atc.ca/files/site/doc/resources/roadsalt-8.pdf

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Syntheses of Best Practices - Road Salt Management (2013): 1.0 – Salt Management Plans
BP-RSM1-E
Disponible en français : *Synthèses des meilleures pratiques : Gestion des sels de voirie (2013) - 1.0 – Plans de gestion des sels de voirie*

https://www.tac-atc.ca/sites/tac-atc.ca/files/site/doc/resources/roadsalt-1.pdf

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Syntheses of Best Practices - Road Salt Management (2013): 9.0 – Winter Maintenance Equipment and Technologies
BP-RSM9-E
Disponible en français : *Synthèses des meilleures pratiques : Gestion des sels de voirie (2013) - 9.0 – Matériel et technologies d'entrentien hivernale des routes*

https://tac-atc.ca/sites/tac-atc.ca/files/site/doc/resources/roadsalt-9.pdf

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Syntheses of Best Practices - Road Salt Management (2013): 2.0 – Training
BP-RSM2-E
Disponible en français : *Synthèses des meilleures pratiques : Gestion des sels de voirie (2013) - 2.0 – Formation*

https://www.tac-atc.ca/sites/tac-atc.ca/files/site/doc/resources/roadsalt-2.pdf

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Syntheses of Best Practices - Road Salt Management (2013): 3.0 – Road, Bridge and Facility Design
BP-RSM3-E
Disponible en français : *Synthèses des meilleures pratiques : Gestion des sels de voirie (2013) - 3.0 – Conception des routes, ponts et installations*

https://www.tac-atc.ca/sites/tac-atc.ca/files/site/doc/resources/roadsalt-3.pdf

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Syntheses of Best Practices - Road Salt Management (2013): 4.0 – Drainage
BP-RSM4-E
Disponible en français : *Synthèses des meilleures pratiques : Gestion des sels de voirie (2013) - 4.0 – Drainage*

https://www.tac-atc.ca/sites/tac-atc.ca/files/site/doc/resources/roadsalt-4.pdf

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Syntheses of Best Practices - Road Salt Management (2013): 5.0 – Pavements and Salt Management

BP-RSM5-E

Disponible en français : *Synthèses des meilleures pratiques : Gestion des sels de voirie (2013) - 5.0 – Gestion des chaussées et des sels de voirie*

http://www.tac-atc.ca/sites/tac-atc.ca/files/site/doc/resources/roadsalt-5.pdf

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Syntheses of Best Practices - Road Salt Management (2013): 6.0 Vegetation Management

BP-RSM6-E

Disponible en français : *Synthèses des meilleures pratiques : Gestion des sels de voirie (2013) - 6.0 – Gestion de la végétation*

/sites/default/files/site/roadsalt-6.pdf

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Effective Strategies to Influence Travel Behaviour: Practical Guide

PTM-ITB

Various governments and organizations across Canada are investigating strategies to motivate sustainable travel habits among Canadians. Social marketing is one of the tools that can be used to shift long-term consumer behaviour. It emphasizes the need for a thorough understanding of target markets, motivators and barriers to desirable behaviours.

Users of this Guide will understand the need for holistic, market-based social marketing approaches to influence travel behaviour. Public and private sector organizations will also learn which transportation demand management tools are effective in their jurisdictional, community and strategic contexts.

Keywords: Traffic and transport planning; behaviour; journey to work; legislation; marketing; policy; publicity; road user; selection; textbook; traffic control; transport mode.

Disponible en français : *Stratégies efficaces pour influencer les habitudes de déplacement : Guide pratique (2012)*

Download the Primer

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Synthesis of Practice for Implementing Public-Private Partnerships in Transportation Related Projects

PTM-P3S-E

Canada is one of the leading practitioners of public-private partnerships (P3) in the transportation sector. Some provinces have adopted this delivery format for infrastructure including hospitals, municipal buildings and detention centres. More recently, this format is increasingly used for larger transportation infrastructure projects.

As these larger infrastructure projects are completed, and as their operations and concessions begin and evolve, there are opportunities to determine if a project is successful during the implementation phase both for the public and the private side of the equation. In order to capture these relevant experiences the document synthesizes lessons learned from the implementation of P3 projects for transportation infrastructure, with a focus on roads and highways.

Most of the information to prepare this synthesis was gathered through a comprehensive literature review and from public entities that have managed or are about to implement road transportation projects using a form of P3 delivery. This publication:

Describes P3 projects and their key components;

Outlines and discusses the key steps and considerations to initiate, develop and implement transportation P3 projects; and

Provides an overview of the experience Canadian and American public sector agencies have gained in relation to the administration of transportation P3 projects.

Keywords: Economics and Administration; Administration; Construction; Evaluation (Assessment); Financing; Highway; Public Private Partnership; Specifications; Textbook

Disponible en français : *Synthèse des pratiques de mise en œuvre des partenariats public-privé des projets liés au transport (2012)*

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Guidelines on the Use and Installation of Chevron Alignment Signs

PTM-CHASI-E

The safety risks of horizontal curves are generally related to vehicles leaving the roadway and striking fixed objects such as trees, utility poles or rock faces, often resulting in severe or fatal collisions. Guidelines on the Use and Installation of Chevron Alignment Signs is intended to provide engineers and practitioners across Canada with the understanding of the key considerations in the use and installation of chevron alignment signs – a chief traffic control device considered for improving warning and guidance where there is a change in the horizontal alignment of a roadway.

The provided guidance on the use of chevron alignment signs addresses rural/urban locations, road classification and network elements. The correct/incorrect placement of chevron alignment signs, hierarchy of curve delineation devices and temporary conditions are also addressed.

The guidelines are intended to supplement the section documenting the use and installation of chevron alignment signs in the *Manual of Uniform Traffic Control Devices for Canada (MUTCDC)*

Disponible en français : *Lignes directrices concernant l'utilisation et l'installation des panneaux chevrons d'alignement (2012)*

Media type: PDF
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Performance Measures for Highway Road Networks

PTM-PHWYN-E

Performance measurement in transportation departments has long been used as part of pavement and bridge management systems but is increasingly becoming a core component of public sector management processes, as well as extending to applications in construction and maintenance, and operations and safety programs. All Canadian provinces and territories use some form of performance measures to evaluate their road networks, however the type of performance measures used and the implementation practices vary significantly between jurisdictions. Performance Measures for Highway Road Networks identifies performance measures that could be used by all jurisdictions in the country to effectively manage rural highway infrastructure in the areas of transportation system preservation and safety.

The recommended performance measures will provide a means to compare roads in different jurisdictions to one another, and assist senior officials and transportation professionals in decision-making on planning, evaluation, investment, asset management and day-to-day operations. The recommended performance measures could be used to communicate with and report to the public regarding the importance and performance of transportation systems.

Keywords: administration; economics; efficiency; evaluation (assessment); measurement; network (traffic); network (transport); pavement management system; planning; safety

Disponible en français : *Mesures de performance des réseau routiers (2012)*

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Recommended Practices for LED-Embedded Traffic Signs (LETS)

PTM-LEDSGN-E

This document provides guidelines for use of LED-embedded static traffic signs (LETS) on Canadian roads. The conspicuity of a static traffic sign may be increased by embedding light emitting diodes (LEDs) on the sign face. LEDs on the sign face may also serve to increase the legibility distance of the sign by highlighting the sign message or the outline of a uniquely shaped static sign. Due to the potential for LED-embedded traffic signs to be distracting, and because excessive use may decrease the effectiveness of similar static signs, LED-embedded traffic signs use should be limited.

To take advantage of the shape-recognition advantage provided by LETS, LETS should be restricted to STOP signs, YIELD signs, and the stop side of the STOP/SLOW paddle as these are uniquely shaped signs and are most easily recognized from shape alone.

The document is intended as a reference for traffic engineering practitioners and supplements the Manual of Uniform Traffic Control Devices for Canada (MUTCDC), which is the primary reference document for practitioners concerning traffic control devices design and use.

Disponible en français : *Pratiques recommandées pour les panneaux de signalisation à DEL (PSD) (2011)*

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A Guide for the Accommodation of Utilities Within Freeway Rights-of-Way

PTM-ACUTFRW-E

Utility firms provide essential services to the public. They often install their facilities within the right-of-way of public roads. If the utilities were not allowed to use the right-of-way, they could be required to purchase their own land, which would increase the overall costs to the utility firms and to the public.

This guide provides assistance to various road authorities with establishing and administering reasonably uniform guidelines for the accommodation of utilities within freeway rights-of-way in order to maintain safety, traffic-carrying ability, and the physical integrity of freeways across Canada.

The *Guide to the Accommodation of Utilities Within Freeway Rights-of-Way* is provided for consideration and use by provincial road authorities in regulating the use and occupancy of freeway rights-of-way by utilities. The Guide makes no reference to the legal right of utilities to use or occupy freeway rights-of-way, or to the financial responsibility involved in the adjustment or installation of utilities within such rights-of-way.

http://tac-atc.ca/sites/tac-atc.ca/files/site/doc/resources/ptm-acutfrw-finalpub-e.pdf

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Winter Road Condition Terminology User Guide

PTM-CONDITION-E

This national guide presents winter road condition vocabulary and definitions tested with the driving public. The guide will help road operations staff to assess and report on road and visibility conditions in a consistent manner. It will also enable communications personnel and media to consistently report driving conditions across Canada.

Many provinces post winter road condition information on their websites; this information is also disseminated by media outlets. Due to inconsistencies in definitions and reporting of driving conditions across Canada, planning long trips can be challenging, particularly when crossing provincial / territorial boundaries.

Recognizing this need, Canadian road authorities have worked together to develop a new and consistent vocabulary as part of 511 systems being implemented by jurisdictions throughout the country. This system is designed to provide the travelling public with information on road conditions that is reported consistently in every province and territory.

Disponible en français : *Lignes directrices relatives à la construction et à l'exploitation des routes d'hiver (2011)*

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Quantifying and Forecasting Greenhouse Gas Emissions from Urban Passenger Transportation - TECHNICAL APPENDICES



RPT-QFGGEAPP-E

This report captures the presentations used at the "Quantifying and Forecasting Greenhouse Gas Emissions from Urban Passenger Transportation" workshop held by TAC, which was a forum for exchanging ideas and knowledge.

http://tac-atc.ca/sites/tac-atc.ca/files/site/doc/resources/report-ghg-appendices.pdf

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http://conf.tac-atc.ca/english/annualconference/tac2011/english/index.htm

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Knowledge Management Framework

RPT-KMF-E

This document provides background and key definitions, presents a framework of knowledge management activities, and describes an implementation process.

http://tac-atc.ca/sites/tac-atc.ca/files/site/doc/resources/report-knowledge-mgmt-2010.pdf

Disponible en français : *Cadre de gestion des connaissances (2010)*

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Active Transportation - Making it Work in Canadian Communities

PTM-ACTIVE

With growing concern over issues such as climate change and public health, addressing the active transportation needs in Canadian communities is of high importance. In a survey of TAC member municipalities, respondents enthusiastically identified many upcoming initiatives and works-in-progress. This report is an attempt to uncover relatively undocumented success stories that are developing throughout Canada to assist local, regional, provincial and federal Canadian governments in understanding the critical factors for successful implementation of active transportation strategies.

The report is an exploration of experiences based on interviews and focus group discussions with practitioners in the field, as well as the survey of TAC member municipalities. Drawing on this extensive material, the study team articulated 11 principles for consideration by those working to improve active transportation in Canadian cities.

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PRIMER: Developing and Managing Transportation Infrastructure in Permafrost Regions

PRM-DMTIPR-E

A primer of the TAC publication *Guidelines for Development and Management of Transportation Infrastructure in Permafrost Regions* (2010), PTM-PERMAFROST, available for purchase in the TAC Bookstore.

http://tac-atc.ca/sites/tac-atc.ca/files/site/doc/resources/primer-permafrost2010.pdf

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Urban Transportation Indicators - Fourth Survey

RPT-UTIP4-E

This report presents data and statistics based on information submitted in response to the Urban Transportation Indicators Survey questionnaire prepared and administered by the Transportation Association of Canada (TAC).

http://tac-atc.ca/sites/tac-atc.ca/files/site/doc/resources/report-uti-survey4.pdf

Disponible en français : *Indicateurs de transports urbains - Quatrième enquête (2010)*

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Guidelines for Transit Lane Conspicuity Through Surface Treatment

PTM-LANEMARK

Surface treatments, including the coloration of asphalt, continually convey the "special transit only status" message to motorists without drawing their attention off the road. Transit lane violation has a negative impact on both transit travel times and the image of the transit facility. By making transit lanes more obvious to the eye and mind, lane violation can be significantly decreased or eliminated. This TAC guideline recommends using red for the coloured surface treatment of transit lanes.

The guidelines were developed based on four key principles:
1) The use of strict conditions for implementation instead of widespread implementation;
2) A focus on restricted areas versus conflicting areas;
3) Partial and full-length application; and
4) Compatibility with other transit lane design elements.

Agencies designing transit lanes should follow existing guidelines or standards for transit lane markings and signage.

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Structural Concrete Deck Protection Systems

PTM-DECKPRO

This report contains information on the selection, design, construction, maintenance and rehabilitation of structural deck protection systems (SCDPS) for Canadian conditions. It focuses on structural waterproofing systems commonly used on infrastructure reinforced concrete components to provide an impermeable barrier to protect from corrosion damage.

An illustrated overview of concrete bridge deck waterproofing systems, performance problems, corrosion, and concrete deterioration is highlighted within the report. A list of recommended current SCDPS technical resources and a summary of North American standards for deck protection systems is also provided.

The technical and financial comparison and evaluation of generally available current SCDPS for a new bridge deck project involves three main components: feasibility assessment; a comparative rating of the features and performance; and a life-cycle cost analysis. The report includes an example illustrating this evaluation methodology.

A significant portion of the cost of concrete bridge components is related to the deterioration of reinforced concrete decks subjected to heavy loadings, harsh weather conditions, and regular winter use of anti-icing and de-icing salts across Canada. Enhanced technical and cost-effective structural concrete deck protection systems can play a key role in reducing maintenance, repair, and rehabilitation costs.

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Guidelines for the Planning, Design, Operation and Evaluation of Reversible Lane Systems

PTM-REVERSE

This publication presents a set of national guidelines and list of considerations for the planning, design, operation and evaluation of reversible lane systems (RLS).

Reversible roadways and lanes are considered to be one of the most cost-effective means of increasing roadway capacity under certain conditions. In a reversible lane or roadway, the direction of traffic flow is reversed to the opposing direction for some period of time. This takes advantage of the unused capacity of the minor flow direction to increase capacity in the major flow direction, potentially negating or deferring the need to construct additional lanes.

These guidelines offer roadway design practices and suggested warrant guidelines / thresholds, as well as an evaluation of multiple configurations, addressing left turn issues and safety considerations. Systems capacity and evaluation / assessment methods are also included.

Various themes are discussed in the guidelines, such as:
• Operational and safety implications and potential benefits of the RLS system.
• Traffic control measures including evaluation of appropriate system timings, clearance methods, and monitoring and lane reversal change thresholds.
• Quantifying the improvement in roadway operations in terms of volume capacity, travel time / speed and safety.

Disponible en français : *Lignes directrices pour la planification, la conception, l'exploitation et l'évaluation des systèmes de voies à sens réversible (2010)*

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Phase 2 of the Framework for High Quality Data Collection of Urban Goods Movement in Canada

RPT-2FHQDC-E

This report presents a recommended framework and a program for gathering high-quality data for urban goods movement surveys in Canada.

http://tac-atc.ca/sites/tac-atc.ca/files/site/doc/resources/report-goodsmovement-phase2.pdf

Disponible en français : *Cadre de collecte de donnés de qualité supérieure sur le transport urbain des marchandises : Phase 2 (2010)*

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http://conf.tac-atc.ca/english/resourcecentre/readingroom/conference/conf2010/english/table_of_contents.htm

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Guidelines for the Application and Implementation of the School Bus Stop Ahead (WC-9) Sign

PTM-SCHOOLBUS

Guidelines for Application and Implementation of the School Bus Stop Ahead (WC-9) Sign consolidates the best available information to develop national guidelines for the application and installation of warning devices in advance of school bus stops. In particular, guidelines are presented for the MUTCDC approved WC-9 sign.

Section A3.7.5 of the Manual of Uniform Traffic Control Devices for Canada (MUTCDC) introduces the School Bus Stop Ahead Sign (WC-9). This sign is meant to warn drivers that they are approaching a school bus stop when the sight distance to the bus stop is limited to less than the minimum stopping sight distance.

Other signs also exist that provide regulatory information or warning regarding school bus operations. However, no specific guidelines have been developed regarding their application and implementation. Various jurisdictions have developed their own practices, which has led to a lack of consistency in application and implementation across Canada. Due to the sensitive nature of school bus transportation, the signs have become overused in some jurisdictions, and the removal of unnecessary warning signs has been a challenge.

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Winter Maintenance Performance Measurement Using Friction Testing

PTM-FRICTION

Winter Maintenance Performance Measurement Using Friction Testing provides developments in winter friction testing and a survey of practices throughout Canada and abroad. The study investigates the



approaches of road agencies related to communicating road conditions and friction levels to motorists during winter. The types of equipment used and their effectiveness based on the experience of road agencies are also reviewed.

The benefits of winter road surface friction testing include facilitating winter maintenance planning, evaluating the effectiveness of winter maintenance operations, minimizing environmental impacts, and enhancing road safety by clearly communicating friction levels to motorists.

Winter road surface friction measurement has been implemented by Finland, Norway and Sweden as a quality standard. Scandinavian road agencies found it to be a useful tool to enhance traffic safety. The study highlights lessons learned from the usage of friction measurements as well as research gaps, such as a thorough evaluation of winter friction devices; harmonization of winter friction measurement; an evaluation of actual vehicle performance on winter roads; and a selection of friction devices for Canadian applications.

Disponible en français : *Évaluation du rendement de l'entretien hivernal à l'aide d'essais de frottement (2009)*

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Environmental Management Systems User Guide for Transportation Practitioners
PTM-EMSGUIDE
This comprehensive user guide is designed for Canadian jurisdictions when making decisions on Environmental Management System (EMS) framework planning, design, implementation, maintenance and related costs (including operations and maintenance implications). The Guide was the basis of a highly successful session at the recent TAC Conference in Toronto.

EMS is comprised of a set of management procedures that allows an organization to analyze, control and reduce the environmental impact of its activities, products and services, and operate with greater efficiency and control. The Guide includes outlines of EMS best practices, success stories and lessons learned.

The Guide is divided into two parts:

A "How-to" for developing an EMS in an organization

Examples and Case Studies; practical experience from agencies in developing and implementing an EMS

Clear symbols and tables are used throughout to emphasize key points, help focus information and provide examples, tools and advice.

Keywords: Environment; environmental management system; planning; administration; policy; guidance; operational research

Disponible en français : *Systèmes de gestion environnementale - Guide d'utilisation à l'intention des praticiens du transport (2008)*

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Management of Utilities in and Adjacent to the Public Right-of-Way: Survey of Practices
RPT-MUAPRW-E
The intention of this effort was to gather practices from across Canada supplemented by a project-specific questionnaire distributed to the road authorities of each province and territory as well as one municipality in each province.

http://tac-atc.ca/sites/tac-atc.ca/files/site/doc/resources/report-mgmt-utilities-row.pdf

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Best Practices for the Technical Delivery of Long-Term Planning Studies in Canada - Final Report
RPT-BPTDLTP-E
This report describes the findings of research focused on the analytical tools and associated data that support long-term transportation planning practices of small- and medium-sized communities in Canada.

http://tac-atc.ca/sites/tac-atc.ca/files/site/doc/resources/report-bp-techdelivery.pdf

Disponible en français : *Bonnes pratiques techniques d'exécution des études de planification des transports à long terme au Canada - Rapport final (2008)*

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Phase 1 of the Framework for High Quality Data Collection of Urban Goods Movement in Canada



RPT-1FHQDC-E

This project was conducted to develop an understanding of the types of data that are needed to address urban goods movement issues as they relate to land use planning, infrastructure planning, traffic safety and operations, demand management and sustainable transportation.

http://tac-atc.ca/sites/tac-atc.ca/files/site/doc/resources/report-goodsmovement.pdf

Disponible en français : *Cadre de collecte de donnés de qualité supérieure sur le transport urbain des marchandises au Canada : Phase 1 (2007)*

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Development of Winter Severity Indicator Models for Canadian Winter Road Maintenance

PTM-WINTERSEV

This report discusses the development of a TAC Winter Severity Index. (For report purposes, a winter severity index is defined as a measure of the relative impact of winter weather on winter road maintenance (WRM) operations using historical meteorological or Road Weather Information System (RWIS) data.)

A set of models were developed using Canadian WRM, Meteorological Service of Canada (MSC) and RWIS data. WRM data were collected from across Canada from eight provincial road authorities and seven cities. Salt usage in tonnes (salt (t)/lane-km/day) was chosen as the dependent variable, standardized to account for differences in road network and the number of days in the observation period.

The first model developed, based on MSC data alone, achieved a goodness of fit of 0.54. Explanatory variables were based on snowfall occurrence, air temperature, freezing rain occurrence, and an east-west dummy variable to account for differences in winter road maintenance practices in different parts of Canada. A second model was developed based on MSC data together with RWIS data. This achieved a goodness of fit of 0.60, but was based on a significantly smaller sample size.

Calibration factors were developed for twenty different homogeneous groupings across Canada using the Bayesian method. Based on the calibration, thirteen of the twenty groups achieved a better goodness of fit compared to the national model results.

The report is accompanied by a spreadsheet designed to calculate the winter severity index using Environment Canada data.

Keywords: Winter maintenance; winter; weather; storm; impact study; measurement; mathematical model; maintenance; planning; Canada

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Synthesis of Quality Management Practices for Canadian Flexible Pavement Materials and Construction

QM-PAVMAT

The Synthesis of Quality Management Practices for Canadian Flexible Pavement Materials and Construction reviews practices for the quality management of materials, production and placement in flexible pavement construction. More specifically it describes:
1) Design considerations;
2) Flexible pavement materials: granular sub-base / base; hot-mix asphalt aggregates and asphalt cements (typical performance graded asphalt cements); and miscellaneous materials such as reclaimed asphalt pavement, tack coat, fillers, fibres and polymer modified asphalt cements;
3) Subgrade preparation;
4) Placement and compaction of granular sub-base and base;
5) Hot-mix asphalt production and transportation, including environmental control; and hot-mix asphalt paving and compaction - trial section, substrate preparation, tack coats, material transfer devices, joint construction and working with polymer modified asphalts.

The publication also summarizes the quality control and quality assurance sampling, testing and inspection associated with each of these materials and methods in terms of technician and testing equipment/laboratory requirements to monitor compliance with flexible pavement project quality requirements.

Lastly, the Synthesis of QM Practices offers recommendations for a QM system template based on a contractor's quality control plan and an agency's quality assurance plan. The template is, however, subject to the specific project requirements of an agency for flexible pavement materials and construction.

The importance of a contractor's and agency's commitment to quality and teamwork, at all stages of flexible pavement materials and construction methods, in order to ensure enhanced life-cycle costs and performance, is emphasized throughout.

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Guide for the Design of Roadway Lighting - Design Examples

TOOLS-GDRW

Design examples of lighting installations, site plans, wiring documents, elevations, street lighting, pathway lighting, parking lot lighting, etc.

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Synthesis of Practices for Work Zone Speed Management

PTM-WORKZONE

Speeding in work zones is one of the most common traffic violations observed by road builders and road maintenance crews. It creates an unsafe environment for road workers and all types of road users.

Synthesis of Practices for Work Zone Speed Management is intended to help address this situation by reviewing work zone speed management efforts in Canada and the United States. The report provides an overview of technologies and methods for managing speed in work zones, with topics ranging from posted speed limit reductions and narrowing lanes to portable variable message signs and enforcement. In addition, the report discusses other methods for speed management, including merge control, driver and worker education, and real-time traffic information systems. The report also provides a number of conclusions and recommendations based on the synthesis, which identify some of the key problems and solutions.

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Synthesis of Practices for the Implementation of Centreline Rumble Strips

PTM-CENTER-RS

Rumble strips are raised or grooved patterns installed on the road surface to provide an auditory warning (rumbling sound) and a physical vibration to alert drivers that they are leaving the travel lane.

Centreline rumble strips (CRS) are applied along the centre of undivided roadways and generally used to prevent head-on collisions. The purpose of this publication is to review and synthesize current literature and practices on CRS's in North America and internationally and to recommend an appropriate update to TAC's Geometric Design Guide for Canadian Roads.

The report:

Reviews current practices, including design elements and documented issues;

Outlines conclusions based on the literature, including recommendations for design elements and application guidelines;

Presents potential future research topics; and

Provides appendices containing design drawings from several jurisdictions and the provincial and state CRS policy documents reviewed.

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Urban Transportation Indicators - Third Survey

U-INDIC05

This publication contains the results of TAC's third survey on the health of transportation in major urban Canadian centers. Conducted in 2003 and based on the 2001 census, the survey represents a comprehensive look at a variety of transportation trends and revisits issues such as land use and urban structure, transportation demand and supply, transportation financing and spending and overall transportation use and environmental implications. All 27 Census Metropolitan Areas participated, although the level of their participation does vary.

The 2-volume report describes the survey process and results, draws conclusions on trends from the resulting database and discussed progress towards achieving the TAC Vision for Urban Transportation, in light of the survey findings and in comparison to international data.

An Excel database of the information upon which the report and the profiles are based is provided, as well as the raw data for the previous 1991 and 1996 surveys.

http://tac-atc.ca/sites/tac-atc.ca/files/site/doc/resources/complete_0.pdf

Disponible en français : *Indicateurs de transports urbains - 3e enquête (2005)*

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TAC Conference Proceedings - 2005

CPR-TAC2005-E

The TAC conference papers are posted online, organized by author, title and category. They are available to view or download in PDF format.

Disponible en français : *Compte rendu du congrès de l'ATC - 2005*

http://conf.tac-atc.ca/english/resourcecentre/readingroom/conference/conf2005/english/table_of_contents.htm

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TAC Conference Proceedings - 2004

CPR-TAC2004-E

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Disponible en français : *Compte rendu du congrès de l'ATC - 2004*

http://conf.tac-atc.ca/english/resourcecentre/readingroom/conference/conf2004/english/table_of_contents.htm

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Disponible en français : *Compte rendu du congrès de l'ATC - 2003*

http://conf.tac-atc.ca/english/resourcecentre/readingroom/conference/conf2003/pages/contents.html

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What Was Heard - A Report Documenting the Results of consultation on the Transportation Association of Canada's Business Plan

RPT-WWH-E

Disponible en français : *Les membres se sont prononcés! Sommaire des consultations concernant le prochain plan d'affaires de l'Association des transports du Canada (2002)*

http://tac-atc.ca/sites/tac-atc.ca/files/site/doc/resources/report-businessplan.pdf

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Study of Natural Gas Pipeline Placement in Rural Road Right-of-Ways

PTR-NATGAS

The placement and location of hydrocarbon pipelines with respect to road geometries and cross sections can have an effect on
1) the safety of the highway system, its users and adjacent residents and
2) the operational and economic impacts of highway maintenance.

TAC's study is intended to provide readers with a qualitative and quantitative understanding of the implications of locating pressurized natural gas pipelines in various locations within rural road right-of-ways. The study's conclusions and recommendations include definition of compatible and incompatible combinations of pipeline and location installations in terms of safety, cost and constructibility; various risk and impact mitigation measures to enhance safety and reduce costs; and long-term approaches to optimize the situation.

Keywords: Network (transp); Highway; Pipe; Gas; Safety; Operational Research; Economics; Location

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Best Practices for the Implementation of Shoulder and Centreline Rumble Strips

PTS-RUMBLE

Synthesis of Practice No. 8

A number of Canadian provinces have developed guidelines and policies for the implementation of shoulder rumble strips. Alberta has implemented centreline rumble strips. This document provides a summary of current practices and would be of particular use to agencies looking to develop local guidelines and policies.

For ease of use, the Executive Summary has been designed to be a quick reference tool, providing an overview of the best practices and key recommendations.

http://tac-atc.ca/sites/tac-atc.ca/files/site/pts-rumble.pdf

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Urban Transportation Indicators – Survey 2, 1996

PTR-UTI99

In 1993, the Urban Transportation Council (UTC) of the Transportation Association of Canada (TAC) proposed a New Vision for Urban Transportation, describing 13 principles which point the way to desirable future transportation sysems and related urban land use. The Council reconized that periodic surveys of transportation indicators would be required to monitor progress towards achieving the Vision. To this end, a pilot survey was carried out in 1995 using 1991 as the study year and including eight urban areas. This report describes the second survey which included 15 urban areas and was carried out in 1999 for the 1996 study year.

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PRIMER: Highway Asset Management Systems

PRM-ASSETMGMT

TAC's primer on highway asset management systems introduces the concepts of asset management, outlines the potential benefits and describes how to successfully plan and implement an asset management system. Managing highway assets is not a new concept; highway agencies have been using pavement, bridge and maintenance management systems for decades. What sets asset management systems apart today is the move to merge these single-asset management systems into an integrated whole. Asset management is a comprehensive process that allocates funds effectively and efficiently among competing pavement, structure and other infrastructure needs.

This document will be of interest to all government transportation and finance departments at the federal, provincial and municipal levels, as well as academics, associations and private sector firms who have an interest in asset management systems and procedures.

Disponible en français : *NOTIONS ÉLÉMENTAIRES : Les systèmes de gestion des éléments d'actif routiers : notions fondamentales*(1999)

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In-Line Skating Review Phase II

INLINE

In-line skating in Canada is worthy of consideration as a mode of transportation. In TAC's In-line skating review it was revealed that in-line skating represents a concern for many municipalities in terms of their ability to manage, regulate and enforce this activity on the transportation system. As the activity grows in scope and scale, a need becomes evident for the development of design, operational and safety guidelines.

The objective of the In-line Skating Review: Phase 2 was to undertake a comprehensive investigation of some pertinent issues relating to in-line skating and to establish guiding principles with respect to:
1) the appropriateness of permitting in-line skating on any roads, sidewalks, bicycle routes and offroad facilities and
2) the need for and type of protective equipment that should be used.

The report includes a thorough assessment of the current technology, the basic operational characteristics of in-line skating, performance characteristics/constraints, the safety record of the equipment, a review of enforcement issues and suggested criteria to be used in assessing the capability of infrastructure elements to safely accommodate in-line skaters.

http://tac-atc.ca/sites/tac-atc.ca/files/site/inline.pdf

Disponible en français : *Synthèse sur le patinage sur roues alignées : deuxième étape (1997)*

Media type: PDF
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Determining the Winter Design Temperature for Asphalt Pavements
WINT
This document develops a method to enable the selection of asphalt binders that resist thermal cracking in very cold winter climates. An algorithm is developed which estimates design temperatures for a pavement test site from the local winter temperature history. This equation includes a factor for the desired reliability, and can be used with the SUPERPAVE paving mix design system.

http://tac-atc.ca/sites/tac-atc.ca/files/site/determining_winter.pdf

See also: *Determining the winter design temperature - Supplement for air and pavement temperature data*

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Urban Transportation Indicators in Eight Canadian Urban Areas
U-INDIC
The publication presents 24 indicators which will serve as a basis for the continuous monitoring of transportation development in Canadian municipalities.

http://tac-atc.ca/sites/tac-atc.ca/files/site/u_indic-urban-indicators-eight.pdf

Related publication: *Urban Transportation Indicators: 1996 survey 2 (1999)*

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1996

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Metric Curve Tables: Circular and Spiral Curve Functions for Layout Purposes
METRICCURV
Prepared mainly to facilitate field layout work using both horizontal circular curves defined by the radius and spiral curves defined by the spiral parameter. Adequate information is also included for design purposes.

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