



**Report on the Scenario Workshops of  
the Futures and Strategies Network (FSN)**

Prepared for


**National Research Council Canada**

Prepared by:



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## 1. BACKGROUND / INTRODUCTION

### 1.1 A Succinct Explanation of Scenarios and Scenario Planning

*“Scenario planning is a discipline for rediscovering the original entrepreneurial power of creative foresight in contexts of accelerated change, greater complexity, and genuine uncertainty.”* Pierre Wack, Royal Dutch/Shell, 1984

Scenarios are tools for ordering one's perceptions about alternative future environments in which today's decisions might be played out. Unlike traditional forecasting or market research, scenarios present alternative images instead of extrapolating current trends from the present. Scenarios also embrace qualitative perspectives. Consequently, creating scenarios requires decision-makers to question their broadest assumptions about the way the world works so they can foresee decisions that might be otherwise missed or denied.

Strategic VISION prediction, is a concise definition and labeling of the established information. Scenario building is predicated on the assumption that if you speculate on a number of future outcomes, the real one will be one of them (Porter). Porter described a scenario as “not a forecast but one possible future structure”. It not only focuses on the outcome but equally on the forces that compel the outcome.

The College of Marin in California which teaches scenario planning (see web site at <http://www.marin.cc.ca.us/scenario/>) has a brief description of the approach which was used by the FSN:

"The process is highly interactive, intense, and imaginative. The initial phase usually involves rigorously challenging the mental maps that shape one's perceptions, and then searching for relevant information, often from unorthodox sources. We all see certain things, and have blinders on about others. Our perceptions are shaped by our past successes and failures, which may no longer be relevant. A good scenario planning project expands leaders' peripheral vision and forces them to challenge their own assumptions.

The next steps are more analytical: identifying the driving forces (social, economic, political, and technological) and the predetermined elements (i.e., what is inevitable about the future, like many demographic factors that are already in the pipeline). These factors are then prioritized according to importance and uncertainty. These exercises culminate in three or four carefully constructed scenarios. "

Scenarios then are:

- ❑ Descriptions of future environments,
- ❑ Project based on the past, the present, visible trends into the future,
- ❑ Take into account uncertainties and their impact,
- ❑ Build several consistent views of the future,
- ❑ Deal with qualitative (social values) aspects,
- ❑ Fact based, viable and relevant.

The benefits of the approach, are that it:

- ❑ Builds on team's different expertise,
- ❑ Identifies assumptions used,
- ❑ Considers multiple outcomes, future impacts,
- ❑ Has a broader outlook,
- ❑ Highlights uncertainties.

The process used to build scenarios can differ, but in our case:

- ❑ allowed systematic analysis and alternative interpretation of the present,
- ❑ allowed idea sharing and expectation discussions from different angles,
- ❑ stimulated thinking and learning and application of trends and variables,
- ❑ resulted in a range of possible outcomes, based on solid knowledge, arrived at through the use of imagination and never complete.


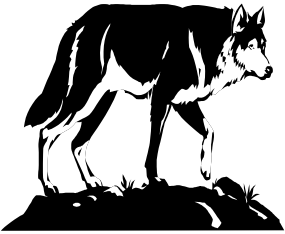
## **1.2 The Five Scenarios**

Narratives linking the various characteristics for each of the five (5) scenarios were then developed to serve as a backdrop for the impact of the future on specific areas (such as the future scientific research priorities NRC). The synthesis is presented below as the final result of the three workshops.

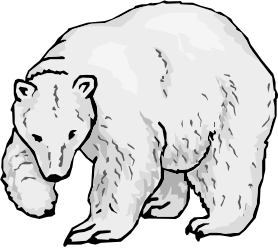

In practice, scenarios resemble stories, written or spoken, built around carefully constructed plots with sound logical foundations. These 'stories' are prepared based on the known constraints, expected risks, viable alternatives identified. The participants usually identify more readily with being in the future. They can therefore test what the accepted strategy and policy is doing 10 years from hence, their strengths and weakness and their success in accomplishing or not the wanted result. This story format allows all the

scenarios to be strengthened allowing for better strategies to be formulated for all eventual outcomes.

The use of animals or birds with certain characteristics to symbolize each of the scenarios is a technique used often, and occasionally ingeniously, in scenario planning. The scenarios for the emerging South Africa (see the Mount Fleur interviews), for example, used the images of a "lame duck" or a "flight of flamingoes" to illustrate the scenario of a country headed for disaster or toward a hopeful future. In this exercise, the participants chose Canadian wildlife with perceived characteristics, such as determined and farsighted (woodpecker in a pine tree), or strong but limited by its environment (wolf on an ice floe) or weak and a victim of its circumstance (beefalo in a theme park) or big and strong with no constraints (polar bear in a coca cola world) -or the timid beaver, circling in the middle of the pond, not daring to stay for long in any new scenario or world. More characteristics of these scenarios are given below.

<p style="text-align: center;"><b>Scenario #1</b></p> <p style="text-align: center;"><b>Pileated Woodpecker in a Pine Tree</b></p>  <p><b>High Intentionality, Low Constraints</b> The woodpecker, working efficiently high up in the pine tree, can see both opportunities and hazards from far away. In this scenario, the woodpeckers do their work at home but, face more opportunities than critical shortages or environmental crises, and through highly developed networks which link communities as well as their cousins in other countries, they stay abreast of changing times, technologies and the need for new policies - and take proactive steps to overcome obstacles before they threaten to dull progress.</p>	<p style="text-align: center;"><b>Scenario #2</b></p> <p style="text-align: center;"><b>Wolf Pack on an Ice Floe</b></p>  <p><b>High Intentionality, High Constraints</b> The Wolf Pack on an Ice Floe envisages a tough, strong, proud and independent country that thinks that it can protect itself from and understands the serious dangers that lie ahead and enacts strong measures to counteract these threats, even when these involve tough domestic choices. The people in this country are well-connected both among themselves and with their leadership but not with the international community and, especially, not with the USA. As a result, the country loses out to global competition, not only economically in exports and through lost tax revenues and through e-commerce, but also through</p>
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	<p>a flight of skilled professionals and knowledge workers to better opportunities abroad. Faced with limited economic resources they choose to make some choices that put the quality of life for the community ahead of global economic competitiveness. It turns out that the net effect of this brain drain and trade and financial flows is not entirely negative.</p>
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<p style="text-align: center;"><b>Scenario #3</b></p> <p style="text-align: center;"><b>Polar Bear in a Coca Cola World</b></p>  <p><b>Low Intentionality, Low Constraints</b></p> <p>The Polar Bear scenario depicts a big, pompous, hedonistic animal living off its resources with no time for what is around or ahead of it, taking what is offered. The country recognizes the brute reality that it is not able to engage in long-term planning or national priority-setting and decides to eat, drink and be merry for a few happy decades. It is caught in the tidal wave of American commerce and lives or dies with it, not taking any precautions to avoid danger or any risks to take advantage of economic or technological opportunities, except where they translate into short term profit. It invests little in government or government policy capability- and, in return, gets little benefit from a public sector, depending almost entirely on the private sector for any change.</p>	<p style="text-align: center;"><b>Scenario #4</b></p> <p style="text-align: center;"><b>Beefalo in a Theme Park</b></p>  <p><b>Low Intentionality, High Constraints</b></p> <p>The Beefalo in a Theme Park scenario sees an endangered herd of individuals, wandering alone in the world with no sense of purpose and dominated by events from around and outside- economic, environmental and technological. Decisions are avoided whenever it is possible to do so, and are taken only in cases of absolute necessity and usually too late. Individuals are highly stressed through a lack of community (or government) concern and support and through the loss of personal identity and, as a result, loss of responsibility for individual action. As stresses accumulate faster than the community can deal with them, social and ethnic divisions deepen and fundamental cohesiveness is lost.</p>
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## Scenario #5 Ad-hoc Beaver in Middle of Pond



### Medium Intentionality, Medium Constraints

The Beaver depicts a country and a government that does not want to move very far away from the centre, does not want to make waves- at least not big ones. Never a risk taker, the beaver reacts to events, particularly major international ones- both political and technological, rather than taking or making initiatives of its own - except for small to medium scale ones which are trumpeted as more significant than they really are. Nevertheless, the "business" beaver through hard work - living up to it's motto "busy as a beaver" -manages to maintain its position in the world of beavers - economically, by becoming even more dependent on exports for trying to maintain the economy and the standard of living. The industrial beavers, driven by profits from sales abroad, take the lead on developing science and technology themselves rather than depending on basic science from public laboratories. Because policy is reactive, it tends to be conservative and not always as timely as called for. The graying "boomer" beavers find that they need to keep working to an older age than previously, in order to be able to maintain their life style which is neither rich nor poor.

## 2. THE PROCESS

### 2.1 The Participants

The participants at the three (3) workshops, included members of the civil service, private industry and consultants. Some participated in all three workshops, while some were involved in the preparation and facilitation of them. The list of participants included:

<b>Work-shops</b>	<b>Participants</b>	<b>Affiliations</b>	<b>Expertise or Background</b>
1	David Anido	Private Sector	Culture, foreign affairs
1	Fred Belaire	Private Sector	Energy, economics

1,2,3	Louise Bergin	NRCan	Environment policy
1,2	Charles Bokor	Private Sector	IT, business planning
1	Martin Brooks	NRC	IT, systems
1,2,3	Alexander Bryce	DFAIT	Environment
1	Abraham Chiasson	Private Sector	Government, planning
1,2	Arthur Cordell	Industry Canada	Telecommunications
1,2	Eleanor Glor	Health Canada	Innovation
1,2	Peter Gunther	Private Sector	Constitutional law
1	Michael Hamilton	NRC	Business relations
1	Roy Hanna	HRDC	Learning & education
1	Robert Hoffman	Private Sector	Global natural resource modelling
1	Jay Johnson	DND	Defense technology
1	Margret Kopala	Private Sector	Journalism, politics
1,2,3	Steve Kurtz	Private Sector	Ecology, demography, commerce
1	Charles Langemeyer	NRC	Information technology
1	Robert McFetridge	Private Sector	Ecology, biodiversity
1,3	Peter Padbury	DFAIT	International, scenarios
1,2,3	William Pugsley	Private Sector	Environment, climate, strategy
1,3	Marvin Rusk	Private Sector	Tourism, marketing
1,2,3	Jack Smith	NRC	Science, technology economics
1,2	Catherine Starrs	Private Sector	Environmental science policy
1,2,3	Gail Stewart	Private Sector	Socio-economics, public policy
1	Danielle Tanguay	Private Sector	Scenario study facilitator
1,2	John Verdun	DND	Personnel policy & future trends
1,3	Tracey Waite	DND	Personnel policy & future trends
1,2,3	Pat Webb	Private Sector	Learning & education

\* background intended to be descriptive, not definitive or limited

1. Jan. 25,2000

2. Feb, 25, 2000

3.. Apr17, 2000

## 2.2 Background on the FSN

The Futures & Strategies Network (FSN), is an informal network of individuals, specializing in strategic trends, seeking out and exploring emerging areas of national and international interest. FSN is an open-minded, wide-ranging discussion and issues group aimed at challenging concepts and assumptions among people interested in Canada's future and how Canada functions and endures as an intentional community distinct from the United States and its culture.

It is the amalgamation of the former Interdepartmental Committee for Futures and Forecasting (ICFF) and the Federal Strategic Planners' Network (FPN).

Additional information about the FSN, its members and their work is included in the referenced brochure (see ANNEX “B”).

## **2.3 Outline of the Entire Process**

The overall process was described in an outline, prepared just before the first workshop by the Co-Chairs. The main points from that outline are given below; more details are found in the complete note contained in Annex C

### **Step 1: The Question**

We first need to discuss further and agree on the single general question that reflects our broad interest and which relates to where Canada may be by 2010.

#### **What will be the social, economic and environmental integrity of Canada in 2010?**

This is meant to include cultural, political and state of the nation factors, and the use of integrity is meant to refer to sustainability and identity factors – those elements, that despite what’s changing all around Canadians, could be sustained in any event or possibly through all scenarios.

This question is mostly for focusing after we have done the analysis and scanning and structuring, but it can also keep us somewhat focused as we go through the process according to the structure below

### **Step 2: The Proximate Environment**

We start with a listing, in brainstorming mode of those factors, trends, values and characteristics which we believe distinguish Canada or Canadians and which are unlikely to change substantially to 2010. These are the well defined, perhaps familiar, perhaps given aspects of Canada and the things that seem to anchor the nation and its people. They can but don’t have to be a list also of those things we will want, in an intentional mode to sustain through 2010 if possible.

### **Step 3: The Driving Forces and Change Factors**

In brainstorming mode we next need to list the driving forces as best we can, starting globally and according to three broad categories - tasking separate groups if necessary to do this.

For each of these we should attempt to identify the following: what the driver is, how broadly it may shape things, what its uncertainty level or boundaries might be in terms of more or less, higher or lower force etc. This enables us to both accept an observation and to ask ourselves what if it is the opposite- i.e. each driver can be a continuum of potential or probability.

**Step 4: Clustering and Impact Assessment**

Recognizing that these global driver categories are not isolated from each other, and to tie them to a Canadian context, we need to start the synthesis process by creating clusters of forces which align in ways that seem logical or possible, ideally seeking no more than 6 broad clusters – remembering that we are still in the analytical or scenario feeding phase not the scenario creating stage.

**Step 5: Consensus, Wild Cards and Plot Composition**

We start with a summary of the clustering exercise and reviewing again the approach from here forward. We will begin creating the story lines or at least the general outlines, nomenclature, labels etc. which we can use for potential scenario categories – focussing on the differentiators and implications of the various clusters

**Step 6: Scenario Definition and Review**

This is the real synthesis as we provide the literary story line summaries which characterize our scenarios. This involves crafting the literary form and attractive labels and rich descriptions of what we would include as the 4-5 best integrated and loosely verified possible scenarios - as well as identifying what we think of as the "bet-able" scenario - the one we either like or expect to evolve or both.

The process used to produce the outcome presented here, involved facilitators and recorders, three (3) workshops and a host of participants. While the first whole-day workshop, introduced the concepts to the participants, the second and third workshops elaborated the clusters and described the scenarios and implications. A more detailed description of the process is given below.

## 2.4 The Workshops

**January 25, 2000** all day Workshop:

A proposed question that was of concern to all, reflecting broad interests was enunciated, discussed and accepted (see ANNEX "B")

Participants brainstormed facts, trends and characteristics regarding certainties and uncertainties, which relate to the question. This established the base line.

Participants identified driving forces that were expected to have an impact on future. Each force was associated with a level of certainty/uncertainty of its occurrence, its impact and hence its relative importance. In this workshop specific major drivers were divided into three groups, i.e.

- Technology
- Environment
- population

Grouping of variables, concerns, issues, driving forces, impacts and participants; a short list was produced,

The synthesis process and scenario building involved establishing the implications, working in chosen (preferred based on expertise and interest) groups, defining the story, the explanation and implications

Strategic VISION prediction, is a concise definition and labeling of the established information

**February 25, 2000** and **April 17, 2000** half day Workshops:

The second and third workshops started with the outcome produced in the previous workshop. These workshops focused on the relevance of the aspects earlier identified and the creation of the global view or scenario. Having chosen two axes, defined as:

- Intentionality (from low to high)
- Constraint (from low to high)

four distinct scenarios were positioned in the four quadrants created by the axes.

The team also evaluated the feasibility of taking a mid point on both axes, i.e. having neither much intentionality nor a lot of constraints- or alternatively, floating around the centre, trying out the four available scenarios but never staying in one for long (a.k.a. "incrementalism" or "pragmatic politics"). Although the concept of a fifth "mid-way"

scenario is unusual in a matrix scenario approach, it served as a useful way of capturing a seemingly realistic choice for planning the future.

## 2.5 Workshop Objectives

The objectives of the workshops were stated in a note from Workshop Co-Chair, Jack Smith, to the potential participants on January 4, 2000, as follows:

"There are therefore at least two broad levels of approach that we are seeking to examine:

- Canada – what are some broad socio-economic and political, cultural scenarios for Canadian society at 2010?
- Canadian Science & Technology and Innovation Environment and the NRC's possible positioning scenarios

This will be an outside-in exercise. It first attempts to define the broad global (e.g. social, environmental, technological, security, trade, cultural, population and environment factors) and regional (i.e. Americas) drivers that are important to framing the Canadian context. It then tries to apply the methodology to both the FSN domains of interest (i.e. What would Canada look like as an intentional community) and to the S&T context and positioning options for the NRC.

The objective is both to formulate some broad scenarios for Canadian society and to develop some options or scenarios for the more particular challenge of what the NRC might envision as its way forward to the end of the first decade of the new century."

### 3. REPORT ON THE WORKSHOP PROCESSES

#### 3.1 Summary of the *January 25, 2000 Workshop* proceedings

- *The competencies and gaps observed in Canada*
  - Competencies
    - Compromisers
    - Civil society respectful of rules and law and tolerance
    - Suppression, indirectness, self-constraint,
    - good competitive educational or literacy level
  - Gaps
    - Short term focus, no vision
    - High energy use, lack of respect of natural resources
    - Uncooperative institutions
    - Government structural antagonism + division
    - Low employment rates (income gap re USA)
    - Elitist/conservative/lack of innovativeness
  - Other
    - Competent civil service
    - Regional diversity and attitudes
    - Social safety net costs
    - Small population in global terms
    - Identity versus US: no unity/but opportunity/too much US focus
- Participants brainstormed to identify the ‘driving forces’ (e.g. Population/immigration dynamics) that describe various future events (e.g. immigration influx from overcrowded, violent or poverty stricken places) which were then grouped and voted on to establish importance. Those driving forces which received 4 or more votes were:
  - Population/immigration dynamics
  - Knowledge intensive economy and innovation
  - Climate change
  - US determinism
  - Global insecurity/distrust in multi-polar world
  - Global homogenization
  - Global mobility of telecom/\$/people
  - Demography: aging population
  - Secularization and commercialization (as an ideology)
- The Group identified the ‘unthinkable’.

- The synthesis process and scenario building was done in focused teams and team discussions.
  - Of the 28 factors/driving forces identified
  - further to a review, 14 priority driving forces were retained, and
  - were grouped into five (5) clusters, namely:
    - GEOPOLITICAL / DEMOGRAPHY
    - ECONOMIC
    - TECHNOLOGY
    - SOCIAL
    - ENVIRONMENT

### 3.2 Summary of the *January 25, 2000 Workshop Results*

- After the first part of the workshop, which established the question to be answered and the clusters to be evaluated, participants were divided into teams, based on their individual and specific interests,
- The teams, with now more specific knowledge on the clusters (e.g. Economic), identified sub-clusters (e.g. U.S. Determinism), some descriptions or specific references (e.g. monetary union) and evaluated the certainty level (e.g. low, medium, high) as well as the impact of the specific sub-cluster reference;
- Each team reported on one of the five (5) clusters, naming the retained sub-clusters.
  - **GEOPOLITICAL / DEMOGRAPHY**
    - political/global political governance
    - global environmental factors
    - technology
    - economics
    - culture
  - **ECONOMIC**
    - US determinism
    - Knowledge economy
    - Globalization
    - Post materialization
    - Innovation
    - Funding of government
    - Public/private sector balance
    - Connectivity
    - Financial collapse

□ **TECHNOLOGY**

The 12 sub-clusters of the TECHNOLOGY cluster are presented in table below. As technology was seen to be an influence, risk and impact on all the clusters, it was cross referenced to the other 4 clusters, and tabled as follows:

<b>CROSS IMPACT ANALYSIS</b>				
<b>SUB-CLUSTER</b>	<b>SOCIAL CLUSTER</b>	<b>ENVIRONMENT</b>	<b>GEO-POLITICAL/ DEMOGRAPHY</b>	<b>ECONOMIC</b>
More global			1	
More mobile			1	
Impact on knowledge accessibility				1
Market for competencies vs employees	1			
Connectivity			1	
Bio-genomics	1	3		2
System & device smartness				
Open vs proprietary	1			
Techno polarization/ economic literacy	1		2	3
Psych-tech/social computing	1			1
Techno security/ vulnerability/privacy	1	4	3	2
Ecotechnology		1	2	3

Relative impact code – 1-strongest, 2-next strongest

□ **SOCIAL**

- Demographics
- North American integration
- Decreased competency in public programs delivery
- Polarization of 'have' and 'have not's
- Increased regionalism
- Urban concentration
- Common safety net/Expectations/costs of growth of intentionality
- Social expectations
- Entertainment/info media
- Knowledge society + integrated approach
- Consumerism
- Connectivity
- Technology and values

□ **ENVIRONMENT**

- ❑ Depleting/degrading resources
- ❑ Technology
- ❑ Waste/climate change
- ❑ Biodiversity human population
- ❑ globalization

The most critical uncertainties identified and retained are listed in the table below. They were ranked in order of importance based on the number of votes received. These were to be part of the consideration when building the scenarios.

<b>MOST CRITICAL UNCERTAINTIES</b>	<b># VOTES</b>
U.S. Determinism	11
Globalization: Environment + Technologies	10
Techno + Knowledge Accessibility	10
Tax structure (revamping) eco / income / internet	10
Biogenomics	9
Psych – Tech – Social	9
Techno – Security / Privacy	3
Financial Collapse	1

- ❑ Based on the above, and further to the evaluation reports from the cluster groups, the most important driving forces “of Canada’s integrity up to 2010” were retained as:

<b>MOST CRITICAL DRIVING FORCES</b>	<b># VOTES</b>
Connectivity	10
US Determinism	8
Market for competencies including knowledge economy	7
Global environmental factors	7
Population shifts (including urban concentration)	6
Global political factors	4

Techno polarization	4
Corporatism	4
Techno gap / literacy	2
Biogenomics	2
Growth of fundamentalism	2
Regionalism	1
Consumerism	1
Public / private balance	1

### 3.3 Summary of the February 25, 2000 and April 17, 2000 results

The *January 25, 2000 Workshop results* were under five (5) clusters, namely:

- GEOPOLITICAL / DEMOGRAPHY
- ECONOMIC
- TECHNOLOGY
- SOCIAL
- ENVIRONMENT

#### Selection of Scenario Axes and Matrix Quadrant

The next step was to categorize the projections contained in the five clusters and agree on a two influences or axes which would delineate a matrix of four quadrants. The single general question that reflected our broad interest and which relates to where Canada may be by 2010 was enunciated as: "*What will be the social, economic and environmental integrity of Canada in 2010?*" It therefore was proposed that the three specific aspects: social, environmental and economic be examined from the point of view of the scenarios, to be defined by the choice of axes.

On the choice of axes, we asked the participants: If you could know just two things about the future that would enable you to create a sound long-term strategy, what would you like to know?

After much deliberation, the group agreed that they wanted to know: What would be the constraints (and how constraining would they be) to affect Canada's integrity in 2010? and

How "intentional" would the leaders and members of Canadian society be when it comes to making the future happen? A country with few constraints to act or develop would have more options and opportunities than a country saddled with obstacles. Similarly, a country with a highly developed sense of priorities and the capacity to act on long range plans might have a better chance at achieving long range goals than a country that suffered from near-sightedness.

The following matrix was then constructed to enable the discussion of four scenarios and a notional symbol used to designate each of the four quadrants (the reason for the selection of these symbols will become more obvious after the discussions that follow

	LOW CONSTRAINT	HIGH CONSTRAINT
HIGH INTENTIONALITY	1. Pileated Woodpecker in a Pine Tree	2. Wolf Pack on an Ice Floe
LOW INTENTIONALITY	3. Polar Bear in a Coca Cola World	4. Beefalo in a Theme Park

This approach then led to discussion groups for each of the four quadrants that would examine social, environmental and economic questions or implications that would arise in each scenario. A further refinement to this original matrix was made by adding the concept of a "Beaver in the Centre of the Pond" which would have the characteristic of medium constraints and medium intentionality. - geometrically located at the centre of the matrix.

Also, the topics of implications for Public Policy, Science and Technology and Innovation were seen as sufficiently important to be considered along with the more general headings of Social, Environmental and Economic factors.

### 3.4 The Resulting Scenarios

The ideas distilled from the Scenario Workshops (see ANNEX "A") used to arrive at the final results are summarized in the tables that follow for each of the five (5) scenarios:

<b>Scenario #1</b>	<b>Pileated Woodpecker in a Pine Tree</b> <b>High Intentionality, Low Constraints</b>
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<b>Social</b>	<ul style="list-style-type: none"> <li>- work at home/ telecommute ; piece-work &amp; contracts</li> <li>- Less need for conventional roads</li> <li>- Highly developed social environment; civic society strong &amp; needed</li> <li>- Less costly education</li> <li>- More leisure time</li> </ul>
<b>Economic</b>	<ul style="list-style-type: none"> <li>- Short term work the rule</li> <li>* Use of U.S. dollars possible, but strong income redistribution supported</li> <li>- Economy working but constrained by FTA</li> </ul>
<b>Environmental</b>	<ul style="list-style-type: none"> <li>- low polluting air-rail-road transportation</li> <li>- develop biotechnology; seek intellectual property rights for genetic engineering</li> </ul>
<b>Public Policy</b>	<ul style="list-style-type: none"> <li>- government working; people solve problems; populace and leaders want change</li> <li>- needs longer term planning horizon; new horizons possible</li> <li>- political sustainability of Canada; constraints largely go away</li> <li>- may require higher taxes to reallocate away from older economy</li> <li>- strong limits to policy context</li> </ul>
<b>Science and Technology</b>	<ul style="list-style-type: none"> <li>- requires vast political understanding &amp; support; science more responsible, better sense of whole</li> <li>- techno-optimism reigns; reverse brain drain helps;</li> <li>- new economy anticipated due to the high environment constraints by doing so by S&amp;T; move to fuel cells and solar energy and efficient transport and housing; 90% electric, non-carbon emitters; electric trains and subways</li> <li>- Reliance on information systems monitoring; Canada is leader in G.P.S navigational systems</li> <li>- new Canadian industries for eco-regeneration and biofuels</li> </ul>
<b>Innovation</b>	<ul style="list-style-type: none"> <li>- expanded distance learning activities and teaching through internet</li> <li>- innovation resources abundant</li> </ul>
<b>NRC</b>	To be developed

<b>Scenario #2</b>	<p><b>Wolf Pack on an Ice Floe</b></p> <p><b>High Intentionality, High Constraints</b></p>
<b>Social</b>	<ul style="list-style-type: none"> <li>- Uncertain Canadian unity; independent of US</li> <li>- High social dependence (employment insurance)</li> <li>- Highly selective immigration with focus on younger immigrants</li> <li>- Improved design of health-education systems</li> <li>- Communities attract knowledge workers</li> <li>- youth want job, life, health security, not motivated by community or loyalty to country, just \$</li> </ul>
<b>Economic</b>	<ul style="list-style-type: none"> <li>- Large national debt; tough-it-out government</li> <li>- Globalized economy, exposure high, leakages on tax, brain drain</li> </ul>

	<ul style="list-style-type: none"> <li>- Loss of tax resources from e-commerce world</li> <li>- US economic determinism; diminished Canadian influence</li> <li>- Weak innovation but highly capable civil service</li> <li>- High connectivity, different from U.S.- need to prepare people</li> <li>- Make some economic priority choices, consistent choices among economic priorities, sustenance choices, good foresight</li> </ul>
<b>Environmental</b>	<ul style="list-style-type: none"> <li>- Apparent environmental degradation but really environmental amelioration</li> <li>- Northern strength and focus</li> </ul>
<b>Public Policy</b>	<ul style="list-style-type: none"> <li>- Very focussed intentional government; clear focussed public leadership</li> <li>- Economy tough and proactive; very distinct choices; niche leadership</li> <li>- Tough it out, strong government and high quality public service and social consensus</li> <li>- Finnish model</li> <li>- Tax leakages due to globalization and locations of industry</li> <li>- Uncertainty re Canadian unity/identity but willingness to assert sovereignty in different areas</li> <li>- U.S. economic determinism and cultural chauvinism and diminished Canadian global influence</li> <li>* Social consensus, can build independent of USA - not appendage</li> <li>- Civic society believes in intentionality policy; Make most of education and health abilities</li> <li>* Canadian national unity -&gt; uncertainty, relations, continued stand-off with Quebec</li> <li>* Reform of governance (several aspects) to face emerging problems</li> <li>* Social cohesion on a low budget</li> <li>* Highly selective immigration</li> <li>* Northern strength (clear sovereignty, territorial)</li> </ul>
<b>Science and Technology</b>	<ul style="list-style-type: none"> <li>- Smaller NRC, more effective</li> <li>- Critical sale of talent (reversals); brain drain higher</li> <li>- High connectivity as necessity driven by government</li> <li>- Improved design of health/education systems within available resources</li> <li>- Public policy proactive, \$ towards science and tech innovation</li> </ul>
<b>Innovation</b>	<ul style="list-style-type: none"> <li>- Innovation can be high but more public in nature</li> <li>- Sub-optimality in education system</li> <li>- Weak innovation investments, fall behind, (R&amp;D) lack opportunities for talent</li> <li>- Continued high social dependence levels and sub-optimal educational performance</li> <li>- Indifference, scarcity of knowledge workers</li> </ul>
<b>NRC</b>	To be developed

<b>Scenario #3</b>	<p><b>Polar Bear in a Coca Cola World</b></p> <p><b>Low Intentionality, Low Constraints</b></p>
<b>Social</b>	<ul style="list-style-type: none"> <li>- loss of privacy</li> <li>- pompous, moralizing</li> <li>- multiculturalism overcomes regionalism</li> <li>- decentralized decision making; fully consumptive/ individualistic mode</li> <li>- abandoning Canadian civic community; do not get community innovation</li> <li>- High immigration from economic migrants; over-population threat(boat people pressure)</li> <li>- Human resources leave; fall behind on education</li> </ul>
<b>Economic</b>	<ul style="list-style-type: none"> <li>- Lower economic lead, merged into North America economy</li> <li>- Little Canadian influence; strategic control lost</li> <li>- US advertising (like Coca Cola, McDonalds) sweeping through our environment</li> <li>- Get enhanced private wealth; faith in markets</li> <li>- Continued triumph of market, few constraints</li> <li>- Economic freedom within global competition</li> <li>- Economic focus on daily trade; short term economy O.K. but long term poor</li> </ul>
<b>Environmental</b>	<ul style="list-style-type: none"> <li>- High natural resource exploitation; don't want to curb pollution; few environmental regulations</li> <li>- Little capability to redefine (move) its environment, but vulnerable to global environmental constraints.</li> <li>- Global warming benefits (but not because of any national policy); rise in ocean water level (global warming impacts on low areas, boreal/agricultural environment. Canada benefits economically</li> </ul>
<b>Public Policy</b>	<ul style="list-style-type: none"> <li>- Fully consumptive model; live for today; short term horizon</li> <li>- Think low constraints, low recognition; no urge to action or protection- in denial</li> <li>- Less government (lower cost); laissez-faire; lots of "freedom"; level playing field</li> <li>- Elite power politics; function of public authorities narrows to public risk areas</li> <li>- Embracing corporatism</li> <li>- Bipolar world</li> </ul>
<b>Science and Technology</b>	<ul style="list-style-type: none"> <li>- Lots of innovation but private sector active only where market flourishes not much innovation for social good; is there a role for public S&amp;T?</li> <li>- Technology taker; loss of R&amp;D</li> <li>- Forintek example - contract as agency for industry - projects relevant by definition but purposes less distinct; CANARIE approach (led by</li> </ul>

	private sector) thrives - High natural resource exploitation
<b>Innovation</b>	- Spurs initiatives & motivation but within American model; American model without strings - Extended patent protectionism - Innovate only what's marketable - Lots of innovation by individuals & private corporations = \$
<b>NRC</b>	To be developed

<b>Scenario #4</b>	<b>Beefalo in a Theme Park</b>  <b>Low Intentionality, High Constraints</b>
<b>Social</b>	- Inflexible constitution ; no political consensus or ideas; locked-in paralysis governance - Increased loss of cohesion; increase in personal stress; no sense of community - Increased use of private charities - Social safety net not as secure; loss of identity and social cohesion - Stable and aging population - Low personal responsibility; loss of identity/ socially increased loss of cohesion - Immigration (closed door) - Growth of extremism & intolerant with social implications - Decrease in personal discretionary time, disempowerment
<b>Economic</b>	- Loss of Canadian status; uses the US \$; we become a franchise; US determinism limits sink factor but constrains us - No increase in value of information; technology fails to keep pace - Higher export of resources - Dependent consumers
<b>Environmental</b>	- Inadequate regulation and enforcement for common good
<b>Public Policy</b>	- Increase in foreign economic dominance; leads to crisis; might get to innovation through crisis - Russia 1970 - 2000: the Canadian scenario - docile animal; forward/domesticated - Canada not prepared to make tough decisions; less freedom of action; swing to the right - Private charity to fill void - End up with extremism possible & tight immigration policies resulting in a smaller population
<b>Science and Technology</b>	- NRC disappears, lots of privatization, less federal S&T, no government R&D - No partnerships

	<ul style="list-style-type: none"> <li>- Technology fails to keep pace</li> <li>- Threats of mystery viruses and no adequate response by public sector health system &amp; science</li> </ul>
<b>Innovation</b>	<ul style="list-style-type: none"> <li>- Innovation from necessity not choice</li> <li>- Less innovation, less competitiveness but areas of private innovation grow</li> <li>- Information/knowledge and resources do not increase in value</li> </ul>
<b>NRC</b>	To be developed

<b>Scenario #5</b>	<p><b>Beaver in Middle of Pond</b></p> <p><b>Medium Intentionality, Medium Constraints</b></p>
<b>Social</b>	<ul style="list-style-type: none"> <li>- immigration increase</li> <li>- regionalism</li> <li>- more civic society by necessity</li> <li>- middle class predominant</li> <li>- social cohesion</li> <li>- government less important</li> </ul>
<b>Economic</b>	<ul style="list-style-type: none"> <li>- more polarization of population by wealth</li> <li>- natural resources more expensive &amp; valuable</li> <li>- retirement pressure on economy; baby boomers hang on to 65</li> <li>- commerce generation</li> <li>- Canada cycles ahead of world but behind USA</li> <li>- more independent than most nations</li> </ul>
<b>Environmental</b>	<ul style="list-style-type: none"> <li>- continued deterioration of environment</li> </ul>
<b>Public Policy</b>	<ul style="list-style-type: none"> <li>- reactive; catch up mode</li> <li>- more strategic policy</li> <li>- increased military insecurity; more dependent on USA military</li> <li>- health, education &amp; social policy intensify but more conservative</li> <li>- more dependent on global policies</li> <li>- nation state drifts &amp; manages the losers (social welfare)</li> <li>- affects local players (trend toward Balkanization within Canada)</li> <li>- borders need more security</li> </ul>
<b>Science and Technology</b>	<ul style="list-style-type: none"> <li>- universities subsume NRC roles &amp; industry expands (using exports for profits)</li> <li>- higher electronic identity checks</li> <li>- water /fish /minerals/oil added value of efficiency/ improvements key</li> <li>- more niche private oriented workforce</li> <li>- wireless world here</li> </ul>
<b>Innovation</b>	<ul style="list-style-type: none"> <li>- continued S&amp;T/ innovation turbulence</li> </ul>

NRC	To be developed
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## 4. CONCLUSIONS

The work presented in this report, focused on the question: “What will be the social, economic and environmental INTEGRITY of Canada in 2010?”. The information, gathered from the expert participants, is valuable objective information and can be an appropriate input to NRC’s VISION building. In order to extract the most benefit from it, however, it must now be re-focused to address two (2) specific questions, namely:

1. How do the information and conclusions gathered apply to NRC and the effort it has undertaken elsewhere to generate the foundation for its futures document?
2. What measures must be identified now (in the near future) in order to allow the information to be a constructive basis of actions? Specifically,
  - \* "How can NRC lead applied science, and what measures can we use in 2005 that would demonstrate that the proper course has been taken and that the effort will pay off in 2010"?
  - \* "What does NRC need to see in 2005 in order to be well placed in 2010"?
  - \* What broad agendas for science and research agenda for government must NRC develop today?

The work presented here, was an innovative attempt to integrate opinions of outside (the NRC) experts with the work executed elsewhere (inside NRC). Such attempts, demonstrate NRC’s leadership role and can allow NRC to move further towards the science leader role and facilitate the success of the research that is to be done in Canada.

**ANNEX “A”      REFERENCED DOCUMENTS**

- **INTRODUCTION TO SCENARIOS**  
Arden C. Brummell  
GBN Canada
- **What could be the social, economic, environmental INTEGRITY of Canada in 2010?**  
FSN – Jan25th Scenario Building Meeting
- **NOTES on FSN Scenario Workshop #2 – February 25, 2000**
- **NOTES on FSN Scenario Workshop #3 – April 17, 2000**
- **ACKNOWLEDGEMENT** – The authors of this report acknowledge the contributions made by the following individuals:
  - Danielle Tanguay, Workshop 1 facilitator
  - Alexander Bryce, Jack Smith, Gail Stewart and Tracey Waite for their help in reconstructing the scenarios of Workshops 2 & 3.
- **Shell – Mt. Fleur Scenario**  
Interview with Dr Betty Flowers, scenario specialist with Shell

**ANNEX “B”      FSN BROCHURE**

*An informal network of individuals, specializing in strategic trends, seeking out and exploring emerging areas of national and international interest*

**Who is FSN?**

We are an amalgamation of the former Interdepartmental Committee for Futures and Forecasting (IICFF) and the Federal Strategic Planners' Network (FPN).

Members are senior federal officials, specialized consultants, academics and retired executives. We have present and former representatives from: PCO, Finance, Treasury Board, Public Service Commission, Transport, Environment, Natural Resources, Heritage, Industry, Human Resources, Development, National Defence, CSIS, Foreign Affairs, Secretary of State, CMHC, NRC, NCC, the National Gallery and 20 other federal agencies.

**What is FSN?**

FSN is an open-minded, wide-ranging discussion and issues group aimed at challenging concepts and assumptions among people interested in Canada's future. Our current focus is on Canada as an intentional community. FSN serves as a source of strategic information for the federal government and other interested organizations such as Project 2020 for Canada's Air Force, Future Policy Framework for the Privy Council Office, Canada@2000+, a preview of Canada's possible futures.

**For further details, check out our web-site:**

<http://members.theglobe.com/fsn1/home.html> or (for Netscape browsers)

<http://fsn.homestead.com>

## **Trends**

**1984-86: Long Term Trends** African Famine; Future of Canada's Foreign Relations; Food and the Future; The Arctic in the Future; Environment and the Future.

**1987-91: National Issues** Energy and the Future; The Canadian Economy, Structural Change and the Future; Predicting War; Science, Technology and the Future; What Capital for What Canada; Future Scenarios for Health Care in Canada; Challenges of Canada's Pluralistic Identity to Employment.

**1991-93: Global Issues** European Community – Strategic Scenario Perspective; OECD International Futures Program; Discussions on Canada's Future (Spicer Forum); UNCED and Beyond; Trends and Models of Violent Crime; Changing Diplomacy in a Global Environment; Nunavut: Redrawing the Map of Canada.

**1994-96: Project 2020** Economic Dimensions; Technology – Partner or Predator? Artificial Intelligence; Jobs: Business and Labour Task Forces; European Union – Norway's Referendum on Membership; Canada's Peacekeeping Mission; Environmental Change and Regional Conflict; Climate Change; Canada as the World's First Postmodern Nation.

## **Papers 1996 : Canada @ 2000+**

Canadian Civil Society and its Cultural Enterprise;

Canada as an Intentional Community: Implications for Spatial Development;

Internalizing Environmental Values;

Canada's Global Relations at the 'End of History';

Future of Governance;

Canada in the Communications Age;

Canada's Role in the Future of International Development: Creating a Better World for all in turbulent times;

Past, Present and Future of Public Administration: Where Are We Headed?

Revisiting a Specific View of Canada as an Intentional Community;

Canada as an Intentional Community: Some Historical Reflections;

The Evolutionary Economy and the Government role for the Future;

Biodiversity: A New Synthesis or Passing Fad;

Intentional Community and the Crisis of Public Expectations;

Emerging Challenges to Canada's National Security;

The Case for Smaller Governments in the Global Economy;

The Road not Taken; Canadian Tourism Issues:

Implications for the Intentional Canadian Society;

Knowledge, Learning and Innovation for a Future Canada;

Life and the Quality of Life;

Some Musings toward Canada as an Intentional Community;

The Future of the City;

L'espace francophone du Canada au 21e siècle: enjeux d'intendance et de gouvernance;

On Being a Canadian.

## ANNEX “C”      WORKSHOP PROCESS - Scenario Planning Steps

National Research Council      Conseil national de recherches  
Canada                              Canada

Corporate Services              Services intégrés

Ottawa, Canada  
K1A 0R6

# MEMORANDUM

**Date:** 21/January/2000

**To:** Scenario Participants

**From:** Jack Smith and Bill Pugsley

**Re:** Canada @2010 Scenario Planning Steps

This note is to summarize the key steps we will use toward formulating our scenarios - or at least to make significant progress today. We are considering a second half day session on Tuesday February 22 12-5 PM to complete the exercise if we are unable to do so today.

### Step 1; The Question

We first need to discuss further and agree on the single general question that reflects our broad interest and which relates to where Canada may be by 2010.

The umbrella question derived from our February 11 session is:

***What will be the social, economic and environmental integrity of Canada in 2010?***

This is meant to include cultural, political and state of the nation factors, and the use of integrity is meant to refer to sustainability and identity factors – those elements, that despite what’s changing all around Canadians, could be sustained in any event or possibly through all scenarios.

This question is mostly for focusing after we have done the analysis and scanning and structuring, but it can also keep us somewhat focused as we go through the process according to the structure below

### Step 2: The Proximate Environment

We start with a listing, in brainstorming mode of those factors, trends, values and characteristics which we believe distinguish Canada or Canadians and which are unlikely to change substantially to 2010. These are the well defined, perhaps familiar, perhaps given aspects of Canada and the things that seem to anchor the nation and its people. They

can but don't have to be a list also of those things we will want, in an intentional mode to sustain through 2010 if possible.

### Step 3: The Driving Forces and Change Factors

In brainstorming mode we next need to list the driving forces as best we can, starting globally and according to three broad categories - tasking separate groups if necessary to do this. Three categories of major drivers, trends and expectations are proposed for efficiency and to get the process into high gear:

- **TE: technology and economy (wealth drivers)**
- **EH: environment and health ( quality of life drivers)**
- **PS: population and security (social community drivers)**

For each of these we should attempt to identify the following: what the driver is, how broadly it may shape things, what its uncertainty level or boundaries might be in terms of more or less, higher or lower force etc. This enables us to both accept an observation and to ask ourselves what if it is the opposite- i.e. each driver can be a continuum of potential or probability.

### Step 4: Clustering and Impact Assessment

Recognizing that these global driver categories are not isolated from each other, and to tie them to a Canadian context, we need to start the synthesis process by creating clusters of forces which align in ways that seem logical or possible, ideally seeking no more than 6 broad clusters – remembering that we are still in the analytical or scenario feeding phase not the scenario creating stage.

The impact assessment can be done somewhat intuitively or more comprehensively and rationally as a cross impacts process – which some of us have tried to do before and know that it can be quite time consuming. So, depending upon the extent and diversity of the drivers, we could consider an additional analytical step: we could create two levels of cross reference axis maps - each to each and how each inter-relationship could be impacting on the other two relationships - i.e.

- TE-EH
- TE-PS
- EH-PS and
- TE-EH impacting PS
- TE-PS impacting EH
- EH-PS impacting TE

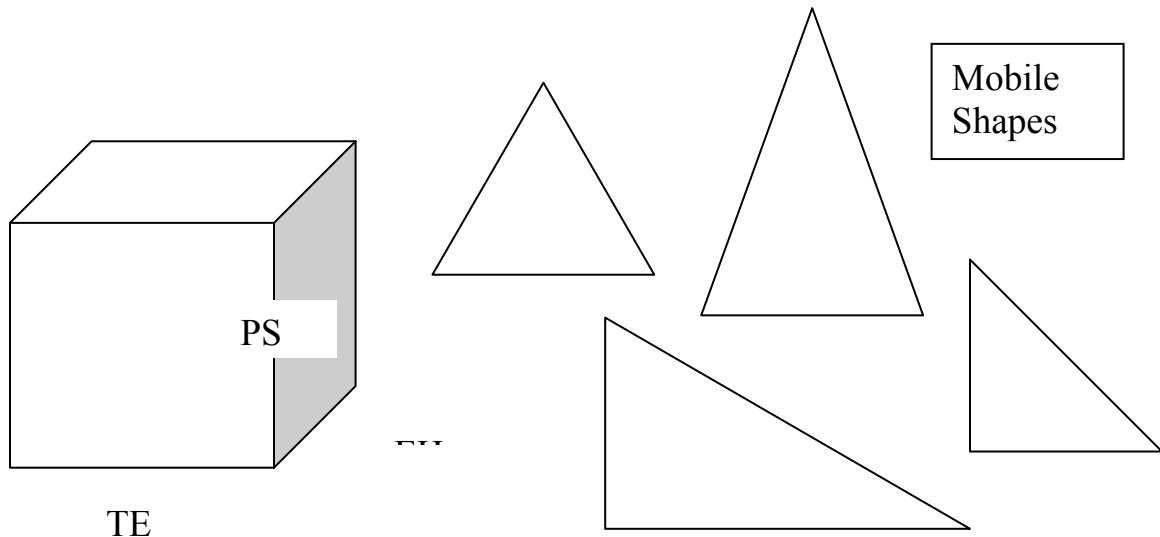
This will create six groups of scenario feeding observations, speculations and possible plots and states of possibility which we can use to go to the next step. However as noted above this additional step may be analytical overload and could bog us down from

proceeding further in synthesis, so the decision will depend upon our progress and time constraints.

### Step 5: Consensus, Wild Cards and Plot Composition

We start with a summary of the clustering exercise and reviewing again the approach from here forward. We will begin creating the story lines or at least the general outlines, nomenclature, labels etc. which we can use for potential scenario categories – focussing on the differentiators and implications of the various clusters. In this stage we would probably want to divide into groups who would be asked to develop and name one scenario according to how some of the dominant forces are seen to be exerting themselves or not in different directions.

If we prefer to represent these different groupings of drivers graphically, we could construct either a 3 dimensional cube structure and a mobile that would have different shapes of triangles as a proxy for the dominance of some forces.



In any event these play out into different potential characterizations when cross referenced to the other forces.

### Step 6: Scenario Definition and Review

This is the real synthesis as we provide the literary story line summaries which characterize our scenarios. This involves crafting the literary form and attractive labels and rich descriptions of what we would include as the 4-5 best integrated and loosely verified possible scenarios - as well as identifying what we think of as the "bet-able" scenario - the one we either like or expect to evolve or both.

If we get this far, we can then begin to consider, even at a subsequent meeting, what some of the more precise implications for Canadian S&T and for the NRC as Canada's leading public R&D organization might be.

We appreciate your participation and look forward to this exercise.