

EVOLUTION AND LEGACY OF PAVEMENT MANAGEMENT IN CANADA: A CGRA/RTAC/TAC SUCCESS STORY

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ABSTRACT

The evolution and legacy of pavement management in Canada represents a unique success story. With a compilation of knowledge and best practices covering more than four decades, Canadian road agencies have been provided with up-to-date technologies and management guidance in the pavement field.

While those responsible for creating the legacy can justifiably take pride in their accomplishment it is equally important that the “story” of the evolution and legacy be written for the leaders of tomorrow.

The pioneering work began in the late 1950’s with formation of a Pavement Design and Evaluation Committee in CGRA. Based on nationwide investigations of pavement sections, and an extraordinary level of effort and commitment by the committee members and their organizations, “A Guide to the Structural Design of Flexible and Rigid Pavements in Canada” was published in 1965.

The next major milestone and achievement can be credited to the Pavement Management Committee, under RTAC, the successor to CGRA. Their work resulted in the first ever book on the subject, “Pavement Management Guide”, published by RTAC in 1977, and “Guide de Gestion Routière” published by the Association Québécoise de Transport et des Routes”.

The following era saw a substantive increase in pavement design and management technology, including the initiation of SHRP and C-SHRP. Now under TAC as the successor to RTAC in 1991, the Committee began work on a new Guide. It was published in 1997 as the “Pavement Design and Management Guide”.

A need for updating the 1997 Guide became apparent in the 2000 era and a project supported by TAC’s Standing Committee on Pavements and Soils and Materials was launched in 2010, with an expected publication date of a new “Pavement Asset Design and Management Guide” in 2012.

A number of key contributing factors to the legacy include leadership and commitment, a comprehensive and stable pavement management framework, a vision of the technical, economic and institutional needs of agencies and users, an understanding of available technologies and best practices, incorporation of a life cycle approach and an environment (CGRA/RTAC/TAC) which fosters innovation.

Needed improvements in advancing pavement management have been identified in each chapter of each Guide, and a consolidated list is provided in the paper. Finally, suggestions toward an ideal pavement management system of the future are also provided in the paper.

INTRODUCTION

Early Historical Background

The concept of pavement management was pioneered in Canada in the 1960's, which led to the first ever book on the subject, RTAC's "Pavement Management Guide, published in 1977. A start for this initiative actually occurred in 1958 with the formation of the Pavement Design and Evaluation Committee within CGRA. It consisted of representatives from the provincial highway departments, the federal public works and transport departments and others from the private sector, associations and academia.

The original Committee was charged with developing methods of design for rigid and flexible pavements for Canadian environment and traffic conditions, and to develop method(s) for evaluating the strength and serviceability of existing pavements.

Based on a comprehensive plan [1] and testing procedures, several thousand rural highway test sections were identified across Canada for an evaluation of their design, construction and performance. This was a massive undertaking which represented an extraordinary commitment by the players involved. An extensive amount of data was collected – and it should be noted this was a complementary effort to the AASHTO Road Test, which in fact had a Canadian observer, but differed in terms of geographic extent, climate conditioning, traffic, etc. Progress on the work was reported to the CGRA Conferences in 1960, 1961, 1962, and 1963, including relationships to AASHTO Road Test results [2].

During that time, data collection and analysis continued and in 1965 the Committee's efforts resulted in publication of CGRA's "A Guide to the Structural Design of Flexible and Rigid Pavements in Canada" [2].

In essence, this early work was the foundation for subsequent advancements in developing and implementing pavement management systems across Canada. Leadership was an essential factor, in addition to the commitment previously noted. Further description of the evolution and legacy of what has been a remarkable CGRA/RTAC/TAC success story follows.

SCOPE AND OBJECTIVE

A brief summary of the previous early historical work is followed in the next sections by a description of the evolution and legacy of pavement management in Canada, including a perspective on how and why events and achievements occurred.

It is intended in these sections to define what constitutes a legacy and how it was realized by the CGRA/RTAC/TAC success story. Further, the objective is to describe the framework of current operational pavement management systems and to identify some of the key advancements in technology which contribute as driving forces to the advancement of pavement management itself.

Finally, the purpose of this paper is to discuss the challenges and future opportunities for pavement management as a contribution to the leaders of tomorrow, similar to what the early leaders contributed to the status of pavement management today.

A CHRONOLOGY OF MILESTONES AND MAJOR ACHIEVEMENTS

Table 1 is a very summarized chronology of milestones and major achievements in the evolution of the pavement management success story. It includes the early historical background (mentioned in the Introduction), followed by the milestones and achievements culminating in the 1997 Pavement Design and Management Guide [3].

The leadership of the Committee Chair for the 1965 Guide, Mr. E B. Wilkins of the B.C. Department of Highways and Public Works, and the Chair for the original 1977 Guide, Mr. G. Robert Tessier of the Ministère des Transports du Québec, were vital elements, as were the participation and contributions of the various committee members. A key player for the 1965 Guide, as Secretary of the Committee and Editor, was Dr. Gordon Campbell, Director of Technical Services for CGRA at that time.

It should be acknowledged that there were also pavement management activities underway in the United States and elsewhere starting in the 1960's, as described in the second book on the subject [4].

The 1997 Guide, while produced under contract like the 1977 Guide, received direction and oversight by a Steering Committee, rather than by the Pavement Management Standing

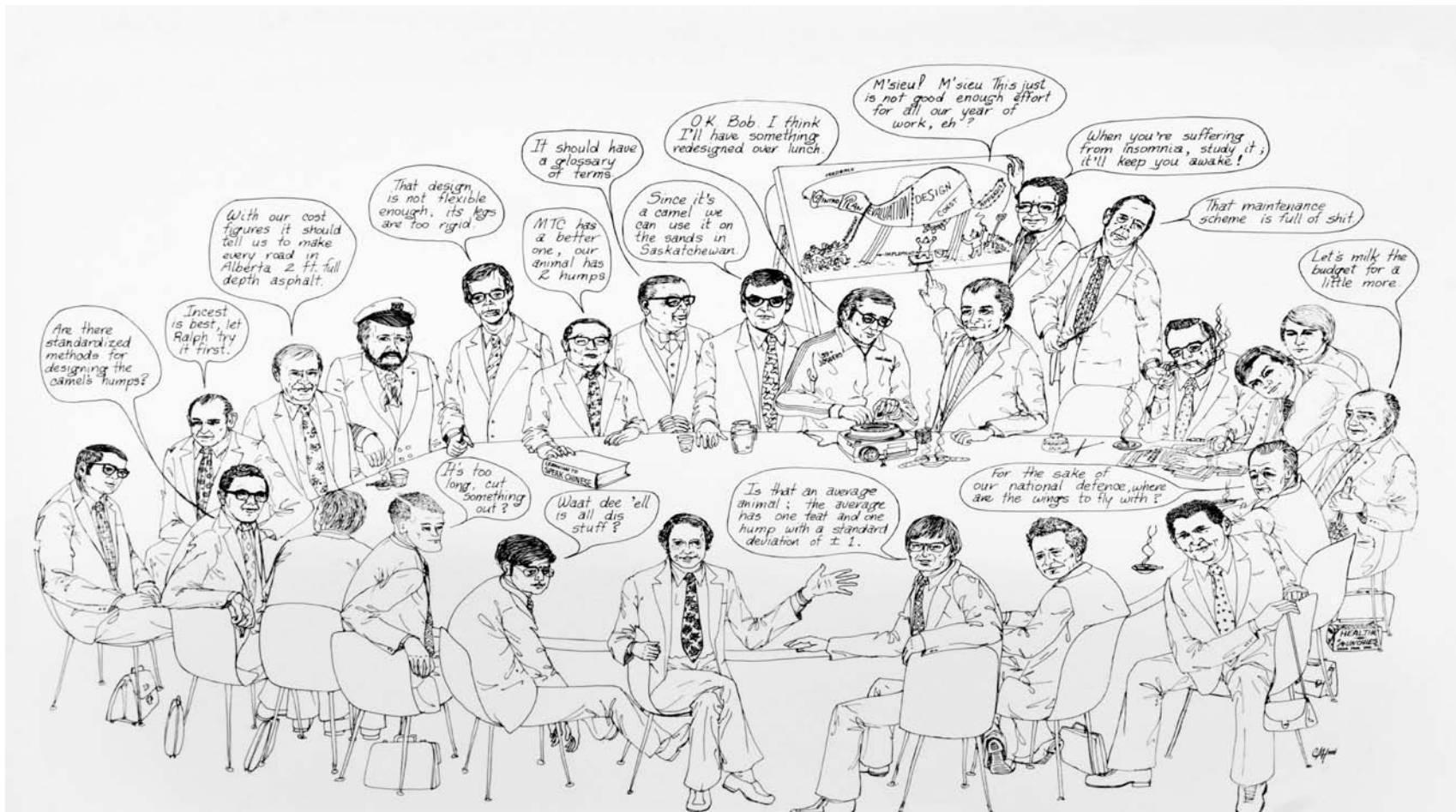
Committee as a whole. Most of the members of the Steering Committee, however, did come from the two TAC Standing Committees, Pavement Management, and Soils and Materials.

Table 1

Milestones and Major Achievements in the Pavement Management Success Story

Timelines	Milestones and Major Achievements	Remarks
INITIAL ERA: CGRA’S Pavement Design Guide		
1958	Formation of CGRA’s Pavement Design and Evaluation Committee; E. B. Wilkins of B.C. Dept. Of Highways Chair; G.D. Campbell of CGRA Secretary	Representation from provincial and federal departments, associations, industry and academia (“pioneers”)
1959 to 1964	Development of a plan and test procedures; investigation of several thousand highway sections performance across Canada	Extraordinary level of effort, commitment and resources by provinces and CGRA (Dr. Campbell’s involvement)
1965	Results of Committee’s work as a CGRA publication “ <i>A Guide to the Structural Design of Flexible and Rigid Pavements in Canada</i> ”.	A flagship document which saw widespread use by provinces, municipalities and federal agencies
SECOND ERA: RTAC’s Pavement Management Guide		
1966 to 1971	Restructuring of the original committee’s scope and objectives within a pavement management framework	Succession of some original committee members by new members
1971	Formation of new Pavement Management Committee as RTAC succeeds CGRA	G. R. Tessier of Ministère des Transports du Québec new Committee Chair; Ralph Haas, Secretary
1971 to 1976	Major initiative carried out to develop a Pavement Management Guide (contract to University of Waterloo; R. Haas PI)	Guidance and oversight by Pavement Management Committee; financial support from Transport Canada
1977	Publication of RTAC’s “ <i>Pavement Management Guide</i> ” and AQTR’s “ <i>Guide de Gestion Routière</i> ”	The first (hardcover) book ever published on the subject
THIRD ERA: TAC’s Pavement Design and Management Guide		
1978 to 1990	Focus by the pavement community of practitioners and researchers to advance the state of pavement design and management technology and knowledge. Substantial increase in R&D and in training and education. Initiation of SHRP and C-SHRP	Major advances in data collection methods, materials, network level analysis, pavement structural design, pavement evaluation and construction and maintenance
1991 to 1996	Initiative launched to prepare a new Guide with compilation of best practices for new generation of users, (contract to University of Waterloo, R. Haas, PI) as well as promotion of good pavement management practices among provincial, federal and municipal owners.	Intention for initiative to be a natural continuation of the work originated in CGRA and carried on under RTAC and then TAC. Steering Committee formed, Tom Kazmierowski of MTO Chair
1997	Publication of TAC’s “ <i>Pavement Design and Management Guide</i> ”, and national tour of seminars and workshops	Widespread acceptance of new Guide nationally and internationally
FOURTH ERA: TAC’s Pavement Asset Design and Management Guide		
1998 to 2012	Continuation of activities under TAC’s Standing Committees on Pavements and on Soils and Materials.	Project Steering Committee formed, with Marta Juhasz of

	Contract for preparation of updated Guide awarded to University of Waterloo (Dr. Susan Tighe, PI) in 2010. National project team formed.	Alberta Infrastructure as Chair. Publication of new Guide expected in 2012.
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Future 1 Original RTAC Pavement Management Committee (1970's)

Upon completion of the 1965 Guide, a restructuring of the original Committee's scope and objectives within a pavement management framework was carried out, and in 1971 a successor Pavement Management Committee was formed under the successor to CGRA, the Roads and Transportation Association of Canada. The new Committee, under the leadership of G. Robert Tessier, undertook a major initiative to develop a pavement management guide, and a contract with financial support from Transport Canada was awarded to the University of Waterloo in 1973, with Ralph Haas as P.I. Committee members and their organizations were very active during the ensuing period in providing information, reviewing material and providing direction and oversight, all on a volunteer basis. Figure 1 is an artist's rendition of the key players involved, but the camaraderie of this who's who in Canadian pavement engineering at that time, and the base established for ongoing collaboration was invaluable to advancing pavement management.

The 1977 "Pavement Management Guide" published by RTAC, and the French version "Guide de Gestion Routière, published by the Association Québécoise du Transport et des Routes (AQTR), was the first ever book on the subject. It is important that the Guide had a broad definition of pavement management, encompassing all activities at the network and project levels ranging from planning to design to construction and maintenance to evaluation. That scope has prevailed through subsequent guides, as well as the intended use for engineers and technologists in public and private agencies, and as an education and training tool.

What was particularly noteworthy of this pioneering effort was that no agency had yet even implemented a pavement management system, so the Guide included a Part on Guidelines for Implementation. As well, the Guide was strongly influenced by the fact that the Committee was almost entirely composed of practitioners, who wanted to see a minimum of jargon.

A major impact of the 1977 Guide was the impetus it gave to the development and implementation of operational pavement management systems (PMS) by the provinces and territories, federal agencies and municipalities, starting in the late 1970's and continuing through the following decades. The 1977 Guide had a perhaps unexpected impact as an internationally recognized pioneering contribution and in fact proved to also be an impetus for implementation of PMS in other countries. In Canada, it provided the technology and management basis for the first consultancy in the area and the experience gained over the following decade was undoubtedly a factor in that firm securing two of the four North American Regions of the Long Term Performance Program (LTPP) of SHRP. This represents another aspect of the success story of the 1977 and subsequent Guides in that they proved to be of value to both the public and private sectors.

The two decades after the 1977 Guide saw not only a rapid expansion in PMS implementation but also substantial advances in the technologies for pavement monitoring and evaluation, data

capture and databases, network optimization tools, mechanistic-empirical pavement design, construction and maintenance. As well, SHRP, and C-SHRP in Canada, and the LTPP program, were initiated in the late 1980's. Much of the PMS implementation experience and technology advances were reported in the first (1985) and second (1987) North American-Conferences on Pavement Management (5, 6) in Toronto, which subsequently become the International Conference on Managing Pavement Assets, ICMPA, the latest of which will be held in November, 2011 in Santiago, Chile. The early conferences received significant support from FHWA, AASHTO, TRB, and others, as well of course from MTO and RTAC.

In fact, by the time of the second conference, sufficient PMS experience had been gained to enable a look ahead in a paper titled "Future Prospects for Pavement Management" (7), many of which proved to be valid in the subsequent decades (8).

The Standing Committee on Pavements, under TAC (which succeeded RTAC in 1991), saw a need to update the 1977 Guide, and articulated in 1991 the following specific objectives: 1. To provide an up-to-date comprehensive consolidation of pavement design and management knowledge for a new generation of users; 2. To promote good pavement design and management practice among the provincial, federal and municipal owners of pavements, and 3. To incorporate new technology within a systematic, organized management framework. A Project Steering Committee (PSC), based primarily on the standing committee memberships and sponsors was formed, under the leadership of Tom Kazmierowski of MTO, and a contract was awarded in 1993 to the University of Waterloo, with Ralph Haas as PI.

A national project team was formed to carry out the work, and the first step was a comprehensive survey of Canadian pavement design and management practices, the results of which are summarized in the 1997 TAC "Pavement Design and Management Guide (9). A key part of promoting the new Guide was a national tour of workshop and seminar presentations to public, private and academic sector forums.

The 1997 Guide proved again to be a flagship publication for TAC, it has received extensive use, and it became a valuable education tool at the university and college levels.

Like any Guide, however, a need for updating became apparent in the 2,000 era and through the cooperative efforts of TAC's Standing Committees on Pavements and on Soils and Materials, a sponsored project to update the 1997 Guide was approved. The objective, as defined by the project Steering Committee (PSC), under the leadership of Marta Juhasz of Alberta Infrastructure, was to ".....update the 1997 Pavement Design and Management Guide.....supplemented with new information while highlighting Canadian practices and recommending best practices."

A study team consortium with cross Canada representation from the private and academic sectors was formed, and a contract was awarded to the University of Waterloo in late 2009, with Dr. Susan Tighe as PI. At the time of preparing this paper, a draft of the new Guide has already been put together for review. In addition to updating chapters of the 1997 Guide updating also meant addition of new knowledge and practices, a more explicit emphasis on asset management and a means of communicating an overview of the Guide to non-technical people, executives and politicians. Fulfilling those needs is reflected in the new Guide by new chapters on Principles of Asset Management, Gravel and Surface Treated Road Design, standalone chapters on Flexible and Rigid Pavement Design, Life Cycle Analysis and Sustainability in Pavement Engineering and Management.

In essence, the foregoing chronology of milestones and achievements represent a unique and continuous success story over five decades. This is a legacy which has and will continue to serve both the pavement engineering community and the public and private sector stakeholders in roads and pavements. But in addition to the major achievements, there are also key contributing factors essential to the legacy, as described in the next section.

THE LEGACY AND CONTRIBUTING SUCCESS FACTORS

A legacy consists of something of value which has been created for today and tomorrow. It can consist of codes of practice, investments and assets, mentoring and/or training of new leaders, business models, guides, new knowledge and technologies, basis for ongoing sustainability of assets and practices, and others. The three existing CGRA/RTAC/TAC Guides, and the current one under development, certainly embody this concept of a legacy.

Creating a legacy, however, requires a number of contributing factors, which include the following particularly important ingredients for success of the Guides:

- Leadership and commitment, institutionally and individually,
- A comprehensive pavement and asset management framework,
- A vision of technical, economic and institutional needs in asset management which exist and likely for some foreseeable period into the future,
- An understanding of available technologies and best practices, support for continuing advancements, and recognition of the driving forces in the evolution of and future challenges for pavement management,
- Acquisition of and/or access to data and information,
- A broadly based, experienced team,
- Incorporation of a life cycle approach
- Acceptance of a reasonable degree of risk
- Creation of product(s)/guides which serve the user community

- An inherent philosophy that succession planning is a process which continues over time not only for people but also for advancements in technology, information, education and training, commitment of resources and sustainability.

The foregoing are largely self explanatory, but further elaboration is warranted on some of the evolutionary advances and innovations that have occurred, and the management framework which characterizes pavement and road asset management and the improvement needs or challenges which will be faced by the users of the new Guide in the next cycle of advancing pavement management. The point is that while the evolution and legacy of pavement management in Canada has been a unique success story, future advancements must also occur for the legacy to continue in existence.

EVOLUTIONARY ADVANCES AND INNOVATIONS

A historical perspective on the evolution of pavement management in Canada suggests that this is largely due to continuing advancements and innovations. While numerous specific examples could be cited, a few but certainly not exhaustive highlights are:

- An all encompassing framework (including planning and priority programming in-service monitoring and evaluation, design of new pavements, preservation and rehabilitation of existing pavements, construction and maintenance), which was originally defined in the 1977 Guide (3) and has sustained for over four decades.
- Major technology advancements in high speed, automated methods and equipment for pavement surveillance and data acquisition; also, availability of web-based performance data.
- Integration of pavement management, as a major component system, within broadly based asset management at the strategic, network/system wide and project/site specific levels, and recognition of asset valuation as a key element. Widespread incorporation of life-cycle analysis in pavement design and management
- Recognition of the value of preventive and rehabilitative maintenance in pavement preservation
- Growth in long term performance based maintenance contracts
- Extensive accumulation of performance data in the LTPP data base and by provincial and municipal authorities in Canada.
- A key influence on bridge management, improved maintenance management, and related subsystems such as safety management.
- Improved ability to validate models used in pavement management, largely due to the performance data noted above
- Improvement in the pavement management process itself, such as linear referencing systems, dynamic sectioning, use of GIS and portrayal of the information on GIS maps,

access to web-based data and models and the capability in turn of serving many more additional users.

The all encompassing framework for pavement management can be placed within the broader context of road asset management, as illustrated in Figure 2, and described more fully in Chapter 2 of the new Guide currently under development and to be published in 2012. Essentially, Figure 2 indicates that road or transportation authorities operate within a business plan or business environment, which may be formally articulated in a mission statement followed by, for example, a 20 year vision of broad goals related to safety, environmental stewardship, mobility and accessibility, stakeholder group interests, etc., or which may be in the form of an implicit operating environment of policies, social and economic responsibilities of those appointed or elected to act on behalf of the public.

While the detailed structure of road asset management, and component systems such as PMS, varies from agency to agency, examination of actual best practice in Canada and internationally reveals that there are interrelated levels, all of which should exist within the agency's corporate business plan:

- Strategic level where the business plan's mission statement, level of service and safety targets and policy objectives plus various economic, social, political, environmental and public or stakeholder group input factors are taken into account, where long range financial forecasts and investment needs are carried out, and cost estimates are prepared to meet the defined targets. Current and future expected asset values should be included.
- Network or system wide level where alternative programs of asset preservation and network expansion are considered, performance estimates are made and life cycle cost analysis (LCCA) are used to determine an optimal program for given budget(s) or funding levels.
- Project level where detailed LCCA and other relevant inputs are used to identify and implement the most economically effective alternative for a project/link/site specific area.

IDENTIFYING NEEDED IMPROVEMENTS IN ADVANCING PAVEMENT MANAGEMENT SYSTEMS

Looking Forward

A key feature of the 1977, 1997 and the (forthcoming) 2012 Guides was, after each Chapter, a Section on improvement needs. This was a valuable element of looking forward, which inherently included the following motivating factors:

- Clear recognition of the challenges faced in advancing pavement management

- Recognition of the benefits of current PMS as well as new benefits from advances
- Desire to continually improve technology and the state of practice and the state-of-knowledge
- Willingness to accept risk associated with research, development and implementation
- Recognition of the substantive benefits in moving pavement management forward through regular and intensive training

There was also recognition, although not explicitly stated, that there are roadblocks to advancing pavement management. While not insurmountable, they can include the following:

- Institutional inertia in terms of being comfortable with business as usual, an aversion to risk and short term outlook
- Lack of willingness to commit the necessary resources to research and development
- Lack of knowledge of what already exists in the literature or other information services, either due to turnover of staff and the result of being new to the field, or an attitude of not willing to study

Improvement needs in pavement management, which can also be looked at as challenges, are represented to a large degree by a myriad of research problem statements and ongoing research initiatives. For example, the Office of Asset Management of the U.S. Federal Highway Administration (FHWA) launched a project in late 2009 titled “Development of a Pavement Management Roadmap”. This intent was to provide direction for future research, development and technology transfer activities through identifying focus areas (eg., data collection, system performance, decision support, etc., etc.) and the gaps or needs that have to be addressed within these areas. Regional workshops, with Canadian participation, held in 2010 developed specific needs and problem statements within these focus or topic areas. While advancements in the technology and practice of pavement management resulting from these workshops are still to be realized, The Roadmap suggests that pavement management system improvements needs can be categorized within the following theme areas, details are provided in Ref. (10).

- Theme 1: Use of Existing Technology and Tools
- Theme 2: Institutional and Organizational Issues
- Theme 3: The Broad Role of Pavement Management
- Theme 4: New Tools, Methodologies and Technologies

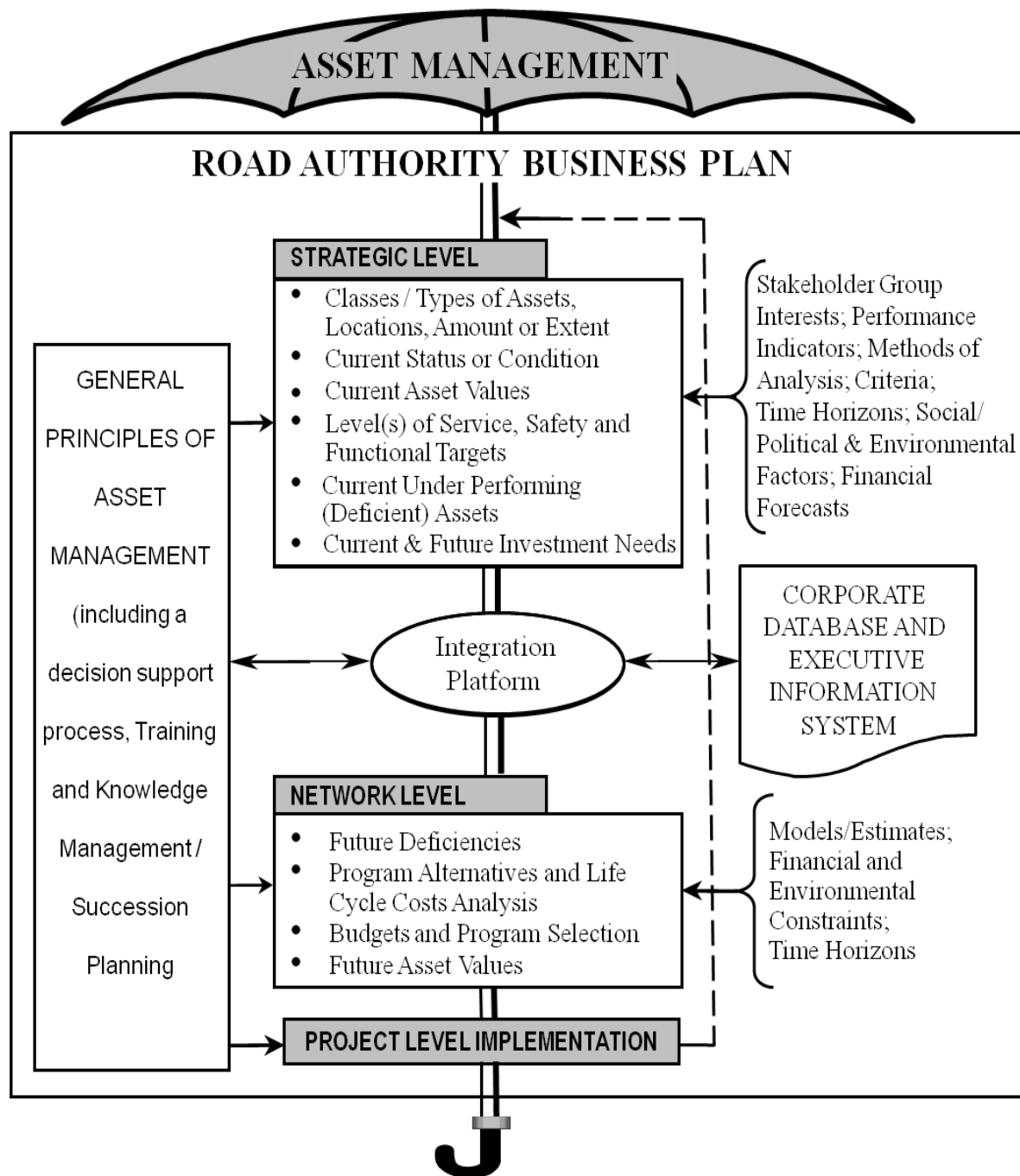


FIGURE 2: Overall Framework for Road and Pavement Asset Management

The “Roadmap” on the future of pavement management provides an excellent context for identifying improvement needs and/or the challenges to advancing pavement engineering and management. Based on the opportunity to participate in this initiative, including the previously noted workshops as well as the Expert Panel, afforded the opportunity in turn for the writer to suggest forward looking improvement needs particularly applicable to the Canadian environment. These are detailed in Ref. (11), and categorized as follows:

- A. Pavement Data (Needs and Cost-Effectiveness; Collection Technologies; Quality Assurance; Storage and Integration)
- B. Pavement Management Process (Structural Design and LCAA; Performance Modeling; Treatment Selection; Quantifying Benefits; Decision Support)
- C. Institutional Improvements (Organizational Structure; Location of PMS and AMS; Technology; Skills; Public-Private-Partnerships)

The issues relevant to or underlying the improvement needs, as well as the short to long term prospects for realizing advances in each of the categories, are also provided in Ref. (11). Certainly the improvement needs identified at the conclusion of each chapter in the new 2012 Guide will be a valuable complement to or update of Ref. (11).

TOWARD AN IDEAL PMS OF THE FUTURE

Pavement management has evolved to a widely applied process not only in Canada but worldwide. There is a continuing need, however, for future advances and their continued implementation as a key component of overall road asset management. Realization of this future will depend in large part on commitment, on technical, economic and institutional improvements and on adequate resources.

Based on the evolution and many successful applications of pavement management, and an expectation that the opportunities and challenges will be met to a substantial degree, the ideal PMS of the future might incorporate the following (8):

- Effective integration with broader asset management system(s) and seamless implementation at all levels
- Effective communication with all stakeholders, both within agency and external
- Explicit incorporation of the PMS into the agency’s business plan with demonstrable benefits
- Provision of resources to keep the PMS dynamic
- Leadership with a commitment to excellence
- Buy-in at all levels of agencies to policy objectives, performance indicators and implementation

- Extensive, reliable long term data base
- Inherent “culture” of innovations and advancements
- A skilled and knowledgeable complement of practitioners and researchers

CONCLUSIONS

Pavement management in Canada is an unqualified success story, with a legacy that spans five decades through CGRA, RTAC and TAC. Much of this legacy is reflected in the extensive use made of the three Guides to date, 1965, 1979 and 1997, and expected use of the forthcoming new 2012 Guide, the widespread implementation of pavement management systems at the provincial/territorial, municipal and federal levels, and the education and training provided to practitioners and to students. Description of the legacy in this paper provides not only a summary to the leaders of tomorrow of what has been accomplished in pavement management but also motivation, hopefully, to move forward with continuing advancements over the next decades.

ACKNOWLEDGEMENTS

The author has made extensive use in preparing this paper of the contributions of many colleagues in Canada and elsewhere over several decades. While they are too numerous to be named individually this good fortune is gratefully acknowledged. As well, the usual excellent work of Ms. Shelley Bacik in producing the paper is much appreciated.

REFERENCES

1. CGRA, “Manual of Pavement Investigations”, Technical Publ. No. 11, Canadian Good Roads Association, Ottawa, 1959
2. CGRA, “A Guide to the Structural Design of Flexible and Rigid Pavements in Canada, Canadian Good Roads Association, Ottawa, Sept., 1965
3. RTAC, “Pavement Management Guide”, Roads and Transportation Assoc. of Canada, Ottawa, 1977
4. Haas, Ralph and W. Ronald Hudson, “Pavement Management Systems”, McGraw Hill, New York, 1978
5. MTO, “First North American Conference on Pavement Management, Proc., Ministry of Transportation Ontario, Toronto, March, 1985
6. MTO, “Second North American Conference on Managing Pavements”, Proc., Ministry of Transportation, Ontario, Toronto, Nov., 1987
7. Haas, Ralph and W. Ronald Hudson, “Future Prospects for Pavement Management”, Proc., Second North American Conference on Managing Pavements, Toronto, Nov., 1987
8. Haas, Ralph, W. Ronald Hudson and Lynne Cowe Falls, “Evolution of and Future Challenges for Pavement Management”, Proc., 8th Int. Conf. On Managing Pavement Assets, Santiago, Chile, Nov., 2011
9. TAC, “Pavement Design and Management Guide”, Transportation Assoc. Of Canada, Ottawa, 1997
10. Zimmerman, Kathryn A., Linda M. Pierce and James Krstulovich, “Pavement Management Roadmap: Executive Summary”, Document publ. By Federal Highway Administration, Washington, D.C., Dec., 2010
11. Haas, Ralph, “Generating and Implementing Forward Looking Innovations in Pavement Research”, Proc., Transp. Assoc. Of Canada Annual conf., Halifax, Sept., 2010