Preliminary Report, Commentaries on Methods and Techniques that Could be Used in Making Decisions about Identifying, Adopting, or Implementing Sustainable Transport Practices

RESEARCH REPORT 2

Transport Canada Project

Methodologies for Identifying and Ranking Sustainable Transport Practices in Urban Regions

Principal Investigator:

Barry Wellar, PhD, MCIP
Professor Emeritus, University of Ottawa
Principal, Wellar Consulting Inc.
wellarb@uottawa.ca
http://www.wellarconsulting.com/

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A. Report Context and Purpose

Research Report 1, Methods and Techniques that Could be Used in Making Decisions about Identifying, Adopting, or Implementing Sustainable Transport Practices (Wellar, 2008), began by making explicit the three states of usage of methods and techniques which are pertinent to this project:

- The methods and techniques that *are used*.
- The methods and techniques that ***could be used*.**
- The methods and techniques that *should be used*.

After discussing the relationships between the states of *are used*, *could be used*, and *should be used*, Research Report 1 focused on the methods and techniques that ***could be used*** in making decisions to identify, adopt, or implement sustainable transport practices. Table 1 contains the methods and techniques selected from the literature on sustainable transport, and from the suggestions of experts, to illustrate the potential choices available to decision makers.

Table 1. Initial Selection of Methods and Techniques that *Could Be Used* in Making Decisions about Identifying, Adopting, and Implementing Sustainable Transport Practices

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

By way of a brief review, the process of selecting methods and techniques was then discussed, references to a number of texts on research methods and techniques were provided, and then Research Report 1 presented commentaries by the Principal Investigator on five of the items contained in Table 1:

- 1. Anatomical Sourcing
- 9. Cost-Benefit Analysis
- 21. Life-Cycle Analysis
- 25. Open House
- 39. Walking Security Index.

The intent of Research Report 1 was 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 of Research Report 1, 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.

Further, it was 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."

In terms of the reasons for selecting the five methods and techniques to start the discourse, they are paraphrased as follows from the discussion in Research Report 1:

- Each method and technique (M&T) could be applicable to the decision making process for any of the stages in achieving a practice (identifying, adopting, implementing), so they all have general applicability to the stages of the decision process;

- At least one M&T would likely be familiar to each of the groups involved in debates, discourse, deliberations, etc., involving decisions about sustainable transport practices, so the commentaries avoid the "ivory tower" label ;

- One or more M&T would likely have been a subject of discussion in each of the disciplines noted in Table 1, Research Report 1, as having an interest in the topic of this project, which means that a wide net is cast in terms of potentially engaging different research perspectives in the current project;

- Municipal governments that have given consideration to one or more of the five methods and techniques selected for demonstration purposes would likely be at different stages of sophistication and application regarding their use, which means that one or more commentaries may bring something new to the attention of municipal governments;

- It is highly likely that one or more of the methods and techniques selected for a commentary is already receiving consideration in principle, and perhaps even in practice from several to many municipal governments, so using an M&T or two which is or are familiar to municipal governments should help to facilitate communications between the Principal Investigator and the survey respondents for the participating municipal government.

Those summary comments provide the context for Research Report 2, and lead directly to a brief statement about the purpose of this report.

Research Report 2 extends Research Report 1 by presenting commentaries by the Principal Investigator on an additional four methods and techniques (Counterfoil Research, Follow the Money, Impact Assessment, and Normative Delphi), as well as a commentary by Murray Turoff on Policy Delphi.

Again, and consistent with the purpose of Research Report 1, the intent of this part of the project is to provide an indicative introduction to the kinds of methods and techniques that ***could be used*** in making decisions about identifying, adopting, and implementing sustainable transport practices.

In terms of the overall research process, a number of experts who expressed interest in contributing to the project were invited to prepare commentaries on the existing Ms and Ts, and/or to propose new Ms and Ts to be added to the list, and provide the accompanying commentaries. The objective behind seeking the broad base of contributors is to bring together as many opinions as circumstances permit, and thereby increase the expertise and experience being brought to bear on this very important topic.

A number of offers to prepare commentaries were received, but due to existing commitments and impending circumstances, many of the contributions are “on hold” for several weeks or more, and delivery dates are uncertain. On the other hand, however, municipal respondents, citizen groups, advocacy groups, members

of the media, and graduate students are inquiring about the availability of additional commentaries to those that appeared in Research Report 1. It appears, therefore, that while a more complete package would be the result of waiting until more commentaries can be assembled, there is a strong interest in seeing additional commentaries without having to wait several more weeks or longer to do so.
The compromise position is that by publishing Research Report 2 now as a preliminary report, more commentaries will be immediately available for all interested parties while the survey of municipal governments is in its early stages. Further, in the interests of completeness, the final research report on methods and techniques that ***could be used*** will include the current commentaries, as well as the commentaries in process and under consideration, and an end-of-year target date has been set for the final report.

It is appropriate to note as a form of *caveat*, therefore, that publishing the preliminary report is an interim measure. A more comprehensive set of methods and techniques that could be used in making sustainable transport decisions will be made available on or about the end of December, and sooner if sufficient numbers of commentaries are assembled before that date.

B. Organization of Research Report 2

This report builds directly on Research Report 1, and primarily involves adding commentaries for methods and techniques listed in Table 1.

The methods and techniques chosen for inclusion in Research Report 2 reflect a mix of requests received from readers of Research Report 1, topics not assigned to external commentators, and the Principal Investigator's impression of the commentaries that might best serve as means to make connections between the methods and techniques that are currently used to make decisions about identifying, adopting, and implementing sustainable transport practices, and those that should be used.

Table 2 contains the titles of the methods and techniques for which commentaries are presented in Section C. The commentaries in Research Report 1 are included for the convenience of the reader, and to build a cumulative, self-contained body of commentary.

The topics listed in Table 2 appear sufficient to meet the objective of providing an expanded, indicative introduction to the methods and techniques that ***could be used*** in making decisions about identifying, adopting, and implementing sustainable transport practices.

Further, they also appear sufficient to indicate the nature of the discussion later in the project regarding the relationships between methods and techniques that *are used* (under development via the municipal government survey), those that *could*

be used, and those that *should be used* in making decisions about identifying, adopting, and implementing sustainable transport practices.

As noted earlier, the methods and techniques that *could be used* are discussed during this phase of the project, and those that s*hould be used* will be the focus of attention when the results from the survey of municipalities are in hand, and the final compilation of methods and techniques that *could be used* is assembled.

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

Name of Method or Technique	Commentator
1. Anatomical Sourcing	Barry Wellar
2. Cost-Benefit Analysis	Barry Wellar
3. Counterfoil Research	Barry Wellar
4. Follow the Money	Barry Wellar
5. Impact Assessment	Barry Wellar
6. Life-Cycle Analysis	Barry Wellar
7. Normative Delphi Technique	Barry Wellar
8. Open House	Barry Wellar
9. Policy Delphi Technique	Murray Turoff
10. Walking Security Index	Barry Wellar

C. Commentaries on Methods and Techniques

Several conditions or caveats associated with exploring the ***could be used*** aspect of employing methods and techniques in decision making were stated in Research Report 1, and are stated above in this report, so there should not be a need to repeat them again. However, it is my experience that it is advisable to err on the side of explicitness and over-statement, rather than implicitness and under-statement, when it comes to writing reports on research methods and techniques, and particularly when the materials may be used in debates about transportation issues. These comments are intended to minimize the extent to which the commentaries could be inadvertently misconstrued.

First, 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. These are not advanced as good, better or best methods and techniques; rather, they are a selection of methods and techniques that ***could be used*** because all of them have in fact been used in transportation decision-making situations, and/or have appeared in one or

more of the bodies of literature which comprise the literature on sustainable transportation.

Second, the Ms and Ts are listed in alphabetical order for convenience, and their order of appearance does not necessarily indicate their value, merit, utility, etc., as decision-assistance instruments.

Third, the terms of reference for the commentaries in research Report 2 follow the advice expressed in Part A of Research Report 1, that is, "… keep discussions about methods and techniques of decision making as brief, simple, and to-the-point as circumstances and skills permit."

Towards that end, 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 the limited writing space tends to limit opportunities for commentaries to go off on tangents.

Fourth, it is emphasized that these and future commentaries are not articles 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.

This approach is consistent with the objectives and research design of the project, and leaves the "heavy lifting" of a more learned report to a future activity.

Finally, commentaries are provided for 10 methods and techniques. This appears to be a sufficient amount of coverage for an indicative introduction to the topic of methods and techniques that could be used to make decisions about identifying, adopting, and implementing sustainable transport practices.

As demonstrated, some of the methods and techniques are strong in terms of analytics and others are weak, some are more applicable to one phase or another, whereas others are applicable to all phases, but all the methods and techniques discussed in this report could be used in the process of identifying, adopting, and implementing sustainable transport practices. Consequently, they serve the purpose of beginning to elaborate the mix of methods and techniques that could be used for decision-making purposes, and outlining the possible connections between methods and techniques that could be used vis-à-vis those that are used and should be used.

Information about the commentators, including their affiliations, email addresses, and website urls is provided in Appendix 1. Interested readers can "check out" the commentators in terms of expertise, training, experience, etc., via the urls, or via a Google search.

Anatomical Sourcing

Barry Wellar

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 been mentioned for decades in newspaper stories, radio talk shows, television news broadcasts, and more recently as highly visible listserve topics involving communications critical of how decisions are reached by elected and appointed officials in local governments.

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 spectrum.

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 am not ashamed to admit that I have nor been able to read all the reports, and that I really do not understand what is going on; it is all so complicated, with the charts and different points of view about whether buses or trains are better, and which way the modal splits are going, and how many seniors want to walk for health, and then there is 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 rubber-tipped hammer to check out whether your foot moves in response to the whack. An 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

Barry Wellar

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 (see references to the work of William Garrison in prior project reports) 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.

Counterfoil Research

Barry Wellar

Among its many features, Counterfoil Research challenges conventional wisdom, confronts the bandwagon effect, ensures that opposing alternatives are explicitly recognized, and emphasizes that the search for the right way to do things is to provide a full and fair hearing for different and opposing points of view. While this may be seen as a contrarian procedure, it is not; rather, it is another means of improving the validity, reliability, reproducibility, and credibility of research processes and research outcomes, which in point of fact is the essence of methodologically-designed research. (**Note:** The CR line of thinking began for me while in graduate studies at Northwestern University in the 1960s, was expanded at the Ministry of State for Urban Affairs, 1972-1979, and has been ever-present during my involvement in community affairs in a number of cities in Canada, the U.S., and abroad over the past 40 years. Any seeming reference to particular municipal councils, or municipal officials, is purely coincidental.)

It is my impression that few municipal governments in Canada have formally adopted Counterfoil Research (CR) as a practice to incorporate in decision making, so this commentary is written at the "Methods 101" level. Readers who want more depth can find it in textbooks and by searching the Internet. To introduce the Counterfoil Research (CR) method, I first briefly characterize the thinking among officials sitting at what might be termed "the comfortable committee table" at city hall.

Comfortable Committee Table

Around this table the following thoughts, and admonitions-to-self, arise when the presentation on a complex and controversial sustainable transport issue concludes, and all eyes are on the committee members:

- Don't rock the boat! Don't make waves!
- Where is the path of least resistance on this one?
- Remember: You get along by going along.
- Ask no questions if you won't understand the answers.
- Damn, is that woman from the community newspaper here again?
- Better to look wise and say nothing, than to ask a question and get an answer that makes people in the public gallery snicker.
- These consultants and city staff could be in my ward next, so what happens if I disagree with their report?
- Is this a good time to suggest another study?
- This situation is dragging and dragging, is there no way to move it off the table and away from the media?
- Will I be seen as a trouble-maker if I disagree with the basic premise behind the study?
- Why don't we just do things the way we always have?

It is my experience in government, and in communication with others in government, that many elected officials and staff opt to "go with the flow" whenever the opportunity presents itself. Rarely do they rouse themselves to take serious, protracted, informed issue with such fundamental. research concerns as assumptions, premises, quality of data, representativeness of data, methods of research design, logic of hypotheses, biases, powers of techniques of analysis, theoretical underpinnings of empirical 'findings', the robustness of interpretations, or the soundness of generalizations.

Enlightening Committee Table

In city halls where elected officials and staff are conscientious about public issues, they sit around what might be called "the enlightening committee table". These are some of the thoughts they have, and public statements they make:

- I'm from Missouri on this notion, and I do not accept the recommendation.
- I am totally skeptical about those findings. What methods were used, and why, to make the predictions?
- I'd have to suspend disbelief to buy that reasoning. The time series run for 30 years, why did you only use the last 30 months?
- Is there any substantive evidence to support that recommendation?
- How hard did you try to find an alternative explanation?
- Does everyone believe, with certainty, that this is the best way to go?
- We have only heard from transportation experts who want to build roads. When do we hear from transportation experts opposed to road-building?
- For years staff argued to go north-south with LRT, and now they are arguing to go east-west with BRT. This research process is illogical.
- Staff agreed with the consultants when they bent one way, and now they agree with them when they bend the other way? What is going on here?
- The consultants got a lot of money to produce that LRT plan, and even more to defend it. How much was spent to challenge it from premises and assumptions through analysis to interpretations and findings?

Counterfoil research could be pertinent to any situations or circumstances involving non-trivial aspects of identifying, adopting, or implementing sustainable transport practices, and could even be used as an accountability instrument. That is, since the CR method can be used throughout the sustainable transport decision-making process, it is a means for elected officials to oblige staff and consultants to provide detailed accounts of how and where the CR method is used in a project, and to provide detailed explanations of why it is not used.

Follow the Money

Barry Wellar

While some elements of this method of decision making have remained constant for many decades, other elements have undergone major changes in recent years. As a result, it is important for all affected parties -- politicians, professional staff, and citizens -- to understand which element(s) of the Follow the Money method is driving decisions. Some of the elements and their strengths/weaknesses may be summarized as follows.

The Follow the Money or FtM method is sometimes confused with a related method referred to as the Other People's Money (OPM) method, because a core element of FtM is to base decisions involving capital projects on how much money can be obtained from other governments. By way of illustration, if the federal and provincial governments in combination cover 90 per cent of the capital costs of a project, then that becomes a "ten cents on the dollar" initiative by a municipal government. As shown by the Canadian record over the past 40 or so years, a project with that level of funding is very attractive relative to one which requires the municipality to put up 80 or 100 per cent of the capital cost.

Similarly, and more importantly for many infrastructure programs, when it comes to the matter of never-ending and ever-increasing operating costs, municipal governments are much attracted to initiatives for which the cost-sharing burden falls in part, or better yet, largely, on other governments. The key point is that capital costs have an end, but operating costs continue until the facility is de-commissioned and removed, so there is considerable appeal in following money trails to the coffers of other governments if they lead to operating cost relief.

One major attraction of this method is that municipal politicians and staff can provide infrastructure at perceived bargain prices, property taxes do not take a hit, and municipal taxpayers can seemingly enjoy an infrastructure which is far "richer" than the one available if the money trail did not extend beyond city hall.

Unfortunately for municipal governments, a major weakness of the FtM approach lies in the absence of guarantees that the full amount of promised or expected capital funding or operating support will be provided in a timely, unconditional matter. Consequently, the FtM method can be the source of nasty surprises. And, as bad luck would have it, the bigger the project dollarwise, the greater its indivisibilities, the longer its lifespan, and the deeper its legacy hooks, the nastier the surprises when things go awry and for political, financial, or other reasons the money trail suddenly disappears leaving municipal governments holding the bag.

Other elements under the FtM umbrella include "zero-based budgeting", "lowest bid selection procedures", "value for money", "accountability", "the buck stops here", "zero means zero", and "the bottom line". In all cases the focus is on "the money" raised and spent by municipal governments, and "the money" is a key

factor in making decisions to do or not to do things, such as identifying, adopting, and implementing sustainable transport practices.

All these elements and others have aspects or dimensions that cause their presence to be felt regularly at municipal council and committee meetings, and always during budget deliberations. And, since money is involved, other parties such as corporations and ordinary citizens have an interest in the money trail, and especially if it leads to their tax bills and then their bank accounts/wallets.

In the remainder of this commentary about FtM I note characteristics of elements that illustrate why the FtM method ***could be used*** **in making or challenging decisions** in any of the identifying, adopting, and implementing phases:

- "Equity": Who receives the benefits, and who pays? FtM.

- "Accountability": Who approved the program cuts, and the expenditures? FtM.

- "Value for money": Look to the opportunity costs, bearing in mind that knowing the cost of everything and the value of nothing does not bode well for achieving sustainable transport systems. FtM.

- "Penny wise and pound foolish": Who determined that it is cheaper to pay the costs of civil suits than to properly maintain roads and sidewalks in winter? FtM.

- "Pay me now or pay me later". These words were/are used in an ad for Fram oil filters, and the point was/is to replace the oil filter at regular intervals for about $10, or run the risk of an engine job costing a lot more, say $2500. The Fram filter message is fully applicable to sustainable transport deliberations, and is very relevant to pedestrians who trip on broken or icy sidewalks, cyclists who cannot safely navigate poorly designed or non-existent bike lanes, transit riders who must clamber over snow banks to access or egress buses, and motorists who cannot evade wide and deep potholes, all of whom can and do sue municipal governments for redress. FtM.

Finally, it is appropriate to emphasize that the Follow the Money method is directly related to at least ten of the other methods identified in these reports, including cost-benefit analysis, cost-effectiveness analysis, econometric analysis, highest and best use, life-cycle analysis, squeaky wheel, and those such as Walking Security Index which assign responsibility and liability to municipalities for achieving practices that provide safe passage of pedestrians.

Impact Assessment

Barry Wellar

Conceptually and operationally, the field generally referred to as Impact Assessment (IA) encompasses some of the most powerful bodies of methods and techniques that could be used to assist in making decisions about identifying, adopting, and implementing sustainable transport practices.

The price to be paid for this capability is that the degree of technical difficulty is relatively high. However, a bit of methodological and technical difficulty is a small price to pay to achieve sustainable transport practices in the face of capital and operating transportation costs in multi-millions of dollars every year in each of Canada's large urban centres, to say nothing of the negative effects that excessive fossil fuel consumption has on the earth's climate, public health, etc.

In this commentary I outline a selection of distinguishing features of Impact Assessment, including several that may assist the reader to decide how to peruse the 4,850,000 results that a Google search (November 29, 2008) located for the phrase "Impact Assessment".

First, impact assessment is conceptually and operationally different in one very fundamental respect from the related fields of activity known as policy analysis, policy research, or impact analysis. While the latter approaches are concerned in varying degree with the basic who, what, where, when, why, and how of policy considerations, ***Impact Assessment (IA) contains an explicit evaluative component regarding the consequences of public policy processes, and the associated plan, development, and program interventions which implement public policies.*** Since the evaluative feature is central to ranking potential sustainable transport practices from worst to best, IA could be used to assist decision making in each of the phases.

Second, by design IA establishes relationships between causes (policy, plan, development, or program interventions) and effects (consequences arising from interventions), which means that IA could be used during the process of identifying, adopting, and implementing sustainable transport practices, all of which involve interventions to either do or not do something about a situation.

Third, an IA is a multi-tasking capability that can be structured to deal with evaluating policy, plan, development, and program consequences on a sectoral basis (e.g. environmental, financial, energy, economic, social, health, resource consumption, etc.), or on a multi-sectoral basis (two or more sectors are combined in the evaluation of consequences). As a result of that flexibility (and very importantly for this project), the IA can be structured to evaluate the consequences of identifying and not identifying, adopting and not adopting, and implementing and not implementing sustainable transport practices for people and freight transport modes, as well as for an entire urban transport system.

Fourth, an IA study can be organized on a spatial basis, which means that it can operate at the most disaggregate level for which data are available or can be collected, such as intersections for the road network, postal codes for the origins and destinations of cyclists, pedsheds for transit users, and traffic zones for the origins, distributions, and destinations of person and cargo trips by private motor vehicle. The consequences of interventions (sustainable transport practices) can therefore be evaluated wherever they occur, by mode on a neighbourhood, ward, traffic zone, or other locational basis throughout the urban region. Moreover, and directly pertinent to this project on sustainable transport practices, the IA exercise can be designed to yield evaluative statements about the health, economic, environmental, social, public safety, pollution, equity, etc., consequences of changes in accessibility, mobility, and other measures due to interventions.

Fifth, Impact Assessment exercises are longitudinal rather than cross-sectional studies. As a result, in addition to being a means to evaluating the consequences of states of affairs at points-in-time such as annually, IA can be applied to processes by adding a points-over-time dimension to capabilities noted above. Hence, the process of identifying, adopting, and implementing sustainable transport practices can be associated with such processes as urbanization, intensification, densification, sprawl, congestion, environmental degradation, and resource depletion on a fine-screened temporal basis, such as hourly or daily.

Sixth, IA is a form of macro method driven by its emphasis on evaluation, and provides an analytical/synthetical umbrella for other methods and techniques in Table 1 that in combination can contribute to a comprehensive determination of consequences arising from interventions. Candidates for inclusion in an IA exercise evaluating the consequences of identifying, adopting, and implementing sustainable transport practices include the methods and techniques numbered 7, 9, 10, 11, 12, 13, 16, 17, 19, 20, 21, 22, 23, 27, 29, 30, 31, 36, and 38.

For this project, the most obvious, potential application of IA is to the implementation phase, since it is unlikely that any municipal government in Canada decides to proceed or not proceed with a non-trivial transportation intervention without carefully evaluating the consequences of the decision. At the adoption stage IA has various uses, such as evaluating how, for example, part or parts of a transportation system could be affected by increasing or decreasing modal splits should a policy, plan, development, or program intervention be adopted to achieve a particular sustainable transport practice.

Finally, application of the IA approach at the identifying stage includes situations where empirical evidence is available for deriving the variables representing sustainable transport consequences of interest to municipal officials, interest groups, citizens, as well as provincial and federal governments.

Life-Cycle Analysis

Barry Wellar

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 could usefully contribute 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 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.

Normative Delphi

Barry Wellar

The Delphi technique is a means of organizing a group discussion in a structured way so that the views, expertise, beliefs, aspirations, etc., held by individuals effectively and efficiently converge to represent a group opinion about how to best address a problem, issue, concern, opportunity, etc.

There are a number of different kinds of Delphi exercise, but they tend to fall into three basic categories. The categories are briefly described, and then the Normative Delphi is discussed in the remainder of the commentary.

Delphi Categories

Normative Delphi exercises are explorations of *what should be*, and are therefore pertinent to this project which has specific regard for the methods and techniques which are used, could be used, and should be used in making decisions about sustainable transport practices. Achieving consensus about a preferred future state or process is typically the primary research objective, and the research might seek an opinion on targets for trip shares by mode and geographic area that best advance a sustainable transport agenda, or it could focus on infrastructure-based intensification levels most likely to encourage active transportation and discourage private motor vehicle use.

The objective of ***Forecasting Delphi*** exercises is to derive *predictions* about events for which limited, uncertain, conflicting, or undirected knowledge currently exists. For example, the research problem could involve wanting to know when a municipality will need to remove roads and streets from the transport grid because of maintenance costs, or when a city's public transit fleet and operations will require major make-overs to deal with an expanding clientele of seniors who are prepared to give up their private motor vehicles but not their mobility.

Policy Delphi exercises focus on issues, problems, questions, etc., that have a *public policy* or *political* aspect. The purpose of the policy Delphi is not to achieve expert consensus; rather, it is concerned with ensuring that the range of politically relevant variables and contextual parameters are identified and explored, and a basis is in place for informed policy discussions by elected officials, bureaucrats, or citizens, all of whom have an interest in policy choices. A policy Delphi exercise of broad interest would be an exploration of how mixed-use development promotes active transportation while achieving health, tax, greenhouse gas, and global change benefits in the process.

With those paragraphs as context, and noting that each category is pertinent to this project, the Normative Delphi is briefly discussed. I am pleased to add that Professor Murray Turoff has prepared a commentary on the Policy Delphi, and it is included later in the report.

Normative Delphi and Identifying, Adopting, and Implementing Sustainable Transport Practices

As noted in Research Report 1 on the *are/could/should* states of decision-making, the first opportunity for a group dynamic is to identify sustainable transport practices. The practices can be associated with each of the people modes (walk, cycle, skateboard, scooter, transit, private motor vehicle, etc.), each of the freight modes (courier, private motor vehicle, rail, etc.), as well as the data-moving, substitution (e.g., telecommuting) mode, and the practices that should be identified for possible adoption and implementation can be done on a mode-by-mode basis, on a comparative mode basis, or on a system basis.

As for the "experts" on the Normative Delphi panel(s), they include users of modes; representatives of mode advocacy groups, public interest groups or vested interest groups; planners; engineers; health professionals; public safety professionals, and elected officials. The primary criteria for membership on the panel include expertise by training and/or experience in prescribing what should be in regard to achieving sustainable transport practices by mode or modes, and the willingness to adjust personal positions in order to make unbiased decisions in the pursuit of group consensus.

The second task for the Normative Delphi group or groups of individuals is to achieve consensus on which of the identified sustainable transport practices should be adopted, with pertinent issues addressing such topics as the priority of practices adoption, the timing of adoption, and the trade-offs to be made under different financial, economic, social, political, environmental, geographic, or other scenarios particular to a municipality. In large measure the same criteria for panel membership apply, but the extent to which members have knowledge about and experience in using research methods and techniques along the lines of those presented in this report is likely to directly affect both the amount of time needed, and the quality of findings.

Task three in this Normative Delphi illustration is to achieve consensus on which of the adopted practices should be implemented, and again such issues as when to implement which practices, where they should be implemented in what order, the priorities for implementation, proper evaluation procedures, financing arrangements, and legacy strategies come into play as the identifying and adopting processes come to the final, action stage of "doing" the practices.

The media, listserves, newsletters, and conference sessions are increasingly noting the number of occasions that discussions about transportation matters frequently seem to go around in circles, return to square one after months or even years of meetings, or otherwise fail to come to a productive conclusion. The Normative Delphi is a technique which is designed to achieve consensus on what should be in regard to sustainable transport practices, and could be used to facilitate the identifying, adopting, and implementing decision process.

Open House

Barry Wellar

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 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.

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”, “scam” 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.

Policy Delphi

Murray Turoff

The design of a communication structure for the Policy Delphi resulted from the problem a high level US government director expressed in the late 1960's:

> "When I ask the bureaucracy for information on a major policy decision, the result is that they try to guess what decision I plan to make and give me only the material to support that view. Even if the situation predictates a specific result, I need to know the most significant counter arguments I will be up against when I go public!"

He stated this when he was told about a Delphi process that had recently been used for a forecast of the use of strategic materials in the steel and ferroalloy industry. That exchange of communications resulted in a specific design for a Delphi which was oriented, not to obtaining a consensus, but to generating the strongest pro and con arguments for different resolutions of a specific policy issue. The characteristics of this design were:

1. Invite at least 20 individuals already committed to being strong advocates of very different resolutions of the policy issue. (In general 3-5 individuals for every very different type of resolution.)
2. Make a list of the **obvious resolutions** and ask each participant to add any resolutions they feel are missing from the list. This is supplied as part of the invitation to participate.
3. Take the final list of all the contributions and ask the respondents to vote on two relevant scales for each option:
    a. **Desirability**: how desirable is the solution?
    b. **Feasibility**: how feasible was the solution?
4. Look for those items that exhibited either polarized or flat uncertain distributions on either variable and ask the respondents to state:
    a. The **rationale or justification** for their view
    b. The **uncertainties** that might change their view with better or different information
5. Collect these and ask respondents to vote in the following round on two scales for all these comments or replies to the original options for decision:
    a. **Importance** of the comment to influencing the choice of the option
    b. **Validity** of the comment since it might be important only because others believed it was true.
6. Collect the votes and provide at least one more round for further input either in vote changes or added comments.

If the amount of alternative resolutions is in the range of three to five, the exercise can be designed to try to complete the process in three Delphi rounds by collecting more responses to positions in the first and second rounds. If it is a more complex situation, it would normally take five rounds to handle with the original paper and pencil process. Every participant is shown his or her prior votes, and given the option for changing a vote at any time in the process.

Today, the exercise can be performed in one continuous process when it is created as an online Dynamic Delphi. By this technique individuals can do any of the above operations at any time, and the computer serves to organize the material in the above structure as it is created and as it is changed. If one is dealing with a committed group of professionals with respect for the other participants, even though they may have disagreements, this complete freedom of response is possible. However, when there are emotions that lead to difficulty in communication or maybe even problems such as insults, everything (except votes) should be reviewed by a monitor before it is made visible to the group.

Each summary of the results, whether done by paper rounds or a single computer-based structure, should keep reorganizing the results into lists which are reflected in design characteristics 3, 4, and 5, above, that is lists of most desirable policy options and sub-lists of feasibility within that classification, and the most important comments with sub-lists of validity.

What one hopes is that agreements will occur on rationales and justifications that both sides can agree are important and valid. This may lead to new options being proposed or for vote changes on the original options, which in turn could bring about a shift in the most preferred options, and in some instances an emerging consensus.

When the Policy Delphi involves a group of individuals who have respect for one another, it can be left to the participants to decide whether to enter comments anonymously or with their names attached. Flexibility is important, since in professional circles participants might want credit for supplying information useful to others. However, when this is not the case it may be desirable to allow pen names that refer to participants but do not divulge identities.

There are policy choices to be made during each of the phases of identifying, adopting, and implementing sustainable transport practices. As a result, the Policy Delphi could build upon or be based on the outcomes of a Normative Delphi exercise. Conversely, the Policy Delphi could be the exercise that sets the stage for a Normative Delphi, and in this arrangement the policy choices for each phase in the sustainable transport practice process become the basic inputs to the search for consensus about policy options via the Normative Delphi. The general comment about the Policy Delphi technique is that it could be used in making decisions during each of the phases of identifying, adopting, and implementing sustainable transport practices.

Walking Security Index

Barry Wellar

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.

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 formula, IVDI = V1 • V2 • V3 • V4 •V5 • V6 • V7 • V8, that scores and ranks intersections in terms of “pedestrian friendliness”, *where*,

V1 = number of passenger car equivalents^2 per 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.

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

where,

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

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

$\frac{FTYI}{P}$ = 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, normative Delphi, panel evaluation, pilot study, policy Delphi, pre-test, and trial run.

D. Summary

Research Report 2 is an extension of Research Report 1 (Wellar, 2008), and the remarks made in the prior report are fully applicable for this report:

"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*** in making decisions about identifying, adopting, and implementing sustainable transport practices."

This report extends Research Report 1 by increasing the number of commentaries on methods and techniques from five to 10. Since the intent of Research Report I and Research Report 2 is to present an indicative introduction to methods and techniques that ***could be used*** in making decisions about sustainable transport practices, the 10 commentaries serve that purpose for a preliminary report, and more can be added in a follow-on report.

Looking ahead to the discussion about methods and techniques that *are used*, *could be used*, and *should be used*, it seems likely that the selection of methods and techniques with associated commentaries presented in this report is sufficient to support the ***could be used*** leg of the discourse. However, it is intended that, circumstances permitting, more commentaries will be added in order to provide as robust a bridge as possible between the methods and techniques that are used, and those that should be used.

E. References

Wellar, B. 2008. *Methods and Techniques that Could be Used in Making Decisions about Identifying, Adopting, or Implementing Sustainable Transport Practices*. Research Report 1 **http://www.wellarconsulting.com/**

APPENDIX 1

Contributors to the Transport Canada Project Publication,

Preliminary Report, Commentaries on Methods and Techniques that Could be Used in Making Decisions About Identifying, Adopting, or Implementing Sustainable Transport Practices

Murray Turoff
Consultant
Professor Emeritus, New Jersey Institute of Technology
turoff@njit.edu
http://is.njit.edu/turoff
Telephone (after January 16th) 973 361 6680
Skype: mturoffsrhiltz

Barry Wellar
Principal, Wellar Consulting Inc.
Professor Emeritus, University of Ottawa
Distinguished Research Fellow, Transport 2000 Canada
wellarb@uottawa.ca
http://www.wellar.ca/wellarconsulting/