

Sustainable Transport Practices in Canada: Exhortation Overwhelms Demonstration

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A White Paper on Canada's progress in achieving sustainable transport practices, and an introduction to the elements of an action-oriented research agenda in sustainable transport for Transport 2000 Canada

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Author's Preface

In May 2005 I accepted an invitation to prepare the country report for Canada as part of an international overview of sustainable transport experiences. As a result of encouraging discussions, it was anticipated that funding support would be provided by a federal agency, and that the date of May 30, 2006 for submitting the report could be met. Unfortunately, due to uncertainties created by a federal election and changes within the agency, the project approval process could not be completed in time to conduct the empirical, evidence-based research that is traditionally undertaken for articles published in academic journals. The initial intentions about how to conduct the study had to be abandoned in late 2005.

By that time, however, there was a compelling reason to carry the project through to completion, with or without funding. That is, the background research undertaken in the preceding months appeared to reveal a serious, expanding gap between promise and performance in Canada in regard to this country's sustainable transport experience.

The following “say one thing, do another” mismatches illustrate this apparent finding:

- governments call for more transit ridership, but spend ever-increasing amounts of money on road expansion and maintenance programs, year after year after year;
- provincial and municipal plans emphasize increased urban densities, but proposals for sprawling, car-oriented residential subdivisions and big box retail stores receive approvals across the country;
- local politicians extol the value of walking and cycling by children, youth, adults and seniors, but fail to ensure that sidewalks are cleared of ice and snow in the winter, that bicycle paths and networks provide safe, comfortable, and convenient passage, or that pedestrians, cyclists and transit users are given priority over private vehicle operators at intersections; and,
- while governments, corporations and citizens talk about the need to reduce fossil fuel consumption and pollution levels in order to help combat the ills of climate change (global warming), massive amounts of freight continue to be moved by truck rather than rail in urban corridors, sales of SUVs increase even in urban areas, national fuel consumption levels continue to rise, and no city in Canada appears to have removed even one kilometer-lane of roadway as part of a light rail or bus transit-based smart growth strategy.

Based on the perceived, urgent need for a country report that critically examined the extent of the promise–performance gap, and constrained by the absence of funds to undertake a comprehensive, field survey and interview study, three practical research design decisions were made in order to continue and complete the assessment of Canada's sustainable transport experience by the end of May, 2006.

First, the research design was structured to outline Canada's record of promises made, and to then critically examine the country's record of performance in the context of those

promises. Two fundamental questions were used direct the review and assessment of Canada's sustainable transport experiences:

- What sustainable transport practices have been achieved by Canadian governments, corporations and citizens?
- What are the tangible, measurable results that have been realized from the sustainable transport practices implemented by governments, corporations and citizens?

These two questions leave very little “wriggle room” in terms of the kinds of answers that are relevant, credible responses to issues associated the performance aspect of our sustainable transport experience. Further, the explicit references to achieved and tangible, measurable results in the questions define and emphasize the meaning attached to experiences in this country report.

Second, the funded study would have included a literature search component. The difference in the research design for this non-funded study is that in the absence of surveys and interviews, published documents now constitute the basis of the review and assessment. Moreover, due to resource constraints, priority would necessarily be given to documents that can be electronically accessed. This approach is well-suited for Canada because of the central role that publications by governments, corporations, interest groups and the media play in Canadian society. Further, the priority assigned to publications that can be electronically accessed is fully consistent with Canada's emergence two decades ago as a member of the Information Society.

Third, the “sustainability” literature is piled high and wide with attempts to define the concept and its associated principles. However, the concepts and principles of sustainable transport are taken as given in this project, for a practical design reason. That is, this investigation is about practices achieved by governments, corporations and citizens, and the associated results arising from those practices. Consequently, if achievements and results are claimed, then the onus for definitions of sustainable transport practices and results rests with those claiming achievements and results. This practical design decision not only saved the writer numerous hours of effort and several pages of text, but it introduces an element of accountability that is frequently missing from the literature in the sustainability domain.

During my career I have had occasion to publish academic papers in learned journals, and opinion articles in media and interest group publications. This report, *Sustainable Transport Practices in Canada: Exhortation Overwhelms Demonstration* is a combination of the two kinds of publications, and I am pleased that Transport 2000 Canada is making it available to interested readers in Canada and abroad by posting the document on the organization's website.

It is acknowledged in closing that all errors of omission or commission in *Sustainable Transport Practices in Canada: Exhortation Overwhelms Demonstration* are solely my responsibility.

In the event that errors are identified, I welcome receipt of the corrective evidence at the earliest moment so that I can modify the posted report accordingly. It would be most appreciated if corrections sent as emails or email attachments are directed to me at wellarb@uottawa.ca, and that hardcopy materials are addressed to me as follows:

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President's Foreword

Transport 2000 Canada has actively supported sustainable transport initiatives for more than thirty years. We are very pleased, therefore, to publish this insightful, instructive and challenging White Paper written by our Distinguished Research Fellow, Dr. Barry Wellar.

As some readers are aware, there is a very large body of literature on the concepts of sustainable transport concepts and principles. However, there are relatively few reports on the topic of sustainable transport practices, and none that we have seen which is as thoughtful and persuasive as *Sustainable Transport Practices in Canada: Exhortation Overwhelms Demonstration*.

As emphasized throughout the White Paper, the focus of Dr. Wellar's research is on whether sustainable transport practices that have been implemented in Canada, and identifying the real, measurable changes related to sustainability that have been achieved.

In a very rigorous, hard-edged and highly readable manner, he examines the Canadian record and finds that although Canada has been a leader in embracing the idea of sustainable transport, our governments, corporations and citizens have largely failed to turn words into deeds or promises into actions.

The Board of Directors of Transport 2000 Canada thanks and congratulates Dr. Wellar on behalf of the membership for this outstanding contribution to the literature on sustainable transport. We invite all readers to visit our website on a regular basis to learn more about opportunities to participate in activities designed to make Canada a world leader in achieving sustainable transport practices.

David L. Jeanes, P.Eng.
President
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Ottawa, Ontario
August 18, 2006

Sustainable Transport Practices in Canada: Exhortation Overwhelms Demonstration

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Abstract

Sustainable transport concepts appeared in Canadian publications more than 30 years ago, received extensive media coverage during the past three decades, and currently generate millions of ‘hits’ when expressed as keywords in Google searches of Canadian web sites. This country report establishes that governments, interest groups, professionals and citizens significantly affect the extent and rate that sustainable transport practices are achieved, or not, and uses nine best practices as the standard for measuring Canada’s record. The general finding is that despite an early alert about the need to adopt sustainable transport practices, and professed widespread support from citizens, politicians at all levels, and strong representations by alternative transport public interest groups, Canada has made minimal progress in achieving sustainable transport practices.

Keywords: sustainable transport concepts, principles, practices, geography, Google

1. INTRODUCTION

This country report begins with several observations that put the study design and direction of the discussion in perspective.

First, topics associated with sustainable development and sustainable transport in Canadian literature can be traced back at least 30 years, as many references in Gertler and Crowley (1977) attest. Consequently, it is reasonable to set the bar moderately high in an analysis of Canada’s record.

Second, in addition to the economic, social, environmental, energy, health and moral reasons for countries to adopt sustainable transport practices, a driving force behind Canada’s interest in sustainability is its physical geography. The country’s large land mass, cold climate, and variations in topography directly affect the costs of building and maintaining transport infrastructure, and in moving goods and people between regions, urban places and rural areas. As a result, it has long been recognized that the financial aspect of sustainability is tied directly to Canada’s physical geography.

Further, while Canada has a relatively substantial energy resource base (fossil fuel, hydroelectric, nuclear, wind, solar, biomass), the surge in demand for fossil fuel in recent

decades caused a dramatic reduction in the supply of high-quality, easily-accessible oil. An immediate consequence of demand pressuring supply is that the low-price expectations of all fossil fuel users, and especially the motorized transport sector, are rapidly dissolving. Moreover, the frequency that the phrase “peak oil” appears in literature on Canada’s energy future is taking on ominous tones (Centre for Sustainable Transportation, 1999).

As a result of the impact of physical geography on achieving sustainable transport, this report assesses how well that reality has been factored into policies, programs, plans and other initiatives that underlie achieving sustainable transport practices.

Third, human geography considerations are equally germane to the mission of achieving sustainable transport practices in Canada. Two notable features of urban Canada are outlined here and re-visited later in the paper.

Canada is among the most highly urbanized countries of the world, with more than 80 per cent of the population in urban areas. However, the national population density is relatively low, and there are large distances between many urban and rural centres. Consequently, the extent and rate to which sustainable transport practices are achieved directly affects such matters as: expenditures by governments, businesses, and households on transport infrastructure; local, regional and national productivity levels; the incidence of municipal, provincial and federal taxes; highest and best uses of resources allocated to transport-related activities; and, types, levels and distributions of pollutants and the associated health costs (Wellar, 1994).

In addition, expansions of many cities and urban regions in Canada have turned prime agricultural land and environmentally sensitive areas into shopping malls and housing subdivisions, and put surface and sub-surface drinking water sources at risk.

Achieving sustainable transport practices as part of urban sprawl avoidance strategies has far-reaching implications for present and future generations of Canadians. As a result, an important dimension of this paper involves ascertaining the extent to which policies, programs, plans and other initiatives associated with sustainable transport practices take into account how geographic factors affect urban places, processes and systems.

Fourth, sustainable transport practices are achieved through the actions of governments, interest groups, and citizens. However, since this report is based on published materials, consideration of the private sector is limited to what can be found in the extant literature.

Fifth, major contributions have been made to Canada’s development by the modes of water, air and pipeline transport. However, due to resource limitations these modes cannot be considered in this paper.

Finally, the process of achieving sustainable transport practices involves many factors, and is affected by the ideas and actions of citizens, politicians, journalists, professionals,

entrepreneurs, and researchers. As a result, emphasis in this report is on extensive coverage, and on providing a framework for intensive research and application projects.

2. METHODOLOGY

The primary research procedure used in this paper is a keyword-based literature search. Secondary procedures include list serve solicitations, a request for information from colleagues engaged in sustainable transport research and applications, consultations with individuals in the media, and discussions with representatives of the walk, cycle and transit modes for people movement, and the truck and rail modes for freight movement.

Keyword-based literature searches have a lengthy history, and each type of literature identified in Table 1 has been subjected to search and review processes in numerous curiosity-driven as well as client-driven research studies.

Table 1.
Types of Literature Pertinent to a Report on the
State of Sustainable Transport in Canada

<ol style="list-style-type: none">1. Learned Literature2. Popular Literature3. Corporate/Institutional-Public Literature4. Corporate/Institutional-Private Literature5. Legal Literature6. Regulatory Literature7. Professional Group Literature8. Public Interest Group Literature9. Vested/Special Interest Group Literature

Source: After Wellar (2005)

For this assignment, it was known from experiences in the public service, academia, community participation, and consulting (including projects in sustainable transport), that each type of literature warrants consideration. In the sections that follow, findings from each type of literature are presented, although emphasis is given to searches involving the Internet and the media. That decision reflects an early, in-study finding that these two sources contain the most readily accessible and informative materials on the topic of achieving sustainable transport practices in Canada.

The second research procedure uses list serves to solicit feedback from individuals with expertise in sustainable transport. The list serves employed for this project posted communications to two groups with substantial track records in the sustainable transport domain: 'Caglist' (Canadian Association of Geographers); and 'Tr2000' (Transport 2000 Canada). The following sentence illustrates the nature of the posted message:

“I would be most grateful, therefore, for the assistance of readers who will be kind enough to apprise me of publications – their own, or of others -- in the open literature on any aspect of Canada’s sustainable transport experience, and especially hardcopy publications written in the 1990s, 1980s, 1970s, or earlier.”

To supplement the literature searches and communications to the list serve members, a request for contributions was sent to investigators associated with a transport futures assessment project. The expertise of these investigators covers all modes of transport, including the sustainable practices aspects. Communications were also exchanged with representatives of the walk, cycle and transit modes, since they are directly involved in research and/or advocacy activities pertinent to this study.

3. ORIGINS OF SUSTAINABLE TRANSPORT CONCEPTS IN CANADA

This section provides an historical context for documenting and analyzing the state of sustainable transport practices in Canada. Three aspects of the context require elaboration.

First, many of the concepts associated with the term ‘sustainable transport’ pre-date the introduction of that term to any body of literature. As a result, in order to appreciate how long Canada has actually been engaged in the sustainable transport domain, it is necessary to look to the history of the concepts behind the term rather than focus solely on the term itself.

Second, no definitive, comprehensive statement has been located which identifies the origins and originators (in Canada) of either the term “sustainable transport”, or the concepts associated with the term. As a result, it appears appropriate for this report to provide an indicative timeframe for the emergence of publications on sustainable transport concepts in Canada. Further, discussions about this report with government officials, professionals, and members of the media led to musings that the concepts emerged in the 1990s. Tracking the concepts back to the 1970s should be sufficient to justify the premise that Canada has had ample time to transform sustainable transport concepts into achieved practices.

Third, it is generally agreed that there are serious societal consequences associated with the adoption or the non-adoption of sustainable transport practices. As a result, to be most useful as a decision support or evaluation document, this report needs to have an “edge” in order to clearly discriminate between promise and performance, or talk and action. The exhortation-demonstration dichotomy developed by Harris and Wellar (1992) in their assessment of the literature on developing information and knowledge bases for decision-making is applicable here.

Following from the methodology of the Harris-Wellar study, published materials on sustainable transport practices in Canada are divided into two classes:

Statements of **exhortation** that endorse, promote, support, or otherwise encourage sustainable transport practices, but do not represent actual, implemented sustainable transport achievements in real-world terms.

Statements of **demonstration** that show through empirical evidence, examples, results, records, operations, etc., that changes in transport activities in the direction of enhanced sustainability have occurred, thereby substantiating claims that sustainable transport practices have been implemented in real-world terms.

Two publications appear sufficient to illustrate that many of the concepts which are currently core elements in the sustainable transport discussion in Canada had their origins in the mid-1970s, and earlier. The first document is from the *Seminar on Alternatives*, convened by the Canadian Council on Social Development and the federal Ministry of State for Urban Affairs in 1975. The primary objective of the seminar was to initiate and foster debate about alternative futures. The following excerpts address several themes that have become central to sustainable transport discourse in Canada.

“Will urban land uses, including housing, be so distributed that we profligately consume scarce or non-renewable resources while traveling millions of journey-to-work person-miles every day, that walking school children are put in competition for space with driving adults, that city residence-to-recreation site distances are routinely separated on a greater-than-walking distance basis?” (Wellar, 1975a, p.7)

“If 1 million Canadians travel an average of 10 miles per day in cars yielding 100 miles per gallon of gas, we consume 100,000 gallons per day and 36,500,000 per year... Change the input numbers to 20,000,000 trip-makers each driving 20 miles per day at 20 miles per gallon, and our consumption numbers change to 20,000,000 gallons per day, and 7,300,000,000 per year. That is, 7 billion, 300 million gallons of gasoline are burned off in order to drive the family automobile each year, every year, as a minimum, most likely.” (Wellar, 1975a, p.7)

“Unless someone has mastered the feat of reversing the gasoline combustion process whereby the burning reaction can be driven backward ..., then I submit that urban land uses in two- and three-dimensions must soon begin to reflect an awakened Canadian mentality in this regard.” (Wellar, 1975a, p.8).

In addition to the sustainability concepts contained in the excerpts, two newspaper headlines cited in the paper (Wellar, 1975a) also attest to how long ago sustainable transport issues became a matter of public record in Canada:

“Energy warning: Intensify search or ration”, *The Citizen*, Ottawa, May 10, 1975.

“Federal plan will help buses in place of cars”, *The Citizen*, Ottawa, May 24, 1975.

The second background or historical document is a newspaper column that was also published in 1975. Several excerpts from this column (Wellar, 1975b) assist in

establishing the extent to which sustainable transport concepts and concerns were a matter of public record in Canada more than 30 years ago.

“... Traffic counts ... have so far yielded the following tally for both eastbound and westbound traffic flow during the morning and evening rush hours: one-person cars (273); two-person cars (19); three-person cars (2); four-person cars (3). That is, out of a total of 297 cars, 90 per cent of them carried one person.”

“Buses carrying in excess of 70 passengers wait at lights and intersections while one or a dozen cars (carrying one person each much more often than not) proceed through.”

“... the home-to-work-to-home journey ... is a daily eight to 40 miles, stop-and-start round trip, at 40 miles per hour or less.”

“... The Citizen (Oct.9, 1975) tells us that the City of Ottawa is installing a computer to improve traffic flow. Presumably if the traffic flow improves, then we can resolve current congestion problems, and maybe handle even more automobiles at some 260 intersections. Is it the policy of officials to encourage automobile traffic in Ottawa and Hull?”

“Transportation facilities consume resources that can be put to alternative uses (housing, recreation, etc.), and cars consume resources that can be put to alternative uses (chemicals, food, heating, etc.). Does anyone believe that anything more than small percentages of the resources committed in the name of the car are being put to their highest and best use?”

“... In fact, many car drivers are either oblivious to or are consciously opposed to the notion that their cars could stay in the garage with only a minimum amount of ‘sacrifice’.”

“While it has not reached tidal wave proportions, there is at least a groundswell indication that many people ... have serious misgivings about the car continuing as a dominant force in our way of life.”

“Selected streets should have buses-only sections and lanes during the morning and evening peak hours. Buses should be equipped with devices for changing light signals upon approach. Buses in cities should have legal and acknowledged right-of-way for turns at intersections and into traffic, regardless of street signals and markings.”

“Capital expenditures by governments on prospective urban transportation facilities with an automobile bias should be postponed for a minimum of five years.”

“Operating costs for transportation facilities should be diverted into public transit-related expenditures for a five-year period.”

“Gasoline prices in smaller, or more remote communities which cannot support a public transit service should be subsidized by revenues collected from gasoline sales in places like Toronto, Montreal, Ottawa, Hamilton, etc., where there is no excuse for not having and not using public transit for work and other trips.”

“No transportation (or other) project at any level of government should be started without examination of the results derived from a counterfoil research study.”

“Governments should begin to speak publicly, now, about the inevitable demise of the automobile industry as we currently know it.”

“The futurists of a decade ago suggested that the negative aspects of the automobile were increasing at an algebraic rate, and that problems of any magnitude were a number of generations away. Unfortunately, things are coming to a head at a geometric clip due to accelerated urbanization, population increases, and the exponential rate of depletion of automobile-associated resources.”

The term ‘sustainable transport’ does not appear in the excerpts from either of the documents published in 1975. However, each excerpt contains concepts or variables that continue to appear in all the sustainable transport literature covered by the entries in Table 1. Further, although the cited materials are from the 1970s, they express concerns, identify issues and suggest cause-effect relationships that are the subject of debate in Canada in 2006 about how to achieve sustainable transport practices.

The key message from this brief return to the 1970s is that sustainable transport concepts were known entities in Canadian publications more than 30 years ago. As a result, it is appropriate to base this analysis on documented achievements over the three decades that Canada has been in position to put concepts and principles into practice.

In addition to the awareness factor, however, there is the underlying question of whether sustainable transport concepts and practices have been “on the radar” of Canadians and their institutions. That is, if no one cares about the concepts, then the practices are not likely to follow. The level of interest in the topic of sustainable transport is examined in the next section by using the Google search engine to perform a keyword-based search of Canadian web sites.

4. POPULARITY OF SUSTAINABLE TRANSPORT TOPICS IN CANADA, ACCORDING TO GOOGLE

For this Google search, the keywords are drawn from a variety of publications, including all the types of literature described in Table 1. As shown in Table 2, about 75 terms are combined with “sustainable transport” to achieve a sense of their relative popularity when used as keywords. Several aspects of Table 2 require clarification, however, to ensure that popularity is not confused with substance.

First, it has become commonplace for researchers, elected officials, members of the media and ordinary citizens to ‘drop’ high-sounding terms into statements that get published, but which do not include instructions or information on how to apply the terms in non-trivial, sustainable transport situations. Particularly troublesome is the widespread use of such terms as impact assessment, multivariate, index, performance indicators, and optimize, which are among those shown in italics in Table 2.

Table 2.
Results from a Keyword-Based Google Search to Ascertain the Popularity of Selected Topics Associated with “Sustainable Transport in Canada”*

Search Keywords and Domain (The Google searches are limited to ‘pages from Canada’)	Number of Pages Containing Search Keywords
	(Searches done in March, 2006)
Sustainable transport	1,610,000
+ programs	1,280,000
+ issues	1,070,000
+ <i>impact assessment</i>	1,020,000
+ policy	701,000
+ measurement tools	658,000
+ infrastructure	611,000
+ adoption rates	538,000
+ reviews	614,000
+ practices	592,000
+ action	586,000
+ groups	560,000
+ results	539,000
+ organizations	524,000
+ plans	522,000
+ cause	500,000
+ analysis	472,000
+ strategy	471,000
+ implementation	448,000
+ <i>statistics</i>	432,000
+ relationship(s)	414,000
+ budget	408,000
+ objectives	393,000
+ rail	383,000
+ <i>index</i>	359,000
+ evaluation	329,000
+ application	323,000
+ methods	311,000
+ priorities	311,000
+ improvements	310,000

+ test	302,000
+ conflicts	270,000
+ indicators	256,000
+ transit	249,000
+ solution	247,000
+ evidence + achieved adoption rates	246,000
+ cycle	229,000
+ models	229,000
+ findings	223,000
+ geographic	214,000
+ <i>performance indicators</i>	208,000
+ facts	206,000
+ measurement	185,000
+ modes	170,000
+ budget	170,000
+ <i>parameters</i>	162,000
+ demonstration project	153,000
+ measurement	151,000
+ <i>theories</i>	147,000
+ walk	141,000
+ <i>methodology</i>	139,000
+ definition	131,000
+ demonstration	130,000
+ variables	125,000
+ achievements	119,000
+ spatial	118,000
+ automobile	111,000
+ <i>lifecycle cost</i>	108,000
+ lifecycle benefit	102,000
+ empirical evidence	88,000
+ <i>optimize</i>	83,000
+ correlation	66,000
+ dependency	64,000
+ validation	59,400
+ truck	53,000
+ externalities	29,000
+ modal shift	23,000
+ propensity	22,000
+ impact assessment + multivariate	16,000
+ achieved modal shift	15,000
+ multivariate	12,000
+ comparative analysis + modal shift + achieved	964
+ impact assessment + multivariate + applied practice + achieved results	862
+ confirmed modal shift	655
+ modal split shifts	531

+ cause-effect	521
+ impact assessment + modal shift + multivariate + applied practice + achieved results	139

*Entries in italics are among those frequently “dropped” into materials, and those in bold illustrate how large numbers of hits for individual terms can be drastically reduced when the keywords are combined in a directive procedure.

All the italicized terms necessitate sophisticated research methods, techniques and operations in order for their application in real-world situations to satisfy conditions of robustness, validity, and reproducibility. In the vast majority of Google results, the words are not accompanied by explanations of how they contribute to achieving sustainable transport practices.

Second, linking the bolded terms in Table 2 reveals that there is considerable superficiality or ‘inflation’ in much of the proclaiming about sustainable transport initiatives. As shown in Table 2, the results for the *individual*, bold-face keywords show a seeming abundance of pertinent pages. That is, when combined with “sustainable transport” the search results are 1,020,000 for impact assessment; 539,000 for results; 323,000 for application; 23,000 for modal shift; and 12,000 for multivariate.

The utility of the Google search procedure for this project, however, is not its capacity to generate hits simply because a keyword appears on a page. Rather, its value resides in the functionality of creating strings of keywords that get past the popularity factor, and allow the analysis to probe the materials in a search for substance.

This point is demonstrated by the last entry in Table 2. When the individual, bolded terms are combined into a string of keywords, the net result is a very short list of just 139 pages -- pages, not reports -- that are likely to have even potential pertinence for a report on the state of sustainable transport practices in Canada.

To return to the exhortation and demonstration classes to which the results are assigned for this paper, the message from the Google search could not be clearer. **That is, while the topic of sustainable transport is popular in Canada, in excess of 99.9 per cent of the references electronically accessed by Google are of the exhortation variety.** Or to re-phrase the finding and put a cutting edge to it, only a miniscule proportion of the numerous pages identified by the selected keywords actually have even the potential to demonstrate the achievement of real-world, sustainable transport practices in Canada.

The implications of the Google search and a review of a sample of the 139 pertinent pages are discussed below in section 7.

5. MEDIA COVERAGE OF SUSTAINABLE TRANSPORT ISSUES

The media are important compilers, developers, presenters and interpreters of stories on matters of societal interest. They are included in the ‘popular’ component of literature in Table 1. In view of the central communications role that the media play in Canadian affairs, it is appropriate to discuss the contribution made by the media to the discourse on sustainable transport practices. Table 3 provides an indication of what the term ‘media’ entails in Canada. As shown, there is a full range of types of media available to inform Canadians of local, regional and national achievements in implementing sustainable transport practices.

Table 3.
An Elaboration of “The Media” by
Unbundling the Phrase “Popular Literature”

<ol style="list-style-type: none">1. Newspapers2. Magazines3. Newsletters4. Radio5. Television6. Internet
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Source: After Wellar (2005)

For reasons of both space and resource limitations, only the contribution of newspapers is discussed. It bears noting that while consideration of other media would no doubt add to the details of this paper, a recent study into the role of the media in matters of societal interest (Wellar, 2005) suggests that broadening the scope to include all the media would not significantly change the nature of the findings on this topic.

Canada’s newspaper sector currently includes in excess of 100 dailies, of which more than 90 provide online access; an estimated 1000-1200 community papers that publish on a weekly schedule; and several thousand print operations that publish on bi-weekly or monthly schedules. A detailed search of that many newspapers is beyond the purview of this study. However, it is possible to generate an estimate of articles published to establish that newspapers have given substantial coverage to the sustainable transport domain over the past 30 years, and especially during the last 10-15 years.

Two sources are used for the estimate. First, newspaper search and review assignments were included in every course on research methods, urban geography, and planning taught by the writer at the University of Ottawa from 1979 to 2004. Further, many of the newspaper assignments dealt with sustainable transport topics and situations at the national scale, and numerous theses supervised during that time also included newspaper searches and reviews on research problems involving sustainable transport.

Second, newspaper searches and reviews were part of the methodology of a number of curiosity-driven and client-driven research projects and papers that the writer has undertaken since 1972. Many of those projects and papers included a sustainable transport dimension, and collectively incorporated all the terms presented as keywords in Table 2. (Information on how to access author’s publication titles, and a selection of his papers, reports, and media items is provided in the section About the Author at the end of the White Paper.)

Based on those experiences, supplemented by a sample survey of online newspapers, it is estimated that Canadian newspapers presently carry, at a minimum, an average of 5,000 items per week that pertain to the topic of sustainable transport.

As for the orientation of the items, that aspect varies within and between provinces, and even within and between communities within metropolitan regions. Table 4 contains several dozen of the thousands of sustainable transport articles published in Ottawa newspapers over the past two decades. This limited set of articles include references to most if not all the types of literature in Table 1, many of the keywords in Table 2, and most of the sustainable transport concepts in sections 1, 2, and 3. Multiple versions of Table 4 could be produced for every metropolitan and non-metropolitan region of Canada.

Table 4.
Selection of Ottawa Newspaper Articles Typifying the Public Discourse on Sustainable Transport Practices in Canada, Last Two Decades

Newspaper Article Title	Yr.	News paper*
Regional officials urge new roads, east-west extension of transitway	85	A
The transitway: Has it failed to ‘re-shape the urban structure’?	85	A
Road use outpacing construction: survey	87	A
No need to delay wider Queensway: region	88	A
Road woes region’s fault, MPP says	89	A
Planners tackle traffic-clogged Merivale Road	89	A
Let’s pave everything	89	A
The mouse that squeaked	90	A
Auto-free cities — Breaking the car addiction	92	A
Politicians clash over plan to halt growth of suburbs	95	A
Kanata expansion doesn’t mean urban sprawl	95	A
Urban sprawl: Other cities show us the dangers of uncontrolled development	96	A
Builders, politicians fight suburban growth limits	96	A
Creating child-friendly neighbourhoods	97	A
This road tolls for you	97	B
Convenience key to good public transit	98	A

Crossing a hazard to walkers	98	A
Walking Security Index	98	E
Traffic slices residential area	99	B
East end of region is neglected on road projects	00	A
Combating commuter crawl	00	A
How will Queensway actually be improved?	00	A
Roadblocks to future growth	00	A
How to avoid a sprawling metropolis	00	A
Ring-road scheme just a ruse to allow more urban sprawl	01	A
Light rail: Aggressive bid chugs forward	01	C
'Smart growth' can't be smart if it's predisposed to growth	01	A
Infrastructure delay shouldn't be an option	01	C
Biz groups getting road-weary	01	B
Flaherty targets 'gridlock threatening quality of life'	01	A
City's official plan stalls on transit	02	A
Smart Growth policies are nothing new	02	D
City heading for 'traffic heart attack'	02	A
Put brakes on 417 plan	02	A
And maybe another bridge—MPP announces ring road study	03	A
Urban sprawl, gridlock blamed for slow rush hour traffic	03	A
Widening Queensway won't help: Professor	04	A
Grands parleurs, petits faiseurs	04	F
Ottawa is a place that 'drives people to drive'	04	A
Transit: Who should be wielding the carrot on a stick	05	C
Pump prices fuel anger, but little action	05	A
Queensway widening, good health not compatible	05	D
Come on, people; take public transit , already	05	C
Bad traffic en route to disaster	06	B
The end of suburbia?	06	D
Thinking ahead	06	D
*Legend: A = Ottawa Citizen; B = Ottawa Sun; C = Ottawa Business News; D = The News; E = Centertown Buzz; F = La Rotonde		

The relevant conclusion to be drawn from this section is that sustainable transport issues have been considered highly newsworthy by the print medium for many years. The relationship between this finding and the level of sustainable transport practices achieved in Canada is discussed in section 7.

6. GROUPS ENGAGED IN ACHIEVING SUSTAINABLE TRANSPORT PRACTICES IN CANADA.

A country report on Canada's record of achieving sustainable transport practices requires identifying the agents responsible for the record, the nature of their contributions, and their roles in the process. The brief, indicative comments that follow appear sufficient for the purposes of this paper.

6.1 Federal, Provincial and Municipal Governments

All levels of government in Canada affect the extent and rate to which sustainable transport practices are achieved, but not necessarily in the ways that appear to be generally perceived. That is, while much is often made of government policies, in reality they are merely political pronouncements which of themselves have no direct impact on achieving practices. Similarly, while strategies can shape the formation of governance agendas and provide an umbrella under which practices are achieved, practices are often implemented without any reference to a strategy.

The key element of governance from a practices perspective is the budget and associated programs, because programs include the funds needed to pay for public transport infrastructure, goods, and services. As a result, progress in achieving sustainable transport practices is directly and significantly affected by the funding decisions of governments at all levels.

Due to the critical role that programs play in achieving sustainable transport practices, a number of attempts were made to locate publications reporting on relevant capital and operating expenditures by mode. Despite making a number of inquiries, including electronic searches, attempts to locate a comprehensive body of information on government programs to achieve sustainable transport practices were unsuccessful. As a result, it is not possible to factually report on the absolute or relative amounts of money that Canadian governments are allocating to achieve sustainable transport practices.

Plans comprise the second instrument that governments can call on to achieve sustainable transport practices. Relevant plans common to many provincial and/or municipal jurisdictions include land use plans, economic development plans, regional development plans, official plans, comprehensive plans, transportation master plans, plans of development, open space plans, plans of subdivision and site plans.

The third means available to governments wanting to achieve sustainable transport practices falls within the rubric of *instruments of governance*, and the list of available options in the transport field is limited only by the imagination, courage and conviction of elected officials and the council or government in which they hold office. Examples of these instruments are fuel taxes, property taxes, speed limits, zoning by-laws, parking lot restrictions, tolls, transit subsidies, pollution restraints, vehicle idling by-laws, traffic signal priorities, vehicular prohibitions, roadway deconstruction, traffic calming devices, walkers' rights ordinances, bicycle paths, curb cut restrictions, amenity provisions for

walkers, cyclists and transit users, and reductions in level of service standards for private vehicles.

For reasons related to funding power, planning authority, and the wide range of instruments of governance at their disposal, including the ability to implement, enact and enforce laws and by-laws, governments are positioned to significantly affect the extent and rate to which sustainable transportation practices are achieved. Several preliminary assessments of how their performances have contributed to achieving sustainable transport practices are presented in section 7.

6.2 Public Interest Groups

Over the past 30 years, many hundreds of local, regional and national public interest groups and many thousands of their members have conducted research, lobbied politicians, participated in public meetings, maintained mailing lists, operated list serves, developed proposals, and created briefs and charters, all in the name of achieving sustainable transport practices. The names and URLs of ten groups/projects with many years of civic engagement and numerous published works to their credit are presented in Table 5. I hasten to add and emphasize that this list could be expanded significantly, and that the named groups/projects are presented for illustrative purposes only.

The ten groups/projects identified in Table 5, and numerous other groups/projects across Canada, undertake research, education and advocacy tasks in the interests of users of the walk, cycle, bus-rail transit and train modes. In addition, as part of an alternative transport strategy agenda or a broad sustainable transport mandate, their missions may include seeking and promoting ways to reduce the role of the private motor vehicle in the movement of people or freight, that is, cars, SUVs, minivans, pick-up trucks, etc., in the movement of people, and various kinds and sizes of trucks in the movement of freight. As a result, these groups may participate in a variety of civic activities, including those associated with land use planning, transportation system planning, health programs, mobility programs, public safety issues, infrastructure funding and maintenance programs, traffic calming initiatives, and interventions to reduce global warming and pollution.

Examination of these web sites, and others that can be readily located via Google or visiting the named sites, suggest that public interest groups represent a very positive force on the side of achieving sustainable transport practices. Several comments on the contribution of public interest groups are presented in section 7.

Table 5
Examples of Public Interest Groups and Projects that Contribute to
Achieving Sustainable Transport Practices in Canada

Name of Public Interest Group and URL
1. Better Environmentally Sound Transportation www.best.bc.ca/
2. Car Free Day Canada – Sierra Club www.carfreeday.ca/
3. Centre for Sustainable Transportation www.cst.uwinnipeg.ca/
4. Go for Green www.goforgreen.ca/
5. Ottawalk www.ncf.carleton.ca/freeport/ community.associations/ottawalk/
6. Toronto Pedestrian Committee/Toronto Pedestrian Charter www.toronto.ca/tpc/index
7. Transport 2000 Canada www.transport2000.ca/
8. Vélo Québec www.velo.qc.ca/
9. Victoria Transport Policy Institute www.vtppi.org/
10. Walking Security Index Project aix1.uottawa.ca/~wellarb/

6.3 Vested Interest Groups

Thousands of business entities in Canada are financially affected by the extent and rate that sustainable transport practices are implemented. The following types of firms are among those which stand to gain from implementation of sustainable transport practices.

- Firms that deal in goods and services used to meet the needs of persons who walk, cycle, and/or use transit (buses, street cars, light rail, trains).

- Firms that deal in goods and services used to move freight in ways that minimize resource consumption and negative externalities, while maximizing the societal return on public investments in road and rail infrastructure.
- Telecommuting firms that deal in goods and services which allow the physical transport of people and things to be replaced by the electronic transmission of data/information.

The second group of vested interests includes entities that stand to lose financially as sustainable transport practices are implemented. This is a large and wide-ranging set of industries and firms, with numerous inter-connections and inter-dependencies. The following brief list is illustrative of the economic/financial interests that are not likely to favor achieving sustainable transport practices in Canada.

- Automotive industry.
- Real estate industry.
- Petroleum industry.
- Land development industry.
- Retail industry.
- Construction industry.
- Homebuilding industry.
- Road building industry.
- Aggregate industry.
- Trucking industry.
- All the other industries that obtain goods and services from or supply goods and services to the industries listed above.

Several comments about the contributions of vested interests are presented below in section 7.

6.4 Professional Associations

Traditionally, planners and engineers are the professional groups most directly involved in transportation matters. Their contributions to achieving sustainable transport practices are outlined below, and returned to in several comments in section 7.

Examination of the planning literature, and especially municipal planning documents, reveals that planners in Canada have long been interested in the concepts associated with sustainable transport. However, the literature review for this paper did not yield any compelling evidence that planners have generally succeeded in incorporating sustainable transport practices in government legislation, policies, plans or programs, or in private sector development plans, subdivision designs, site plans, etc. Indeed, the popular literature search encountered numerous letters to editors in which planners and the planning profession are criticized for the lack of progress in achieving sustainable transport practices.

As for the engineering profession, it plays a central role in both the rail and road domains, and is involved in such tasks as selecting rights-of-way, designing and specifying infrastructures, making recommendations about modal choices, and overseeing system expansions and operations. The last task is especially germane to the sustainability issue, since the primary objective of the operations group appears to be consistent across all jurisdictions in Canada: ensure that rolling stock and vehicles -- freight and passenger trains, inter- and intra-city buses, trucks, cars, SUVs, etc. – are able to ‘keep moving’ regardless of surrounding circumstances and situations.

The assessment of the engineering profession group parallels that of the planners. That is, no published evidence was found to demonstrate that the engineering profession has made significant contributions to implementing sustainable transport practices, and newspaper articles are generally critical of the profession’s efforts in regard to the walk, cycle and transit/train modes.

It is emphasized that within the past decade several other professions have become increasingly active in support of achieving sustainable transport practices. These professions, which appear poised to play a very influential role in this domain, include public health, architecture, road and traffic safety, and urban design.

6.5 Academia

Universities, colleges and schools at all levels in Canada foster discoveries and discussions involving sustainability, including the sustainable transport aspect. However, this study encountered only a very limited number of documents that report on academics (university and college faculty) whose work contributed to achieving sustainable transport practices in either the public or private sectors.

Principals and teachers at high schools and elementary schools, on the other hand, have been very successful in promoting the adoption of practices by local governments, police, and school boards that support and promote sustainable transport, and particularly the walking and cycling modes. These achievements include initiatives to slow down speeding traffic in school zones, restrict vehicular movements in the vicinity of schools, implement traffic calming measures, increase the police/enforcement presence on regional roads, improve the safety, comfort and convenience that sidewalks provide for children walking and cycling to and from school, recruit crossing guards to ensure safe passage by children across streets, and modify intersection designs and markings to serve and promote the needs of children who walk or cycle between home and school.

6.6 Citizens

The citizens of Canada are far and away the most important group affecting the extent and rate that sustainable transport practices are achieved at the local, regional, and national levels. Simply put, if citizens drive millions of private motor vehicles per day, make multi-millions of trips per day, make the vast majority of work, shop, recreation, school, etc. trips by private motor vehicle, have a propensity to drive that overwhelms the

inclination to walk, cycle, or use transit, or they choose to locate their residences in the outer reaches of metropolitan regions, then attempts by the other groups to implement sustainable transport practices are doomed to fail.

Conversely, by substantially changing those attitudes, habits and patterns, and regardless of what any of the above groups want to do, the citizens of Canada have the capacity to determine the extent and rate that sustainable transport practices are achieved.

A preliminary assessment of the contribution made by ordinary citizens to sustainable transport practices, including a finding from a recent national survey, is presented in section 7.

7. CANADA'S RECORD OF PUTTING BEST PRACTICES IN SUSTAINABLE TRANSPORT INTO PRACTICE.

The term 'best practice' is used in this paper to refer to initiatives and activities that most effectively contribute to making sustainable transport practices a reality. During the research for this study, about 50 proposed, proclaimed or purported best practices were identified through the literature searches, consultations with individuals who responded to list serve postings, and communications with sustainable transport researchers in Canada and other countries.

Due to time and resource limitations, the treatment of best practices in this report is limited to nine items, and a brief comment on how Canada has performed in each case. Each of the best practices is regarded as a high priority in the sustainable transport literature, and is readily within the technical and financial capacity of Canadians and Canada to achieve. Separately and in combination they provide a reasonable standard for assessing this country's record of taking action to achieve sustainable transport practices.

7.1 Sustainable Transport Test

The keyword "sustainable transport + test" appears in a number of publications in various bodies of literature (Table 1), generated more than 300,000 hits when used as keyword in the Google search (Table 2), and appears to be widely recognized as an essential element in federal, provincial or municipal government decision processes involving transport policies, programs, plans, or practices.

Finding: Although Canada's physical and human geography accentuate the many economic, social, energy, financial, environmental, and health reasons to apply a sustainability test to transport decisions from the local to national scales, no evidence was found to establish that any government in Canada has designed, much less implemented a rigorous sustainable transport test for use in established programs. Further, no evidence was located on the use of a sustainability test for decisions or other actions involving an instrument of governance.

7.2 Integrating Land Use and Transportation System Planning and Development

This best practice was established in the 1960s, and has been widely embraced in principle by all levels of government, as well as by urban experts, regional scientists, land economists, geographers, transportation planners and other professionals, and by public interest groups.

Finding. It appears that no federal or provincial agency has fully implemented this best practice, and at the municipal level there are likely less than a half-dozen jurisdictions which can legitimately claim to have achieved this practice across all modes.

7.3 Smart Growth/New Urbanism

Over the past decade the principles of smart growth/new urbanism became the ‘mantra’ of politicians at all levels, as well as planners, developers, environmentalists, media commentators, etc., and were trumpeted as the best way to support the alternative transport modes (walk, cycle, transit) while reining in Canada’s car culture.

Finding. No evidence has been located to demonstrate that even one municipal government in Canada has consistently achieved non-trivial sustainable transport practices under the rubric of smart growth/new urbanism, or that any provincial government has succeeded in implementing such an initiative.

7.4 Development and Adoption of a Pedestrian Charter

Charters and bills of rights for pedestrians are seen as major instruments for improving the walking experience of pedestrians in municipalities across Canada. A common vision among citizens and public interest groups is that charters and bills of rights can help ensure that due regard is shown for pedestrians’ safety, comfort and convenience when public bodies deliberate matters affecting access, mobility, etc. of those who walk.

The Toronto Pedestrian Charter is a leading example of this best practice. This charter was created by community activists, and was formally adopted by Toronto city council in 2002.

Finding. The charter that was adopted by Toronto city council in 2002 has not been put into practice. Further, and despite the purported high regard for pedestrians and the walk mode in many municipal plans, no evidence was located to establish that a pedestrian charter or bill of rights has been put into practice by any municipal government.

7.5 Incorporating Time as a Criterion for Defining Sustainable Transport

The time factor is incorporated in speed limits and traffic light signal timing, is the basis of schedules, due dates and deadlines, and is a critical reference point in numerous other aspects of the human experience. The concept of sustainability by definition involves a temporal process, and in order to give sustainability real-world meaning, a timeframe

must be included so that progress in achieving sustainable transport practices can be definitively measured and evaluated. This best practice therefore explicitly specifies numeric start, interim and end points such as 2006, 2010, 2015, and rejects such vague notions as ‘soon’ and ‘near future’.

Finding. No government in Canada has been identified that assigns numeric start, interim and end points to programs, plans or instruments of governance for the purpose of quantitatively measuring actual changes in the extent and rate that sustainable transport is being achieved in practice.

7.6 Incorporating the Geo-Factor in Sustainable Transport Measures

Over the past 30 years and especially in the last decade, advances in geographic information systems (GIS) applications have been designed to support increasingly sophisticated transportation studies and operations. Typical multi-modal applications address origin-destination patterns, trip generation and distribution rates, route selection decisions, modal splits and modal shifts, as well as analyses dealing with levels of access, service, mobility, security, congestion, reliability, spatial inequality, and vulnerability. A central feature of this best practice is ensuring that the spatial units and geo-reference aspects of the database are appropriately specified for all modes.

Finding. Federal and provincial agency activity in this domain is almost totally limited to the private vehicle mode (car and truck traffic). Further, indications are that less than a half-dozen municipal governments have incorporated the full array of point, line, polygon or object-oriented features in the geographic information system (GIS) software required to measure changes arising from sustainable transport practices across all modes.

7.7 Using Indexes for Decision Support

Indexes and similar analytical instruments have been used for decades in Canada, and the Google keyword search with “sustainable transport index” yielded 359,000 hits. Because of their capacity to rank-order phenomena, indexes are especially useful in complex transportation studies, programs and plans. Governments across Canada make numerous transport-related decisions on a daily basis, and indexes are among the primary set of decision support tools available to assess the match between situations and proposed solutions.

Finding. No evidence has been found of even one case of an index being used by a government agency in Canada to make a policy, program, planning, project or applied research decision involving a sustainable transport practice.

7.8 Defining Road/Highway “Improvements” in Sustainable Transport Terms

The term “improvements” has been used in the transportation field for decades, and “sustainable transport + improvements” generated 310,000 results in the Google search. The term ‘improvements’ has historically been used in reference to projects designed to

increase intersection, road segment and network capacity, or reduce impediments to vehicular traffic flow. The objectives of those projects include increasing vehicle volumes and speeds, reducing congestion levels and vehicle operating costs, reducing trip times, and enhancing the convenience, comfort and safety of vehicle operators and their passengers.

The design and implementation of sustainable transport practices requires that projects are justified on the basis of sustainability criteria, which means that the inputs and outputs of projects in all modes – walk, cycle, transit/train, private motor vehicle – are expressed in sustainable transport terms. This means, applying one sustainability criterion as an example, that improvements are defined and measured according to the extent and rate that trip volumes and modal shares shift from private motor vehicles to the walk, cycle, and transit modes for people, and from trucks to trains for freight.

Finding. Fragments of this best practice can be found in a number of municipalities, but no municipality has been located in which this practice is fully operational. No published documents were located to demonstrate that any provincial or federal agency has undertaken studies into how to define road/highway “improvements” in sustainable transport terms, much less adopt this best practice for any mode.

7.9. Implementing Measures to Simultaneously Increase Walk, Cycle and Transit/Train Trips while Decreasing Trips by Private Motor Vehicle

Successful alternative transportation strategies are based on the best practice of simultaneously increasing the number and share of trips made by the walk, cycle and transit modes, and decreasing the private motor vehicle component. The following survey result suggests that the majority of Canadians favor implementing measures to achieve this best practice:

“82% agree Canada should introduce laws to promote denser, walkable cities that would make public transit more practical and reduce traffic congestion.” (McCallister Opinion Research, 2006)

Finding. Based upon the results of the Google searches, literature searches (especially the newspaper searches), and responses from list serve respondents, it appears that the majority of Canadian citizens embrace this best practice, but only in principle. No evidence was located to indicate that the measures would be accepted, or that any governments or corporations favor imposing these kinds of measures, even at the 82% public approval level.

8. A COMMENT ON HOW WELL GEOGRAPHY IS FACTORED INTO ACHIEVING SUSTAINABLE TRANSPORT PRACTICES IN CANADA

One means of assessing how well geography is factored into policies, plans, and programs associated with achieving sustainable transport practices is to examine the language of the documents. If core geographic concepts such as accessibility, cluster,

connectivity, density, dispersion, distance, interaction, proximity, and sprawl are represented by variables and empirical data in official government reports, then there is the possibility that geographic factors are receiving due consideration during the policy, plan and/or program processes.

For the purposes of this paper, the screening test of primary importance is represented by the nine best practices discussed in section 7. That is, if geographic factors are included in the language of best practice documents, then they are not being overlooked or ignored and their role in the practice can be evaluated. If they are not present, then they are being overlooked or ignored and their factor value in practical terms is zero.

In this study the role of geography in achieving sustainable transport practices is found to parallel the *in principle-in practice* dichotomy which marks the evolution of the field itself. On the one hand, much is said about the importance of geographic factors to the structure and function of Canada's national, regional and local transportation networks, systems, and services.

However, when it comes to actually incorporating geographic factors in the best practices, it appears that very little has been achieved. In fact, even though Canada is a leader in the GIS field, applications involving sustainable transport practices that are reported in the published literature are very low-powered in their capacities to incorporate spatial features in models and scenarios, or to explain and predict the spatial outcomes of sustainable transport options and initiatives.

9. CONCLUSION

Using nine best practices as the standard against which to measure performance, the general finding of this study is that Canadians' high level of professed support for sustainable transport practices is not matched by action. The phrase "exhortation overwhelms demonstration" is used in the title of the paper to represent that finding.

In the event that this country report is a catalyst for studies or other initiatives by earnest citizens, interest groups or governments, the following lessons learned and recommendations from this project may be of practical value.

1. Regard all the types of literature in Table 1 as potential sources of critical information.
2. Employ directive, analytical terms in keyword-based searches to identify the most pertinent, electronically-accessible documentation (Table 2).
3. Appreciate that newspapers are likely the richest source of public expression on sustainable transport issues, and the most useful body of media literature (Table 3) on how to engage citizens in civic affairs.
4. Recognize public interest groups involved in walk, cycle and transit/train activities as an exceptional source of ideas and support for achieving sustainable transport practices.

5. Adopt sustainable transport best practices, and especially the sustainability test, indexes, and the time factor practices, as the measures against which all phases of transport-related policies, plans, programs, and operations are justified, approved, funded, implemented, and evaluated.

10. REFERENCES

Centre for Sustainable Transportation, 1999. Sustainable transportation and the end of cheap oil. *CST Monitor*. <http://cst.uwinnipeg.ca/monitor.html>

Gertler, L. and R. Crowley, 1977. *Changing Canadian Cities*. Toronto: McLelland and Stewart.

Harris, B. and B. Wellar, 1992. Information and knowledge bases for decision-making: A progress report. In *IS/GIS/LIS in Public Policies, Plans and Programs*. B. Wellar and D. Parr, eds. Washington, DC: Urban and Regional Information Systems Association, 85-105.

McAllister Opinion Research. 2006. Nine in 10 Canadians fear our lifestyle is not sustainable-Most blame lack of government leadership.
www.newswire.ca/en/releases/archive/March2006/31/c0938.html - 15k - 17 Apr 2006

Wellar, B. 1975a. Housing for the future: Some questions and arenas for action. Ottawa: Ministry of State for Urban Affairs.

Wellar, B. 1975b. Taking steps towards the end of the automobile era. Ottawa Citizen, Dec.9, p. 6.

Wellar, B. 1994. Transportation planning in Canada's medium- and small-sized communities: In *Transportation Solutions for Today, Tomorrow and Beyond*. Washington: Transportation Research Board, 462-475.

Wellar, B. 2005. Geography and the media: Strengthening the relationship. Ottawa: Canadian Royal Geographical Society. www.ccge.ca

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