

Curriculum Vitae

Dana J. Vanier, PhD (Architecture), M.Eng (Building Engineering), B.Eng (Civil), P.Eng., MCSCE

Sessional Lecturer, CIVL 425/521

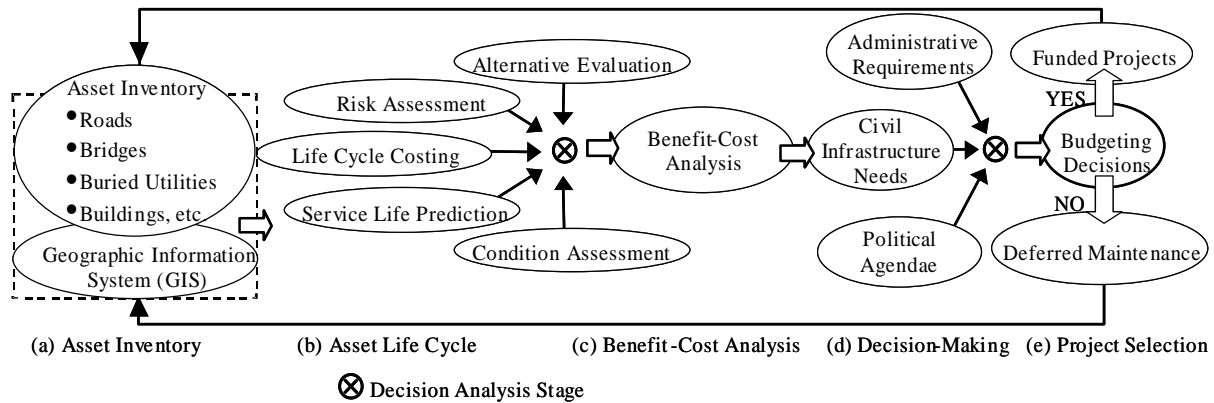
Sessional Lecturer, Master of Engineering Leadership MEL URSY 550

Languages: English (spoken/written) – French (spoken)

Citizenship: Canada, European Union (Italy)

Research Vision

My current area of research expertise relates to sustainable and strategic infrastructure management, and more specifically, municipal infrastructure management. It focuses on both “building and infrastructure lifecycle phases [design, build, and operate including retrofit, reuse and recycle]; and ... analysis of complex large-scale infrastructure and building projects”.



Framework for integrated and interoperable infrastructure management

Stages (a) to (e) outline the principal areas explored in my research. For example, Stage (a) involves the development of comprehensive infrastructure data models. A suggested implementation strategy (and tool) in this research would involve Geographic Information Systems (GIS), as illustrated in Stage (a). These tools provide the opportunity for municipalities (and regional and federal governments, as well) to spatially coordinate data for all aspects of the life cycle of civil infrastructure assets. The core of my personal research is devoted to Stage (b) on “Asset Life Cycle”. My past research has concentrated primarily on condition assessment and service life prediction of buried utilities. At NRC, we implemented one “benefit-cost” model in a tool called SSAM-I (Sustainable and Strategic Asset Management-Integrator). SSAM-I is currently designed as a “plug-in” to complement and extend the capabilities of existing asset management applications. Stages (d) and (e) require expertise from business schools or management schools, a collaboration we have started at UBC with the new Master of Engineering Leadership (mel.ubc.ca) program in Urban Systems. It is essential to involve all levels of government in a client-funded research consortium: federal, provincial, regional and municipal.

I have been fortunate in the past 30 years of my career to focus on all aspects of the built environment: architecture, building sciences and civil engineering. As the Technical Coordinator and speaker at a seminar series visiting 12 major Canadian cities, my contact with municipal engineers across Canada confirmed my views and my beliefs about sustainability. A large proportion of municipalities in North America are struggling under the combined challenges of decaying assets, infrastructure growth, changing population demographics and fixed tax bases (in many regions), little life cycle or condition data and few best practices. As a society (and as engineers serving this society), it is mandatory that we pass on a “sustainable built environment” to our future generations. Education is the proper course of action

Education:

Ph.D., Architecture, Université de Montréal, Montreal, Canada, 1994.
M.Eng., Building Engineering, Concordia University, Montreal, Canada, 1978.
B.Eng., Civil Engineering, Royal Military College, Kingston, Canada. 1974.

Expertise Summary

Dr. Vanier is currently involved in both strategic and client research that assists organizations to manage sustainable urban infrastructure. His career experience has included the graphical visualization of heat loss, 3D computer graphics, computer aided design, integrated databases, automation of the National Building Code of Canada, and for the past 10 years, asset management. He was a researcher at NRC for 23 years, and has worked as a researcher with the Federal government of Canada for 25 years total. He is the principal investigator (and initiator) for research at the NRC that has garnered over \$1 million from outside agencies in the past five years. His work experience prior to NRC includes two years as a building scientist with Public Works and Government Services Canada (PWGSC), two years with the PWGSC CAD Centre, and five years as a military engineering officer (construction) with the Department of National Defence. He is very active physically and participates in a wide selection of sports (skiing, cycling, soccer, etc.) and hobbies (guitar, investment properties, etc.). He has been married to Margaret for 37 years and they have a son who is 25 years old and a graduate of Saint Francis Xavier University (B.Sc.) in Nova Scotia. In his spare time, Dana is learning Italian and volunteers at Whistler Blackcomb as Mountain Host.

At UBC, he has been actively involved in lecturing to both graduate and undergraduate students. Although fully retired from the Federal government, he lectures part time in the winter to over 75 students on *Case Studies in Construction Methods*. He has pioneered the first infrastructure asset management course at a Canadian university and he is currently developing an “online” *Infrastructure Asset Management* course for UBC in concert with students and faculty at UBC and the University of New Brunswick.

Expertise Details

Dr. Vanier was the project manager and lead researcher for a project on municipal infrastructure investment planning (MIIP). The objectives of this project were to develop prototype decision support tools and guidelines on asset management for Canadian municipalities. It was a \$1.5 million research project with partners from across Canada: NRC, Calgary, Edmonton, Hamilton, Ottawa, Prince George and Regina, the regional municipalities of Durham, Halton and Niagara, and the Department of National Defence. This four-year project was completed in December 2006 and many of the client reports are available to the general public (<http://nparc.cisti-icist.nrc-cnrc.gc.ca/eng/search/?q=miip&m=1>).

Most recently, Dana Vanier has been involved in an NRC technology outreach activity, serving as the Technical Coordinator for a seminar series on “Sustainable Infrastructure: Techniques, Tools and Guidelines”. A team of six senior researchers from NRC and elsewhere has lectured to over 450 municipal engineers and decision makers in 12 major cities across Canada.

Dr. Vanier was the interim Chair of the Board of Directors of the Canadian Design Research Network (www.cdrn.ca) of the Networks of Centre of Excellence (NCE) in Canada. The CDRN was a new consortium of academics and partners from the private, public and non-governmental sectors working together to improve design outcomes in Canadian society through research in design.

Dana Vanier also managed NRC’s Building Envelope Life Cycle Asset Management (BELCAM) project, dealing with service life prediction of the building envelope components. This project produced over 40 referred publications related to the asset management of buildings.

Dr. Vanier’s current research interests are focused on the sustainable management of urban infrastructure. Most recently, he has contributed two chapters to a monograph on this topic. In order to realize the ultimate goal of managing sustainable urban infrastructure, Dr. Vanier is focusing on two research priorities. First, he is interested in the use of geographic information systems (GIS) to model urban infrastructure. This research attempts to formalize an “object-oriented” description of the components of different types of municipal infrastructure (water/wastewater systems, buildings, road networks, etc.) and to represent them realistically and accurately in both time and space. His second research interest is the use of decision support systems (DSS) to assist decision makers. In this effort, he is investigating the use of techniques

such as the analytic hierarchy process (AHP), multi-objective optimization and multi-criteria decision making to assist municipal leaders to prioritize maintenance and renewal projects.

He has co-supervised a number of successful Ph.D. candidates at UBC and he has presented numerous lectures and papers around the world on the topic of asset management. He has conducted a one-week intensive course on Public Infrastructure Management to 20 graduate students at UBC (CIVL 598). He is a founding Co-editor of ITCON, the first peer-reviewed “electronic” journal dealing with IT in construction. He was the guest editor of an ITCon special issue on “Decision Support Systems for Infrastructure Management.” (www.itcon.org “Special Issues”). Recently, he was a keynote speaker at Edmonton’s Canadian Network of Asset Managers annual convention.

His Ph.D. research involved the development of a prototype decision support tool to assist regulators use the National Building Code of Canada (NBCC). The thesis is entitled: *A Parsimonious Classification System to Extract Project-Specific Building Codes*. The thesis describes an expert system to assist the user classify the building and a search engine to retrieve the governing NBCC articles. This “Minicode Generator” was implemented as part of the Building Code of Australia.

His previous research at Public Works and Government Services Canada (PWGSC) involved the investigation and modeling of heat loss in buildings. He has also developed software in this area for the CAD Centre at PWGSC. His military experience includes five years as a military officer managing construction engineering at numerous installations across Canada. During this time, he was responsible for construction and maintenance activities at a number of bases and stations, was responsible for the supervision of hundreds of tradesmen, and supervised the implementation of multi-million dollar maintenance and construction projects.

Dana Vanier has lectured at many universities and was a sessional lecturer at School of Architecture at Carleton University. The course was a CAD workshop introducing students to Computer Aided Design, a novelty in the early 1980’s.

Dr. Vanier has published over 130 articles in peer-reviewed journals and conference proceedings. A complete list of publications is available at irc.nrc-cnrc.gc.ca/ircpubs using the search term AUTHOR = VANIER.

Keynote Presentation

Vanier, D.J. (2013) Expanding our Knowledge Horizon: Beyond Counting Stuff, Canadian Network of Asset Managers Annual Conference, Edmonton, AL.

Journal Publications, Book Chapters and Client Reports (by Date)

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- Newton, L.A.; Vanier, D.J. MIIP Report: The State of Canadian Sewers - Analysis of Asset Inventory and Condition, pp. 38, June 01, 2006
- Halfawy, M.R.; Newton, L.A.; Vanier, D.J. "Review of commercial municipal infrastructure asset management systems," Electronic Journal of Information Technology in Construction, 11, January, pp. 211-224, January 01, 2006
- Vanier, D.J.; Newton, L.A. Open Forum on Opportunities for Research in Asset Management in Canada, pp. 17, June 01, 2005
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- Vanier, D.J.; Newton, L.A. "Summary of open forum on opportunities for research in asset management in Canada," Public Sector Digest, July/August, pp. 1-5, July 01, 2005
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- Vanier, D.J.; Rahman, S. MIIP Report: Survey on Municipal Infrastructure Assets, pp. 63, February 01, 2004
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Vanier, D.J.; Turk, Z. "Internet and the construction industry," CAD Systems, 13, (3), pp. 1,14-15, June, 1995

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