

Transportation Planning: Public Attitude Research Report

NWMO-REP-06310-0201

December 2018

Hill + Knowlton Strategies

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ABSTRACT

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Abstract

In 2018, the NWMO commissioned Hill + Knowlton Strategies to lead Public Attitude Research to support NWMO's transportation planning for the long-term care of Canada's used nuclear fuel. This research built upon public attitude research carried out by Hill + Knowlton in 2017. Activities included 14 focus groups (two in each of Toronto, North York, Scarborough, Mississauga, Brampton and Ottawa, as well as two focus groups held in Ottawa with Indigenous peoples); and a day-long public dialogue session held in North York.

The objectives of the 2018 Public Attitude Research were to:

1. Validate the key findings from the 2017 PAR, including:
 - a. the considerations and basic requirements the public believes should be addressed in the NWMO's transportation plan;
 - b. the principles, objectives and values the public believes should inform the NWMO's transportation plan; and
 - c. salient concerns and questions about the transportation dimension of Canada's plan.
2. Delve into four issues identified by 2017 research as requiring further exploration, including the environment, inclusivity, oversight, and financial sustainability.

The **NWMO Public Attitude Research Report** presents findings from the focus groups and group dialogue.

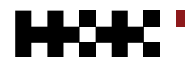
These research findings as well as ongoing conversations with communities involved in the siting process and others that are interested, will be used to develop the NWMO's draft transportation planning framework for the APM process.



Transportation Planning: Public Attitude Research Report

December 7, 2018





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1. Executive Summary

Objectives and Methodology

The NWMO has been engaging in conversation with the public for several years about transportation planning for Adaptive Phased Management (APM). This includes several years of Public Attitude Research. In 2018 NWMO conducted public attitude research (PAR) to meet two objectives: 1) validate and build on key findings from previous studies (e.g., principles and objectives that could inform the plan), and 2) examine, in-depth, four issues flagged from the NWMO's 2017 PAR as requiring further exploration (i.e., environmental protection, understanding who should provide input to make good decisions and how people should be informed or engaged, oversight/accountability, and financial sustainability).

The research, which was conducted in the fall of 2018, consisted of 14 two-hour long focus groups, including two sessions in each of Toronto, North York, Scarborough, Mississauga, Brampton and Ottawa, as well as two focus groups held in Ottawa with Indigenous peoples (i.e., First Nations and Métis). In addition, a full-day dialogue session was held in North York with residents from across the GTA. A total of 151 randomly selected members of the public, representing a range of perspectives, participated in the research.

Validating and Building on Key Findings From 2017 PAR

The results of the 2018 research corroborate, as well as shed additional light on, the main findings from the 2017 PAR, including:

- + High participant awareness of Ontario's use of nuclear power to generate electricity (e.g., familiarity with plant names and locations), as well as the prevalent assumption that Canada's used nuclear fuel is being placed "underground" in a remote part of the country (e.g., Northern Ontario) perhaps in an "abandoned mine".
- + Broad acceptance of APM's rationale (e.g., need for permanent solution), and a general view of it as "well thought-out".
- + Initial questions and concerns about APM's cost, the transportation of used nuclear fuel (e.g., how? where?), the potential impacts of radioactivity, the repository siting process, and the influence of international lessons learned and best practices on Canada's plan.
- + The following were identified as core elements for inclusion in a transportation plan/framework:
 - **Safety:** as the main consideration in decision-making.
 - **Security:** to prevent a "terrorist attack".
 - **Emergency preparedness:** to ensure safety and security in the event of an incident.
 - **Engaging with communities and local governments along the routes (including Indigenous):** to coordinate (e.g., on emergency response issues), receive local knowledge, and work towards gaining community acceptance.
 - **The best science and international lessons learned.**
 - **Financial surety and prudence and accountability/oversight.**
 - **Logistics:** to ensure transportation planning considers scenarios related to weather, road conditions and seasonality.
- + Participants saw APM's guiding principles and objectives as reflecting their own thinking about how the transportation of used nuclear fuel should be planned. For example, safety was identified by almost all participants as the most important guiding principle and the objectives linked to safety, security, environment and capacity to adapt to change resonated with participants. "Transparency" was most frequently identified as needing to be added as both a principle and an objective. It should be noted that Transparency is one of NWMO's core values.

Key Findings on Selected Issues

Environmental Protection

Participants identified two risks to the environment emanating from the transportation of used nuclear fuel: 1) "spills", which participants saw as very unlikely but potentially catastrophic, and 2) greenhouse gas emissions and other collateral impacts (e.g., from improvements to transportation infrastructure), which participants saw as inevitable, but relatively benign because, for example they saw a high likelihood of non-carbon emitting trucks and trains by 2040.

Participants agreed that environmental protection should be specifically addressed in the NWMO's transportation framework because of its intrinsic importance and salience in the public's mind. Most also thought that the NWMO's

document for guiding transportation planning could satisfy public concerns and questions by conveying that: 1) NWMO is aware of the entire range of potential environment impacts; and 2) measures will be in place to reduce and mitigate impacts, effectively respond to accidents/incidents, and remediate environmental damage. Suggested measures to increase public confidence included environmental monitoring (e.g., of radiation along routes), “off-sets” (e.g., rehabilitating habitat) and thorough accident and management response planning.

Discussion of the environment extended to how events such as forest fires, snow storms and tornados could impact transportation, and therefore, needed to be considered in transportation planning. It is also worth noting that participants often linked this threat to global warming.

Inclusivity (Who Should be Involved)

Semantics played an important role in how participants discussed the broad issue of engagement. They began by using words like “consult”, “engage”, “involve” and “inform” interchangeably, but quickly appreciated the necessity of defining what they meant.

There was agreement that groups such as federal and provincial governments, nuclear power generators, first responder/emergency response organizations and experts, should have some direct influence over decision-making.

Engaging with communities along the routes was often assigned a high priority, but participants believed that NWMO’s objective should be to “inform” residents by providing information, answering questions and addressing concerns. Community engagement was viewed as the “right” thing to do: “I think people have a right to know about this; I would definitely want to know.” It was also viewed as a strategically smart way for NWMO to secure a critical mass of acceptance: “You don’t want people finding out about this first from other sources.”

A commonly held perspective was that there was value in proactively assuaging fear about the transportation of used nuclear fuel before it becomes entrenched. There was a general sense among most participants that with enough time, care, transparency and skill, the NWMO’s community engagement efforts should be able to reassure most community residents, and the broader public, about the need for the project and the soundness of the transportation plan. To substantiate this view, participants often explained how exposure to information and the opportunity to discuss the issue during their session had caused their own views to evolve: “At first I had a lot of questions and concerns and I thought the whole thing was a hard to believe, but when you see how much thought has gone into this and the safety of containers, I think it could be done safely.”

Financial Sustainability

The research suggests that the public will want to know about APM’s financial management, including the question of financial surety. General questions that participants wanted to see addressed, included:

- + How much will the project cost? (participants’ guesses varied widely, but with many pegging the cost at somewhere between \$15 billion to \$50 billion).
- + Will funding the project necessitate an increase in electricity rates (or possibly even taxes)?
- + Who will pay for the project? Where will the funding come from?
- + How does Canada’s plan ensure that funding will continue to be available for APM?

Transportation-specific questions posed by participants included:

- + Does the overall cost include road/rail or other necessary infrastructure upgrades?
- + Does the budget include money for clean-up/remediation in the event of an accident/incident during transportation?

Participant reaction to a handout on APM funding was positive and provides useful guidance for presenting financial information to the public. First, most were pleasantly surprised by APM’s estimated cost (though everyone expected that actual costs would be higher). Participants also liked the fact that nuclear energy producers, and not governments, were paying, and they considered the resulting electricity rate increase to be “reasonable”. The existence of a trust fund with a substantial amount of money already in it inspired a degree of confidence, while the presence of federal legislation providing for continuity of funding was reassuring. The questions about funding for transportation-specific activities signals that it would be beneficial for NWMO to be prepared to provide more detailed information about cost-break downs.

Oversight

Participants raised oversight and accountability issues at various points in the discussion. These issues were thought to be especially relevant given the long-term nature of the transportation plan, its cost, perceived risk to public safety and security, and the large number of different stakeholders involved. The most fundamental question on the minds of participants was who or what organizational structure was in “in charge”; with the most common assumption being that the federal government was.

Participants agreed that APM’s transportation plan must be designed to ensure:

- + a high level of coordination between all involved (e.g., different levels of government and departments/agencies, first responders, community leaders);
- + responsible fiscal management;
- + transparency and public accountability; and
- + fiscal and administrative “continuity” over the life of the project, meaning that the integrity of the project and associated funding will remain constant through potential changes in government.

Participants were provided with a handout that summarized the primary roles and responsibilities of NWMO and the Canadian Nuclear Safety Commission (CNSC) and Transport Canada. Reaction was mixed -- Participants were able to understand how and why different agencies would have responsibility for overseeing different aspects of transportation, but some worried that such a structure could make coordination difficult and accountability murky. Participant feedback suggests that an effective way of conveying the oversight and accountability framework is by describing NWMO’s role as implementing Canada’s plan, and the role of government departments and agencies as monitoring NWMO to ensure compliance.

The Perspective of Indigenous Participants

The views expressed by Indigenous participants were generally consistent with those of other research participants, particularly with respect to their knowledge of the issues (e.g., nuclear energy production), the questions they posed, the elements they thought NWMO should address in its transportation framework and in their reaction to the handouts and informational videos. Notwithstanding these similarities, the research points to some potential differences in views, which are described fully in Section 3.7.

Cross-cutting Themes

The following four themes permeated the focus groups and dialogue session:

- + **Informing and Engaging are Key to Social Acceptance:** Participants effective, fact-based community engagement as the most effective means of addressing public concerns and potential opposition, particularly from communities along the routes. Participants also agreed that this was both a socially responsible and strategically wise approach for NWMO to take.
- + **Transparency as the *Sine Qua Non* of APM Transportation Planning:** Throughout the sessions, participants used the term “transparency” to describe how they wanted NWMO to approach its work, particularly as it pertains to its interaction with the public (e.g., in communicating potential risks). Participants agreed that the quality of transparency was key to gaining public trust, and, by corollary, public acceptance.
- + **Balancing Adaptation and Continuity:** This theme revolves around the need for the planning framework to encompass two opposite qualities: 1) insuring that the transportation plan is flexible enough to continuously incorporate the latest and best science and technology, and 2) providing continuity throughout the project, particularly with respect to project finances and changes in government.
- + **APM as a Societal Good:** Participants often explained that their countenance of APM was in large measure based on their view of it as being in the broader public interest. For this reason, they thought it important that NWMO clearly convey APM’s environmental benefits (i.e., dealing permanently with Canada’s used nuclear fuel): “Critics will say that the project poses a risk to people and the environment. But leaving it where it is isn’t sustainable and riskier. I think if people understand that, it’s going to make a big difference in terms of acceptance.”

2. Objectives and Methodology

2.1. Objectives

The safe and secure transportation of used nuclear fuel is an important component of Adaptive Phased Management (APM), Canada's plan for the long-term management of used nuclear fuel. While the transportation of used nuclear fuel from temporary storage locations to the eventual repository site will not commence until about 2040, careful planning takes time. The NWMO has been engaging in conversation with stakeholders and the public for several years. In 2017, the NWMO carried out public attitude research to identify the principles, values and objectives the public wish to see reflected in transportation planning, with the organization's discussion document serving as the key resource for the design of the research.¹ The 2018 public attitude research (PAR), which is the subject of this report, can be viewed as a complement to the NWMO's ongoing dialogue with communities involved in the site selection process and interested citizens more broadly. The information presented in this report, along with previous years' research and NWMO's ongoing dialogue with citizens, is intended to inform the development of a Transportation Planning Framework².

The objectives of the 2018 PAR were to:

- + Validate and build on the key findings from the 2017 PAR, including:
 - + the considerations and basic requirements the public believes should be addressed in the NWMO's transportation plan;
 - + the principles, objectives and values the public believes should inform the NWMO's transportation plan; and
 - + salient concerns and questions about the transportation dimension of Canada's plan.
- + Delve into four issues identified by 2017 research as requiring further exploration, including the environment, inclusivity, oversight, and financial sustainability.

Qualitative research findings are not generalizable to the study population (the way that surveys of probability-based samples of the population are). Rather, focus groups, and other qualitative research techniques, are useful for understanding the feelings, values, and thoughts on which perceptions are based, as well as for capturing the language and imagery people use to discuss the study issues. Qualitative research is thus very useful for developing informational and communication materials, particularly on complex policy issues.

It is also important to note that the individual views of research participants were not recorded as formal comments on NWMO's planning work and only aggregate comments were considered.

2.2. Methodology

The research methodology consisted of 14 focus groups (including two with Indigenous participants) and one day-long dialogue. All session participants were randomly recruited members of the public.

The issues examined in the focus groups and day-long session were very similar, albeit with different emphases. The following summary table presents the topics by type of engagement:

Issue Set	Indigenous Focus Groups	Focus Groups	Dialogue Session
Transportation planning principles	✓		✓
Environment	✓	✓	✓
Who to Involve/Inclusiveness	✓	✓	✓
Oversight		✓	
Financial Sustainability		✓	✓
Objectives for Transportation Planning	✓	✓	✓

¹ *Planning Transportation for Adaptive Phased Management*. September 2016. NWMO.

² Note: the term "framework" is used throughout this report to describe the NWMO's guiding document for transportation planning (to be released in 2019) because this was the term used in the sessions. The document's eventual title, however, may or may not include the word "framework".

Focus groups

Fourteen two-hour long focus groups were conducted in Ontario, including two in each of Toronto, North York, Scarborough, Mississauga, Brampton and Ottawa, as well as two focus groups held in Ottawa with Indigenous peoples (i.e., First Nations and Métis).³

A total of 109 people participated in the focus groups. They were randomly recruited based on several socio-demographic indicators (e.g., age, gender, education, household composition) to ensure that a cross-section of the population was heard. Similarly, the use of attitudinal screening ensured that each session included some participants with an open attitude towards nuclear power and others who are skeptical (see Appendix A for research participant screening criteria). The focus group sessions were conducted during the last two weeks of October 2018.

An H+K facilitator used a semi-structured moderator's guide to address the study issues. In addition, several handouts and two videos provided participants with fact-based information on the issues discussed. The focus group guide and handouts/worksheets are appended to this report (Appendix B).

Public Dialogue Session

The public dialogue workshop was held on November 3th, 2018 in North York. A total of 42 people, coming from all regions of the GTA, participated in the full-day session. Participants were randomly recruited based on the same socio-demographic and attitudinal screening criteria used to recruit the focus group participants (Appendix A).

Participants were assigned to small groups of 5-6 people to ensure demographic and attitudinal diversity at each table. Following a "Nuclear in Ontario" trivia ice-breaker exercise and an introductory presentation on the NWMO and Canada's plan (APM), participants were tasked with discussing the five issue sets identified in the above table. NWMO officials provided context at key points and responded to questions at key points in the dialogue. A team of H+K facilitators guided participants through a mix of individual reflection, table brainstorming exercises and plenary discussion. As in the focus groups, informational videos and handouts were used throughout. Before leaving, participants completed an evaluation questionnaire. The dialogue session guide/presentation and handouts/worksheets are appended to this report (See Appendix C).

³ Note: None of the Indigenous participants identified as being associated with any of the Indigenous communities that NWMO is currently engaging with.

3. Detailed Findings

The focus group and day-long sessions were deliberative in nature. Participants were provided with fact-based information at key junctures and given time to reflect (e.g., by jotting down thoughts on paper) before discussing their views with others. While the topics covered in the focus groups and day-long session were very similar, the approach taken to presenting information and raising points for discussion varied somewhat.

For the reader's ease, each major section of this chapter begins with a brief description of how the issue/set of questions were introduced to participants.

3.1. Knowledge and Awareness of Nuclear Power Use and Used Nuclear Fuel

The focus groups began with an unaided discussion of participants' knowledge and awareness of Ontario's use of nuclear power and of used nuclear fuel (e.g., Approximately how much of Ontario's power comes from nuclear energy? What is done with the used fuel?). Then participants were provided with a description of NWMO (e.g., non-profit organization established in 2002 by Canada's nuclear electricity producers). This was followed by a short video describing APM, Canada's plan. Participants were invited to share their thoughts, including questions they had about Canada's plan.

Day-long session participants were introduced to NWMO as an organization, discussed their awareness of nuclear power in Ontario by means of an "ice-breaker" trivia game, and then were provided with a description of APM (including the same video shown in the focus groups). A plenary discussion ensued, in which participants were invited to share their thoughts, including questions they had about Canada's plan.

Overall, awareness and perceptions about nuclear energy and used nuclear fuel were consistent with the 2017 PAR findings. We found:

- + high awareness of Ontario's use of nuclear power to generate electricity, including familiarity with plant names and locations;
- + generally positive views about nuclear power having served Canada/Ontario well (e.g., clean, safe affordable);
- + some unprompted concerns and questions about used nuclear fuel and how it is "dealt" with;
- + some participants, especially in the dialogue session, saying that they had given little thought to used nuclear fuel or its safe long-term storage; and
- + a handful of participants with prior knowledge of Canada's plan.

Most participants thought that Canada's used nuclear fuel was being placed "underground" in a remote part of the country (e.g., Northern Ontario), perhaps in an "abandoned mine". Others thought the used fuel was being kept at the power plants, either above ground or in pools of water, while only a few felt completely uninformed about this.

It is worth noting that for participants' discussion in the Scarborough focus groups, particularly those living within view of the Pickering plant, revealed a higher level of knowledge and awareness, with nuclear energy and used nuclear fuel.

3.1.1. Salient questions from participants

The description of APM elicited mainly positive responses. Notwithstanding a few participants thinking that the best course of action might be to keep storing the fuel temporarily until a better technology was developed, a large majority of participants felt that governments, Canada's scientific community and other stakeholders had developed the most practicable plan possible. Some also argued that it would be unfair and irresponsible to pass the problem on to younger and future generations. In addition, we found that:

- + Most participants were impressed by the science, technology and thoughtfulness of the plan: "It looks really well thought out."
- + There was a mix of skepticism and incredulity that there would be a "willing and informed" community willing to host the facility: "Who is going to want that in their community? Come on."
- + Many were struck by what they considered to be the enormity, as well as long duration of the project.

It is also important to note that across the sessions participants sought reassurance that Canada's plan was based on international lessons learned and best practices: "I would want to know that this is based on what has worked and not worked in other countries. Is it?" "There is a lot of experience internationally – that provides me with comfort."

The description of APM also prompted several other questions and some concerns, as follows:

- + Quite a few participants wondered about cost of the project and the related issues of "who pays" and how: "I was thinking about how much this whole thing is going to cost. It looks like it will be a fortune."
- + Some wondered about how the fuel would get from the nuclear power plants to the repository: "There was nothing in that video about transportation. You said there were five plants, including New Brunswick? If this community is going to be someplace like Northern Ontario, then it has to travel for thousands of kilometers. That's what I'm worried about; the rest of the plan looks good."
- + At this early juncture, as well as throughout the sessions, participants asked questions about the nature and potential impacts of radioactivity (e.g., radioactive characteristic of used fuel bundles), as well as other technical questions such as what scientific research has been done on storage for 1 million years, and whether additional bordering space would be required to restrict development immediately outside the 250-acre storage facility site. In short, they wanted to know the risks.
- + Participants also had process questions about APM, including how a host community indicates its willingness ("does there have to be a plebiscite?) and what would happen if at the end of the process there is no willing host community.

3.2. Elements to Include in the NWMO's Transportation Framework

In both the focus groups and day-long session, participants were provided with some background about the transportation of used nuclear fuel as part of APM, along with some key pieces of information (e.g., approximately 40 years of transportation beginning in 2040 or so, potential use of truck and/or rail, anticipated average number of shipments per year).

Participants were then asked to develop a list of core elements for inclusion in a transportation plan/framework.

The results of the exercise, which are presented in Table # below, are very consistent with the 2017 PAR.

Top Tier Framework Elements

(most often included on participant lists and most likely to be placed near the top)

Safety

- + To realize the lowest level of potential risk, safety must be the main consideration in decision-making.
- + Pertains to all that could be affected: public, environment, animals, workers.
- + Pertains to all aspects of transportation, including employee training, design of shipping containers, selection of mode(s), design of vehicles/trains/ships, selection of routes (e.g., avoiding populated areas, accounting for weather, traffic partners, etc.)
- + Ensuring safety over the lifespan of the project by avoiding the pitfalls of complacency and greed. Participants cautioned that any organization with a hand in ensuring the safe transportation of used nuclear fuel should not let initial success dull their vigilance and weaken their commitment to safety: "It's the eventual cutting of corners. After a few years accident-free, they decide, 'well, maybe we can buy cheaper materials', or 'we don't need to check it so often'."

Security

- + The notion of security centered on preventing a "terrorist attack".
- + Some imagined police or even military escorts.
- + Participants wondered whether the used fuel could be weaponized (e.g., to make a "dirty bomb").
- + Some debate about the pros and cons of publicly identifying shipments as carrying radioactive material and making available information about the time and routes of shipments "I can see both sides of the argument: it

Top Tier Framework Elements

(most often included on participant lists and most likely to be placed near the top)

- seems that the public has a right to know, but at the same time, you don't to make these shipments easier to target."
- + As with ensuring safety, avoiding complacency and resisting the temptation to "cut corners", was viewed as key to success.

Emergency Preparedness

- + Pertains to ensuring safety and security in the event of an incident.
- + Involves planning to respond to all potential scenarios (e.g., accidents), with an emphasis on the importance ensuring clear roles and responsibilities for all parties involved emergency response. In support of their suggestion, some participants pointed to the "Mississauga derailment": "Oh my God. First of all, no one knew that this stuff was coming through the community, so nobody knew what to do when it happened, no one was prepared. They evacuated the whole city. It turned out okay, but this could have been a total disaster."⁴
- + Also means ensuring that first responders along the routes have the training, equipment and planning in place to respond effectively. Many participants assumed that some first responders would require additional resources: "You're talking small towns, sometimes First Nations communities, with volunteer fire departments. Are they going to be able to handle something like this?"
- + Coordination was also seen as key to success, including clear plans and roles for first responders and other personnel: "If something happens, you can't have all the different agencies standing around either because they don't know what to do or because they think it's another [agency's] responsibility." Throughout the discussion, there was some concern and skepticism expressed about the ability of different agencies and governments to work seamlessly together: "I don't see a great track record there."

Engaging with Communities and Local Government Along the Routes

- + This element is based on the principle that communities have a "right" to know. For many participants, it also has an important strategic dimension: "It's only through engaging with these communities that you're going to get the social license you need to do this project."
- + Engagement with communities, specifically local government and first responders, is also seen as key to effective coordination and mitigating risk: "They can tell you, 'hey that part of the road won't take a heavy truck. You need to shore it up or take another route.'"
- + There was some debate about how to provide information to communities without compromising security: "I'm not sure I would let people know when those trucks are coming through. You don't want to make it easier for any bad actors out there."

Based on the best science and international lessons learned

- + The conviction that the transportation plan should be based on the best available evidence was echoed throughout the discussion. In particular, participants thought it was very important for Canada to learn all it could from "other countries": "I would want to make sure that they learn from other countries' experiences, like what worked, what didn't."

⁴ On November 10, 1979 the derailment of a freight train containing propane and other chemicals (e.g., chlorine) caused a large explosion in Mississauga triggering the evacuation of over 200,000 people. Ref: *"The Mississauga Evacuation, Final Report, November 1981". Ministry of the Solicitor General of Ontario. Retrieved 2006-11-21.* Available online: <http://cidbimena.desastres.hn/docum/crid/Diciembre2004/pdf/eng/doc4131/doc4131.htm>.

Other Framework Elements (included on several participant lists)	
+	Financial certainty, continuity and prudence: ensuring financial resources are available to complete the project, that funds are managed in a responsible and transparent way, and that the project be free of “political interference”.
+	Accountability/oversight: often expressed in terms of holding organizations and individuals accountable for their decisions and actions: “Someone or something has to be responsible if something goes wrong. The buck has to stop somewhere.”
+	Logistics: often raised by participants that wondered whether transportation logistics (e.g., timing of shipments) would consider scenarios related to weather, road conditions, and seasonality.

Few participants’ list explicitly included the environment. Probing revealed that many participants felt it would be “covered” through solid planning and execution around safety, security and emergency preparedness: “To me I sort of have it under ‘safety’. If the environment is contaminated, then the people aren’t safe.”

Very few non-Indigenous participants included an Indigenous-related consideration on their list. Those who did mostly spoke about the need to: engage with Indigenous communities, ensure that the plan respected Indigenous rights and treaties and/or, ensure that the plan has the benefit of Indigenous knowledge (e.g., environment).

Participants who had not included an Indigenous-related element on their list of transportation framework considerations often explained that it hadn’t dawned on them to specifically mention these communities in contradistinction to other communities along the routes: “I didn’t mention it specifically, but obviously given where this stuff is going to end up, it’s going to go through a lot of Indigenous areas, so yeah, you need to sit down with them too.”

Of note: some participants felt that transporting nuclear fuel is qualitatively different than transporting any other material. As such, participants often spoke about the need for “special” requirements, such as the involvement of the military, enhanced training and vetting for employees, including drivers, specially designed vehicles and rail cars, the “clearing” of rails and roads of other traffic and even the building of dedicated roads and/or rail lines. In discussing the need for such precautions, they voiced their own concerns: “I wouldn’t want to be on the road at the same time as one of these trucks.” They also often highlighted what they considered to be the public’s fear and misunderstanding of things nuclear: “How many trucks are going down the 401 every day carrying who knows what, and no one says anything, but as soon as you mention nuclear, it becomes a whole different ball game. So, people are going to expect that it be treated differently.” As participants learned more about the robust containers and the plans that would be in place for transporting used nuclear fuel, the need for many of these special requirements diminished in the minds of many participants.

3.3. Principles for Guiding the Development of the APM Transportation Plan

The NWMO's draft principles for guiding APM, which were developed through previous engagement with Canadians and included in the 2016 discussion document as a starting point for discussion of principles for guiding APM transportation, were addressed in depth during the day-long session. The principles were introduced to participants, then individually and in their small group session, they were asked to consider which principles resonated most from a transportation perspective and why, and what principles, if any, were missing.

The principles were also discussed in the Indigenous focus groups, but significantly less depth.

Feedback was obtained on the following principles:

- + **Safety is the overarching principle guiding all APM planning and activities:** Safety, security, and protection of people and the environment are central and must not be compromised by other considerations.
- + **Meet or exceed regulatory requirements:** The plan must meet, and if possible, exceed all applicable regulatory standards and requirements for protecting the health, safety, and security of humans and the environment, and respect Canada's international commitments on the peaceful use of nuclear energy.
- + **Indigenous rights, treaties and land claims:** The plan must respect Indigenous rights and treaties, and take into account that there may be unresolved claims between Indigenous peoples and the Crown.
- + **Inclusiveness:** The plan must respond to and address, where appropriate, the views of those who are most likely to be affected by the plan.
- + **Informing the process:** The plan must be informed by the best relevant available knowledge, including science, social science, Indigenous Knowledge, and ethics. This information used to develop the plan must also be made public.
- + **Ongoing engagement of governments:** The NWMO must involve all potentially affected provincial governments in the development and review of the plan.

Safety was identified by all participant groups as the most important principle. Several groups went further and suggested it be identified as an overarching, prime principle.

Groups identified additional principles for consideration.

- + **The ideal of consensus-based decision-making:** decisions should be acceptable to all stakeholders (as the discussion evolved, many participants came to see consensus-based decision-making as unrealistic, as well as unnecessary).
- + **Citizen-first approach:** emphasis should be on citizens and protecting their interests.
- + **Transparency:** the process should be conducted in an open and accountable way.
- + **Inter-generational fairness:** process should not pass costs or other burdens to future generations that can be addressed today.
- + **Flexibility:** the plan should be able to adapt to changing and unanticipated developments.
- + **Public education:** public awareness and knowledge of Canada's plan and the transportation of used nuclear fuel should be increased.
- + **Openness to new technologies:** planning should consider new technologies and other innovations.
- + **Audit and oversight:** the planning process should be conducted with effective governance (i.e., appropriate decision-making processes should be in place to ensure accountability and some level of independent review).

3.4. Exploration of Environment, Inclusivity, Financial Sustainability and Oversight

A review of the 2017 PAR suggested that the development of the Transportation Framework would benefit from an in-depth exploration of four issues: environmental protection, understanding who should provide input to make good decisions and how people should be informed or engaged (also referenced in this report as “inclusivity”), oversight/accountability, and financial sustainability. All of these were discussed in the non-Indigenous focus groups. In the day-long session oversight was not introduced for discussion, though participants raised aspects of it throughout. In the Indigenous focus groups, only the environment and inclusivity were explored in depth, as a greater emphasis was placed on discussion around principles and objectives.

Prior to discussing these issues, and to provide additional context to the environmental issue in particular, participants were provided with information about the certification and testing of transportation packages (i.e., by means of an NWMO video). Day-long session participants also received information on the regulation of radioactive materials in Canada and the international track record related to transporting used nuclear fuel.

Handouts and worksheets were used to inform and facilitate this part of the sessions (see appendices).

3.4.1. Environmental Protection

As noted, part of the sessions was devoted to probing participants’ values, concerns and suggestions with respect to how NWMO’s transportation framework should address environmental protection. To set up this discussion, participants viewed the NWMO’s video on packaging. Consistent with the 2017 PAR, most participants reacted positively to what they saw; they were generally impressed with the design, testing and resilience of the transportation packages. Questions centered around the nature of the package testing (e.g., was used nuclear fuel inside the package) and the package’s design (e.g., how easy/difficult it would be to unscrew bolts). Some participants suggested that the video should be updated to include more recent testing, noting that this gives the public more reassurance.

There were two ways in which participants spoke about this issue: 1) “spills”, and 2) greenhouse gas emissions and other collateral impacts. The results of these discussions are summarized below.

An Incident or Accident Leading to a “Spill”

Participants were able to imagine a variety of scenarios that would cause at least part of a load of used nuclear fuel to escape from its cask into the environment, including accidents, acts of terrorism and sabotage: “I’m picturing a truck sliding off a bridge and into the St-Lawrence River”. They were also often quick to add, however, that the odds of used nuclear fuel spilling into the environment appeared to them to be extremely low, given what they had learned about transportation container design and testing: “Anything is possible, but given what we saw in the video, those containers are pretty secure. It’s hard to imagine any type of leak, but they have to be prepared for it.”

In the absence of science-based information about the potential impact of spills, most participants assumed that the release of used nuclear fuel into the environment would be potentially catastrophic (and many participants assumed that used fuel is a liquid): “It depends on where it was, but if it was close to a city, then yeah, I’d imagine thousands of people could die.” One of the most common questions raised by participants was about the potential impact of a used nuclear fuel spill: “What would the radius of contamination be? Are we talking 50 meters, 500 meters? What if it’s water?” The fact that the used fuel is solid, as opposed to liquid, reassured participants: “I don’t know what would happen, but let’s say somehow the top of the container came off while it was on its side and some pellets rolled out. I’m thinking that as long as they were cleaned up quickly, the impact wouldn’t be much.”

Greenhouse Gas (GHG) Emissions, Other “Collateral” Damage and the Impact of the Environment on Transportation

Participants were as likely to talk about the collateral effects of transportation on the environment as they were to talk about contamination from an incident. Collateral effects included GHG emissions, as well as the impacts that improvements to infrastructure (e.g., widening roads, building segments of dedicated rail lines, reinforcing bridges) could have on the local environment, especially around fragile habitats. Some also pointed out that there would be impacts related to the manufacturing of transportation equipment (e.g., mining of the metal for transportation packages).

With some exceptions, participants thought that the overall negative impacts of GHGs (e.g., from diesel-burning trucks and trains) would be relatively small, even negligible: “We said it was two trucks a day for 40 years? An extra two trucks added to the thousands that are on the road now isn’t going to make much of a difference.” In addition, several participants suggested that by 2040 road vehicles and trains would no longer be emitting GHGs: “We have electric cars now.” In a related point, some participants expected that vehicles would be “driverless”.

In addition to discussing the potential impacts of the transportation of used nuclear fuel on the environment, many participants noted how environmental conditions could have an impact on the safety of transportation. Factors that participants felt NWMO’s transportation plan should consider included forest fires, snow storms and tornados. It is also worth noting that several participants linked this issue to climate change (i.e., that climate change would cause more challenging weather conditions and events).

Addressing Environmental Protection Within the Transportation Framework

Participants agreed that environmental protection should be specifically addressed in the NWMO’s transportation framework because it is a legitimate concern and is critical to obtaining public acceptance. In this vein, some participants spoke about how the framework should convey that: 1) the NWMO is aware of potential environment impacts; and 2) measures will be in place to reduce and mitigate these impacts: “I think it definitely needs to be in there because people generally worry about the environment, but I don’t think you need to devote a lot of space to it.” Suggestions included:

- + Acknowledge the potential for different types of environmental impacts.
- + Note that all emergency response plans include approaches to minimize environmental impacts, and that plans cover all potential eventualities. A few suggested that the public might be reassured by radiation levels being constantly monitored along the route.
- + Note that NWMO will identify environmentally sensitive areas along routes and take all appropriate precautions around them.
- + Consider “off-sets” to make-up for negative impacts on the environment (e.g., planting trees, rehabilitating habitat).
- + Note that the plan would incorporate “green” technology as it becomes available.
- + Commit to engage with environmental groups and experts, as well as Indigenous communities, to further the NWMO’s understanding of the issues.
- + Consider implementing a system of environmental “monitoring”, which could include constant measuring of radiation along transportation routes and regularly assessing the impact of transportation of the environment (e.g., on wildlife, sensitive habitats).

Components of the Plan that would Increase Public Confidence

During the dialogue, participants were asked what would need to be included in the transportation plan to give them comfort and confidence that the environment will be protected. Individually, and then in small groups, participants identified a series of components:

- + Equipment standards: knowing that equipment used in transportation met appropriate and high standards.
- + Accident management and response: knowing that a robust plan was in-place to deal with accident scenarios and ensure coordinated response measures.
- + Infrastructure: knowing that infrastructure will meet transportation needs, or that there is a plan and funding available to upgrade infrastructure before the transportation of used fuel begins.
- + Notifications: knowing that first responders and municipal governments along the eventual route will be notified of transportation shipments including dates and times.
- + Human resource policies: knowing that transportation providers have policies to ensure employees are physically and mentally safe to perform their tasks (similar to airlines)
- + Truck labelling: some groups felt that warning labels on transportation packages would help them feel safer. Others disagreed, arguing that these labels could make the packages more visible and could increase the chances of a security incident.
- + Containment crew on-hand: some groups also said that it would make them feel more confident if shipments were accompanied by specialized containment crews. Others felt differently and said they would be more comfortable if local first responders were trained and equipped for accident scenarios.
- + Environmental monitoring of radiation and of impacts of transportation on the environment.

3.4.2. Inclusivity: Who Should Be Involved

The session discussions around inclusivity were aimed at obtaining participants' feedback on with whom and to what extent NWMO should engage to ensure that good transportation planning decisions are made. Participants were also encouraged to provide a rationale for their choices.

Two different worksheets were used. For the dialogue session, participants were asked to jot down who they thought should be involved, to what end (i.e., why?), and at what level of priority. The corresponding focus group worksheet asked participants to consider the same questions. In the interest of time, however, the following groups were already included on the sheet: scientist/experts, federal and provincial government departments/agencies, nuclear power generators and Indigenous governments, as these were groups that were raised frequently in the 2017 research.

At the beginning of this discussion participants often used terms such as “consult”, “engage”, “involve” and “inform” interchangeably. As they spoke, however, participants realized that it was important to define what they were proposing: “I don’t think we want to consult. Inform yes, but consult is on a different level.”

Collectively, participants saw a continuum ranging from awareness raising at one end, to involvement in decision-making at the other end. There was agreement that groups such as federal and provincial governments, nuclear power generators, first responder/emergency response organizations and experts, should have some influence over decision-making.

First responders, for example, were included on many participant lists and ranked as a high priority group. The most common rationale put forward by participants was that successful incident response requires a lot of planning and coordination, particularly when the responders to an incident may be dispersed over vast territory: “They need to know what everyone’s capacity is, what equipment they have and how to respond based on different scenarios. So obviously NWMO needs to engage with all those responders, and hospitals too.”

As discussed below, there was some debate about how involved Indigenous communities/governments should be. And, much of the discussion, particularly in the focus groups, revolved around communicating and engaging with communities along transportation routes.

Residents of communities along the routes

Engaging with communities along the routes was on practically everyone’s list, and for the most part, was ranked as a high priority. This issue also generated lively discussion among participants.

From the perspective of values and principles, community engagement was viewed as the “right” or socially responsible thing to do. In support of their view, participants often said that they would want (and expect) the NWMO to engage with them if they were living in a community along the routes: “I think people have a right to know about this; I would definitely want to know.”

From a more practical and strategic standpoint, participants strongly agreed that community engagement was the key to ensuring that the transportation planning and implementation went smoothly (i.e., without significant protests, roadblocks, lawsuits, injunctions or other barriers that could delay or even potentially derail the plan).

Some participants had used words such as “approval” and “referendum” to explain what they had in mind when the issue was broached during the initial part of the sessions. As the question of community engagement was revisited and discussed in more depth, however, almost everyone concluded that obtaining community consent was unrealistic and impractical: “If you go the approval route, it will never get done. You can’t have a handful of communities derailing something that is for the benefit of the province.” Instead, participants agreed that “informing” communities, was sufficient, while cautioning that the NWMO’s community engagement needed to be sincere and meaningful, with transparency and proactivity as its hallmarks: “You don’t want people finding out about this first from other sources.” Other recommendations included:

- + Adopt a long-term approach – start early and allow communities the time they need to absorb information and ask questions.
- + Use multiple modes of communications/engagement (e.g., town halls, newsletters, online resources, displays, social media): “Websites are for seniors, seriously. You need to use social media and use it well.”
- + Explain the risks. A frank discussion of risks will add credibility to the process.
- + Answer questions frankly.
- + Consider deploying resources-people that could travel to communities on a regular basis to update residents and answer questions.

- + If possible, work with schools/teachers to educate children and youth about nuclear energy and Canada's plan to deal permanently with used nuclear fuel.

There was a general sense among participants that with enough time, care, transparency and skill, the NWMO's community engagement efforts should be able to reassure most community residents about the need for the project and the soundness of the transportation plan. To substantiate this view, participants often explained how exposure to information and the opportunity to discuss the issue during their session had caused their own views to evolve: "At first I had a lot of questions and concerns and I thought the whole thing was a hard to believe, but when you see how much thought has gone into this and the safety of containers, I think it could be done safely."

Discussion of community engagement led some participants to ask whether communities could expect to receive some form of "compensation". A few had financial compensation in mind, for example to make up for potential declines in property values. For the most part, however, participants imagined benefits such as improvements in training and equipment for local first responders, as well as improvements in local transportation and social / health infrastructure. For these participants, the idea was not for the NWMO to exchange benefits for support, but rather to communicate the possibility of benefits where they existed: "If you are going to improve road plowing because of this, or if the local fire department is to get more resources, then communities should know this."

There was some debate as to when NWMO should start engaging with communities. Most thought that this should happen as soon as possible, given the number of communities involved and anticipated level of initial concern/resistance. Others thought that since the actual transportation would not begin for another generation, it made sense to engage closer to that time (e.g., 10 to 5 years before the initial shipment). It is also interesting to note that several participants suggested that the NWMO had to be ready to "get out in front of the issue", "control the narrative", and "counter misinformation campaigns". In a similar vein, there were several calls for NWMO to raise its public profile: "It's hard to trust someone you know nothing about."

Municipal governments along the route

Participants felt that it would be important for the NWMO to engage with municipal governments, including elected officials and town/city managers, for three reasons:

1. As with members of the public, participants see engagement as key to gaining acceptance of the transportation plan among municipal officials.
2. Community residents would likely look to their municipal government for information about the transportation plan and its implementation.
3. Because municipal governments need to be involved in coordinating key aspects of the transportation plan, such as evacuations, emergency response and road maintenance. It was also felt that their "local knowledge" would help NWMO learn about environmentally sensitive areas and weak/hazardous stretches of road and rail line.

Environmental perspectives (both expert and advocates)

Many participants thought it would be wise for the NWMO to engage with what participants collectively described as "environmental groups", "environmentalists" and "environmental experts". Here, as elsewhere in the discussions, participants put forward both practical and strategic reasons for doing this.

From a practical standpoint, there was general agreement that the environmental protection part of the NWMO's transportation plan would likely benefit from the perspective of environmentalist and environmental experts (e.g., to flag potential problems and solutions that the NWMO might not be aware of): "You're dealing with all sort of experts in science and transportation, so why wouldn't you want to get expert input when it comes to protecting the environment."

"Critics" in general

Strategically and optically, many participants thought that it would be smart for the NWMO to engage with its potential critics and detractors. They thought that doing so was in keeping with the principles such as openness, honesty and transparency. They also believed that it would enhance the NWMO's credibility among the public: "There is a risk in doing that, but I think they would take a bigger risk trying to shut them out." They referred to individuals or groups who may question Canada's Plan for environmental, financial or other reasons.

Other countries/international experts

At various points throughout the sessions, participants flagged the importance of ensuring that the transportation plan (as well as Canada's overall plan for dealing permanently with used nuclear fuel), benefits from the best available information, including lessons learned from other countries: "We don't want to be reinventing the wheel".

A common assumption among participants seemed to be that other countries (e.g., US, EU, UK) would have more experience than Canada in transporting used nuclear fuel – a view that was perhaps suggested or reinforced by the packaging video featuring British and German package-testing scenarios.

A minority of dialogue participants expressed skepticism about the involvement of scientists and technical experts: “Experts might have self interest in their industries and their science.”

A note on engaging with Indigenous communities and governments

Indigenous communities were not often mentioned by non-Indigenous participants. When the topic was raised, for example as part of the discussion on inclusivity, participants agreed that the NWMO must engage with Indigenous communities along the routes. In the eyes of some participants, and as noted, engaging with Indigenous communities is part and parcel of engaging with all communities along transportation routes. These participants also felt that the approach to engagement should be essentially the same as that used with any other community.

Other participants, however, including all the Indigenous people who participated in two focus groups held in Ottawa, felt that NWMO had to engage differently with Indigenous communities. Two lines of reasoning were put forward in support of this approach:

1. **Principle:** Past wrongs, the persistence of political and socio-economic inequities, and the pursuit of reconciliation as a societal project, required a “higher level of” and “more respectful approach to” engagement. Indeed, for a few participants, including several Indigenous participants, the right thing to do was for NWMO to obtain the “consent” of Indigenous communities along the route. As discussed later in this report, however, discussion led most Indigenous participants to soften their stance on consent.
2. **Treaties, land claims, the Constitution and the courts:** Several participants pointed to past and current legal battles involving Indigenous peoples (e.g., to alter or stop resource extraction projects) as evidence that Indigenous communities cannot, in fact, be treated in the same way as other communities, because they have “different” legal status. And, moreover, that recent court decisions (e.g., Trans Mountain Pipeline) suggest that the Canadian courts may be increasingly sympathetic to Indigenous legal claims: “We can say that they can be treated the same way as other communities, but the reality is that they have things like land claims and treaty rights that makes things different.” Some participants raised the possibility of “compensation” for Indigenous communities over and above the type of infrastructure and other improvement that non-Indigenous communities might gain.

The public living outside of communities along the routes

Most participants agreed that Canadians in general should be made aware of the project, albeit with a lower level of priority. They felt that the project is sufficiently large (and carried enough potential risk) to be of interest to those outside directly affected communities.

As part of this discussion some participants suggested that the project be positioned as part of Canada’s societal efforts to protect the environment (i.e., because the project represents an effective, permanent solution to deal with a serious environmental hazard): “I’m not sure I’d go as far as calling it a ‘good news’ story for the environment, but it’s certainly not a ‘bad news’ story.”

Others that could be involved

In smaller numbers, participants mentioned others that could be involved:

- + Youth
- + Transportation companies
- + Trade unions (of transportation company employees, first responders)
- + Citizen groups (e.g. community associations)
- + Security agencies (e.g. RCMP, CSIS, Canadian military)
- + School board administrators
- + Insurance companies

Inclusivity: Addressing Concerns

In a follow-on discussion at the full-day dialogue, participants were engaged in a conversation about how NWMO could adequately address concerns raised about transportation. In small groups, participants were given the following scenario and question to consider:

The regulator has evaluated the transportation plan to ensure the appropriate safety provisions are in-place to protect people and the environment and has granted a license to transport.

However, a community along the route does not want the waste transported on roads in/through its community because some community members are fearful.

What does the NWMO need to do to adequately address these concerns to make good decisions?

Small dialogue session groups reported that they struggled with the question and recognized that there is no easier answer or single “magic way” to address any or all community concerns. As one group put it, “we went all over the place with this one”.

One point of agreement across several groups was the value in proactively preventing fear about transportation before it becomes widespread. According to one table spokesperson: “by being proactive, by reaching out to communities and instilling safety, knowledge and education from the beginning then you’ll be ahead of the game. We didn’t talk about hating environmentalists or anything but once fear is instilled, it’s hard to remove. If people feel they have been educated and informed, then it will calm their fears. Once you get people afraid, they are very resistant to move.” Some participants recommended using social media to reach, educate and engage local residents on the safety of nuclear fuel transportation.

Several participant tables suggested that NWMO proactively engage with communities as soon as transportation routes are shortlisted or finalized through community-level education and outreach. If concerns develop, participants suggested being transparent, recognizing the concern publicly and providing balanced, accurate information to address concerns. An additional perspective was to provide independent experts to respond to the concern.

Another table suggested using exhibits or displays to demonstrate safety, perhaps through unconventional means: one proposed example was to leave a transportation package in an outside civic space for a week and invite local residents to explore its safety themselves, even using hammers and other tools. A related idea was to show celebrities standing close to transportation packages, including elected officials, to demonstrate their safety.

If concern persists, participants offered some ideas for resolution. Some participants felt it was important to provide “incentives” (material and/or psychological) to communities to recognize they are participating in a solution to a Canadian problem. Another group asked whether it would be feasible to simply bypass communities where concerns exist and could not be addressed to their satisfaction.

3.4.3. Financial Sustainability

The session discussions around financial sustainability were more general in nature, although set in the context of a discussion about transportation planning. A handout was provided during the discussion, which was a distilled version of the *Funding Canada’s plan for the safe, long-term management of used nuclear fuel* handout (March 2018). The handout identified and answered four key questions:

1. Who will pay for the safe, long-term storage of used nuclear fuel?
2. How much will the entire project cost?
3. Is this expensive relative to the cost of electricity?
4. How can the public be sure that funding is in place?

Throughout the sessions, prior to receiving the handout, participants raised questions about how Canada’s plan to deal permanently with used nuclear fuel would be funded. Most prevalent general questions included:

- + How much will the project cost?
- + Who will pay for the project/where will the funding come from?
- + Will funding the project necessitate an increase in electricity rates (or possibly even taxes)?
- + How will Canada’s plan ensure that funding is available?

Transportation-specific questions posed by participants included:

- + Does the overall cost include road/rail or other necessary infrastructure upgrades?
- + Does the budget include money for clean-up/remediation in the event of an accident/incident during transportation?

During the discussion on financial sustainability, participants were invited to try to answer their own questions about costs before commenting on the “Funding Canada’s Plan” information handout:

- + Participants’ estimates of the overall cost of the project (they were informed that this includes planning, design, construction of the repository, emergency response funds, transportation and about 70 years of storage maintenance) varied wildly: ranging from \$3 to \$4 billion on the low end to upwards of \$1 trillion, and with many pegging the cost at somewhere between \$15 billion to \$50 billion.
- + The most common assumption was that the federal government would probably be the body who would pay for the project. Some thought nuclear power generators would pay, while others expected the funds to flow from a variety of sources. There was agreement, however, that regardless of where the money came from, the ultimate payer would be “citizens”, “taxpayers”, “average people”, or as many chose to put it “us”: “You can say it’s going to be the government [who pays], or the companies, but at the end of the day it’s going to be us, whether through our taxes or hydro bills.”
- + It is worth noting that this part of the discussion sometimes prompted questions about fairness, equity and transparency in how the project’s funding burden would be shared (e.g., across Canada, among Ontario, Quebec and New Brunswick, between governments and the private sector).
- + Another common assumption was that whatever the funding mechanism, participants thought that it had either only recently, or, not yet been, activated: “So, when are we going to start paying for this?”

Overall reaction to the handout was positive; participants were impressed with how well it responded to their questions on the topic:

- + First, many said that they were pleasantly surprised at how “low” the estimated cost of the project was: “I thought it would be a lot more than that.” Second, and sometimes in the same breath, participants said that they expected “cost overruns”: “We know that it is going to end up being more than that, that’s just how it works. The question is how much more?” The tone participants took in discussing the prospects of cost-overruns was often one of resignation, verging on acceptance, rather than of anger or disgust: “It’s just the way it is with any large project, even for a home renovation, add 20 per cent to the quoted price.”
- + Participants responded positively to what they read about the owners of used nuclear fuel paying for the project. However, they were quick to reiterate that this ultimately meant hydro customers would pay; an assumption they believed the handout confirmed.
- + Participants felt that having each nuclear energy used fuel owner’s contribution to the trust fund based on the number of bundles it has produced to date was “fair”. It also answered people’s questions about how NWMO would ensure that funding remains available for all APM activities, transportation included.
- + The fact that waste owners had already contributed a substantial amount of money to a trust fund was a key point for many. For many, this conveyed notions of fiscal prudence, thoughtful planning, commitment, and continuity: “I was impressed that they’ve already contributed \$4 billion to this trust fund. And the fact that there is a trust fund means to me that nobody can touch it, that it has to be used for this project.” “It shows that they’re serious about it.” Similarly, several participants were heartened to read that there was a legislative framework in place to ensure funding, though this section’s wording was rather opaque to some.
- + Finally, it was difficult for many participants to understand the calculations and projections pertaining to project costs: The use of 2015 dollars was confusing to some, even though participants understood the notion of inflation. And others observed that the \$67.7 million 2018 deposit seemed too small to allow the fund to reach \$23 billion. Similarly, many participants found it hard to relate to the cost projection of 0.1 cent per kilowatt hour of electricity produced (despite sounding reasonably low). As an alternative, participants suggested that ratepayer costs be conveyed using examples, such as monthly or yearly additional cost for a “typical” household.

Dialogue participants added several other considerations, including a public website with detailed cost management and financial performance information. They suggested that funds set aside for future costs should be invested ethically and with strict requirements about the kinds of industries and jurisdictions in which these funds could be invested.

3.4.4. Oversight

The topic of oversight was probably the most challenging issue for participants to explore during the focus groups given the number of organizations and agencies involved in the safe and secure transportation of used fuel. In order to convey some key concepts about this topic, a handout was provided to participants based on information contained in the *Safe and Secure Transportation of Canada's Used Nuclear Fuel* booklet (May 2015). The handout summarized the primary roles and responsibilities of NWMO and key regulators, specifically the Canadian Nuclear Safety Commission (CNSC) and Transport Canada. It also provided a high-level summary of roles related to emergency management (e.g., Transport Canada's Canadian Transport Emergency Centre (CANUTEC).

Participants raised oversight and accountability issues by various points in the discussion. These issues were thought to be especially relevant given the long-term nature of the plan, its cost, perceived risk to public safety and security, and the large number of different stakeholders involved. The most fundamental question on the minds of participants was who or what was in "in charge"; with the most common assumption being that this rests with the federal government.

Sometimes pointing to current and past examples of mega-project mismanagement in Ontario and elsewhere in Canada, participants agreed that regardless of legislative framework and management structure, a plan must be designed to ensure:

- + a high level of coordination between all involved;
- + responsible fiscal management;
- + transparency and public accountability;
- + protection against political "interference" and "exploitation";
- + fiscal and administrative "continuity" over the life of the project: "One of the concerns that I have is that they start this, is that then down the road we have a new government that says: 'we are not doing this anymore, our priorities are different'."

Participants often grappled with wanting a) clear political accountability, and b) minimal involvement of elected officials: "The buck has to stop somewhere, and, as a citizen that's with my elected representative, not with the companies; they are not accountable to me." "Personally, I don't want politicians involved in any of this. It should be left to public servants, experts and scientists." Participants desire to see Canada's plan developed and executed by subject matter experts was highlighted by several participants' positive reaction to the fact that Transport Canada's Canadian Transportation Emergency Center (CANUTEC) is staffed by "scientists".

Reaction to the handout on oversight was mixed, but with a lean towards the positive: "It covers a lot of the same stuff we were talking about." Participants' intuition suggested to them that an overarching body (e.g., federal government department) would possess ultimate responsibility for implementing Canada's plan, and they searched for evidence of that in the handout. Some thought they found it, others were not sure: "It says the NWMO is in charge; it's right there in the first sentence." "I think it's the CNSC; that's government, right?" "It sounds like different groups are responsible for different things."

Discussion revealed that participants could understand how and why different agencies and groups would have responsibility for overseeing different aspects of transportation. Nevertheless, some worried that such a structure could make coordination difficult and accountability murky: "You hear about government departments not working together, even working against each other, and here we have a whole bunch of different governments involved. I just worry that if something ever happens everyone is going to point fingers at the other guy."

In response, some participants suggested the creation of a governing body made up of 12 to 15 experts, elected officials and community members (including from Indigenous communities). Participants also acknowledged that such a body would have its own challenges and weaknesses.

The discussions suggest that one potentially effective way of conveying the oversight and accountability framework was to describe the NWMO's role as implementing Canada's plan, and the role of government departments and agencies as monitoring NWMO to ensure compliance with regulations and standards. In addition, they argued that research on the transportation framework should clearly explain:

- + the private vs. public nature of the nuclear energy producers;
- + the involvement, if any, of the federal government in managing/steering the NWMO; and
- + that the CNSC is a federal government agency.

3.5. Feedback on Objectives for Guiding the Development of the APM Transportation Plan

Towards the end of the sessions, participants were asked to review and comment on the appropriateness and comprehensiveness of a preliminary set of objectives, which were initially developed for the APM project as a whole, as they related to guiding transportation planning). The same handout was used in both the focus groups and the dialogue session.

Feedback was obtained on the following objectives:

- + Protect public health and safety from the risk of exposure to radioactive or other hazardous materials, and from the threat of injuries or deaths due to accidents;
- + Protect workers from and minimize hazards associated with managing used nuclear fuel;
- + Ensure fairness in the distribution of costs, benefits, risks, and responsibilities;
- + Ensure the well-being of all communities with a shared interest;
- + Ensure the security of facilities, materials and infrastructure;
- + Ensure that environmental integrity is maintained over the long term;
- + Ensure economic viability of the used nuclear fuel management system; and
- + Ensure a capacity to adapt to changing knowledge and conditions over time.

The views expressed were consistent with findings of the 2017 PAR, including:

- + Overall, the objectives reflect participants' thinking (e.g., concerns, priorities, suggestions): "I think this is good. It covers all the key points."
- + Ensuring a capacity to adapt to changing knowledge and conditions over time resonated with several participants and aligned with earlier comments about the need to for the plan to be "flexible" enough to incorporate new technology.
- + Some wondered what was meant by environmental "integrity" (e.g., as opposed to "protection")
- + Others also wondered how "fairness" in the distribution of costs, etc. will be determined (e.g., from whose perspective?)
- + A few suggested that "transparency" should be added to the list, along with "engaging" with the public/communities.

During the dialogue, several tables suggested that objective 7, "economic viability" should be removed. From their perspective, cost should not be a factor when it comes to the safe transportation of used nuclear fuel. They felt that including it alongside other objectives implied a balance or equivalency, where meeting other objectives might involve "cutting corners" or accepting risks "for the sake of saving money".

3.6. Final Thoughts and Advice for NWMO

By the end of the sessions, participants' views of the APM transportation plan could be fairly described as ranging from resignation to cautious optimism. First, nearly all participants seemed to accept the premise that there is need to find a permanent way to deal with Canada's used nuclear fuel (i.e., continued stockpiling is not a viable option). And, relatedly, that passing the problem onto to younger and/or subsequent generations would be irresponsible. Second, there was wide agreement that what the NWMO was proposing appeared to be reasonable and "well thought-out": "It's trying to make the best of a bad situation. If we are going to deal with this, then this seems like a reasonable way to do it."

By far, the most often proffered advice to the NWMO revolved around meaningfully engaging with communities along the transportation routes by providing information, responding to questions, and, to the extent possible, addressing concerns. Community engagement is seen as the "right thing" to do, as well as key to gaining a critical mass of acceptance. While most participants anticipate that the NWMO's task will be daunting (e.g., kneejerk NIMBYism), they often pointed to their session as a positive example of how "education" can effectively assuage fears and address misconceptions.

An additional suggestion was for greater public education about Canada's nuclear power use, its plan for the long-term disposal of used nuclear fuel and on safe transportation. Dialogue participants recommended that NWMO more proactively educate the public using many of the materials made available to participants during the event. As one put it, "I think most people will be okay with [NWMO's plan for transportation] if they knew what we learned today".

Nevertheless, there was a broad suggestion to create more up-to-date educational videos on transportation safety.

Participants appreciated the opportunity to be involved and contribute to NWMO's ongoing work: "You are on the right track, I like that you did this consultation. I learned a lot today, thank you".

3.7. The Perspective of Indigenous Participants

As discussed in Section 2.1, qualitative research produces data that is richer and deeper than what can be obtained from quantitative survey data. It is particularly useful for guiding the developing communications (i.e., how to speak with an audience about a topic or set of issues). Conversely, qualitative research findings cannot be generalized to a target population. Notwithstanding this limitation, the research (including two focus groups with Indigenous residents of the Ottawa region) suggests that there may be some interesting similarity and a few potential differences in the way that Indigenous peoples think and feel about the issues.

The views expressed by First Nations and Métis participants were generally consistent with those of other research participants, particularly with respect to their knowledge of the issues (e.g., nuclear energy production), the questions they posed, the elements they thought NWMO should address in its transportation framework and in their reaction to the handouts and informational videos.

In terms of potential differences, the research points to the following:

- + **A higher level of skepticism:** Indigenous participants tended to express more frequent and deeper skepticism (and cynicism) towards Canada's plan, as well as governments and nuclear energy producers. Several justified their view based on what they considered to be the dishonest and roughshod way in which governments and resource companies have dealt with Indigenous peoples: "There has never been a case when governments, provincial or federal, have respected treaties. And an agency? That's even worse, they didn't even sign these treaties."
- + **A weaker sense of ownership of the used nuclear fuel problem:** Some Indigenous participants rejected the notion that as current and past consumers of electricity generated from nuclear power plant, they bear some responsibility, however small, for dealing with used nuclear fuel: "I know what it took away from the earth when you decided to take away the uranium in the first place. Now you plan on returning it, in a totally different form, with fill on top of it. You are just hiding the crap that you did."
- + **Some believe that affected Indigenous communities should receive "compensation":** As noted earlier, many non-Indigenous participants spoke hopefully about the possibility of "benefits" (e.g., improved transportation infrastructure, training/equipment for local first responders) for some communities along the routes. In contrast, some Indigenous participants argued that some form of "compensation" was appropriate and would have to be part of the discussions: "If they want to pass through our land, they are going to have to pay." "Is the federal government, on behalf of First Nations communities, going to be collecting royalties and distributing said royalties to affected communities to compensate for the encroachment on their land rights?"
- + **Consent versus engagement:** While non-Indigenous participants felt that obtaining the consent of affected communities was neither workable nor justified, several Indigenous participants stated that the seeking of "consent" from First Nations and Métis communities along the routes was the respectful thing for the NWMO to do, as well as consistent with the federal government's goal of reconciliation: "According to the TRC commission, if Canada really wants to reconcile with the Indigenous people of this country, one of the first principles is the following: never put into action anything that could impact Indigenous people without their consent."

As the discussion progressed, however, the message from Indigenous participants, including some of the most vocal advocates of consent, became more nuanced. Much like their non-Indigenous counterparts, in fact, they suggested that community engagement, done properly would very likely lead to acceptance: "You have to take into account the Indigenous worldview, it's not as if the land is separate from you. If you are going to do something that might cause a problem [for the environment], everybody has to understand what they might be and how it is to be addressed. You can't rush it." One of the keys to achieving this, some said, was for the NWMO to show some faith and demonstrate goodwill and respect by not placing parameters or time limits on discussions (e.g., taking consent off the table): "You go in, you discuss, you take questions, you hear concerns, you provide answers. Then you go away to let the community discuss and try to reach consensus. You come back later, talk some more. And you keep doing this. You can't rush, you must be patient. You have 20 years to get it right."

4. Emerging Themes

The research findings served to validate some of the key results from the 2017 PAR, notably the worth and resonance of the principles and objectives contained in the APM Discussion Document, the compelling nature of the rationale for dealing now with Canada's used nuclear fuel, and the perceived solidity of Canada's plan for doing so. This research also confirmed the elements that the public expects a transportation framework to contain, as well as the main concerns and questions they have. As in 2017, the research showed how fact-based information and discussion can help participants come to judgement on a complex and controversial issue.

In addition to validating the main 2017 results, the 2018 research furthers our understanding of public expectations regarding environmental protection, inclusivity, oversight and financial sustainability. The inclusion of Indigenous perspectives hints at the existence of some potential differences between the views of Indigenous and non-Indigenous people on a few key issues.

Our analysis of the data from 14 focus group and one day-long dialogue suggests the presence of the following four cross-cutting themes:

4.1. Informing and Engaging are Key to Social Acceptance

It is fair to say that in the eyes of most participants the largest obstacle standing between the NWMO and the success of the APM transportation program, is obtaining social license. That is, to effectively counter the opposition that participants saw as "inevitable", with fact-based information and quality community engagement. In discussing this issue, non-Indigenous participants often reiterated that the NWMO's objective should not be to seek "approval" or "permission" (for this was unworkable), nor should it be to "convince everyone" (for this was impossible). Rather, these participants saw the objective as preventing a groundswell of opposition large enough and/or organized enough to find favour with enough decision-makers to effectively stop a project that is in the public interest.

While participants sometimes used the language of strategy and public relations to make their points, there was barely a hint of cynicism in what they said. In fact, the opposite was true: they warned that a cynical (e.g., *pro forma*) approach to community engagement would likely backfire because it could, among other things, raise alarms and undermine the NWMO's credibility. Instead, there was wide agreement that success was much more likely to come from a sincere, timely and thoughtful attempt by NWMO to fulfil its social responsibility. Simply put, the advice to NWMO was to focus on doing the right thing with respect to potentially affected communities and its strategic objectives would probably take care of themselves.

It is also worth noting that participants envisaged NWMO engaging on the APM as a whole, not just on the transportation aspect, for two reasons: First, they saw the project rationale (e.g., societal/public good, environmental benefits of a permanent solution, current generations taking responsibility) as key to gaining acceptance (see 4.4. below). Second, they thought that people would inevitably have questions about the entire project.

4.2. Transparency as the *Sine Qua Non* of APM Transportation Planning

"Transparency" was the term most often used by participants to describe how they wanted the NWMO to approach its work, particularly as it pertained to the public. They saw transparency as key to trust and trust as key to social acceptance. Participants wanted transparency in financial and project management, in public reporting, in accountability, and above all, in communicating with the public about potential risks, response plans and any incidents that may occur in the future: "If you want people to trust you, you have to be honest with them."

4.3. Balancing Continuity and Adaptation

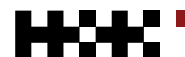
At various points in the sessions, participants spoke about the importance of ensuring that APM, including the transportation of used nuclear fuel, harnesses the latest and best science and technology. Concerned about the possibility of having to rely on "old technology" given the long-life span of the project, they hoped that APM would be sufficiently flexible to regularly incorporate innovations. Examples ranged from the relatively mundane (e.g., adoption of non-GHG emitting trucks and trains) to the revolutionary (e.g., a use for Canada's used nuclear fuel, completely new modes of transportation).

Participants also stressed the need for "continuity", "commitment", "stability" and "follow through". With respect to project finances, it meant ensuring that funds would be in place to fully complete the project (e.g., without a rate or tax payer-funded "bailout"). Second it meant maintaining continuity through changes in government.

4.4. APM as a Societal Good

At various points of the sessions, participants explained that their position on an issue, such as their preference for community engagement over community consent, hinged on viewing the NWMO's APM project as being in the public interest. For this reason, they thought it important that NWMO convey the societal benefits of the project through their public communications and community engagement efforts. Some participants suggested that the public might come to view the project as part of broader Canadian efforts to slow (and perhaps eventually reverse) the rate of environmental degradation: "Critics will say that the project poses a risk to people and the environment. But leaving it where it is isn't sustainable and riskier. I think if people understand that, it's going to make a big difference in terms of acceptance."

Appendix A: Research Participant Screening Criteria



NWMO Focus Group & Dialogue Recruitment Specifications (September 24th)

1.0 Socio-demographics

Gender

- Men: Approximate minimum 40%
- Women: Approximate minimum 40%

Age

- 18 to 34: Approximate minimum 25%
- 35 to 50: Approximate minimum 25%
- 51 TO 70: Approximate minimum 25%

Education

- Less than high school: EXCLUDE
- High school, community college, certificate: Approximate minimum 30%
- University degree: Approximate minimum 30%

Household composition (i.e., children under 18 at home)

- Approximate minimum 25% with children under 18 at home

Household income

- Under 80K: Approximate minimum 30%
- 80K and up: Approximate minimum 30%

2.2 Attitudes to Nuclear Index

An index was created from the following items.

ITEM 1: How much confidence do you have in each of the following to keep Canadians safe and secure?

7-point scale: 1-No confidence whatsoever to 7-A great deal of confidence

- Nuclear energy companies

ITEM 2: Every day in Canada and around the world, natural resources and other products are transported by truck, rail, pipelines, and by ship. Overall, how much confidence do you have in the safety and security of each of the following?

7-point scale: 1-No confidence whatsoever to 7-A great deal of confidence

- Transporting used nuclear fuel by truck

ITEMS 3 TO 5: Please indicate whether you agree or disagree with each of the following statements.

7-point scale: 1-Strongly disagree to 7-Strongly agree

- I think that nuclear power generation in Canada is safe
- I am very strongly opposed to nuclear energy [FLIPPED SCALE]

ITEM 6: Would you rather see used nuclear fuel transported by truck, rail or by ship?

Truck

Rail

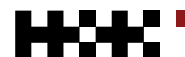
Ship

I don't know, I need more information

I don't think used nuclear fuel should be transported

GROUP "A" ANTI-NUCLEAR (6% of Population) [EXCLUDED]:

- People who strongly who are "very strongly opposed to nuclear energy" (7 out of 7 on the flipped scale)
- People who average less than 2.0 out of seven on the INDEX



GROUP “B” CONCERNED/SKEPTICAL (40% of Population) [MINIMUM FOR 30% MAX 50%]:

- People who average 2.0 to 4.0 out of 7 on the INDEX
- People who think used nuclear fuel should not be transported

GROUP “C” OPEN (54% of Population) [MINIMUM 40% MAX 70%]:

- People who average 4.1 to 7 out of 7 on the INDEX

3.0 Recruitment Screening Survey

This five-minute survey seeks your opinions on energy and transportation infrastructure.

How much confidence do you have in each of the following to keep Canadians safe and secure?

7-point scale: 1-No confidence whatsoever to 7-A great deal of confidence

- The federal government
- Electricity companies
- Pipeline companies
- Nuclear energy companies
- Environmental groups
- Airlines
- Scientist and engineers
- Your local police

Every day in Canada and around the world, natural resources and other products are transported by truck, rail, pipelines, and by ship. Overall, how much confidence do you have in the safety and security of each of the following?

7-point scale: 1-No confidence whatsoever to 7-A great deal of confidence

- Transporting used nuclear fuel by truck
- Transporting oil by pipeline
- Transporting propane by rail
- Transporting chlorine by rail
- Transporting wood logs by truck

Please indicate whether you agree or disagree with each of the following statements.

7-point scale: 1-Strongly disagree to 7-Strongly agree

- We need to invest more in public transit and less in building roads.
- I am very strongly opposed to nuclear energy
- Overall, pipelines are the best way to move oil and natural gas
- There is no reason why all our electricity can't come from green energy sources
- So-called alternative sources of energy, such as solar and wind, will never completely replace fossil fuels
- I think that nuclear power generation in Canada is safe
- Overall, I feel safe travelling on Ontario roads.

Would you rather see used nuclear fuel transported by truck, rail or by ship?

Truck

Rail

Ship

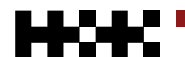
I don't know, I need more information

I don't think used nuclear fuel should be transported

SOCIODEMOGRAPHIC QUESTIONS

Gender

Age



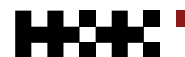
Education
Household composition (i.e., children under 18 at home)
Region (postal code)
Education
Household income

Do you work in any of the following sectors?

- Market research or advertising [EXCLUDE]
- Power generation (e.g., provincial or local electricity utility) [EXCLUDE]
- Long-haul trucking [EXCLUDE]
- Engineering [MONITOR]
- Federal or provincial government [MONITOR]



Appendix B: Focus Group Guide and Handouts / Worksheets



NWMO Public Attitude Research and Dialogue FINAL Focus Group Guide (October 3, 2018)

1.0 Introductions and Ground Rules (5 minutes)

- Moderator welcomes participants and explains purpose of the focus group: “To have a dialogue and hear your views about a few issues related to the production of energy (e.g., electricity).”
- There are no “right” or “wrong” answers. Feel free to agree or disagree. Even if you are just one person that takes a certain point of view, you could represent thousands of other residents in this province who feel the same way as you do.
- Part of my role is to watch for time and introduce new topics. I also have to make sure that everyone gets a chance to speak.
- All comments are anonymous and nothing you say will be associated with your name.
- You are being audio taped for research purposes and a few members of the study team are observing and taking notes.
- Please turn off any cell phones, pagers.

Let's go around for some quick introductions. In addition to your first name, tell us briefly about the sort of work you do if you work outside the home, and who lives with you in your home.

2.0 Ice-Breaker and Introduction to Canada's Plan to Deal Permanently with Used Nuclear Fuel (15 minutes)

1. Where does Ontario's electricity come from?
 - How much of it do you imagine comes from nuclear power?
 - It's about 50%, and nuclear power is used all over Ontario. Are you surprised any of this?
2. Used nuclear fuel is a by-product of electricity generation by nuclear power plants. What do you think happens with the used nuclear fuel? Where does it go?

Canada has a plan to deal permanently with used nuclear fuel, and an organization called the Nuclear Waste Management Organization or NWMO is responsible for implementing the plan. Let me tell you a little about the NWMO:

The Nuclear Waste Management Organization (NWMO) is a not-for profit organization established in 2002 by Canada's nuclear electricity producers in accordance with the Nuclear Fuel Waste Act (NFWA). NWMO is responsible for implementing the approach selected by the Government of Canada in 2007 after a nationwide study involving citizens and Aboriginal peoples. Ontario Power Generation Inc., NB Power Nuclear and Hydro-Québec are the founding Members, and along with Atomic Energy of Canada Limited they fund the NWMO and the full implementation of Canada's plan.

I'm going to play for you a short video that will explain a lot about the plan and something about the technology.

[MODERATOR SHOWS THE SHORT VERSION OF THE APM CLIP].

3. After seeing this video, what is your reaction to Canada's plan? What stood out for you?
 - What questions come to mind?



3.0 Unprompted Views on What the Planning Framework Should Include (25 minutes)

As we saw in the video, the plan will require that all of Canada's used nuclear fuel be brought to the location where the repository will be sited. The siting process is ongoing; the location has not yet been selected. It will be sited in an area with rock that is technically suitable for the repository and where the people in the area are willing to host it. Although the site has not yet been selected, we know that used nuclear fuel will need to be transported from several locations to the repository site no matter where it is located. Transportation of used nuclear fuel is an important part of the plan.

The rest of our discussion will focus on getting your thoughts on how we should go about planning for this future transportation. Things to make sure we do and have in place, things to avoid, questions that need to be answered, concerns that need to be addressed and the objectives and principles we need to keep in mind in future decision-making.

4. What are some of the key things that the plan must include or address for it to be acceptable to you? In other words, what does the NWMO need to make sure of?

[PARTICIPANTS DEVELOP A LIST AND THEN MODERATOR GOES AROUND THE TABLE TO HEAR LISTS AND PROBE.]

- Which are the 3 or 4 most important ones on your list?
- Why are these most important?
- What must be included in the plan to address these important elements?

[DISCUSS/PROBE AS NEEDED THOUGHTS ON THE FOLLOWING:]

- Safety as the overarching principle
- Security of facilities, infrastructure, workers and public
- Meeting or exceeding regulatory requirement
- Respect for Indigenous rights and treaties
- Informing the plan with the best science and knowledge available now and into the future
- Protection of the environment
- Ensuring inclusivity in the decision-making process
- Maintaining proper oversight and accountability
- Ensuring the project is financially sustainable

5. Have we missed anything? Or are you wondering about something you've heard?

4.0 Drilling Down on Environment, Inclusivity, Accountability & Oversight and Financial Sustainability (60 minutes)

I would like us to focus on how the transportation planning framework should address four things/ areas:

- Protecting the environment
- Including the people who need to be involved in the planning.
- Making sure we have strong oversight
- Making sure it is fully funded

Before we dive into that however, I'd like to show you another video. It's about how transportation packages are designed, tested and approved. It will help you get a sense of the science, as well as the rules and regulations, involved.

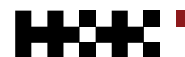
[MODERATOR PLAYS Certifying package designs <https://www.youtube.com/watch?v=bJ1h8zZkZrc>]

6. Did anything in the video stand-out for you?

4.1 Environmental Protection

7. Some of you mentioned that the transportation plan should include environmental protection. What sort of things need to be considered in particular when it comes to the environment?

- Why do those need to be considered?



8. Some people have told us it is important to be able to show the safety of transportation even under accident conditions. Are there scenarios we need to consider and talk with people about? What scenarios? Which are the 2 or 3 most important of these and why? [\[PARTICIPANTS DEVELOP A LIST AND THEN MODERATOR GOES AROUND THE TABLE TO HEAR LISTS\]](#)
9. Now, what would need to be included in the transportation plan to give you comfort and confidence that the environment will be protected? Think in terms of reducing risks, and then dealing with different types incidents.

4.2 Inclusivity: Ensuring We Get the Input We Need

Many different people, groups, organizations and communities have been, and will continue to be, involved in the design and implementation of the transportation plan.

Experts, like scientists and engineers, and federal and provincial government ministries and agencies, like the Canadian Nuclear Safety Commission, Transport Canada, Public Safety Canada and the Ontario Ministry of Transportation, will be involved in developing and implementing the transportation plan. So too will NWMO and Canada's nuclear power generators. Discussions will also take place with Indigenous (i.e., First Nations and Métis) governments.

[\[MODERATOR DISTRIBUTES HANDOUT #1 LISTING KEY PLAYERS ALONG WITH SPACE TO ADD TO THE LIST.\]](#)

10. Are other individuals or groups that the NWMO needs to get input from? Let's add to the list. And while you are at it, think about 1) what the NWMO could learn from these groups and 2) how important they are by ordering them in importance.

[\[PARTICIPANTS ADD TO THE LIST AND THEN MODERATOR GOES AROUND THE TABLE TO HEAR LISTS AND WHAT NWMO CAN LEARN FROM VARIOUS GROUPS. ALSO, WHICH ARE MOST IMPORTANT AND WHY? DISCUSS/PROBE AS NEEDED THOUGHTS ON THE FOLLOWING \(if not already mentioned\):\]](#)

- What about folks living in parts of Ontario that are nowhere near a potential route? Should they be included? How?
 - Communities along potential routes?
 - Municipal governments?
 - First responders?
 - Others?
11. Some people have told us there is a difference between involving people in decision-making about a plan and informing people about a plan that is already developed. Going back to the list, are there some folks it is important to involve, and some other folks that informing is more the goal? Why?
 12. What do you think of this statement: "It's important to understand the values and priorities of a variety of communities, individuals and groups, to ensure that their questions and concerns are addressed?"
 - Can you give me an example of what addressing a concern looks like, say among people who live near a potential route?

4.3 Accountability and Oversight

Some of you identified issues related to accountability and oversight on your initial list of things to include in Canada's transportation framework.

13. From what you know about the transportation plan, what are some of the aspects/areas for which it's particularly important that there be accountability and oversight? Let's make a list of areas, and for each one, please jot down some ideas about who or what should be in charge/responsible for it? [\[PARTICIPANTS DEVELOP A LIST AND THEN MODERATOR GOES AROUND THE TABLE TO HEAR LISTS\]](#).
14. Let's look at this handout on accountability and oversight. [\[MODERATOR DISTRIBUTES HANDOUT #2\]](#)
 - What do you think of what you read?
 - How well does it reflect your own thinking on the issues of accountability and oversight?
 - Is anything confusing, unclear or missing?



4.4 Financial Sustainability

15. Some of you have raised the issue of finances. Let's make a list of these issues. What do you need to see addressed in the framework to inspire confidence in this area? PROBE AS NEEDED ON THE FOLLOWING:

- Project costs?
- Who pays?
- Ensuring that funds will be available to complete the project as planned?
- Cost-effective management (i.e., ensuring the project is completed on time and on budget)?
- Public reporting on progress?

[MODERATOR DISTRIBUTES HANDOUT #3] Let's look at this handout. Take minute to read it and jot down a few notes if you wish.

16. What do you think of what you read?

- How well does it reflect your own thinking on the issue of what is needed? Does it inspire confidence?
- Is anything confusing, unclear or missing?

5.0 Conclusion and Wrap-up (10 minutes)

17. NWMO is trying to get an early conversation started on how we should go about planning future transportation as part of Canada's plan. Do you have any parting words of advice for NWMO, suggestions or any other comments you'd like to make?

Thank you very much for your participation!

Objectives for Guiding the Development of the APM Transportation Plan

The NWMO's five fundamental values are integrity, excellence, engagement, accountability, and transparency. In addition to corporate values, there are principles and objectives that will shape APM transportation planning. A preliminary list of these is outlined below, along with some key guiding questions.

Objectives: The following set of preliminary objectives were identified through dialogue with Canadians:

- Protect public health and safety from the risk of exposure to radioactive or other hazardous materials, and from the threat of injuries or deaths due to accidents;
- Protect workers from and minimize hazards associated with managing used nuclear fuel;
- Ensure fairness in the distribution of costs, benefits, risks, and responsibilities;
- Ensure the well-being of all communities with a shared interest;
- Ensure the security of facilities, materials and infrastructure;
- Ensure that environmental integrity is maintained over the long term;
- Ensure economic viability of the used nuclear fuel management system; and
- Ensure a capacity to adapt to changing knowledge and conditions over time.

Objectives and Principles Guiding the Development of the APM Transportation Plan

The NWMO's five fundamental values are integrity, excellence, engagement, accountability, and transparency. In addition to corporate values, there are principles and objectives that will shape APM transportation planning. A preliminary list of these is outlined below.

Principles: The following initial set of principles emerged from conversations with citizens:

- **Safety is the overarching principle guiding all APM planning and activities:** Safety, security, and protection of people and the environment are central and must not be compromised by other considerations.
- **Meet or exceed regulatory requirements:** The plan must meet, and if possible, exceed all applicable regulatory standards and requirements for protecting the health, safety, and security of humans and the environment, and respect Canada's international commitments on the peaceful use of nuclear energy.
- **Indigenous rights, treaties and land claims:** The plan must respect Indigenous rights and treaties and take into account that there may be unresolved claims between Indigenous peoples and the Crown.
- **Inclusiveness:** The plan must respond to and address, where appropriate, the views of those who are most likely to be affected by the plan.
- **Informing the process:** The plan must be informed by the best relevant available knowledge, including science, social science, Indigenous Knowledge, and ethics. This information used to develop the plan must also be made public.
- **Ongoing engagement of governments:** The NWMO must involve all potentially affected provincial governments in the development and review of the plan.

Objectives: The following set of preliminary objectives were identified through dialogue with Canadians:

- Protect public health and safety from the risk of exposure to radioactive or other hazardous materials, and from the threat of injuries or deaths due to accidents;
- Protect workers from and minimize hazards associated with managing used nuclear fuel;
- Ensure fairness in the distribution of costs, benefits, risks, and responsibilities;
- Ensure the well-being of all communities with a shared interest;
- Ensure the security of facilities, materials and infrastructure;
- Ensure that environmental integrity is maintained over the long term;
- Ensure economic viability of the used nuclear fuel management system; and
- Ensure a capacity to adapt to changing knowledge and conditions over time.



Handout #1: Ensuring NWMO Obtains the Input it Needs

Who should provide input?	What could NWMO learn from them?	What level of priority do you assign to them? High, Medium or Low
Experts, like scientists and engineers		
Federal and provincial government ministries and agencies (e.g., Canadian Nuclear Safety Commission, Transport Canada, Public Safety Canada and the Ontario Ministry of Transportation		
Canada's nuclear power generators		
Indigenous (i.e., First Nations and Métis) governments		

Oversight (Handout #2)

Who is responsible?

The NWMO will have overall responsibility for the safe transportation of used nuclear fuel from the current interim storage locations to the deep geological repository. The Canadian Nuclear Safety Commission (CNSC) and Transport Canada are responsible to ensure regulations are followed.

What is CNSC's role?

The **CNSC** regulates the transport of radioactive material through the Packaging and Transport of Nuclear Substances Regulations (PTNSR), which covers the entire journey of a shipment, including, but not limited to:

- Setting transportation package performance requirements;
- Certifying transportation package designs;
- Establishing and enforcing the radiation protection program for the carriers;
- Evaluating applications and issuing a licence to Transport used nuclear fuel only when the Emergency Response Plan and Transportation Security Plan have been established and approved;
- Providing duty officers 24-7 for any emergency;
- Overseeing all aspects of physical security measures; and
- Performing compliance inspection.

What is Transport Canada's Role?

Transport Canada's Transportation of Dangerous Goods Regulations establish requirements for training, emergency planning, safety marks, and documentation. Transport Canada's responsibilities for the shipment of radioactive materials include:

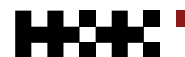
- Establishing and enforcing transportation requirements for the consignors and carriers;
- Establishing requirements and undertaking compliance inspections for areas
- such as training and documentation; and
- Setting and enforcing requirements for Emergency Response Assistance Plans.

What about emergency management?

Transport Canada's Canadian Transport Emergency Centre (CANUTEC) is a national advisory service, staffed by scientists, that assists emergency response personnel in handling dangerous goods emergencies on a 24-7 basis.

As part of its oversight of used nuclear fuel transportation, the **NWMO** will operate a command centre, which would be notified in the event of an incident. The centre will provide a single point of contact for all agencies involved in transportation-related communications. It will allow for quick access to shipment information, including vehicle driver location, weather, traffic, and routing, and will enable communication with the driver, security personnel, and if needed, regulatory agencies and emergency responders.

The NWMO will also provide an emergency response plan to the CNSC, Transport Canada and the provinces, ensuring that information is correct and available to relevant public emergency response agencies. The NWMO will assist response agencies with developing their emergency plans for used nuclear fuel, as required. It will also work in collaboration with provincial and local governments to ensure training and equipment for first responders meet required standards along the transportation route.



Funding Canada's Plan (Handout #3)

In 2007, the Government of Canada selected Adaptive Phased Management (APM) as Canada's plan for the safe, long-term management of its used nuclear fuel. Below are some questions and answers about how Canada's plan is funded.

Who will pay for the safe, long-term storage of used nuclear fuel?

The plan is funded by the owners of used nuclear fuel in Canada: Ontario Power Generation, New Brunswick Power, Hydro-Québec, and Atomic Energy of Canada Limited. The Nuclear Fuel Waste Act (NFWA) requires each of these four companies to establish independently managed trust funds and make annual deposits to ensure the money to fund this project will be available when needed. Deposits have been made since 2002. Under the funding formula, annual trust fund contributions will continue as long as used fuel bundles are being produced.

Each waste owner's deposit is calculated based on the number of fuel bundles it has produced to date. The amounts cover estimated fixed costs for the NWMO to construct and operate a deep geological repository, as well as variable costs associated with managing each fuel bundle.

How much will the entire project cost?

Based on the expected volume of 5.2 million fuel bundles, the total lifecycle cost of the plan, from start to finish, is \$23 billion (in 2015 dollars). This figure covers 45 years of operations and 70 years of monitoring and maintenance. Trust fund balances at the end of 2017 were \$4.2 billion. In 2018, the four waste owners are required to make a total trust fund deposit of \$67.7 million.

Is this expensive relative to the cost of electricity?

Paying for the long-term management of used nuclear fuel is a relatively small portion of the cost of electricity. The cost of the project is only about 0.1 cent per kilowatt hour of electricity produced.

How can the public be sure that funding is in place?

There is a strong legislative framework in place to ensure funding will be available when needed to implement the APM project:

- The Nuclear Fuel Waste Act (2002) addresses funding of the APM project and assigns roles and responsibilities.
- Waste owners must fund the APM project through annual deposits to trust funds at levels set by the NWMO.
- The Minister of Natural Resources approved the APM funding formula in 2009.
- Waste owners are also required under the Nuclear Safety and Control Act to provide to the Canadian Nuclear Safety Commission financial guarantees dedicated to nuclear waste management and decommissioning.



Appendix C: Dialogue Session Guide/Presentation and Handouts/Worksheets



Planning Transportation for Adaptive Phase Management

November 3, 2018
Toronto



Welcome

NWMO: Who we are

- Formed in 2002 as required by *Nuclear Fuel Waste Act*
- Funded by Canada's nuclear energy corporations
- Operates on a not-for-profit basis

Our mission is to develop and implement collaboratively with Canadians, a management approach for the long-term care of Canada's used nuclear fuel that is socially acceptable, technically sound, environmentally responsible, and economically feasible.

3



Our values

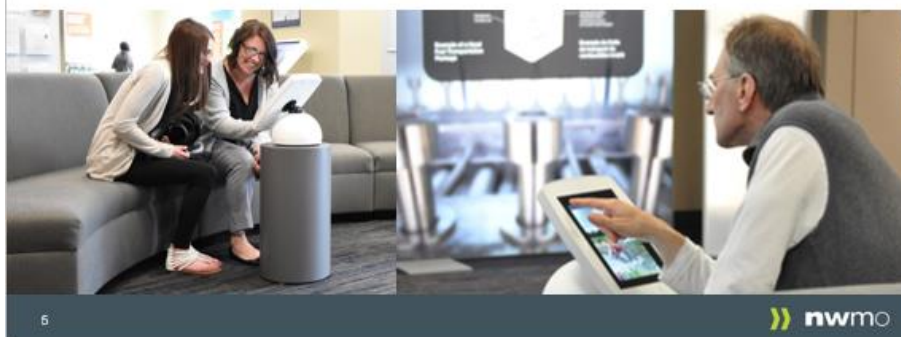
- Integrity
- Excellence
- Engagement
- Accountability
- Transparency

4



Today's objective

To seek your input on questions and considerations for planning the transportation of Canada's used nuclear fuel.



5

Today's focus and agenda

Time	Activity
10:00 – 10:30	Welcome and Introductions
10:30 – 10:55	Canada's Plan: Adaptive Phased Management
10:55 – 11:45	Transportation Planning Overview & Principles
11:45 – 12:15	Lunch
12:15 – 1:00	Topic 1: Environment
1:00 – 2:15	Topic 2: Who to involve
2:15 – 2:30	Break
2:30 – 3:00	Topic 3: Financial considerations
3:00 – 3:45	Topic 4: Objectives for transportation planning
3:45 – 4:00	Final Thoughts, Evaluation and Closing

6

How we'll work together



Presentations



Personal reflection, table
brainstorming and reporting



Plenary discussion

7



Housekeeping



Emergency



Self-Care



Quiet!



Ground Rules



Honoraria



Comments

8



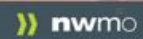




There are no bad ideas.



Share the airtime.





Did you know?

- Chose a trivia card and introduce yourself!
- Read the question aloud to your table
- Let everyone guess away!

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Q: How much of Ontario's electricity needs are produced using nuclear power?

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SOCIÉTÉ DE GESTION DES DÉCHETS NUCLÉAIRES

Q: What international organization promotes nuclear safety and nuclear security standards?

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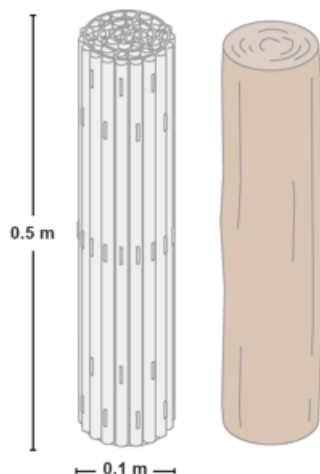
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Canada's Plan for Used Nuclear Fuel

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CANDU Fuel



One fuel bundle . . .

- Is about the size of a fireplace log
- Can power 100 homes for a year
- Contains about 20 kg uranium

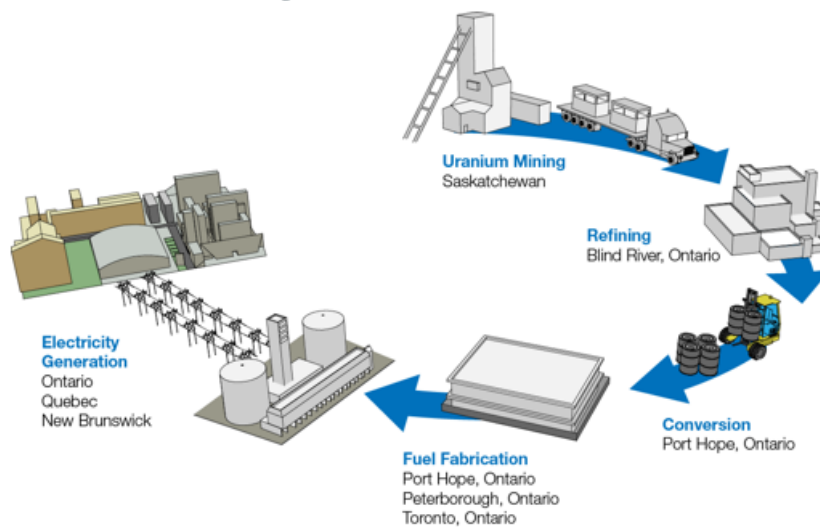
Used nuclear fuel is a potential health risk for a very long time.

It must be safely contained and isolated from people and the environment, essentially indefinitely.

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Nuclear fuel cycle in Canada



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CANDU Reactor

- About 5,000 fuel bundles per reactor
- Each bundle stays in reactor for about 15 to 18 months



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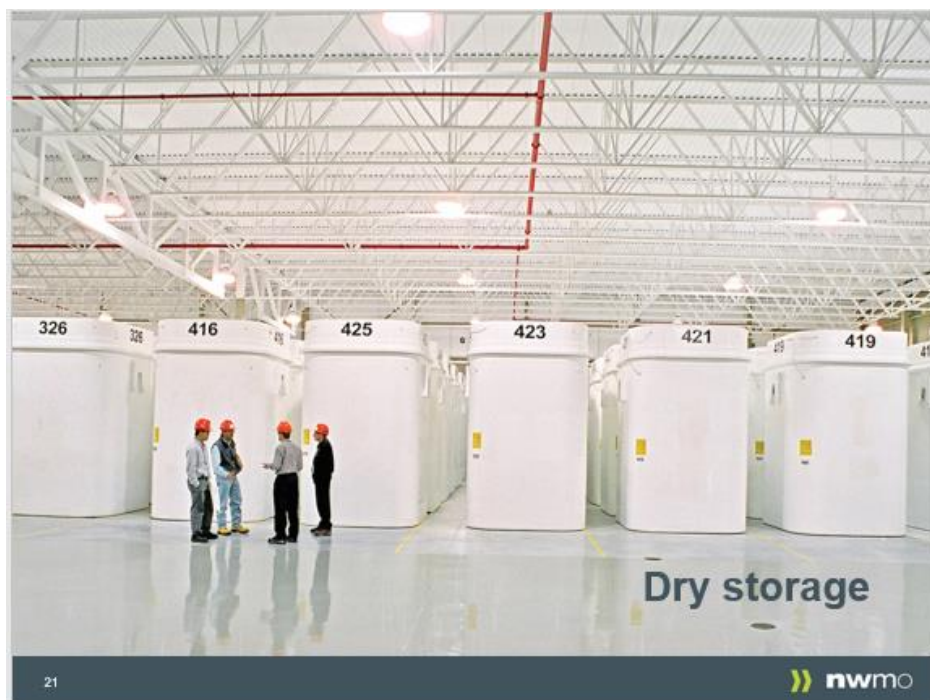


Wet storage

- Used nuclear fuel initially very hot and highly radioactive
- Stored in water pools for cooling and shielding
- Pool water kept separate from other water
- After 7 to 10 years, used fuel cool enough to move to dry storage

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A three-year dialogue with Canadians

- NWMO met with more than 18,000 Canadians (2002 – 2005)
- 2,500 Indigenous people
- 500 specialists
- 120 information and discussion sessions
- Every province and territory



What Canadians told us

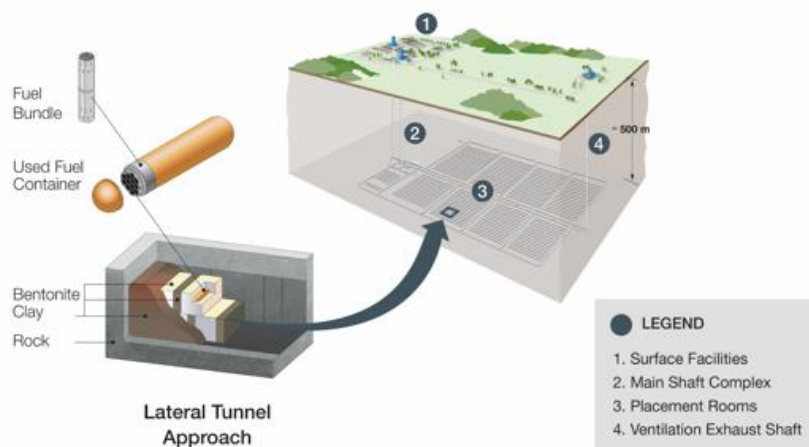
- Safety and security is top priority
- This generation must take action – we owe it to future generations
- Be consistent with best international standards and practices
- Approach must be adaptable – allow improvements based on new knowledge or societal priorities



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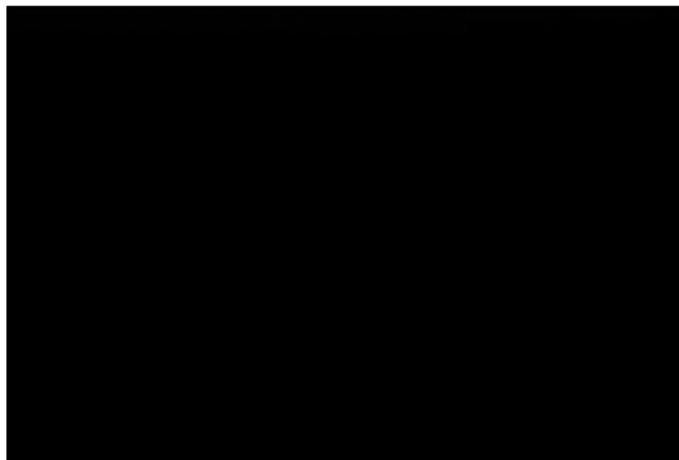
Deep Geological Repository (DGR)



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Adaptive Phase Management



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Site selection process initiated May 2010

Seeking an informed and willing host with a suitable geologic formation

- Communities expressed interest to participate
- Communities can choose to leave the process

The project will only proceed with interested communities, First Nation and Métis communities and surrounding municipalities working in partnership.

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Plenary discussion



Initial thoughts...
What stands out for you?



Do you have any questions or concerns?
What else would you like to know?



Transportation Planning



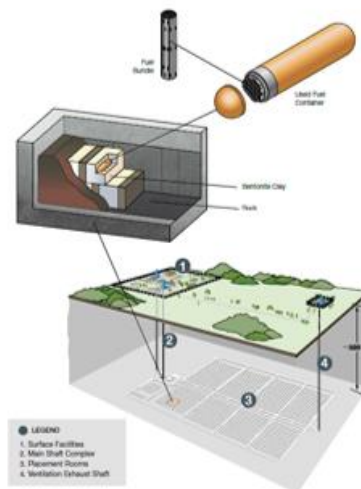
Overview

- Within the next 30 years, Canada's used nuclear fuel will start to be moved from licensed interim storage locations to a deep geological repository.
- Transportation of used nuclear fuel is an important part of Canada's plan to protect people and the environment over the long term.

Overview

Involves:

- Taking the waste, which is currently stored at or near nuclear generating stations and research facilities, to a deep geological repository for long-term management.
- Approximately 40 years of safe transportation, beginning in 2040 or so.



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Used nuclear fuel transportation

- Highly regulated
- Excellent safety record
- More than 50 years with no incident leading to release of radioactive substances
- Robust package design
- Based on international standards & testing
- Road and rail being studied as possible modes



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Average number of shipments per year



The transportation program is expected to extend over approximately 40 years, based on current anticipated volumes from existing nuclear facilities.

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Developing the plan: recent transportation events

We have time to develop the plan and consider it carefully.

Next: Principles

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***DRAFT* Guiding principles for the development of the transportation plan**

1. Safety is the overarching principle guiding all APM planning and activities
2. Meet or exceed regulatory requirements
3. Aboriginal rights, treaties and land claims
4. Inclusiveness
5. Informing the process
6. Ongoing engagement of governments

35



Table discussion: guiding principles

Step 1: Choose a table leader / reporter

Step 2: Personal reflection – individual worksheet

Step 3: Roundtable discussion: capture main points on table summary sheet

Step 4: Report to plenary

36



Table discussion questions– 15 minutes

1. What principles resonate most with you? Why?
2. Are there any principles that you feel are missing?

Instructions

Step 1: Personal reflection – jot down thoughts on your individual worksheet

Step 2: Roundtable discussion – note common views and differences

37



Plenary



Highlights



Points where people agreed



Different perspectives

38





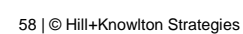
Regulation of radioactive materials

Transport Canada

- Transportation of Dangerous Goods Regulations (TDG)
- Sets transport requirements for all 9 classes of dangerous goods

Canadian Nuclear Safety Commission

- Covers Class 7 Radioactive Materials
- Sets transport packaging requirements
- Packaging and Transport of Nuclear Substances Regulations (PTNSR)
- Based on IAEA Standards



Plenary discussion



Initial thoughts... General reactions to the video

Does what you've learned affect your perceptions of the transportation of used nuclear fuel?



What else would you like to know?

43



Lunch

44





Topic 1: Environment

Table discussion

From your perspective, what would need to be included in the transportation plan to give you comfort and confidence that the environment will be protected?

1. Individual reflection
2. Roundtable discussion

Plenary – Environment



Highlights



Points where people agreed



Different perspectives

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Topic #2: Who to involve



Working together...

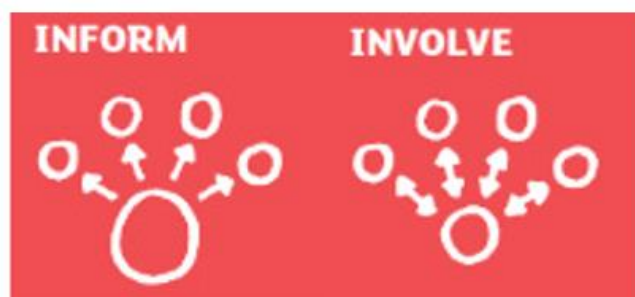


...to make good decisions.

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Key considerations



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A balancing act



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Who to involve

- Who should be involved?
- Why?
- How could that impact decision-making?

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Table discussion

How can we ensure the design and implementation of the APM transportation plan is sufficiently inclusive to ensure good decisions are made?

1. Who needs to be involved? Why?
2. How could that impact decision-making?

Instructions

Step 1: Individually, fill in the worksheet (5 min)

Step 2: Roundtable discussion

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Plenary



Highlights



Points where people agreed



Different perspectives

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Who to involve: scenario

The regulator has evaluated the transportation plan to ensure the appropriate safety provisions are in-place to protect people and the environment and has granted a license to transport.

However a community along the route does not want the waste transported on roads in/through its community because some community members are fearful.

What does the NWMO need to do to adequately address these concerns to make good decisions?

55



Table discussion

Are there other scenarios which should be planned for?

What are those scenarios?

What should be done in response to those scenarios?

56



Plenary: addressing concerns



Highlights



Points where people agreed



Different perspectives

57



Break

58





Topic #3: Financial considerations



Financial considerations: background (1/2)

- The plan is funded by the owners of used nuclear fuel in Canada: Ontario Power Generation, New Brunswick Power, Hydro-Québec, and Atomic Energy of Canada Limited.
- The Nuclear Fuel Waste Act (NFWA) requires each of these four companies to establish independently managed trust funds and make annual deposits to ensure the money to fund this project will be available when needed.

Financial considerations: background (2/2)

- Based on the expected volume of 5.2 million fuel bundles, the total lifecycle cost of the plan, from start to finish, is \$23 billion.
- The cost of the project is about 0.1 cent per kilowatt hour of electricity produced.

Handout has additional information for you to think about!

61



Plenary: financial considerations



What do you need to see addressed to inspire confidence in this area?



What needs to happen to demonstrate costs are managed effectively to stay on budget?



How should the public be kept informed of progress and cost management?

62





Topic #4: Objectives

Objectives (1/2)

1. Protect **public health and safety** from the risk of exposure to radioactive or other hazardous materials, and from the threat of injuries or deaths due to accidents;
2. Protect **workers** from and minimize hazards associated with managing used nuclear fuel;
3. Ensure **fairness** in the distribution of costs, benefits, risks, and responsibilities;
4. Ensure the **well-being of all communities** with a shared interest;

Objectives (2/2)

5. Ensure the **security** of facilities, materials and infrastructure;
6. Ensure that **environmental integrity** is maintained over the long term;
7. Ensure **economic viability** of the used nuclear fuel management system; and
8. Ensure a **capacity to adapt** to changing knowledge and conditions over time.

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Table discussion

From your perspective, overall, are these the right objectives?

1. Individually:

- Review objectives identified in dialogue with Canadians during the development of APM.

2. Discuss:

- Are these the right objectives to guide the development of a transportation plan?
- How could we adjust these objectives to strengthen or clarify them?
- Are we missing any critical objectives?

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Plenary



Highlights by Objective



Suggested language



Are we missing any critical objectives?

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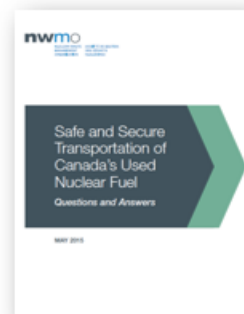
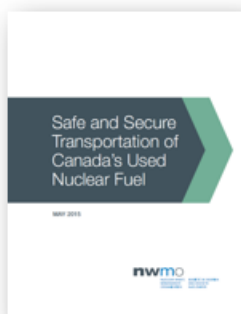
Final thoughts

Is NWMO on the right track?

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Learn more!
www.nwmo.ca



Evaluation

 Closing

 Thank You!



Individual Worksheet: Environment

From your perspective, what would need to be included in the transportation plan to give you comfort and confidence that the environment will be protected?

Think in terms of possible accident scenarios and how they could be prevented or dealt with.



Individual Worksheet: Financial Considerations

What do you need to see addressed to inspire confidence in this area?

What needs to happen to demonstrate costs are managed effectively to stay on budget?



TABLE DISCUSSION #1 – GUIDING PRINCIPLES

	Conversation Highlights	What did your table agree on?	What were some different points of view?
What principles resonate most with you? Why?			
Are there any principles that you feel are missing?			

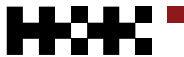
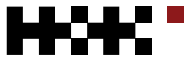


TABLE DISCUSSION #2 – ENVIRONMENT

Table #: _____

What would need to be included in the transportation plan to give you comfort and confidence that the environment will be protected?		
Conversation Highlights	What did your table agree on?	What were some different points of view?



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MANAGEMENT
ORGANIZATION

SOCIÉTÉ DE GESTION
DES DÉCHETS
NUCLÉAIRES

TABLE DISCUSSION #3 – WHO TO INVOLVE

Table #: _____

How can we ensure the design and implementation of the APM transportation plan is sufficiently inclusive to ensure good decisions are made?		
Conversation Highlights	What did your table agree on?	What were some different points of view?



NUCLEAR WASTE MANAGEMENT ORGANIZATION
SOCIÉTÉ DE GESTION DES DÉCHETS NUCLÉAIRES

TABLE DISCUSSION #4 – WHO TO INVOLVE

The regulator has evaluated the transportation plan to ensure that the appropriate safety provisions are in place to protect people and the environment and has granted a license to transport. However, a community along the route does not want the waste transported on roads in/ through its community because some community members are fearful.

Conversation Highlights

What did your table agree on?

What were some different points of view?

Are there other scenarios which should be planned for?

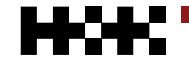
What are those scenarios?

And what should be done in response to each?



TABLE DISCUSSION #5 – Objectives

Are these the right objectives to guide the development of a transportation plan?
How could we adjust these objectives to strengthen or clarify them?
1. Protect public health and safety from the risk of exposure to radioactive or other hazardous materials, and from the threat of injuries or deaths due to accidents
2. Protect workers from and minimize hazards associated with managing used nuclear fuel



3. Ensure **fairness** in the distribution of costs, benefits, risks, and responsibilities

4. Ensure the **well-being of all communities** with a shared interest

How could we adjust these objectives to strengthen or clarify them?

5. Ensure the **security** of facilities, materials and infrastructure

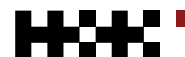
6. Ensure that **environmental integrity** is maintained over the long term



7. Ensure **economic viability** of the used nuclear fuel management system; and

8. Ensure a **capacity to adapt** to changing knowledge and conditions over time.

Are we missing any critical objectives?



Principles for Guiding the Development of the APM Transportation Plan

The NWMO's five fundamental values are integrity, excellence, engagement, accountability, and transparency. In addition to corporate values, there are principles and objectives that will shape APM transportation planning. A preliminary list of these is outlined below, along with some key guiding questions.

Principles: The following initial set of principles emerged from conversations with citizens:

1. **Safety is the overarching principle guiding all APM planning and activities:** Safety, security, and protection of people and the environment are central and must not be compromised by other considerations.
2. **Meet or exceed regulatory requirements:** The plan must meet, and if possible, exceed all applicable regulatory standards and requirements for protecting the health, safety, and security of humans and the environment, and respect Canada's international commitments on the peaceful use of nuclear energy.
3. **Aboriginal rights, treaties and land claims:** The plan must respect Aboriginal rights and treaties, and take into account that there may be unresolved claims between Aboriginal peoples and the Crown.
4. **Inclusiveness:** The plan must respond to and address, where appropriate, the views of those who are most likely to be affected by the plan.
5. **Informing the process:** The plan must be informed by the best relevant available knowledge, including science, social science, Indigenous Knowledge, and ethics. This information used to develop the plan must also be made public.
6. **Ongoing engagement of governments:** The NWMO must involve all potentially affected provincial governments in the development and review of the plan.

What principles resonate most with you? Why?

Are there any principles that you feel are missing?



Thank you

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