EXECUTIVE SUMMARY: ENVIRONMENTAL IMPACT ASSESSMENT OF THE INTERNATIONAL ASSOCIATION OF IMPACT ASSESSMENT CONFERENCE

APRIL 24-30, 2004

Sheraton Vancouver Wall Centre Hotel
Vancouver, British Columbia, Canada

Interdisciplinary Team Management Assignment

EVDS 649

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I. INTRODUCTION

In April of 2004 the International Association of Impact Assessment (IAIA) is holding a global conference in Vancouver, Canada focused on "Industry and Impact Assessment". The IAIA's objectives in holding this conference are:

1. Stimulate effective use of impact assessment tools.
2. Enhance effectiveness of impact assessment tools.
3. Strengthen the role of IAIA-sections through organization of workshops
4. Exchange information and strengthen professional relationships between practitioners through face-to-face contacts.

The following report is an executive summary of an environmental impact assessment (EIA) of the conference, which was conducted by a group of students at the University of Calgary. The group's objectives were to consider alternatives to the planned event and make recommendations for minimizing impacts of the conference while optimizing the benefits noted above. Except for minor modifications, this environmental impact assessment has been based on guidelines developed by the Commission for EIA in the Netherlands for the evaluation of the IAIA'02 conference at The Hague (Commission for EIA in The Netherlands, 2001).

II. DESCRIPTION OF PROPOSED ACTIVITY

Between 600 and 700 EIA practitioners from over 70 countries will converge on the Sheraton Vancouver Wall Centre to participate in this 7-day conference (John, 2004. Pers. Com.). It is estimated that 95% of the participants will travel to and from Vancouver by air and then to the hotel by ground transportation, a one-way distance of 30 kilometres (Ross, 2004. Pers. Com.). It is assumed that most accommodation, meals, and personal services for conference attendees will be provided at this facility. The conference itself will include training courses, social activities, and technical visits. Technical visits will take participants by charter bus or a combination of bus and boat to locations ranging from 20 to 250 km from the conference venue.

III. ENVIRONMENTAL SETTING

Situated on the Pacific coast at the mouth of the Fraser River, Vancouver has a humid moderate marine climate. With a population of approximately 2 million people, the city covers a metropolitan area of 2,880 sq. km and has a population density of 4,750 people per sq. km in the downtown core (City of Vancouver, 2003, About Vancouver).

The majority of conference activities will take place at the Sheraton Wall Centre hotel located in the downtown core. This area is well served by public transportation and private shuttle buses to the Vancouver International Airport. The hotel has 733 guest rooms and maintains it's own "green policy" that covers conservation of energy and water, recycling, and waste reduction (Mansfield,

2004. Pers. Com.). Currently, they do not participate in one of the national or international “green hotel” certification programs. However, the city of Vancouver is nationally recognized for it’s modern waste management and water treatment standards (City of Vancouver, 2004, Sustainable City).

IV. ALTERNATIVES

Alternatives help identify means of reducing adverse impacts or enhancing conference benefits. Several alternatives were identified for the planned conference, with the primary objective of offering recommendations for future conferences. Alternatives where developed by varying factors such as conference location, management, timing, frequency and size.

It is recognized that the 2004 conference will proceed as currently planned.

Table 1. Conference alternatives.

Alternative	Description
Null Alternative	- No conference
Location Alternatives	- Host a virtual conference - Choose a different geographic location to minimize the distance participants must travel to attend the conference - Choose a different facility within the geographic location that 1) minimizes distances travelled during the conference and/or 2) is exemplary in regards to green policy and environmental management - Host a multi-city or multi-venue conference that addresses specific sub-topics and minimizes travel distance during the conference by being located closer to the technical sites that support the sub-topic
Conference Management Alternatives	- Accentuate the capacity building and networking benefits of the conference - Make increased use of public or mass transit for conference-related travel - Organize enhanced media coverage to raise regional awareness of the conference - Adopt a green policy for the conference that minimizes energy consumption, water consumption, and waste
Timing Alternatives	- Reduce frequency of conferences from annual to every 2 or 3 years - Host conferences at different seasons - Host conferences at times when stress on location infrastructure would be minimized
Participant Alternatives	- Restrict attendance to a limited number of delegates from each jurisdiction - Encourage greater participation by the local population

V. Impact Identification

Based on the information available about the proposed conference, four key issues have been identified as being most likely to be significantly impacted by the event.

<u>Energy use</u>

A major impact of the proposed activity is the output of harmful emissions to the atmosphere primarily as a result of the extensive amount of traveling by airplane, chartered buses, and public transit that will occur prior to, during, and after the conference. Another major source of emissions is the combustion of fuel by the hotel for purposes of heating, cooking, and producing hot water. The main emission pollutants examined were carbon monoxide (CO), nitrogen oxides (NOx), particulate matter (PM), and carbon dioxide (CO_2). CO, NOx, and PM are harmful to humans and the environment at high concentrations, and CO_2 is a

recognized greenhouse gas and is at the center of an international debate regarding global warming (Spiro and Stigliani, 1996).

Capacity building

The positive benefits of professionals gathering face-to-face to exchange information, question and debate new knowledge, and transfer technological innovations are difficult to quantify. However, such benefits are expected to be significant and long-lasting in terms of increasing professional impact assessment capacity. Conferences provide an opportunity for building professional contacts and networks that are unequalled by other forms of professional exchange (e.g. journals, tele-conferences).

Waste Production

Waste production is an important issue for a number of reasons: landfill sites take up valuable land and have the potential to pollute soil and ground water, they are responsible for the production of 38% of Canada's methane emissions, and energy and natural resources are required to create many items that will eventually be discarded (Environment Canada, 2004). Conferences bring large numbers of people together in one location and can potentially produce large amounts of waste as a result of:

- promotional materials handed out by presenters and exhibitors (paper, pens, etc.)
- materials that are given to delegates by conference organizers (registration packages, including forms, nametags and nametag holders, notepads for taking notes during sessions)
- food and packaging waste, and disposable serviceware

During a typical conference each participant can collect up to 10 pounds of paper (Metro, 2003). This means that at the IAIA conference approximately 7000 pounds of paper could be produced.

Water Use and Quality

Conference participants would consume water, produce waste, and affect water quality in their home environments, regardless of the conference. However, it is important to consider the capacity of Vancouver's infrastructure to manage the additional consumption and waste produced by the conference delegates. The impacts on local water will generally incur in the conference venue, as a result of waste produced by delegates, the washing of hotel linens and towels, production of food, and the washing of serviceware.

Historically, Vancouver has suffered from water supply shortages (City of Vancouver, 2002). There is much uncertainty in the impact of the local conference as the conditions in April are unknown. It is however unlikely that there will be water shortages at that time. Although Vancouver treatment facilities have been upgraded to secondary and tertiary treatment (City of

Vancouver, 1999), the magnitude of the impact is dependent on the ability of the local environment to assimilate the treated effluent. However, during periods of heavy rainfall there are overflows of untreated sewage into the Vancouver Harbour, English Bay, Fraser River, and False Creek (City of Vancouver Engineering Department, 2003). Overflows will contribute to significant, irreversible environmental impacts. There is much uncertainty in determining the potential impact of overflows during the conference, due to the unpredictability of storm events.

In summary, the major activities resulting in adverse or beneficial environmental impacts are: air emissions due to travel by airplane, ground-based and marine transportation; consumption of energy, resources and water by conference participants at the central facility; production of solid and liquid wastes; and knowledge transfer and enhanced capacity for environmental impact assessment.

VI. IMPACTS OF ALTERNATIVES

Table 2. Environmental Issues, Impacts and Alternatives

Issues	Impacts of Alternatives			
	Location	Conference management	Timing	Participants
Energy Use	Reducing the distance that participants would need to travel to attend the conference could reduce emissions. Choosing a host facility that is more centrally located with respect to technical visits and the airport could also reduce emissions. Choosing a different facility that is more energy efficient would reduce energy consumption.	Public/mass transit would reduce the number of vehicles traveling to conference related events, therefore, fewer emissions.	Decreasing frequency of conference would reduce the frequency of travel to and during the conferences as well as reduce overall energy consumption of the conferences over time. Holding the conference during seasons of mild climate would reduce the need to consume energy for either heating or air conditioning. Holding the conference during times when road infrastructure is not stressed by heavy traffic use would decrease idling time of charter buses during conference travel, thus decreasing emissions.	Restricting the number of participants attending from remote locations would reduce emissions due to travel and energy consumption due to staying at the hotel.
Capacity Building	Hosting a multi-city conference would limit interaction between participants and decrease overall capacity building. Choosing a geographic location that attracts participants would increase capacity building.	Developing technical-visits and conference activities that allows hands-on participation and learning would increase capacity building. Increasing media coverage of the event would increase regional awareness of the event and the issues it hopes to address, thus expanding capacity building to the general public. Arrange airport receptions as participants arrive to instigate networking facilitate charter bus travel to the hotel.	Decreasing the frequency of conferences would negatively affect capacity building by reducing the number of knowledge-sharing opportunities and allowing net-working ties to loosen between professionals by decreasing the frequency of contact. More frequent non-personal interactions between conferences (e.g. mailings or interactive web-site features) could balance reduced personal contacts due to less frequent conferences.	Reducing the number of participants attending from remote locations would negatively affect capacity building by having fewer opportunities for knowledge exchange and professional networking. Increasing the number of local residents participating in the conference would increase the knowledge of local people while limiting the added adverse environmental effects caused travel to and residing in a remote location.

Issues	Impacts of Alternatives			
	Location	Conference management	Timing	Participants
Waste Production	Choosing a different facility that is more efficient in limiting waste production would decrease adverse affects of the conference.	Discouraging the handout of mass amounts of paper and plastic promotional materials at the conference and ensuring that necessary materials are recycled or composted would significantly decrease waste production	Decreasing frequency of conference occurrence would decrease amount of materials necessary for conference organizers to provide delegates and would reduce the amount of promo materials distributed by presenters/exhibitors	As with decreasing the frequency of conferences, decreasing the size of the conference would decrease the amount of waste materials produced.
Water Use and Quality	Hosting the conference at a different location that has a better wastewater treatment facility as well as a water supply with less user stress would decrease the adverse affects of the conference. Choosing a different facility that is more efficient in its water usage would decrease adverse affects of the conference.	Employing strategies to reduce water usage during conference could minimize water use. This could be done by promoting personal efficient use of water by conference participants.	Decreasing frequency of conferences would reduce water usage over time. Choosing to hold conferences at times when seasonal water supplies at the chosen location are under less stress would reduce adverse impacts.	Decreasing the number of participants would reduce water usage.

Table 2 (continued). Environmental Issues, Impacts and Alternatives

* The so-called “Zero alternatives” involving no conference or a “virtual” conference were rejected (i.e. not assessed) because neither met stated objectives of the organization for capacity building and networking.

VII. REVERSIBILITY, UNCERTAINTY, AND MAGNITUDE OF CONFERENCE ALTERNATIVES

Energy Use

The science behind impacts due to air emissions is increasingly complex and the time frames pertaining to those impacts are both extremely long and variable (Spiro and Stigliani, 1996). Therefore, within the scope of this project, such impacts are generally regarded as irreversible. In addition, there are several uncertainties pertaining to the impacts of the alternatives. Without the specific information regarding the origin of delegates it is difficult to know for certain whether or not a different conference location would actually decrease the distance required by delegates to travel. Pending further investigation, there is also uncertainty as to whether or not another facility would be more energy efficient than the one currently chosen. There is also a great deal of uncertainty associated with any measures of impact magnitude, largely due to the complexity of air emission mentioned above. However, the largest impacts are associated with air travel, and any alternative that reduces the extent of air travel would reduce the energy-related negative impacts of the conference.

Calculations of pollutant emissions due to conference related travel are available in Appendix A.

Mitigation - Energy Use

- Compensation program, such as Trees for Travel. Also, Nike has a deal with Delta Airlines whereby every seat purchased by Nike offsets carbon dioxide emissions through an agreement to convert the heating systems in Portland schools non-polluting natural gas (Nachman-Hunt, 2001).
- Conference organizers could arrange for the planting of trees to offset carbon dioxide emissions

Capacity Building

Capacity building a and professional networking opportunities are beneficial aspects of significant importance. They balance against adverse conference impacts, are potentially long-lasting and, by their nature, are cumulative. Given the difficulty in measuring these benefits, there is a strong degree of uncertainty in their magnitude. Applying a combination of conference modifications would optimize their positive contributions.

Mitigation - Capacity Building

- Host poster sessions for the general public and local academics so that they may have an opportunity to learn about EIA
- Increase opportunities for social interaction at airport and conference venues
- Engage participants directly in EIA activities, don't' just "show and tell" them
- Enhance conference profile by increasing local and regional media coverage

Waste Production

The magnitude of this impact could be minimized by managing the conference to discourage the production of waste by attendees and by providing opportunities to recycle and compost waste that is produced. Providing such opportunities could also reverse the potential impact to a degree by preventing some of the waste materials from entering landfills. Choosing a hotel with a more comprehensive waste management policy than the Sheraton's policy could also help to reduce waste. Finally, decreasing the frequency or size of the conference could help to reduce the total amount of waste produced over time as a result of IAIA conferences.

Based on the available information it is uncertain as to whether the conference organizers have already put waste reduction measures into place for the upcoming event. Therefore, it is not clear how much waste will be produced by the conference. Also, while the Sheraton Wall Centre does have a waste minimization policy, it is uncertain whether another hotel in Vancouver may have one that is more comprehensive and likely to reduce the amount of waste produced by the conference as currently planned.

Mitigation - Waste Production

- Encourage presenters and exhibitors to minimize paper handouts and disposable promotional materials. Perhaps they can take e-mail addresses of attendees who would like to have materials e-mailed to them instead.
- Ask exhibitors to use reusable signage and display decorations.
- Collect nametag holders so they may be used for future conferences.
- Select venues that provide reusable serviceware.
- If conference location doesn't provide recycling bins conference organizers can arrange with a recycling contractor to place bins on-site.
- Ask for food items to be provided in bulk rather than single-serve packages.
- Make sure that any leftover food is composted.

Water Use and Quality

When selecting the conference location, local water resources and treatment facilities should be considered. The location will make a significant difference to the magnitude of the impact of the conference on local water supplies and water quality. There is some uncertainty to the water supply at the time of the conference, and the potential of overflows that may occur. The irreversibility of such impacts is largely affected by careful selection of the conference location, and the ability of the environment to assimilate the treated effluent. The magnitude of the impacts relating to the conference may be also be reduced by environmental policies of both the conference venue and organizers. There is some uncertainty of the impact of such policies without knowing if the venue implements all the strategies, and if the conference delegates in the environmental policies. Reducing the frequency of conferences and the number of delegates attending would decrease the magnitude of the impacts on water use and quality. The magnitude of the impacts would also be reduced by

selecting conference location at times when the local water resources will not be stressed, or when other events are scheduled at the same time. There is some uncertainty to predicting the seasonal local water shortages.

Mitigation - Water Use and Quality

- Advise delegates to use biodegradable products.
- Advise the hotel to use wastewater of one laundry load as the wash water for the next load, and wash only full loads of laundry.
- Advise delegates of water conservation measures including reducing towel washing and bed sheets.
- Use Sheraton hotel's ability to measure water consumption, and let the delegates know how they compare each day. This will provide a benchmark for future conferences.

VIII. MONITORING AND ENVIRONMENTAL MANAGEMENT

A number of monitoring and feedback functions are recommended in order to determine implementation and effectiveness of recommended mitigations:

- Conduct a follow-up survey of conference participants to probe for qualitative measures of capacity building benefits such as new knowledge, technology transfer, and development of professional networks.
- Ask hotel engineering staff to monitor and report on water consumption, waste production and energy use on floors occupied by conference participants
- Analyze distance traveled and energy consumption rates for past, present and future conferences to determine trends and identify future improvements.

IX. KNOWLEDGE GAPS

There are a number of knowledge gaps identified that prevented the EIA working group from making accurate predictions of impacts:

- The extent to which the capacity building and networking have positive impacts beyond the conference
- The exact number of participants
- The origin of the conference participants
- The existence and contents of any IAIA environmental policy for the conference

X. CONCLUSIONS AND RECOMMENDATIONS FOR FUTURE CONFERENCES

Given that this assessment was carried out after conference details had been finalized, the preferred alternative is to conduct the conference as planned. However, monitoring of key indicators such as total distance traveled, hotel energy and water consumption rates, and effectiveness of hotel "green" policies, followed by the reporting of these to conference participants, is suggested.

The EIA working group recommends that future conferences be held every two years at globally centralized locations, in facilities that are fully accredited by recognized “green” hotel associations in accordance with UNEP guidelines (date unknown). Technical visits should be arranged to minimize distances traveled while actively engaging conference participants in hands-on environmental mitigation projects and problem-solving sessions regarding local impact assessment issues. We also recommend that IAIA encourage activities and media coverage to raise the profile of impact assessment as a professional practice within the selected region of future conferences. This option would maximize the capacity building benefits of the IAIA conference while reducing its environmental impacts by over 50%.

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Appendix A: Emission Impacts of Proposed Conference Due to Selected Modes of Transportation

Charter Bus Emissions

Pollutant emissions factors were based on the use of a 1994 New Flyer Diesel bus, 12m long with a maximum weight of 17 330kg (Stantarelli et al., 2003). Table 1 lists the pollutant emissions factors used as multipliers to calculate emission masses. Table 2 shows the total emissions impacts, excluding technical visit H, which could not be calculated due to a lack of specific information.

Table 1. Pollutant emission factors.

Pollutant	Factors (g/km)
CO	3.23
NOx	19.57
PM	0.41

Table 2. Estimated emissions per bus for each technical visit.

Technical Visit	Total Distance (km)	CO (g)	NOx (g)	PM (g)	CO_2 (g)
A	30	97	587	12	49
B	120	388	2348	49	195
C	70	226	1370	29	114
D	60	194	1174	25	97
E	140	452	2740	57	227
F	90	291	1761	37	146
G	250	808	4893	103	406
Total	**760**	**2455**	**14873**	**312**	**1233**

Airplane Emissions

For the analysis of this impact, CO_2 emissions per passenger per kilometre of travel was calculated by multiplying by the energy intensity of secondary energy for modern aircraft by an average CO_2 emissions factor for long-distance airplane travel. By definition, energy intensity is the energy used per passenger km that takes into account average load factors and an average freight-to-passenger ratio for long-distance flights (Becken, 2002).

Table 3. Multiplier constants used in the calculation of airplane emissions.

Multiplier Description	**Value**
Energy intensity	1.758MJ/passenger/km
CO_2 emissions conversion	69g/MJ
CO_2 emissions	121g/passenger/km