

***Methods and Techniques that Could be Used in  
Making Decisions about Identifying, Adopting, or  
Implementing Sustainable Transport Practices***

***RESEARCH REPORT 1***

Transport Canada Project

**Methodologies for Identifying and Ranking Sustainable  
Transport Practices in Urban Regions**

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## **A. Report Purpose**

This report contributes to three of the elements of the body of work to be completed for this project (Wellar, 2008b):

- A comprehensive literature search and review of the state of the art/science in the design and application of methodologies for identifying and ranking sustainable transport practices in urban regions.
- Consultation with experts and practitioners on the strengths and weaknesses of current methodologies for identifying and ranking or prioritizing sustainable transport practices in urban regions.
- Development of a network of individuals with an interest in further assessing and extending the state of the art/science on methodologies used in identifying and ranking or prioritizing sustainable transport practices in general, and best practices in particular.

Three states of usage of methods and techniques in decision-making are pertinent to this project, and are illustrated by the following questions:

- Which methods and techniques *are used*?
- Which methods and techniques *could be used*?
- Which methods and techniques *should be used*?

The three states of usage will be frequently discussed individually and in combinations over the course of the project, and this is an appropriate place to outline the relationships among the states using pairwise combinations for illustrative purposes.

As noted in a previous research paper on the relationships between curiosity-driven and client-driven research, it is generally advisable to sort out the pairwise relationships before trying to relate three or more entities in a schematic or text (Wellar, 1998, 2005). That advice is followed here.

Further, it is emphasized that while the focus of this report is on the methods and techniques that *could be used* to assist in decision-making, there are interdependencies among the states. The pairwise combination approach assists in affirming the interdependency feature, and also reveals some of the nuances of the decision process language.

### **a. Are-Could Relationship**

For financial, political, technical, administrative, expertise, cultural, and other reasons, the methods and techniques which *are used* for decision-making in a government, or in all

governments for that matter, will likely always be a subset of the methods and techniques that *could be used*.

That is, there may be 20 different, known methods and techniques that *could be used* in a particular situation, but only one may be chosen for use. On the other hand, a government *could* choose one method or technique without knowing that there *are* 19 other candidates.

This report elaborates the *could* side of the *are-could* relationship by indicating the mix of methods and techniques potentially available to assist in making informed decisions about identifying, adopting, or implementing sustainable transport practices.

### **b. *Could-Should* Relationship**

As noted above, the *could* side of these relationships indicates the mix of methods or techniques that are potentially available to assist in making informed decisions about identifying, adopting, or implementing sustainable transport practices. However, it is the *should be used* side of the relationship which ranks the *coulds* from worst to best. Conversely, the *should* side needs something to work with, and that something is the list of methods and techniques that potentially *could be used*.

### **c. *Are-Should* Relationship**

At a point in time government bodies use the decision-making techniques that they use, and that is a fact of governance. However, is it true that the decision support method(s) and technique(s) which *are used* the one(s) that *should be used*?

Or, to re-phrase by way of an illustrative decision situation, “Does it hold that the methods and techniques which *are used* to make decisions about expanding road networks the ones that *should be used* to make decisions about achieving sustainable transport practices in general, and best practices in particular?” If not, then new methods and techniques need to be considered, and that means shifting from the *are-should* relationship to the *could-should* relationship.

### **d. *Could-Are* Relationship**

With *could* representing potential and *are* representing current status, questions arise about the similarities and differences between the two sides. A matter of singular importance in the quest for best sustainable transport practices is to achieve a transform from the methods and techniques that *are currently in use* to *the best that could be in use*.

### **e. *Should-Could* Relationship**

The value of the *should* side of this relationship is that it puts the potential methods and techniques in context, such as by rating them in regard to utility, functionality, degree of difficulty, etc. Conversely, the *could* side puts a restraint on demands or expectations about

methods and techniques that might be available to support decision-making. In other words, if they are not on the *could* list, then the *should* list provides the basis of a research project or research agenda.

As case in point, let us say that there *should be* an all-purpose method or technique that quickly, cheaply, and reliably provides totally easy ways to think through the most complicated questions about sustainable transport practices. If there is no such method or technique in existence, the question arises, “*Could there be* such a method or technique?” The answer to this question can likely best be answered through a program of methodologically designed research,

#### **f. *Should-Are* Relationship**

In this relationship, the *should* factor points to the most appropriate methods and techniques to use for reasons of utility, (low) degree of difficulty, general applicability, efficiency, insight, and so on. It can reinforce the methods and techniques that also appear on the *are* list, and point out methods and techniques not on the list but worthy of more regard.

Conversely, the *are* side adds a dose of reality to the contents of the *should* side by pointing out the methods and techniques which currently *are used*, and which also make it onto the *should be used* list. This kind of left side-right side comparison is very useful at indicating how far away a government may be from achieving the recommended array of methods and techniques to assist in making informed decisions about sustainable transport practices.

Although brief, those comments on the pairwise combinations illustrate the framework for perceiving methods, techniques, and best practices in this project. That is, due regard is shown for each of the three states -- *are used*, *could be used*, *should be used* -- because each state affects the others, and because understanding those inter-state relationships is a critical and necessary condition for understanding how they combine to influence the process whereby methods and techniques in use evolve.

A companion report now in progress will present the findings from a survey of Canadian municipal governments regarding the methods and techniques that *are used* to assist in making informed decisions about identifying, adopting, or implementing sustainable transport practices. Since little of substance can be said about the *are-could* or *are-should* connections until that work is completed, attention in the remainder this report focuses on the methods and techniques that *could be used*, and is intended to serve several purposes.

First, this is a project with a focus on methodologies, and one of the objectives of the project is to encourage more methodologically robust approaches to making decisions about identifying, adopting, and implementing sustainable transport practices.

Given the project emphasis on methodologies, it is therefore appropriate to explicitly note that the distinctions and relations involving the states of *are used*, *could be used*, and *should be*

*used* did not just ‘pop out of the ether’. Rather, these ideas are based on the concepts and formal logic of methodologically designed research, and three pillars in particular:

- the idealized research model;
- the practical research design phase;
- the operational phase of the practical research design.

Authors who are instructive in these regards include Ackoff (1953), and a number of other leaders in the field of research methodology (Ackerman, 1958; Bailey, 1987; Babbie, 1986; Goode and Hatt, 1952; Kaplan, 1964; Miller, 1970; Miller, 1986; Nachmias and Nachmias, 1987; Northrop, 1959; Simon, 1978; Walizer and Wiener, 1978; Whitehead, 1948).

**(Note:** The distinctions and relations between *is/are*, *could be*, and *should be* appear in discourse and decisions involving the subject matter and the methodological aspects of many fields, including medicine, planning and development, engineering, and public safety. In this report the focus is on the methodological stream, and the subject matter aspect of the states of sustainable transport practices will be the focus of separate reports.)

To return to the writings of Ackoff and the other methods references noted above, those texts demonstrate that *could* is frequently the hinge between *what is* and *what should be*.

By way of brief explanation since this topic is covered in detail in the texts, if the *could* aspect is narrowly defined then so is the *should* aspect. That is, if there is only one perceived way to change the current situation to achieve an alternative situation, then *should* is restricted to the only way available. However, if there are a dozen or 50 ways that *could* be pursued, then ascertaining which one *should be* selected will no doubt require some kind of rationale to decide how to choose the preferred way to proceed from among 12 or 50 alternatives.

In view of the fact that this project is concerned with the alternative ways of making informed decisions about identifying, adopting and implementing sustainable transport practices involving all modes of transport in urban regions, the importance of understanding the different ways that the decisions *could be made* cannot be over-emphasized.

Second, the design approach of involving experts from Canada and abroad provides an opportunity to bring different political, social, economic, technical, and other perspectives into the assessment framework. Clearly, the wider the range of expertise and experience involved in specifying the methods and techniques that could be pertinent, the richer the body of alternatives there could be to put on the table for consideration when the project gets to the *should-be-used* stage of discourse.

In terms of scheduling, the *could be* and *are* aspects of the project research program will proceed more or less simultaneously. Upon completion of those aspects, the results will be compared for evidence, suggestions, or recommendations about the methods and techniques that *should be used* to assist in making informed decisions about identifying, adopting, or implementing sustainable transport practices.

With the report purpose in place, the remainder of the document focuses on the methods and techniques that *could be used* to assist in making decisions about identifying, adopting, and implementing sustainable transport practices.

## **B. Outline of the Research Problem**

While there are exceptions to the rule, it appears fair to say that people generally are not enthusiastic readers of or participants in deep discussions involving methods and techniques used in decision making. As result, it is advisable to keep discussions about methods and techniques of decision making as brief, simple, and to the point as circumstances and skills permit.

Towards that end, I conducted an intensive, keyword-based electronic search of the literature, and communicated with about 50 leaders in the field. In addition, information about the tasks to be undertaken over the course of the project was circulated to more than 20 national and international associations.

One objective of the literature search and the communications was to learn whether anyone had already written, or knew about a brief, simple, and to-the-point discussion of the methods and techniques that could be used to assist in making informed decisions about identifying, adopting, or implementing sustainable transport practices.

Regrettably for all concerned, I was unable to locate a ‘one size fits all’ type of discussion for this part of the Transport Canada project. As a result, it is assumed for the purposes of this project that we do not yet have access to a brief, comprehensive, directive, and easy-to-understand discussion of methods and techniques that reveals all or even much of what is needed to be known when trying to make informed decisions about identifying, adopting, and implementing sustainable transport practices.

Since this report is of necessity going to be longer, more complex, and less directive than I wish, and readers may wish, it may be instructive to suggest why we do not yet have access to a brief, simple, to-the-point discussion of pertinent and significant methods and techniques.

Four factors have been selected which appear to be among the paramount reasons for the lack of convergence on the methods and techniques that could be used to assist in making decisions about identifying, adopting, and implementing sustainable transport practices.

I am optimistic that this explanation will be sufficient to establish that for reasons of technical complexity, as well as differences between communities in political, social, spatial, economic, attitudinal, and other circumstances, it is understandable that a short-and-sweet explanation is not to be found.

**1. Diversity among Decision-Shapers Means Diverse Interests in Methods and Techniques to Assist in Decision-Making.**

The evidence is clear that decisions about identifying, adopting, and implementing sustainable transport practices are made by individuals, governments, and businesses, as well as by public interest groups, vested interest groups, the media, and any other group or entity with opinions on the pros and cons of using the respective modes of transport to move people, move cargo, or move data. As a result of the numerous and diverse sources of opinion involved, it follows that the process of making decisions about identifying, adopting, and implementing sustainable transport practices would likely also involve a large and diverse body of methods and techniques.

**2. Numerous Academic Disciplines with a Teaching, Research, and Community Service Interest in Decision Making Means More Rather than Fewer Candidate Methods and Techniques to Support Decision-Making**

Within the academic and research communities in Canada, opinions on the pros and cons of using the respective modes of transport to move people, move cargo, or move data do not reside in the domain of one discipline or even several disciplines. An extensive review of the learned literature reveals that the disciplines and academic programs listed in Table 1 are among those that contribute to the methods and techniques that could be used in making decisions about identifying, adopting, and implementing sustainable transport practices.

**Table 1. Disciplines and Academic Programs that Contribute to the Methods and Techniques that *Could be Used* in Making Decisions about Identifying, Adopting, and Implementing Sustainable Transport Practices.**

Architecture	Psychology
Business Administration	Public Administration
Civil Engineering	Public Finance
Demography	Public Health
Econometrics	Public Participation
Economics	Public Safety
Environmental Studies	Recreology
Gerontology	Regional Science
Health Geography	Sociology
Health Sciences	Statistics
Land Economics	Telecommunications
Land Use Planning	Transportation Economics
Leisure Studies	Transportation Engineering
Mobility Studies	Transportation Geography
Physical Health and Education	Transportation Planning
Political Science	Urban Geography

It is highly likely that I have missed some disciplines and academic programs, but those listed demonstrate the wide range of disciplines and programs with an interest in this topic. It might be wished that these disciplines and programs would combine their methods and techniques into several dominant themes or orientations, but to my knowledge that is not often the case, and is not likely to become the general case.

That is, in my experience and what I can ascertain from the literature, in their teaching, research and service activities the disciplines hold or represent different objectives and perceptions regarding sustainable transport practices. Further, they have different outlooks on the processes of arriving at decisions to identify, adopt, and implement those practices. As a result, researchers tend to follow their respective disciplinary and program research paths, with only occasional ventures by the more adventurous or curious into extra-disciplinary, multi-disciplinary or inter-disciplinary pursuits.

It follows, therefore, in view of the large and diverse body of disciplines engaged in this field, that they would provide a large and diverse body of methods and techniques that could be used in making decisions about identifying, adopting, and implementing sustainable transport practices.

Further, I hasten to add, on the basis of findings from the literature searches and communications completed to date, it appears that relatively few researchers in this field are fully cognizant of the state of methods and techniques research in their own disciplines, much less in others. Given the seeming absence of convergence of methods and techniques, even within disciplines, the derivation of a short list of pertinent, significant, easy-to-understand methods and techniques from the engaged disciplines therefore seems to be very, very unlikely.

### **3. Differences in the State of Sustainable Transport Practices in Institutions and Communities Means a Range of Candidate Methods and Techniques**

The literature reviews and communications with experts reveal that there are wide ranges in the status of pure and applied sustainable transport research in institutions and communities in Canada (and in most other countries for that matter). Part of the explanation for the wide ranges in the state of research can seemingly be traced, I suggest, to the topic of sustainable transport practices being a relatively new, as opposed to mature, field of pure or applied research in most of the disciplines and academic programs listed above.

Consequently, for reasons of scientific and real world immaturity in the sustainable transport practices field, we are seemingly far removed from achieving consensus about preferred methods or techniques to use in decision-making in this field.

The overall result in the absence of consensus is that we are witness to the large and diverse number of methods and techniques that are encountered in the learned and popular literatures, as well as in consultant reports and government documents.

#### **4. Too Much Emphasis on Principles and Too Little Emphasis on the Methods and Techniques behind the Practices to Achieve the Principles**

The fourth and final reason for the inability to provide a brief, simple, to-the-point discussion of pertinent methods and techniques is due to a situation created by Canadians in general and their governments, including municipal governments.

Evidence from prior studies and current surveys reveals that Canadians and their governments at all levels are generally agreed about the high importance of sustainable transport. However, this is where good intentions and good actions seemingly part ways, because the agreement about the importance of sustainable transport is primarily in principle. That is, sustainable transport is widely embraced in principle by Canadians, but when it comes to practice it is a different story. Simply put, and as the surveys and analyses reveal, the attitude of many Canadians about personal transport is of a split nature. On the one hand, they want to continue driving private motor vehicles themselves but, on the other hand they want others to practice sustainable transport by walking, cycling, taking transit, or staying home and telecommuting, teleconferencing, etc. (Wellar, 2006a, 2007a, 2007b).

As for Canadian governments, there appears to be a similar discontinuity between thought and deed for a number of them. That is, across this country most if not the vast majority of official plans, comprehensive plans, general plans, transportation plans, development policies, growth policies, etc., espouse sustainable transport principles. Moreover, and as demonstrated by municipal governments' advertisements, as well as by municipal politicians' weekly and monthly columns in community newspapers from coast to coast, a great deal of time, effort, and public funds are spent articulating, approving, and promoting those sustainable transport principles.

Unfortunately, statements about principles in public documents are too often little more than expressions of good will, good intentions, or good public relations for tourism, branding, and image purposes. They do not preclude municipalities, or provincial, territorial, and federal governments for that matter, from actually engaging in relatively non-sustainable transport practices by funding, building and/or expanding inter-city expressways, by-passes, ring roads, freeway interchanges, inter-provincial bridges, intra-city bridges, arterial streets and collectors, and all manner of intersections to move more people and goods via private motor vehicles (Wellar, 2008a).

And this is where the methods and techniques research is confronted by a major obstacle. On the one hand, there is a large and relatively deep body of literature (learned, association, government) on sustainable transport principles. On the other hand, however, and as was learned from literature searches and a survey of Canadian municipal governments for a presentation at the 2007 TravelWise in Belfast (Wellar, 2007a, 2007b), the practices literature is still very thin, and by no means is it organized to support comparative studies.

With regard to the literature reviews, electronic, keyword-based searches were undertaken, as were content analyses of a number of texts. The electronic searches found references to

'practices' as a noun and a verb, and numerous expressions of support for both the noun and the verb, but not much in the way of demonstrated, actual practices undertaken by municipalities, corporations, or individuals. And, the same can be said about the textbooks: long on exhortation, and short on demonstration of sustainable transport practices identified, adopted, and implemented by municipal governments, corporations, or individuals.

In the case of the survey done for the TravelWise presentation, it involved more than 40 of Canada's largest municipal governments, and my expectations were high that I would have a solid database upon which to perform analyses. The text of the letter and the form that I designed for municipal respondents to complete are presented as Figure 1 and Figure 2.

The intent of the survey communications was to obtain basic information about practices, to organize the practices on a subject matter and temporal basis, and to re-contact a selection of municipalities to inquire about the methodologies that were used to achieve the practices.

Regrettably, and surprisingly, although several municipalities provided excellent responses, the overall result of the survey was a generally sparse collection of bits-and-pieces about practices. As a result, I had access to a very limited database from which to try to ascertain which methods and techniques may have been used, and whether the same ones were used for identifying, adopting or implementing the same or similar practices among municipalities.

No critical or instructive masses of information formed around any particular method or technique, or even classes of methods and techniques. It was subsequently learned through communications with some of the designated respondents that there may have been a common, widespread reason for the limitations of the responses.

It appears that prior to receiving the letter about the TravelWise presentation and the survey form, a number of the communities had developed relatively limited documentation of their sustainable practices records, and even less that was organized in such a way that it could be readily assembled in the time-structured way that I developed for the survey.

As noted above, there are numerous references in municipal government documents to principles, and many of these documents are posted on municipal websites, but the quality of documentation on practices is considerably weaker in many municipalities. With regard to the process of achieving sustainable transport practices, then, it is not reconciling a plethora of information from municipal governments about methods and techniques that is the research design problem for this report.

Rather, it is the dearth of readily available information about how sustainable transport-related decisions are made, and the absence of an established body of research that creates a very basic research design challenge. In brief, it becomes necessary to design a survey form and approach to obtain data which may not be systematically collected and organized at present, and to package the project in such a way that municipalities agree to participate.

**Figure 1. Letter Sent to Municipal Governments Requesting Information on Sustainable Transport Practices for a Presentation at the 2007 National TravelWise Conference, Belfast, NI, November 8-9, 2007**

Mayor and Council,  
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August 10, 2007

Re: City of ----- and Presentation on Sustainable Transport Best Practices at the National TravelWise Conference, Belfast, November 8-9, 2007.

Dear Mayor and Council,

I have agreed to be the International Speaker at the NATIONAL TRAVELWISE ASSOCIATION (NTWA) CONFERENCE – 8 & 9 NOVEMBER 2007 in Belfast. The theme of the conference is Transport & Climate Change – “Understand the problem – be part of the solution”, and the title of my presentation is “*Sustainable transport: Is there anybody here who can win this game?*”

On January 23, 2007 I gave a luncheon address to the Ottawa Kiwanis Club on a similar topic, *Sustainable Transport: Does Anybody Here Know How to Win This Game?* The PowerPoint slides used in the address were posted on several websites (e.g., Kiwanis Club of Ottawa; Transport 2000 Canada; and LAGGISS, U of Ottawa). That evening I received the invitation to be the International Speaker at the 2007 NTWA Conference.

At the request of NWTWA conference organizers, the focus of my remarks will be the extent to which municipal governments in Canada, including the City of -----, have identified, adopted, and implemented sustainable transport best practices. This line of commentary continues related remarks that I have made in conference presentations and publications on sustainable transport best practices over the years.

I do not know who at the City of ----- is responsible for documentation of this nature, or where it is located or how it can be accessed, so I would be most grateful for your direction on how to obtain the materials. I hasten to add that it would be most appreciated if I could receive a response at your earliest convenience, and that in the interests of time your reply include a “cc” to the City of ----- person responsible for the requested sustainable transport best practices documentation.

Thank you in advance for your consideration of this matter.

Barry Wellar  
Professor Emeritus  
University of Ottawa

**Figure 2. Framework for Organizing Responses to Inquiry about Sustainable Transport Best Practices for Presentation by B. Wellar to the National TravelWise Conference in Belfast, November 2007.**

The schematic shown below may be an appropriate format for organizing your response. Again, I am receptive to whatever is sent, but a tabular format will make it a lot easier for me organize materials for my presentation to the National TravelWise Conference in Belfast.

Experience of \_\_\_\_\_ with Sustainable Transport Best Practices

Name, Title or Phrase Describing Sustainable Transport Best Practice	Level and Year of Practice Achieved		
	Identified	Adopted	Implemented
Integration of land use and transportation planning	1974	1991	-----
Application of sustainability test to transportation projects, planning applications, and rezoning applications	2006	-----	-----
Bike rack requirement at private commercial buildings and public facilities	1993	2001	2005
Signal activation by transmitters in city buses	1988	1999	2006
Application of Walking Security Index to assess intersection performance for pedestrians	1998	2004	-----
Use of traffic calming devices to promote walking and cycling	1983	1987	1994
Moratorium on road or intersection widenings	2000	2001	2003

Thank you for your assistance, it is most appreciated.  
Barry Wellar

In closing the outline of the Research Problem, I suggest that the reasons given above are sufficient to explain why I have been unable to locate a handy-dandy, easy way to understand how methods and techniques are designed or used to assist in making decisions about identifying, adopting or implementing sustainable transport practices.

As a result of that finding, I am resigned to the fact that I cannot obtain what I am looking for in an existing textbook, nor can it be downloaded from the Internet. Instead, to the extent that resources and time allow for this part of Task 2, I am obliged to present a selection of illustrative examples of methods and techniques that *could be used* to assist in making decisions to identify, adopt, or implement sustainable transport practices.

Before providing the examples, however, several points need be made explicit about the limitations of this report in regard to providing details about the process of inquiry, the origins and derivations of the examples, and the decision stages of identifying, adopting and implementing sustainable transport practices.

### **C. Limits on Report Scope and Details**

This project has a limited amount of time and funding to conduct studies and produce findings in a domain which has received a limited amount of deep and sustained attention. Further, the body of work to be undertaken appears to involve a considerable amount of original research, which means that there are few precedents to call upon, or well-worn paths to follow while moving through the project tasks. As a result, in order to make the most effective and efficient use of time and resources, I am obliged to limit detailed discussions to topics that are directly specific to this project. Given that constraint, I call attention to three topics that I suggest warrant independent attention by the reader in order to better appreciate the examples that follow in Part D.

First, the methods and techniques in Part D *may be used* in any of the cataloguing, hypothesizing, or theorizing stages of scientific inquiry. Whether they *should be used* is a different issue, but they *can be used* to produce catalogues, hypotheses, and theories of sustainable transport practices.

As demonstrated by the literature on the topic of logical structures of scientific inquiry (Bowler, 1992; Doby, 1967; Miller, 1987; Simon, 1987; Wellar and Wilson, 1993, 1994) the contribution of these structures and processes to methodologically robust information and knowledge increases from the cataloguing through to the hypothesizing and theorizing stages. Further, in that same vein, the outputs of research methods and techniques are similarly characterized; that is, their contribution to understanding a phenomenon increases when their use or application in studies, projects, etc., moves beyond cataloguing to hypothesizing and then to theorizing.

It is beyond the scope of the present project to pursue such an inquiry, but I suggest that the examples in Part D are candidates for a study that assigns the methods and techniques on a best use basis to the respective stages in the inquiring process.

Second, a textbook or several textbooks of examples could be assembled for this project, time and resources permitting. However, the intent of this report is to prepare an indicative

selection of the methods and techniques that could be used to assist in identifying, adopting and implementing sustainable transport practices.

I believe that the examples in Part D provide a reasonable representation of the pertinent methods and techniques that could be used in the decision process. And, I further believe they provide a satisfactory context for evaluating the methods and techniques used by officials in municipal (and other) governments when making decisions about identifying, adopting, or implementing sustainable transport practices. Regrettably, validation of those impressions is beyond the scope of this project.

Third, identifying sustainable transport practices involves a number of activities, as do adopting and implementing sustainable transport practices. The nature and number of activities in each phase may vary by province, and they may vary between and among municipalities within a province. As a result, it is quite possible that Municipality A could use a total of 11 methods or techniques to move a practice through the process, Municipality B could use 17, and Municipality C could use 23.

Unfortunately, examining the very important matter of how effectively and efficiently municipalities (and other levels of government) perform the functions of identifying, adopting, and implementing sustainable transport practices is outside the scope of this project.

## **D. A Selection of Methods and Techniques that Could Be Used in Making Decisions About Identifying, Adopting, or Implementing Sustainable Transport Practices**

The methods and techniques selected for presentation in Table 2 are based on findings from the literature reviews, communications with leaders in the field, responses to the project notices sent to organizations, and my own experiences in the field of sustainable transport through research, teaching, consulting, service to community groups, service to public interest groups, and government service while at the Ministry of State for Urban Affairs, Government of Canada, 1972-1979.

Since material of this nature does not appear to have been previously published, and because the assembled list of examples has not been subjected to peer or other reviews, it may be prudent to proceed with caution. In that regard, I believe it is appropriate to regard the current list of methods and techniques as a preliminary indication of the kinds of entries that could be candidates for decision support roles.

Further, it is not intended that the presentation of examples of methods and techniques be, or be perceived to be, exhaustive. Rather, the objective at this stage is to be indicative, and to suggest the kinds of methods and techniques that could be used by municipal governments.

As for the rationale behind this approach, it reflects a lesson learned by many applied researchers engaged in public policy analysis, evaluation, etc. Invariably, I believe it is fair to

say, it is wiser to conduct the indicative phase first in order to learn if there is a productive point to going the exhaustive route; or, to re-phrase, what do you do with the product of your exhaustive effort if it turns out that the agency for which you work (on staff or as a consultant) has no intention of adopting or implementing your work?

**Table 2. A Selection of Methods and Techniques that *Could Be Used* in Making Decisions about Identifying, Adopting, and Implementing Sustainable Transport Practices**

1. Anatomical Sourcing	22. Life-Cycle Analysis
2. Attitudinal Surveys	23. Modelling
3. Authority	24. Normative Delphi Technique
4. Brainstorming	25. NIMBY Strategy
5. Charrette	26. Open House
6. Committee Approach	27. Opinion Polls
7. Common Sense	28. Optimization Techniques
8. Comparative Analysis	29. Panel Evaluation
9. Copycat/Follow the Leader	30. Pilot Study
10. Cost-Benefit Analysis	31. Policy Delphi Technique
11. Cost-Effectiveness Analysis	32. Pre-Test
12. Counterfoil Research	33. Referenda
13. Cross-Impact Analysis	34. Roundtables
14. Econometric Analysis	35. Scaling
15. Focus Groups	36. Simulation
16. Follow the Money	37. Squeaky Wheel
17. Forecasting Delphi Technique	38. Surveys
18. Highest and Best Use	39. Trial Run
19. Impact Assessment	40. Walking Security Index
20. Indicators	41. Workshops
21. Indexing	42. YIMBY Strategy

Table 2 lists some of the types, kinds, names, or other characterizations of methods and techniques that have appeared in the sustainable transport literature, or which have been proposed as candidates for inclusion among the array of selected methods or techniques developed for this report. For the reason of convenience, the terms are arranged in alphabetical order.

It is emphasized that this is a Research Report, and as such the contents of the current list are subject to change over the course of the project as new, more pertinent, more significant information becomes available. Readers are therefore invited to suggest additional terms for inclusion in a revised list.

## RESEARCH REPORT 1

### *Methods and Techniques that Could be Used in Making Decisions about Identifying, Adopting, or Implementing Sustainable Transport Practices*

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The proposed new terms will be examined, and will be added if they are deemed to be pertinent and significant additions to the assembled list. Further, descriptions of the new methods or techniques will be incorporated in the revised text, time and resources permitting,

Finally, it is my belief that the methods and techniques selected for Table 2 *could be used* by one or more of the groups of elected officials, professional staff, ordinary citizens, business people, members of the media, university students, researchers, etc., with an interest in sustainable transport practices. I believe it is appropriate at this exploratory stage of the project to place emphasis on breadth in order to present methods and techniques that engage all participants. Depth can always be added later if need be, and especially if additional, highly recommended methods and techniques are submitted by contributors with expertise in research methods and techniques, sustainable transport practices, and decision making processes in municipal governments in Canada or abroad.

## **E. Commentaries on a Selection of Methods and Techniques**

This section of the report contains commentaries on five of the methods and techniques presented in Table 2. The intent at this time is to apprise Transport Canada of the methodological design of the project, report on project progress, and provide examples of commentaries for the information of experts who accept the invitation to contribute to the more detailed, forthcoming project report, *Commentaries on the Methods and Techniques that Could be Used in Making Decisions about Identifying, Adopting, or Implementing Sustainable Transport Practices*.

The terms of reference for the commentaries follow the advice expressed in Part A, that is, "... keep discussions about methods and techniques of decision making as brief, simple, and to-the-point as circumstances and skills permit." As shown, the commentaries are not longer than two pages of text in length, they are similar to the level of reading materials in undergraduate courses, and there is no writing space available to go off on much of a tangent.

Finally, it is emphasized that these and future commentaries are not papers on their way to a refereed journal. Rather, the commentaries are standalone expressions of opinion, and they do not include references in the interests of brevity, keeping things simple, and staying on point for the respective method or technique.

The five methods or techniques selected for commentaries in this report are:

- Anatomical Sourcing
- Cost-Benefit Analysis
- Life-Cycle Analysis
- Open House
- Walking Security Index

The selected methods or techniques appear to be a reasonable starting point for several reasons, as follows: as per the commentaries, each of them could be applicable to the decision making process for any of the stages in achieving a practice (identifying, adopting, implementing); one or more of them would likely be familiar to each of the groups named in part B-1; one or more of them would likely have been a subject of discussion in each of the disciplines noted in B-2; they would likely be at different stages of sophistication and application among municipal governments (B-3); and, in regard to B-4, the respective methods or techniques or variations thereof could already be receiving a range of consideration in principle and in practice among Canadian municipal governments.

## **Anatomical Sourcing**

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The term ‘anatomical sourcing’ is used here to refer to a method of making decisions that is one of the oldest and most informal means of arriving at a decision in politics or any other aspect of life. Further, this approach to decision making is seemingly one of the most popular but least-admitted ways of arriving at a proposed solution to a problem.

Moreover, and despite the high frequency of times that the different ways of anatomical sourcing are mentioned in comments about how decisions are arrived at by municipal government committees, agencies, and councils, I have not encountered even two pages of text on this topic in the formal literature.

However, aspects of anatomical sourcing have frequently been mentioned in newspaper stories, listserv items, radio talk shows, television news broadcasts, and other communications critical of how decisions are reached by local governments and their elected and appointed officials.

There are a number of aspects to anatomical sourcing, but comments on three of them should be sufficient to illustrate where this approach fits in the methodologically designed research scale.

### ***Top-of-the-Head***

Users of this approach make decisions that are seemingly devoid of any sign of formal thinking, there is no apparent evidence to support positions taken, and the associated question at a public meeting could be,

“Did that answer come right off the top of your head? It sure doesn’t seem like you thought about the issue very much, very deeply, or very clearly. Have you actually read the report?”

## **Gut Feeling**

It is likely that every reader of this document has heard an elected official make the following statement or a variation thereof at a public meeting:

“I really do not understand what is going on; it is all so complicated with the charts and different points of view, and a lot of math, a whole lot of math, plus all those maps with routes going in different directions, so I am going to have to go with my gut on this one. I vote yes to spend the money and hope for the best.”

## **Knee-Jerk Reaction**

The knee-jerk reaction is commonly associated with sitting on the edge of an examining table, and the doctor whacks you below the knee with a little, rubber-tipped hammer to check out whether your foot moves in response to the hammer whack.

The associated situation in decision making is to respond instinctively to a button being pushed on some issue: there is no thinking, no evidence is considered, but rather there is a conditioned response to a word, a phrase, a proposition, etc. An illustrative question posed by a journalist to a municipal councillor could be,

“Why is it that every time a road widening proposal is presented to committee you immediately and invariably react by signifying that you are in favour, and every time a spending item comes up that involves walkways for pedestrians or facilities for cyclists, you immediately and invariably react by saying that there are other, higher priorities?”

In each of the examples of anatomical sourcing the decision-making process is easy and inexpensive, in that there is minimal to no thinking, and no evidence is collected or processed.

Under certain circumstances this kind of approach could be fully appropriate, such as replying to the very familiar and trivial question, “One sugar or two?” However, questions about identifying, adopting, or implementing sustainable transport practices are hardly ever trivial, so on its face this seemingly popular anatomical sourcing method is seriously flawed when it comes to using it in this decision environment.

As for methodologically designed research flaws, the following limitations indicate the weaknesses of the anatomical sourcing method.

1. The likelihood of specifying the data, relationships, and tests to support top-of-the-head impressions, unthinking knee-jerk reactions, gut feelings, or similar non-scientific ways of deciding, appears to be extremely low.

2. The likelihood of contributing to information or knowledge about how to make more rational decisions in the processes of identifying, adopting or implementing sustainable transport practices appears to be extremely low.
3. The likelihood of logically explaining decisions (about sustainable transport practices) that are based on top-of-the-head impressions or musings, knee-jerk reactions, or gut feelings appears to be extremely low.
4. The anatomical sourcing method fails the tests of reproducibility, verifiability, representativeness, and other fundamental features of methodologically designed research.

### **Cost-Benefit Analysis**

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There is a long history to cost-benefit analysis (CBA), but conceptually it is fundamentally straightforward. For a project, or for competing or alternative projects, calculate the costs to undertake the project(s) and calculate the benefits to be derived from the project(s), and then compare the totals to learn whether costs exceed benefits, or benefits exceed costs.

In terms of appeal, CBA has much to offer if all the costs and benefits (Cs and Bs) are known, all the Cs and Bs are measurable and quantifiable, all the Cs and Bs can be expressed in monetary terms or in some other pertinent metric, and the temporal and spatial aspects of the cost and benefit items that comprise a project can be totally attributed to that project.

Conversely, CBA loses its appeal as a direct function of the unknowns, immeasurables, and uncertainties associated with the items comprising the list of costs and benefits. And it loses further appeal if other confounding features are introduced into the calculations of costs and benefits, such as differences in the time spans or geographic areas over which costs are incurred and benefits are realized.

As for the term 'analysis', if the project or projects simply involve adding up the columns of costs and benefits, then all that is needed to conduct the CBA is knowing how to do arithmetic, or entering the numbers in a basic calculator, spread sheet, etc.

Conversely, if the CBA involves unknowns, immeasurables, uncertainties, and differences in temporal and spatial units, then the CBA could entail using a variety of estimation, interpolation, extrapolation, statistical, forecasting, fuzzy logic, and other techniques to generate the cost and benefit figures, and perform the cost and benefit comparisons.

Some of the issues in using CBA to assist in identifying, adopting, and implementing sustainable transport practices are outlined as follows.

## **CBA and Identifying Sustainable Transport (ST) Practices**

This is the stage at which naming sustainable transport (ST) practices begins. That is, the concept of sustainable transport is ‘unbundled’ and is represented by individual variables and combinations of variables which represent the different ways that ST may be achieved. During the transform process of moving from ST activities into identifying ST practices (by individuals, corporations, governments), the CBA approach assigns costs and benefits to the respective practices.

It is during this phase of the identify-adopt-implement process when it is learned whether the CBA approach is going to be relatively easy or relatively difficult to apply, and whether the degree of difficulty is going to apply equally or differentially to the modes for moving people (walking, cycling, public transit (bus, rail), private motor vehicle), freight (private motor vehicle, rail), and data (text, graphics, voice, etc.) in urban regions.

Finally, for reasons of changes in the field of sustainable transport, and in urban regions, as well as in the methodology of CBA, the use of CBA by decision makers in identifying ST practices can be an ongoing exercise.

## **CBA and Adopting Sustainable Transport Practices**

As the identify phase proceeds it provides the CBA results for individual, competing or alternative projects, and moves the decision process into the adoption phase. That is, decision makers say “Aye” (adopt) or “Nay” (do not adopt), and part of that deliberation can include declaring whether the CBA results are sufficient, or necessary but not sufficient, or not pertinent.

If the CBA results are necessary but not sufficient for making the adopt-do not adopt decision, the CBA can be extended by incorporating new parameters, conditions, constraints etc., in the calculations. By way of illustration, full life- cycle costing could be introduced or relaxed as the case may be, different financing arrangements could be introduced, as could new population estimates, new modal split assumptions, etc.

## **CBA and Implementing Sustainable Transport Practices**

In addition to critical questions about whether some or all costs are too high, some or all benefits are too low, or the cost/benefit ratio is not compelling, other key decision concerns about whether to implement sustainable transport practices involve where and when issues.

That is, where should one or more projects or parts of projects be located, and in what temporal order should they be built, installed, modified, etc.?

Further, what are the implications of making changes in regard to where and when ST practices are implemented?

This is the important legacy issue (Garrison, 2007) that would have been assessed during the adoption phase, but may warrant a separate CBA as one of the final checks on the completeness of the implementation phase. And, as per the discussion above, the CBA can be extended by taking into account ‘realities’ that sometimes become apparent only after the implementation phase has been initiated.

## **Life-Cycle Analysis**

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The ideas behind “life cycle-related” concepts and associated methods and techniques come from a variety of disciplines, are used in a number of fields including construction, engineering, and manufacturing. Moreover, they received a substantial boost in popularity when they were embraced back in the 1970s for their contributions to defining and measuring sustainability.

As a result, there is a rich and diverse body of “life cycle” experience and documentation, with ‘analysis’, ‘assessment’, ‘cost analysis’, ‘costing’, ‘engineering’ ‘impact assessment’, ‘inventory’, and ‘management’ among the members of the life-cycle family referred to in the learned, government, professional, and other literatures.

Although any member of life-cycle family would make useful contributions to the process of making decisions about identifying, adopting, and implementing sustainable transport practices, the life-cycle analysis technique is selected for this report for reasons which are outlined below.

It is appropriate at this early point in the commentary to belabour the obvious and emphasize that the term “life cycle” means just that, i.e., the full life of the project.

Therefore, and bearing in mind that projects may vary as a result of being built or bought, owned or leased, etc., it is indicatively noted that the full life cycle for a transport project could include such phases and activities as public hearings on planning, zoning, and economic development matters, appeals, design competitions, right-of-way acquisition, construction, operations, maintenance, upgrading, expansion, reduction, re-construction, modifications, replacement, and mothballing, removal, or environmental rehabilitation upon project termination.

As for selecting the analysis feature, the first point of import is that “analysis” is open to considering both costs and benefits. Consequently, life-cycle analysis, or LCA, is more than just a cost-based technique, but is capable of tying in benefits which can in fact change over the full life of a project.

In the case of sustainable transport practices, there are major differences between the life-cycle costs and life-cycle benefits of projects and programs for moving people by walking,

cycling, transit, or private motor vehicle, moving freight by rail or private motor vehicle, and moving data (text, graphics, and voice). Analysis can address those differences.

Second, LCA can significantly extend or expand the decision support information contained in life-cycle costing documentation. By way of illustration, life-cycle costing (LCC) does not stop at capital or initial costs, but calculates the total cost of the project incurred during its lifetime, that is, from start to finish.

By adding an analysis dimension, decision makers can ascertain where and when costs are being incurred to achieve the intended sustainable transport benefits. Moreover, this can be done for each of the identifying, adopting, and implementation phases of each sustainable transport practice, which makes LCA a powerful force for achieving accountability.

Third, and sharing a feature of cost-benefit analysis, the costs and benefits of life-cycle analysis are often expressed in monetary terms, but they can be expressed in other terms including social, environmental, health, etc., as long as the condition is met that the costs and benefits are measurable and quantifiable. If that condition is met, in the case of sustainable transport practices LCA can be directed at one mode at a time or all modes together in a comprehensive LCA, with that decision influenced in large measure by the degree of difficulty or complexity that decision makers can accommodate.

The role of LCA, therefore, is to quantify the inputs and the outputs, as well as externalities at each stage, phase, or interval of a project's life cycle, which is significant information for decisions about identifying, adopting, and implementing sustainable transport practices.

In addition, however, that high level of time-based documentation in and of itself has decision-making value, because it requires taking stock of the inputs and the outputs over a project's full life cycle, including the legacy dimension for the different modes of transporting people, freight, and data. To paraphrase Garrison (2007), the value in avoiding nasty, legacy situations or surprises cannot be over-stated.

Fourth, LCA is an appealing technique because its scope takes in all the impacts over all the stages, phases, or intervals of a transport project rather than focusing on any particular stage, phase, or interval. This LCA feature is of paramount importance if decision makers want to know about the cumulative impacts that are expected or forecasted to occur over the anticipated or assumed life of the project, or projects as the case may be. I hasten to add here that LCA is an analytical tool, and as a result LCA outputs are probably best regarded as inputs to a synthesizing technique for cumulative impact assessment purposes.

Finally, in regard to drawbacks they are not out of the ordinary and are not surprising. The LCA approach takes time and costs money when the analyses are rigorous and the projects complicated, and the state of data availability may not be conducive to immediately running high-level LCAs. However, that is not a cause for serious concern, because those drawbacks are common to many if not all the analytical tools identified during this initial round of

discussion about methods and techniques that *could be used* to assist in making decisions about identifying, adopting, or implementing sustainable transport practices.

**Open House**  
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The term “Open House” is used by municipal and provincial government agencies to refer to come-and-go meetings that are portrayed as opportunities for citizens, business people, community associations and interest groups to provide feedback on planning, development, transportation, zoning, and other proposed initiatives.

However, Open Houses are not solely within the purview of government bodies.

For reasons that include informing citizens about civic issues, shaping opinions on public policy and planning matters, and creating media events, Open Houses are also organized by the proponents or opponents of proposals, priorities, programs, and activities of municipal and provincial governments, as well as those of quasi-public and private corporations such as hospitals, universities, development companies, land developers, waste disposal operators, health facilities, and transportation companies.

Depending upon the issue, an Open house can feature from a half-dozen to fifty, sixty or more static display boards, as well as videos, PowerPoint slide presentations, and interactive computer presentations. The number of professionals on hand (staff, consultants) can range from two or three to 15 or 20. Members of the public in attendance may be fewer in number than the staff, or may outnumber staff by a ratio of 50-1 or more if the planning, development, transportation or other proposal is a contentious issue.

In terms of format, an Open House may begin with an opening statement by an elected official or officials, a staff person, or a consultant, and then one, two, three or more professionals (staff, consultants) make presentations about the purpose of the Open House and offer general comments about the display materials distributed around the hall, gymnasium or room.

The Open House process generally involves members of the public perusing the displays, videos, slides, etc., and then asking questions of the organizers, expressing opinions about the respective displays, and filling in a comment sheet or sheets.

### **Pros and Cons of the Open House as a Decision Support Tool for Sustainable Transport Practice Decision Making**

Initially the Open House technique was regarded by governments, interest groups, and citizens as a useful and reasonably productive means of engaging members of the community in civic affairs. Further, Open Houses were also an opportunity for members of the

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community to pick up reports or other documentation, share views with other members of the community about an issue, and arrive at a consensus position. Open Houses in their early days were deemed to provide a good read of the politics of an issue, largely because Open Houses were “the place” for the community to make its values, attitudes, and voting inclinations known to politicians, bureaucrats, and, very importantly, the media and especially community newspapers.

However, within the past decade several fundamental changes have occurred that make the Open House a marginal technique for many of the decisions involving sustainable transport practices. The changes and the causes of the changes are summarized as follows.

First, online access to municipal and provincial materials in many jurisdictions has significantly diminished the role of the Open House as a place for many people with civic talents, and especially technical skills, to obtain information and participate in civic affairs. The loss of these people downgrades the quality of discourse that could be used for decision purposes, and also raises major doubts as to the representativeness of any notion of consensus that might be reached.

Second, whether for reasons due to amalgamation, complexity of issues, a general decline in public participation, or other factors that diminish the quality of public discourse, there is an increasing sense that the Open House has become less a means of informing and listening to the public and more a means of simply going through the motions of public consultation.

Indeed, references such as ‘fraud’, ‘exercise in futility’, ‘waste of time’, ‘manipulation’, and ‘staged’ are often encountered in media reports to describe Open House topics that have broad and complicated scope, a long timeline, multiple decision points, and involve mathematics, statistics, engineering drawings, and other technical elements.

It seems clear, therefore, that any meaningful Open House contribution to decisions about sustainable transport practices would be highly suspect except under particular conditions and constraints. That is, each of the three phases of identifying, adopting or implementing sustainable transport practices requires more examination and analysis than can be provided by an Open House.

Major shortcomings include the inability to ask detailed questions, share responses, discuss responses among all interested participants, have time for reconsideration of choices, priorities, etc., and then re-visit such major concerns as budgets, timing, and legacy implications associated with each of the three phases.

If, however, an issue revolves around a matter that is particular to a neighbourhood, to a group of transport modes users (e.g. pedestrians, cyclists, transit riders), or sub-groups such as teen, adult, and senior pedestrians, or is otherwise limited in scope, complexity, and legacy implications, and the Open House is seeking a ‘popular opinion’ among the group or sub-group, then the Open House can be a useful, inclusive means for achieving an input for indicative decision purposes.

## **Walking Security Index**

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The Walking Security Index (WSI) project was approved in 1994 as an element of the Transportation Environment Action Plan (TEAP) of the Region of Ottawa-Carleton (now the City of Ottawa). One of the goals of TEAP was to encourage more trips by walking, and the primary mission of the WSI project was to design indexes measuring levels of safety, comfort and convenience experienced by pedestrians at intersections.

The thesis of the WSI research was that indexes could be designed that provide scores on the performance of intersections from the perspective of safety, comfort, and convenience of pedestrians, and the scores could be arranged in rank order. Then, for public safety, quality of life, engineering, traffic, enforcement, maintenance, health, or other purposes, the scores could be used to identify needed corrective actions at intersections rated from best to worst, or at problematic intersection quadrants, and the rankings would provide elected officials and Region/City staffers with information for prioritizing remedial actions.

More than 40 publications describe the research design and findings of the WSI methodology. This commentary overviews a selection of elements of the WSI project which are pertinent to a report on “Methods and Techniques that Could be Used in Making Decisions about Identifying, Adopting, or Implementing Sustainable Transport Practices”.

During the design phase (1995-1998) ten indexes were developed, and in the subsequent pilot study phase (1999-2002) three macro indexes were tested for operationality. In this commentary, the macro indexes are presented along with several observations about similarities between the WSI project and the Transport Canada project in regard to the identifying, adopting, and implementing phases of decision making.

### ***Intersection Volume and Design Index (IVDI)***

The IVDI is a dot product formulation,  $IVDI = V1 \cdot V2 \cdot V3 \cdot V4 \cdot V5 \cdot V6 \cdot V7 \cdot V8$ , that scores and ranks intersections in terms of “pedestrian friendliness”, *where*,

V1 = number of passenger car equivalents<sup>2</sup>/hour

V2 = number of pedestrians/hour

V3 = number of lanes rating

V4 = number of turn lanes by type rating

V5 = intersection geometry rating

V6 = intersection slope rating

V7 = direction(s) of traffic flow rating

V8 = number of channels adjacent to intersection rating.

**Quality of Intersection Condition Index (QICI)**

The QICI formulation uses a tabular format, and consists of 18 variables which represent a selection of design, construction, condition, and maintenance, standards and practices that affect pedestrians' use of sidewalks and intersections. The QICI uses a "Condition Met?" system which is quadrant-based, and the scores for quadrants or overall scores for intersections can be used for remedial and/or ranking and prioritizing purposes by elected officials and staff, as well as for calls for action by citizens and community groups.

**Driver Behaviour Index (DBI)**

The DBI formulation is an equation, and this index measures the level of aggressive driver behaviour at intersections used by pedestrians. Thirteen variables (two for running reds, two for running ambers, and nine for fail-to-yield) were considered when formulating, testing and refining the DBI.

$$\text{Driver Behaviour Index} = \frac{\text{ALI}}{P} + \frac{\text{RLI}}{P} + \frac{\text{FTYI}}{P}$$

where,

$$\frac{\text{ALI}}{P} = \text{amber-light incidents per phase,}$$

$$\frac{\text{RLI}}{P} = \text{red-light incidents per phase,}$$

$$\frac{\text{FTYI}}{P} = \text{fail-to-yield incidents per phase.}$$

The research on methods and techniques in the design phase of the WSI Project is directly relevant to the design phase of the Transport Canada project, as is the WSI pilot study research in the operational or implementation phase.

Making decisions about identifying variables, adopting indexes, and implementing the indexes and acting on index scores and rankings, corresponds to the decision processes of identifying, adopting and implementing sustainable transport practices. In addition, the WSI reports suggest ways of customizing the indexes to make them more appropriate for differences in weather, demographics, motor vehicle types and traffic, etc., which may lead to the kind of flexible methods and techniques needed for decisions about sustainable transport practices.

Finally, the WSI project reports include applications and critiques of a number of methods and techniques that are likely to be pertinent to the Transport Canada project, including attitudinal surveys, authority, comparative analysis, focus groups, indexing, indicators, modelling, panel evaluation, pilot study, policy Delphi, pre-test, and trial run.

## **F. Summary**

Three states of usage of methods and techniques in decision-making are pertinent to this project, and are illustrated by the following questions:

- Which methods and techniques *are used*?
- Which methods and techniques *could be used*?
- Which methods and techniques *should be used*?

The three states of usage will be frequently discussed individually and in combinations over the course of the project. In this report, the focus is on the methods and techniques that *could be used* to assist in making decisions about identifying, adopting, and implementing sustainable transport practices.

As demonstrated, for reasons involving diversity among decision-shapers, numerous academic disciplines with an interest in the report topic, differences in the state of sustainable transport practices in institutions and communities, and more emphasis on principles than on practices, there has been a lack of progress in achieving convergence of methods and techniques used to derive sustainable transport practices. Consequently, it has not been possible for me to prepare a short list of methods and techniques that *are used or should be used* in making decisions about identifying, adopting, or implementing sustainable transport practices.

A first step towards the short list is Table 2, which presents 42 methods and techniques to illustrate the types or kinds of approaches that *could be used* to assist in making decisions about identifying, adopting, and implementing sustainable transport practices.

The entries in Table 2 are from the learned, professional, interest group, and popular literatures on sustainable transport, or have been proposed as candidates for inclusion among the array of selected methods or techniques developed for this report.

The next section of the report contains brief, indicative commentaries on five of the methods or techniques: Anatomical Sourcing, Cost-Benefit Analysis, Life-Cycle Analysis, Open House, and Walking Security Index.

The intent at this time is to apprise Transport Canada of the methodological design of the project, report on project progress, and provide examples of commentaries for the information of experts who accept the invitation to contribute to the more detailed, forthcoming report, *Commentaries on the Methods and Techniques that Could be Used in Making Decisions about Identifying, Adopting, or Implementing Sustainable Transport Practices*.

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