

# **Sustainable Transport Best Practices and Geography: Making Connections**

**Dr. Barry Wellar  
Professor Emeritus,  
University of Ottawa  
Distinguished Research Fellow  
Transport 2000 Canada  
[wellarb@uottawa.ca](mailto:wellarb@uottawa.ca)  
<http://wellarconsulting.com/>**

**Text of the  
Fleming Lecture  
Organized by the University of Washington  
2007 Annual Meeting  
Association of American Geographers  
San Francisco, CA, April 17-21**

# **Sustainable Transport Best Practices and Geography: Making Connections**

**Dr. Barry Wellar  
Professor Emeritus,  
University of Ottawa  
Distinguished Research Fellow  
Transport 2000 Canada**

## **Synopsis**

Factors of physical and human geography directly and significantly affect the structures, functions, and performance characteristics of all modes of transport – walk, cycle, transit (bus, subway, LRT), private motor vehicle (car, truck, minivan, SUV, etc.), heavy rail (passenger, freight), pipeline, water (passenger, freight), and air (passenger, freight). It follows on *prima facie* grounds, therefore, that geographic factors warrant primary consideration as potentially essential features in the conceptualization, design, and implementation of best practices promoted or adopted in the name of sustainable transport.

The 2007 Fleming Lecture begins with a brief review of Canada's progress in achieving core element standing for geographic factors in sustainable transport best practices. This part of the paper grounds sustainable transport in metropolitan regions, and then establishes the essential role of geographic factors in the sustainability of transport systems in Canada, and particularly in its metropolitan transportation systems. With that foundation in place, the paper then presents findings that reveal the extremely limited implementation of nine sustainable transport best practices in Canada's metropolitan regions, and the consequent lack of regard for geographic factors in matters related to achieving sustainable transport practices.

The general finding is that, in contradiction to a need that has been a matter of public record for at least 35 years, the pertinence of geographic factors to sustainable transport practices in metropolitan regions in Canada has not yet been elaborated by any government, much less operationalized. Further, no evidence has been found to suggest that there is likely to be any change in that knowledge gap in the near future.

In the spirit of the Fleming Lecture, however, it is not sufficient to merely identify shortcomings and 'curse the darkness'. Instead, it is appropriate to contribute to the solution, which in this case means suggesting how geographic factors could be pertinent

to the design, implementation, and evaluation of sustainable transport best practices. As a contribution towards that objective, 100 terms are presented to illustrate the various ways that geographic factors are germane to decisions and actions involving the walk, cycle, transit, and/or private vehicle modes in metropolitan regions. The section is concluded by a preliminary indication of the geographic factors that are pertinent to each of the nine sustainable transport best practices used in a country report.

Finally, the issue of how to accelerate the process of achieving core element standing for geographic factors in the body of best practices associated with sustainable transport best practices is examined. Taking into account the failures of governments, big media, corporations, and adults over the past decades, it is argued that children and community newspapers represent the best hope for achieving sustainable transport practices in metropolitan regions in Canada within the next 10-15 years, and for incorporating geographic factors in those practices.

## **INTRODUCTION**

Several previous Fleming Lecturers have also examined aspects of sustainable transport (Black, 1996, 2001, 2005; Hanson, 1998; Haynes *et al*, 2004; Kwan, 1999). Further, some Lecturers have also undertaken both curiosity-driven and client-driven research (Garrison, 2007; Hanson and Schwab, 1987; NRC/NAS, 2005). Since a number of predecessors have track records similar to my own, this would be known as “a tough crowd” in some situations. However, being selected to present the Fleming Lecture is an honor and opportunity that provokes a very exhilarating mind-set. In brief, these people are a challenge and an inspiration because they raise the bar for this Fleming Lecture in a very constructive way. That is, they oblige me to think very carefully and thoughtfully in order to ensure that what I have to say and show substantively contributes to the field of sustainable transport, demonstrates advances in both the curiosity- and client-driven research domains, and provides advice, guidance and encouragement for their own important work (Black, 2005; Dijst and Kwan, 2005; Hensher *et al*, 2004).

As for those in attendance who are new or relatively new to the field of sustainable transport, I am similarly compelled to ensure that what I say and show provides advice, guidance and encouragement as you embark on your careers. Further, I am putting an edge on my remarks for a purpose that has you expressly in mind. Simply put, while we have a large number of sustainable transport principles, and a high frequency of public

and published references to those principles, **relatively little has been achieved in implementing sustainable transport practices.** As a result, part of the advice, guidance and encouragement that I present in these remarks involves highlighting the argument that we are long overdue to achieve sustainable transport in practice through the day-to-day commitment of citizens, corporations and governments in Canada and in countries around the world. I suggest below that you have a major role in making it happen.

For the field of geography and its kindred fields (planning, ecology, engineering, land economics, regional science, etc.), and society in general, the 2007 Fleming Lecture involves a different form of challenge and inspiration. That is, after almost 40 years of research into numerous transportation, planning and development research issues, I am persuaded that one of the most important tasks before us may be summarized as follows:

**To broaden and deepen the body of theoretical and empirical knowledge of why and how geography affects the need for and achievement of best practices in sustainable transport in metropolitan regions.**

In the next section I briefly summarize the origins of the Lecture, and outline my credentials for taking on the best practices topic. These background materials provide a context and rationale for the materials that follow in the remainder of the presentation.

## **BACKGROUND**

My interest in sustainable transport principles and practices began while I was a graduate student at Northwestern University (1965-69), and continued when I took a position at the University of Kansas in 1969. In the former situation with the Chicago Area Transportation Study as context, and the Chicago metropolitan region as a ‘lab’, it was only natural to wonder how long, how well, and by what means all those people and goods could be kept on the move 24 hours per day, seven days a week. Kansas, on the other hand, was a very different environment, where the culture seemed to accept travel if necessary, but not to the point that it became a dominant life force.

In 1972, I returned to Canada and joined the federal Ministry of State for Urban Affairs as a senior research officer. My entrance into the sustainable transport field at the

practices level came to be quickly informed by exposure to both the top-down and bottom-up perspectives, respectively. That is, my position at Urban Affairs involved interacting with the Cabinet Minister responsible for Urban Affairs, as well as with the deputy minister, assistant deputy ministers, and other administrators in my agency as well as their counterparts in a number of federal agencies.

In addition, due to the structure and function of Urban Affairs, and in particular its policy and advisory role, I interacted with researchers, bureaucrats and elected officials at the provincial and municipal levels of government, and I also had dealings with associations and consultants. My duties included providing all manner of subject matter advice on a variety of policy, program, and plan initiatives affecting the economic, social, environmental, etc., development of urban centres, urban systems, and urban regions across the country, all of which fell within the purview of the agency (Gertler and Crowley, 1977).

Further, I was also heavily involved in advising local governments across Canada about the use of information technology and geographic information systems for decision support and operations (Wellar, 1976). In that circumstance (being part of the top-down apparatus) there was considerable anxiety about ‘getting it right’ when dispensing suggestions, instructions or recommendations that could affect Canada’s present and future urban domain, its present and future urban residents, corporations, and institutions, and its present and future urban performance capabilities.

As more fully explained by Garrison (2007), what I am referring to here are legacies, which can be good or bad. It was my early experience that good legacies represented by informed policies, plans, programs, projects, practices, investments, etc., too often seemed to have a very short shelf life. On the other hand, perhaps reflecting the *Law of Perverseness*, the bad ones seemed to last forever. It quickly became ingrained, therefore, that as a public servant I was obliged to try to ensure that my legacy at Urban Affairs included more good outputs than bad, even if that meant raising issues that did not

satisfy the “let sleeping dogs lie” philosophy that may sometimes be found in bureaucracies.

On the other hand, with the regard to the bottom-up (or grassroots) perspective, shortly after arriving in Ottawa I became involved in a numerous contentious community-based issues. These issues frequently involved objections to what was being prescribed for neighbourhoods through regional development plans, municipal official plans, municipal zoning by-laws, provincial government planning and program initiatives, Ontario Municipal Board rulings, and development activities of the National Capital Commission, a federal government agency which frequently seemed to be at odds with many local groups in the National Capital Region. Some of my activities as an ‘activist’ were the basis of media stories, a number of which involved issues that were in the news for years.

A selection of media articles in which I am named has been recorded as part of a virtual library project under the direction of Prof. Mike Sawada at the University of Ottawa. These articles focus on my time at the University of Ottawa, but in many cases the stories had their roots in situations, events, personalities, practices, and decisions of the 1970s. They can be viewed at: <http://www.geomatics.uottawa.ca/wellarweb/home.htm>.

One of the common links between the two perspectives, as perhaps destiny would have it, was the land use-transportation connection. Or, more accurately in my opinion, the land use-transportation system disconnection. As a result of concerns about the disconnection, and perhaps because of conflicts between my top-down and bottom-up worlds, I prepared two documents in 1975 that contained a number of observations about things gone and going wrong in the land use-transportation relationship. The first document was a Discussion Paper for Urban Affairs (Wellar, 1975a), and the second was a newspaper article (Wellar, 1975b).

The primary reason for citing those writings of 30 years ago is that they identified issues, concerns and questions that appear with increasing frequency and urgency today in government documents, as well as in the learned and popular literatures. The following

excerpts from those two documents appear sufficient to establish my motivation to discuss sustainable transport best practices and geographic factors in the 2007 Fleming Lecture.

The first excerpts are from *Housing for the Future*, which I presented at a seminar hosted by the Canadian Council on Social Development. For those of you not employed in government, I note that these are not the kinds of questions that are asked by senior policy researchers who expect to have long, non-turbulent careers in the civil service.

“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).

There are three parts to that question, and each part requires a “No” in order to legitimately claim sustainable transport is being practiced. I suspect that fewer than 15 metropolitan regions in all of North America, and none in Canada, could credibly be accorded a “No” for even one those basic questions posed 30 years ago.

The second excerpt from *Housing for the Future* delved into the realm of fossil fuel consumption, with an implicit reference to the automobile-based development mentality that seemed to be driving Canada’s housing industry in the 1970s:

“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).

That paragraph was the first instance in which I attached numbers, in a published government document, to the amount of fossil fuel being pumped into private motor vehicles, internally combusted, and released into the air as “exhaust”. I recall discussing the use of future consumption numbers of 30,000,000 (thirty million) gallons per day and

11,000,000,000 (eleven billion) gallons per year, but it seemed that the bigger the numbers became the less their impact. And, it appears, things have not changed. While the media is full of stories about Canadians being upset over gas increases of 5 cents a litre or 2 dollars tank, I have not encountered serious, sustained comments in the media or anywhere else on what it means to consume 40,000,000,000 litres of a non-renewable resource every year. However, this is not to say that we are numerically clueless; perhaps it's just we are a nation of small number crunchers.

As might be surmised, it seemed clear to me by 1975 that Canada had a serious transportation-land use disconnect, compounded by a fossil fuel consumption habit of disturbing proportions. Moreover, it seemed that the disconnect and the bad habit needed to be given serious research, policy, and program attention by the Government of Canada...

And then, no doubt as a result of my community group experience, I decided to write a newspaper article to comment on a number of local, provincial, and national issues that did not lend themselves to getting published in a federal government document any time soon. If ever. The article was titled "Taking steps towards the end of the automobile era", and I was identified as "...a senior professional at the Department of Urban Affairs and a former professor of urban transport." This is some of what I wrote in that 1975 column.

"... 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, 92 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 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?”

“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.”

“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.”

“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.”

All the above statements or variations of those statements are being put forward today in the name of sustainable transport, or in the related fields of sustainable development, smart growth, energy conservation, etc., some **30 years after they appeared in print** (Page, 2007; Wellar, 2006a, 2006b, 2006c, 2007c 2007d). Indeed, in a recent study of local governments' regard for the land use-transportation relationship when dealing with

the high-tech industry, all of the themes cited above have appeared repeatedly, year after year since 1975 in Ottawa-area newspapers (Wellar and Novakowski, 2007).

Having established that what some think is new in the land-transportation field is actually old, at least 30 years old to be precise, I next want to sharpen the focus of my remarks by dealing with the **geographic dimension** of sustainable transport. The following excerpts from a White Paper prepared for Transport 2000 Canada succinctly explain why geographic factors warrant primary consideration in the design, conceptualization and application of sustainable transport practices in Canada (Wellar, 2006c).

“... 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 with which 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.

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.”

With those excerpts before us, I believe the Background is complete. That is, based on the fact that I began my research in the field of sustainable transport more than 30 years ago, it is a reasonable choice of topic for my Fleming Lecture. In addition, as a professor, senior civil servant, community association member, public interest group advisor, consultant, and media commentator, I have been engaged in numerous activities seeking to improve products, processes, and outcomes associated with practices in various fields, including public participation, land use planning, transportation, administration, research methods, information systems, geographic information systems, and remote sensing. It

is therefore consistent with that record of pursuing increased effectiveness, efficiency, and security at the operational level for me to put the focus of this Lecture on best practices.

Finally, and perhaps of greatest consequence to the achievement of best practices in sustainable transport, no counter arguments to the statements about the importance of geographic factors have been received. Further, none have been encountered in reviews of the extant, international literature (learned, popular, professional, Internet, etc.). For those reasons, I believe that a satisfactory basis is now in place to proceed to the main body of the Lecture.

### **CURRENT REGARD FOR GEOGRAPHIC FACTORS IN SUSTAINABLE TRANSPORT BEST PRACTICES IN CANADA**

The materials that underpin this section are from a study that I undertook to prepare the 2006 country report on sustainable transport practices in Canada (Wellar, 2006c). The country report-- *Sustainable Transport Practices in Canada: Exhortation Overwhelms Demonstration* – was posted as a White Paper on the Transport 2000 Canada website ([transport2000.ca](http://transport2000.ca)) in September 2006. The White Paper and associated materials have been mentioned in various list serves, the Paper and comments about the Paper have been cited in news releases, and it has been distributed to government officials at all levels as well as to academics and public transport advocacy groups and individuals. Further, it has been used in media stories, and a number of websites have created links to the Transport 2000 Canada website and the White Paper. It appears fair to say, therefore, that the report and associated materials have been readily available for scrutiny for months.

At the time of this writing (March, 2007) I had received no direct challenges to anything in the White Paper, no challenges had been brought to my attention by third parties, and I encountered nothing in any body of related literature (learned, popular, professional, public interest group, Internet, etc.) that caused me to change anything that I had written six to eight months before about the role of geographic factors in sustainable transport best practices in Canada. As a result, it appears that the materials from the country report

can be used to describe the situation in Canada with a degree of confidence that is appropriate for this Lecture.

I want to emphasize that for methodological reasons I do not present Canada as a sample of one, nor as a selection of one. That is, this presentation is limited in scope to the situation in Canada, and no generalizations to other countries are proffered. However, it appears that Canada is very useful as a case study, since it was established in the preceding section that achieving sustainable transport practices in this country can be justified on factors that are grounded in both physical geography and human geography. Further, and not to be too precious since this ranking is not without its issues (Wellar, 2000), Canada is generally rated near the top in the Human Development Index of the United Nations. As a result, it may be instructive to consider the regard that a “high end” country demonstrates towards achieving sustainable transport best practices, and incorporating geographic factors in those best practices.

Two questions were used to direct the research undertaken for the country report. The questions are repeated to make this presentation self-contained, and for the convenience of the reader.

- 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?

After responding to those questions, it will be appropriate to consider the regard shown by Canadian governments, corporations and citizens for geographic factors in the achievement of sustainable transport practices in general and a selection of best practices in particular.

Readers who have examined the White Paper are aware that in the country report project, the onus was on governments, corporations, citizens, and the media for that matter, to spell out what they meant by the phrase “sustainable transport practice”. I was writing a review report, and as a result I was prepared to accept whatever definitions were

employed by the users of the phrase. To organize the materials, however, they would be put in a best practices framework since I was not compiling a comprehensive database of practices. For the benefit of those who have not read the country report, the following definition of “best practice” was employed in the White Paper: (Wellar, 2006c).

**The term ‘best practice’ refers to initiatives and activities that most effectively contribute to making sustainable transport practices a reality.**

Due to reasons of time and available resources, the (un-funded) study for the country report was limited to nine best practices. It would have been possible to expand the country report to include additional best practices, but that step required that a credible person or agency had undertaken the background work that would allow me to incorporate those materials on a face value basis. I did not locate any reports that would allow me to go to ten, eleven, twelve, etc., best practices.

Further, this was a literature-based assessment because the resources needed to undertake interviews, field work, and other on-site data gathering tasks and associated data assembly, analysis, synthesis and interpretation activities could not be arranged in a timely manner. Major stumbling blocks in this regard were: 1) an impending election that ‘distracted’ officials responsible for funding this kind of a project; and 2) a seeming lack of comprehension by these same officials that sustainable transport best practices were not something to be picked out of the air or off the shelf as though they were “low-hanging fruit”.

The brief comments in Table 1 on how Canada has performed in regard to each best practice are from *Sustainable Transport Practices Key to the Harper Climate Change Agenda* (Wellar, 2006b) and *Sustainable Transport – Is it happening?* (Wellar, 2007d). Those documents are derived from the country report, and were prepared as part of Transport 2000 Canada’s contribution to the country’s debate on climate change. For those not familiar with Canadian political figures, ‘Harper’ is currently the Prime Minister.

**Table 1.**  
**Comments on Canada's Record of Achieving**  
**Sustainable Transport Best Practices**

**1. Sustainable Transport Test.** 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 that any government in Canada has implemented or even designed a rigorous sustainable transport test to evaluate policies, programs, plans or projects.

**2. Integrated Land Use and Transportation System Planning and Development.** This best practice was established in the 1960s, but as of 2006 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 for all of the walk, cycle, transit and private motor vehicle modes.

**3. Smart Growth/New Urbanism.** Despite numerous calls for this best practice by officials from all levels of government as well as national and international experts, no evidence has been located that any municipal government in Canada has 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.

**4. Development and Adoption of a Pedestrian Charter.** Charters for pedestrians are seen as major instruments for improving the walking experience of pedestrians. The Toronto Pedestrian Charter is a leading example of this best practice. It was formally adopted by Toronto city council in 2002, but has not been implemented. No evidence was located to establish that a pedestrian charter has been put into practice anywhere in Canada.

**5. Incorporating Time as a Criterion for Defining Sustainable Transport.** The concept of sustainability by definition involves a temporal process; a timeframe must be included so that progress in achieving sustainable transport practices can be evaluated. This best practice rejects such vague notions as 'soon' and 'near future'. No government in Canada has been identified that assigns numeric start, interim and end points to programs or plans for the purpose of quantitatively measuring actual changes in the extent and rate that sustainable transport is being achieved in practice.

**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. Federal and provincial agency activity in this domain is almost totally limited to the private vehicle mode, and likely less than a half-dozen municipal governments are able to use the full power of GIS software to measure changes arising from implementation of sustainable transport practices in all of the walk, cycle, transit and private motor vehicle modes of transport.

**7. Using Indexes for Decision Support.** Indexes and similar analytical instruments are especially useful in complex transportation studies, programs and plans, and are among the primary set of decision support tools available to assess the match between situations and proposed solutions. However, 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, plan, project, or operational research decision involving a sustainable transport practice.

**8. Defining Road/Highway “Improvements” in Sustainable Transport Terms.** The term “improvements” has been used in the transportation field to refer to projects that increase intersection, road segment and network capacity, or reduce impediments to vehicular traffic flow. The design of sustainable transport practices requires that projects are justified on the basis of sustainability criteria. This means, for 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. 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 functional. 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.

**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, 2006)

However, while the vast majority of Canadian citizens embrace this best practice, they apparently do so 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.

As the reader may have observed, no evidence was found to demonstrate that any best practice has been achieved to a significant degree. Moreover, after a second, extensive, keyword-based search using multiple terms to be consistent with the initial searches, it is my impression that there is not sufficient substantive material in the extant literature to write even one informative paper on achieved sustainable transport best practices in Canada. Further, while I am aware of a proposed, sample-based project of on-site visits and interviews to ascertain the extent that sustainable transport best practices have been achieved, I have been unable to learn if any such studies have been completed or even

initiated. (**Note:** I will present a related paper in Belfast, Northern Ireland in November, and readers are invited to contact me for an update on the situation.)

As for underlining the term ‘achieved’ in the preceding paragraph, it was done to re-emphasize that **the focus in this paper is sustainable transport best practices that have been implemented**. A recent event illustrates why my focus is on achieved practices as opposed to the expressions of good intentions, hopes, promises, aspirations, blame, denial, etc., that frequently receive widespread media attention. Further, the event warrants attention in this presentation because it confirms the White Paper finding that Canada is still long on exhortation and short on demonstration, even at the local level of government, when it comes to actually achieving sustainable transport best practices.

The case in point involves the sustainable transport best practice, Integrated Land Use and Transportation System Planning and Development. In early March 2007, the Big City Mayors Caucus of the Federation of Canadian Municipalities endorsed a number of elements of that best practice in a proposal to the federal government about funding for transit. (Rupert, 2007) However, the difference between support and action, as exemplified by the terms ‘exhortation’ and ‘demonstration’ in the White Paper, is revealed upon examining the mayors’ proposal.

Bearing in mind that we are in the year 2007, and cities have existed in Canada for more than 100 years, the mayors’ proposal calls for “...better land use and transportation planning, ...”. There is of course nothing inherently wrong with the plea, but it appears that it was made without realizing that this practice is in fact already the direct responsibility of mayors and councils, and is something that municipal councils should have been achieving for the past 30, 40, 50, or more years. Worse, and as noted in a recent public presentation that has yet to be challenged (Wellar, 2007c), it appears that fewer than a half-dozen municipalities in Canada have made even than minimal progress over the past decade in achieving corrections to the land use–transportation disconnect that is on the mayors’ wish list, and was emphasized in *Housing for the Future* more than 30 years ago. (Wellar, 1975a)

It also warrants noting that while the mayors appear to be of one voice in extolling the virtues of public transit, and the need of federal funds for capital projects, there is a credibility problem with those positions. That is, there does not appear to be any mention in the proposal of what Canada's big cities are doing to reduce expenditures on road programs and projects, or to increase trips by **walking and cycling, which are the most sustainable transport modes and the best of the best sustainable transport best practices**. Simply put, it appears fair to say that Canada's big city mayors can talk the talk in a vague way about sustainable transport best practices, but they really do not understand how to achieve even one sustainable transport practice, much less two, three, four, or more.

With that nail in the exhortation-demonstration coffin, the reader may more fully appreciate the research design difficulty associated with preparing this presentation. That is, as a result of discussions in May and June 2006 about the scope and direction of the 2007 Fleming Lecture, it was intended that the following task would be considered in the remarks:

“... the issue of how to accelerate the process of achieving core element standing for geographic factors in the body of best practices associated with sustainable transport achievements”.

Unfortunately, the situation that lead to the findings contained in Table 1 put that task at risk, and the 2007 transit proposal (instead of a record of achievement) from the big city mayors made it clear that the task could not be undertaken at this time. That is, lack of action in achieving sustainable transport practices means that published documents on the adoption of sustainable transport best practices in Canada appear to be almost non-existent. Consequently, and regrettably from an applied research perspective, the minimal amount of documentation on sustainable transport practices means that the public record of incorporating geographic factors in best practices is by definition exceedingly sparse.

The realization that the public materials I expected to examine would not be available prompted me to resort to “Plan B”. That is, since the formal, literature-based approach could not be pursued, I would try an informal approach. Inquiries were directed to

individuals and agencies in a selection of governments requesting memoranda, committee reports, staff reports, consultant reports, and any available basic data/information that identify: 1) the extent to which sustainable transport best practices had been implemented; and 2) the regard shown for geographic factors. For reasons that include missing documentation, lack of an agency spokesperson, and a seeming general lack of expertise, the informal approach was also unsuccessful.

One disappointing result of the failed mission is that I cannot bring forward any empirical evidence about how geographic factors have been incorporated in sustainable transport best practices in Canada, or about where, when, why and how core element status has been achieved. Indeed, based on the record to date it appears that I am at least ten years early in my request for such data, although the remarks to the Kiwanis Club of Ottawa might induce the City of Ottawa to move a lot more quickly than other municipalities (Wellar, 2007c).

With that information on the table, it would not be surprising for the concerned reader to raise the following question:

“Why bother examining regard shown for geographic factors if there is only minimal progress in achieving best practices in the first place?”

Further, it would not be surprising for some attendees as well as readers to concede that this is a lost cause, and that it would be advisable to move on to other issues.

Once again, however, things are not always as they may seem to the casual eye, and it would be an error to not continue to apply pressure. (I take my inspiration in this case from former Illinois Senator Everett Dirksen who acknowledged, “When I feel the heat, I see the light”.) As circumstances would have it, a very persuasive and growing argument to stay the course with this matter is emerging, and it is largely the result of an idea and an initiative being in the right place at the right time for the right reasons. The convergence of events is as follows.

Many attendees are no doubt aware that the Intergovernmental Panel on Climate Change (IPCC) released Part 1 of its Fourth Assessment Report on February 2, 2007. In my case,

I was at the Ottawa briefing organized by the Canadian Foundation for Climate and Atmospheric Sciences, primarily because two weeks before I had made a presentation on *The Doomsday Map* (Wellar, 1990) to the Canadian Meteorological and Oceanographic Society (Wellar, 2007b). Then, on February 4, the *Ottawa Citizen* carried a feature article titled “Honk if you love smog” (Page, 2007). In that column Shelley Page reviewed my three-decades old concern about the *automobilitis*-sprawl connection, referred to the 1975 article “Taking steps towards the end of the automobile era”, commented on *The Doomsday Map*, and presented a thirty-year retrospective leading into the 2007 climate change and global warming report of the IPCC.

A key consequence of the newspaper article is that my research and advocacy received widespread, positive feedback from citizens, community group leaders, and journalists, as well as support from government and corporate officials. For example, I was invited to address the Ottawa Kiwanis Club on February 23, just three weeks after the newspaper article was published. The title of my presentation to the Kiwanis Club was, *Sustainable Transport: Does Anybody Here Know How to Win This Game?* (Wellar, 2007c).

While it is too soon to say whether that presentation will actually help move the City of Ottawa forward in terms of achieving sustainable transport practices, it appears fair to say that it contributes to making it harder for the City of Ottawa to stay stuck in the 1960s. Further, and thanks to several website postings, a number of groups and organizations in Canada, the U. S., Europe, and Australia have requested permission to use the PowerPoint materials, and inquired about further presentations on sustainable transport best practices.

As a result of those signals I am encouraged that perhaps the end of the automobile era may be on the horizon, and that the time for a sustainability-based transportation-land use relationship in metropolitan areas is approaching. I hasten to add that I do not expect much will happen overnight. However, due to growing concerns about things gone and going wrong in both the natural and built environments, in the next 36 months there could

be more productive action taken on implementing sustainability practices than there has been in the past 30 years.

The implications of those events for this Lecture and its aftermath appear very clear to me. That is, it seems highly likely that we may be on the verge of a “movement”, perhaps only 10-15 years away, when exceptional efforts are made to achieve and maintain significant sustainable transport practices. Consequently, there is an urgent need for geographers to get their act together in two respects. First, we need to establish the geographic factors that are pertinent to defining, specifying, implementing, evaluating, and modifying sustainable transport best practices. Second, we need to figure out how to accelerate the process of achieving core element standing for geographic factors in the body of best practices implemented in Canada and, I suggest, in most other countries of the world.

In the next section I take up those challenges by proposing connections between geographic factors and best practices, and by suggesting several ways to accelerate the regard shown for those connections by citizens, governments and corporations.

### **GEOGRAPHIC FACTORS AND SUSTAINABLE TRANSPORT BEST PRACTICES: MAKING CONNECTIONS**

Research for the White Paper included an extensive keyword-based Google search that yielded large numbers of entries for “sustainable transport” + “other terms”. Unfortunately, very few of the findings contained much content dealing with actual practices. A similar outcome befell a search employing the keyword combination, “geographic factors **and** sustainable transport practices”. Although Google searches located more than a million ‘candidates’, after a full day of searching with various combinations of terms I did not find even one document making the connections that I have in mind for this section. In brief, the phrase “geographic factor(s)” appeared in numerous documents identified during the searches, but many did not go beyond mentioning the phrase. More specifically, and I apologize for any oversight, but I did not locate a list of geographic concepts, variables, measures , or indicators that had

been connected to sustainable transport practices, much less to sustainable transport best practices.

It appears appropriate, therefore, to compile an indicative list of terms under the rubric of geographic factors, and to select some of the terms to illustrate the connections between geography and sustainable transport best practices. I hasten to emphasize that the discussion which follows should be regarded as preliminary, since a great deal of directed research remains to be done before we can say with confidence which geographic factors should be connected to which sustainable transport best practices.

The terms presented in Table 2 are selected from a similar, more comprehensive list of terms prepared for report *Geography and the Media: Strengthening the Relationship* (Wellar, 2005). The goal in the *Geography and the Media* report was to inform the media, geographers, and the public as to some the terms used in news stories that did or could have a geographic aspect. The terms (and their variations) selected from that list for inclusion in Table 2 are among those which are commonly used in association with the function, structure, location, design, appropriateness, etc., of the different transport modes, and as a result it seems reasonable to regard them as candidates for consideration in this presentation. Further, these are terms for which I cannot recall or envisage a serious argument against their use in examining a geographic situation, process, or relationship. Consequently, the entries in Table 2 are deemed a reasonable basis for examining the connection between geographic factors and sustainable transport best practices.

There are about 100 terms in Table 2, and they are intended to present an indicative rather than comprehensive sense of the connections between geographic factors and sustainable transport practices. The terms are what might be called a ‘familiar compilation’, since most of them have been frequently used in curiosity- and client-driven studies, reports, and manuals, and most if not all of the terms have appeared in undergraduate-level geography textbooks for years. By way of illustration, many of the

terms can be found in publications by Fleming Lecturers who have also written on the topic of sustainable transport (e.g., Dijst and Kwan, 2005; Hanson, 1998; Haynes *et al*, 2004; NRC/NAS, 2005; Kwan, 1999) It is highly likely, therefore, that session attendees and readers have a very good understanding of the individual terms, and the collective intent behind Table 2. As a result, it appears reasonable to proceed directly to the task of making connections between the sustainable transport best practices discussed in Table 1 and the geographic factors listed in Table 2.

**Table 2.**  
**A Selection of Terms that Indicate the Potential for Incorporating Geographic Factors in Designing, Implementing and Evaluating Sustainable Transport Best Practices in Metropolitan Areas**

Accessibility	Distance	Link	Route
Adjacency	Distribution	Location	Scale
Area	District	Lot	Segregation
Bikeshed	Edge	Margin	Separation
Block	Elevation	Migration	Shape
Border	Encroachment	Morphology	Site
Boundary	Environs	Movement	Situation
Buffer	Far	Near	Slope
Center	Flow	Neighbourhood	Space
Centrality	Fringe	Network	Spatial
Circle	Function	NIMBY	Sphere
Closeness	Geometry	Node	Sprawl
Cluster	Grid	Orientation	Spread
Commutershed	Gridlock	Origin	Strip
Compactness	Habitat	Parcel	Structure
Concentration	Hinterland	Partition	Surface
Concentric	Integration	Path	System
Congestion	Intensification	Pattern	Territory
Connectivity	Interaction	Pedshed	Topography
Contiguity	Intersection	Perimeter	Topology
Core	Island	Periphery	Walkway
Crossing	Isolation	Place	Walkshed
Density	Land	Proximity	Ward
Destination	Landscape	Quadrant	Where
Diffusion	Lane	Region	YIMBY
Dispersion	Line	Right-of-way	Zone

Connections between sustainable transport best practices and pertinent geographic factors are posited in Table 3. At this stage my objective is to indicate the connections between geographical factors and sustainable transport best practices. The details of how and why to incorporate the factors in best practices in different jurisdictions, under different kinds of development scenarios, different kinds of public values and attitudes, etc., is beyond the scope of this presentation. Further, it is likely a task that is advisedly undertaken on a metropolitan-area-by-metropolitan- area basis, perhaps within the context of comparative analysis studies at regional, national and international scales.

**Table 3.**  
**Connecting Sustainable Transport Best Practices  
and Geographical Factors**

- 1. Sustainable Transport Test.** Sustainable transport best practices occur “on the ground”, that is, the effects of a practice being implemented can be evaluated by examining functional, structural, and output or outcome changes in the affected transportation mode(s). As a result, an assessment of whether a purported sustainable transport best practice has improved, enhanced, or beneficially modified a situation or process would include an examination of such geographic factors as *accessibility, compactness, connectivity, gridlock, integration, interaction, and segregation.*
- 2. Integrated Land Use and Transportation System Planning and Development.** Land uses and transportation systems are of and in the built environment, so the consequences of their being integrated (rather than segregated) must be measurable or expressible in geographic terms. Pertinent concepts or constructs are represented by terms such as *commutershed, diffusion, dispersion, edge, hinterland, pedshed, and sprawl.*
- 3. Smart Growth/New Urbanism.** Land uses and transportation systems are of and in the built environment, and always have been; the intended difference of this best practice is that the former emphasis on automobile-driven growth gives way to an emphasis on alternative transportation (walk, cycle, transit) and increased regard for land and space as limited resources. Pertinent terms to use in designing or evaluating this best practice in terms of its regard for geographic factors include *adjacency, buffer, contiguity, interaction, neighbourhood, path, and walkshed.*
- 4. Development and Adoption of a Pedestrian Charter.** Pedestrians are people who walk between a variety of places -- home, work, school, recreation, shopping, health, medical, entertainment, etc., -- and they frequently are required to use sidewalks as well as the transportation infrastructure that is also used by cyclists, transit riders, and private vehicle operators and their passengers. Terms in Table 2 that apply to his best practice include *buffer, crossing, distance, encroachment, intersection, lane, path, quadrant, segregation, and zone.*

**5. Incorporating Time as a Criterion for Defining Sustainable Transport.** Any of the process terms – *concentration, congestion, diffusion, dispersion, distribution, intensification, etc.*, in Table 2, and any the terms that can be expressed as processes – for example, cluster and *clustering*, link and *linking*, spread and *spreading* – can be used with this best practice. All that is required is an appropriate timeframe, that is, from seconds, minutes and hours, to months and seasons, to years and perhaps even decades to accommodate census data.

**6. Incorporating the Geo-Factor in Sustainable Transport Measures.** All of the terms in Table 2 have been incorporated in geographic information systems software applications, beginning in the 1970s for many of them, and there are a number of applications that combine multiples of the terms contained in Table 2. In view of the arguments given above for the preceding best practices, as well as those that follow, it appears that every term contained in Table 2 could be a candidate for inclusion in one or more sustainable transport measures.

**7. Using Indexes for Decision Support.** With their capacity to rate and rank phenomena, indexes are a proven means to provide decision support information when relatively large quantities of an entity or entities are under consideration. As a case in point, one quickly runs out ways to track the relative performance of 850 signalized intersections, but an index can turn this kind of exercise into child’s play. It is likely that indexes either exist for many of the terms in Table 2, and that existing research would enable the development of indexes for any of the other terms. An initial inspection suggests that *all the terms* in Table 2 appear to be candidates for inclusion in an index to assist in the design, development, or evaluation of a sustainable transport best practice.

**8. Defining Road/Highway “Improvements” in Sustainable Transport Terms.** As noted above, the design and implementation of sustainable transport practices requires that projects are justified on the basis of sustainability criteria, however they are defined. This could mean, for example, that changes for the better (improvements) are made to structures, functions, behaviours, whatever, and these changes affect 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. Terms that are pertinent for defining spatial relationships between causal changes and causal effects include *area, block, border, distribution, district, flow, grid, location, movement, neighbourhood, origin, parcel, place, region,, strip, territory, ward, and zone*.

**9. Implementing Measures to Simultaneously Increase Walk, Cycle, and Transit/Train Trips while Decreasing Trips by Private Motor Vehicle.** Increases and decreases in trips by mode is a topic that lends itself to numerous research scenarios, some of which are indicated by the terms in Table 2. By way of illustration, the following are among the terms that could be used in designing a program to map, analyze and evaluate the spatial outcomes of this best practice: *area, bikeshed, block, boundary, buffer; center, centrality, cluster, commutershed, concentration, congestion, core, distance, distribution, district, flow, fringe, function, geometry, gridlock, integration, intensification, interaction, intersection, lane, location, movement, near, neighbourhood, network, NIMBY, node, path, pattern, pedshed, place, proximity, quadrant, region, right-of-way, route, site, situation, spatial,; sphere, sprawl, spread, structure, surface, system, topology, walkshed, ward, where, YIMBY, and zone*.

A closing comment on Table 3 is that it appears to have considerable potential for growth. As a result, it may warrant serious attention in discussions about how to design, undertake, and implement a geography-based research agenda involving sustainable transport best practices in metropolitan areas in Canada and perhaps elsewhere.

The next section presents several suggestions on how to engage citizens and the media in the mission to make geographic factors a core element of sustainable transport best practices. Governments and corporations also have major roles in this enterprise, of course, and suggestions have already been made in that regard (Wellar, 2006a, 2006b, 2006c, 2007c, 2007d) with more of them to be made in due course. However, the focus of this presentation is on citizens and the media, since their roles in achieving sustainable transport practices deserve much more elaboration than they have received to date.

### **SUGGESTIONS FOR ENGAGING CITIZENS AND THE MEDIA IN MAKING GEOGRAPHIC FACTORS A CORE ELEMENT OF SUSTAINABLE TRANSPORT BEST PRACTICES IN METROPOLITAN AREAS IN CANADA**

H. L. Mencken, a prominent American journalist, critic, satirist and political commentator might not have agreed with what I am about to propose in this section. Let me clarify. As some of you may recall, Mr. Mencken opined,

“As for the great masses  
They can be divided into two classes;  
Those for whom thinking is painful  
And those for whom it is impossible”.

I do not know whether Mr. Mencken was generalizing about the intellectual capacity of a population on all manner of matters, or whether he was provoked by a particular incident. Either way, his words are cause for pause whenever a public initiative is contemplated in Canada, the United States, or anywhere else. In the case of this Lecture, however, Mr. Mencken’s lament is taken as a piece of sage advice. That is, since I believe that the great masses are part of the sustainable transport problem, and are also part of the sustainable transport solution, the message that I take from Mr. Mencken is crystal clear:

Find ways to ease the burden of thinking  
in order to achieve the desired actions.

Examination of Tables 1, 2, and 3 suggests to me that two parts of the “ways strategy” have already been presented. First, none of the best practices in Table 1 requires rocket science skills to understand what is involved. It is my impression that the vast majority of Canadian adults and teens can easily get a handle on the meaning and implications of each best practice.

Second, there is hardly anything brain-numbing about most of the terms in Table 2. Indeed, many of them are in the everyday vocabularies of ordinary citizens, including teens and children, so we are not into the heavy-duty thinking that may have concerned Mr. Mencken. In addition to their lack of perplexity, however, the terms in Table 2 possess a characteristic that gives geography a “hook” which is shared with few if any other disciplines associated with sustainable transport.

That is, through the fact of daily living, people have the opportunity to experience more geographic factors than the factors of any other disciplines that claim a role in shaping sustainable transport practices. Further, members of the media who discuss sustainable transport practices are also people who experience geographic factors on a day-to-day basis. They travel to work, take children to school, cross intersections, breathe vehicle-polluted air, slip on icy sidewalks, wait for trains and buses, sit in traffic jams, complain about fuel prices, pay taxes for road widenings and maintenance, ride on bike paths, and maybe even stop to smell the roses while taking a walk. It is conceivable that even a journalist afflicted by *automobilitis* could experience most of the terms in Table 2 in a week.

As a result of having such a hook, proponents of geographic factors have an advantage in principle over proponents in other disciplines. The challenge, as pointed out repeatedly in this paper, is to convert principle to practice in an effective, efficient, and action-oriented manner. At the time of this writing I have two suggestions.

First, there are distinct limits to the societal influence of “the learned literature”. Simply put, academic journals, conference proceedings, dissertations, and distance learning

channels do not occupy the top rungs when it comes to the reading/viewing inclinations of many if not most Canadians. What are urgently needed instead, in the field of sustainable transport best practices, are popular literature contributions (newspaper, magazine, radio, television, Internet items) that discuss the geographic factors listed in Table 2. The more often these factors appear in the popular media as well-reasoned arguments, the more they are likely to be perceived as core elements of sustainable transport practices.

This is not to say, however, that we just have to do more to do better. That kind of “pile on the quantity” approach has no role here. Instead, we have to carefully think through how to most effectively communicate the message about incorporating geographic factors in sustainable transport best practices. And this may come as a surprise, but I am not looking to the national print, television, and radio networks to save the day.

After reviewing news stories and files that I have compiled over many years, it is my finding that with very few exceptions the major media organizations in Canada are part of the government-corporate complex that got us into this degraded sustainability mess in the first place. By way of a brief reminder, despite a 30-year ‘heads up’ Canada rates as a solid failure on all nine best sustainable transport practices discussed above. Further, it does not appear that Canada has received kudos for any achievement whatsoever regarding any kind of sustainable transport practice, even though this country is generally rated on a per capita basis as the heaviest per capita fossil fuel user on the planet. With that kind of performance, it seems a “no brainer” to expect that many members of the national or major regional media would have made a concerted effort over ten years, five years or even one year to change the situation. However, my review failed to identify any news organization that made such an effort.

Bearing that record of failure in mind, it is my impression that the major media organizations are not be the most effective vehicle for real change in this domain. Instead, recalling that the best practices to resolve sustainability issues involve local initiatives, and that the geographic factors of most import to the day-to-day lives of people are local,

it makes eminent sense to me that the media of most utility in this domain are also local. The media outlets that I have in mind include community newspapers that publish on a weekly, bi-weekly or monthly basis, and television and radio stations that are primarily concerned with local coverage.

In addition, for reasons such as speed, cost, accessibility, and convenience, list serves and websites are excellent means of engaging citizens and the community-oriented media in issues involving regard for geographic factors in local sustainable transport best practices. I recently addressed aspects this topic in a commissioned report (Wellar, 2005), and those materials are pertinent to this suggestion about making a better connection between learned literature and popular literature when communicating with citizens and the media.

What I would add here, however, is that geographers can significantly improve their positions as action-oriented experts, reliable sources, and authorities in this field by adopting a grassroots approach. This means putting a focus on list serve and website activities and materials so that they relate to the interests of local citizens and local media. I suggest that this strategy of “building from the bottom up” will significantly increase the influence of geographers, and geographic factors, in localities that embrace sustainable transport best practices.

Second, it is my opinion that we are likely 10-15 years away from Canadian society taking widespread action on sustainable transport, largely because there is no obvious market-based, health-based, fear-based, or other force to drive near-term change among the 'great masses', or even a large segment of the population. Further, no political party at any level anywhere in the country appears to have the wits, will or support to put sustainable transport at the top of the policy agenda and make decisions accordingly, so the muddling along by governments is destined to continue. However, I believe there is a force for change on the horizon that is currently under the radar, but will soon emerge to lead Canada into a new day on sustainable transport matters: Children.

For the past decade I have given a number of presentations to elementary school children in the Ottawa area, including discussions centered on *The Doomsday Map*. It struck me as revealing that whereas many adults seemed to recoil from the notion of such a concept, a number of children asked a pertinent question:

What can we do to stop the things that are going into *The Doomsday Map*?

That difference in attitude, and the apparent ability of children to understand the headlines in *The Doomsday Map* presentation, prompted a question for me:

If elementary school children can grasp the idea of a Doomsday Map, could they grasp the importance of achieving sustainable transport practices?

The answer, it appears, is “Yes.” All provinces in Canada with the exception of Ontario have an environmental science curriculum, so the means exist to bring sustainable transport principles and practices into classrooms across the country. As for Ontario, it may have a science unit in 2008 that “...would explore natural and human causes of climate change and the global and regional consequences, and examine courses of action that could address the problem.”(Chung and Kalinowski, 2007) Not only would the topic of sustainable transport practices fit into that curriculum, it would be a perfect match since wasted transportation resources and flawed transportation policies have been public issues in Ontario for decades.

Further, conversations with student teachers and elementary school teachers assure me that children have the ability to handle this kind of topic. Indeed, and this view was previously confirmed through the Walking Security Index research (Wellar, 1997, 2007a) project, children who walk, cycle, take transit, or are driven for school, recreation, shopping and other trips have expert opinions about various aspects of the walk, cycle, transit, and private vehicle modes.

After weighing the evidence accumulated over the past 30 years, it is my finding that members of the younger generation, ages 8-14, are the most significant players in Canada’s forthcoming struggle to achieve sustainable transport best practices. In 10-15 years the current group will be 18-29 years of age, which makes it a formidable force in

everything from voting to societal values and attitudes to media influence. Further, what will likely be the most environmentally enlightened body of young adults in Canadian history will be augmented, each year, by a steady influx of young people who ‘graduate’ from the 8-14 age group.

My suggestion to geographers entering this field, therefore, is that the 8-14 demographic should be the focus of your sustainable transport thinking, writing, and activism. However, within a short span of time there will need to be a change in your thinking and approach towards the task of making connections between geographic factors and sustainable transport practices. That is, the members of the 8-14 group will be maturing, the environment will be changing, and new connections between geographic factors and sustainable transport best practices will be emerging. Old ways in new days will not work, and only about six years are available to get things in order for the post-14s who well may ask, “Now what?” It is my guess that they will expect good answers.

## **CONCLUSION**

Two premises underlie this presentation. First, that achieving sustainable transport best practices is fundamental to achieving numerous government, corporation, and citizen goals and objectives associated with greenhouse gases, energy consumption, fossil fuels, air pollution, land use, child and adult obesity, respiratory illness, cardiovascular disease, stress, physical health resources, and so on. And second, that better understanding of and better regard for geographic factors is a necessary condition for achieving sustainable transport best practices.

The evidence examined for this presentation shows that limited progress has been made in achieving sustainable transport best practices in Canada,. As a result, it follows that even less progress has been made in incorporating geographic factors in the best practices process. Indeed, to more precise, no evidence has been found to establish that a Canadian government or corporation has made public a list of geographic factors that could be considered for inclusion in sustainable transport best practices. (To be fair, or perhaps to spread around the blame, it appears that Canada is not alone in its laggardness. I did not

locate documentation establishing that any other country is “all done” when it comes to achieving sustainable transport best practices, or identifying and incorporating geographic factors in the best practices.)

In the main text of the presentation I begin by attempting to meet this challenge head-on. After briefly describing nine sustainable transport best practices in Table 1, about 100 terms representing geographic factors are listed in Table 2. Then in Table 3 I propose a selection of terms from Table 2 that could be incorporated in the design, specification, implementation, evaluation, etc., of the respective best practices.

Based on my experience and understanding of the literature, these appear to be reasonable suggestions. However, the choice about terms to incorporate in a sustainable transport best practice is dependent upon or influenced by political, economic, financial, environmental, engineering, energy, hydrological, legal, regulatory, demographic, public health, public safety, and other decision considerations. This section succeeds in illustrating many connections between geographic factors and sustainable transport best practices, and contributes to a geography-based research agenda in sustainable transport. That said, it is clearly only one of the initial steps in an important but complicated applied research mission.

The next section offers two suggestions about how to engage the public and the media to make geographic factors a core element of sustainable transport best practices that are adopted by all elements of society, including governments, corporations, and citizens. After more than 30 years as a researcher, civil servant, consultant and activist, and more than 1,000 media interviews, columns, letters to editors, etc., I am cautiously optimistic that the next decade could be the basis for major movement in the field of sustainable transport practices, and that geography will become recognized as a core element. In that regard I suggest that terms such as those in Table 2 are central to our mission, that the greatest human force for change will be today’s children ages 8-14, that the best friends we have in the media are community newspapers, local television and local radio stations, and that effective use of list serves and websites is critical.

## REFERENCES

- Black, William R. 1996. Sustainable transportation: A US perspective. *Journal of Transport Geography*, 4, 151-159.
- Black, William R. 2001. An unpopular essay on transportation. *Journal of Transport Geography*, 9, 1-11.
- Black, William, R. 2005. Sustainable transport: meanings and responses. In *Conference on Integrating Sustainability into the Transportation Planning Process, Conference Proceedings 37*, Washington, DC: Transportation Research Board, National Research Council, pp. 15-31.
- Centre for Sustainable Transportation, 1999. Sustainable transportation and the end of cheap oil. *CST Monitor*. <http://cst.uwinnipeg.ca/monitor.html>
- Chung, Andrew and Tess Kalinowski. 2007. Climate change heading into classrooms - environmentalists say new Grade 10 focus 'nice but not enough'. *Toronto Star*, February 11, p. A3.
- Dijst, Martin, and Mei-Po Kwan. 2005. Accessibility and quality of life: Time-geographic perspectives. In *Social dimensions of sustainable transport: Transatlantic perspectives*, edited by K. Donaghy, S. Poppelreuter and G. Rudinger. Aldershot, Hants, England ; Burlington, VT: Ashgate.
- Garrison, William. 2007. Increasing the flexibility of legacy systems. Anderson Distinguished Lecture in Applied Geography. Annual Meeting, Association of American Geographers. <http://agsg.binghamton.edu>
- Gertler, Len and Ron Crowley. 1977. *Changing Canadian Cities*. Toronto: McLelland and Stewart.
- Hanson, Susan. 1998. Off the road? Reflections on transportation geography in the information age. *Journal of Transport Geography*, 6(4): 241-249.
- Hanson, Susan and Margo Schwab, 1987, Accessibility and intraurban travel, *Environment and Planning A*, 19: 735-748.
- Harris, Britton and Barry 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.

Haynes, K., J.Gifford, D.Pelletiere, T.R.Lakshmanan, and W.Anderson. 2004. "Sustainable transportation institutions and regional evolution" *Journal of Transport Geography* Vol. 25: 25-40

Hensher, D., K.Button, K. Haynes, and P. Stopher. 2004. *Handbook of Transport Geography and Spatial Systems*. Vol. 5. Amsterdam: Elsevier.

Kwan, Mei-Po. 1999. Gender and individual access to urban opportunities: A study using space-time measures. In *The Professional Geographer* 51 (2):210-227.

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](http://www.newswire.ca/en/releases/archive/March2006/31/c0938.html) - 15k - 17 Apr 2006

National Research Council/National Academy of Sciences (NRC/NAS). 2005. *Assessing and Managing the Ecological Impacts of Paved Roads*. Washington DC: National Academies Press.

Page, Shelley. 2007. Honk if you love smog. *Ottawa Citizen*, Sunday February 3. P. B3.

Rupert, Jake. 2007. Cities want \$2B a year for transit. *Ottawa Citizen*. Tuesday March 6. P. C1-C2.

Wellar, Barry. 1975a. *Housing for the Future: Some Questions and Arenas for Action*. Ottawa: Ministry of State for Urban Affairs.

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

Wellar, Barry. (ed.) 1976. *Urban Governance and Information Technology*. Ottawa: Minister of Supply and Services.

Wellar, Barry. 1990. Science, applications, coherence and GIS; Seizing the moment. In *GIS/LIS Proceedings*. Vol.2. 854-871.

Wellar, Barry. 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, Barry. 1997. *Walking Security Index Variables: Initial Specification*. Ottawa: Region of Ottawa-Carleton and University of Ottawa.

Wellar, Barry. 2000. *Newspapers as a Source of Fact and Opinion on Pedestrians' Safety, Comfort, Convenience: A Keyword-Based Literature Search and Review*. Ottawa: Region of Ottawa-Carleton and University of Ottawa.

Wellar, Barry. 2005. *Geography and the Media: Strengthening the Relationship*. Ottawa: Canadian Royal Geographical Society. [www.ccge.ca](http://www.ccge.ca)

Wellar, Barry. 2006a. Best practices framework needed for sustainable transit in Ottawa: What must the city do to ensure we have the right light rail plan? *Ottawa Business Journal*, Vol.: 12 No: 3 Monday, October 16, p. 6.

Wellar, Barry. 2006b. Sustainable transport key to Harper climate change agenda. Ottawa: Transport 2000 Canada. [transport2000.ca](http://transport2000.ca)

Wellar, Barry. 2006c. *Sustainable Transport Practices in Canada: Exhortation Overwhelms Demonstration*. White Paper. Ottawa: Transport 2000 Canada. [transport2000.ca](http://transport2000.ca)

Wellar, Barry. 2007a. *Adapting Walking Security Index concepts and procedures to serve and promote the mobility of children*. PowerPoint presentation. 2007 Annual Meeting, Association of American Geographers. [transport2000.ca](http://transport2000.ca)

Wellar, Barry, 2007b. *Making weather connections: From science to common sense and public lethargy to activism*. PowerPoint presentation. [www.cag.org](http://www.cag.org)

Wellar, Barry 2007c. *Sustainable transport: Does anybody here know how to win this game?* PowerPoint presentation. [www.ottawakiwanis.org](http://www.ottawakiwanis.org)

Wellar, Barry. 2007d. Sustainable transport -- Is it happening? *Peace and Environment News*, Volume 22, Numbers1-2, February-March, P. 4.

Wellar, Barry and Nick Novakowski. 2007. Local governments' record of assessing the impacts of the high tech industry on Ottawa's land use-transportation relationship: 1970s-2005. [transport2000.ca](http://transport2000.ca)

Wellar Virtual Library. <http://www.geomatics.uottawa.ca/wellarweb/home.htm>

## **ACKNOWLEDGEMENT**

In addition to the support of Transport 2000 Canada, I want to thank Prof. William Garrison, University of California at Berkeley, for his many sound "second opinions". Assistance in formatting this paper for posting was provided by Sam Herold, Laboratory for Applied Geomatics and Geographic Information Systems Science, University of Ottawa, and it is gratefully acknowledged.