# Transportation Planning: Public Attitude Research Report

NWMO-REP-06310-0203

January 2020

Hill + Knowlton Strategies



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### **Document History**

Title:	Transportation Planning: Public Attitude Research Report				
Report Number:	NWMO-REP-06310-0203				
Revision:	R000	Date:	January 2020		
Author Company(s)					
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Accepted by:	Bob Watts				

Revision Summary		
Revision Number	Date	Description of Changes/Improvements
R000	2020-01	Initial issue

### ABSTRACT

Title:Transportation Planning: Public Attitude Research ReportReport No.:NWMO-REP-06310-0203Author(s):Pat Beauchamp, Vice President, Research + AnalyticsCompany:Hill + Knowlton StrategiesDate:January 2020

### Abstract

In 2019, 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 and 2018. Activities included10 focus groups (two of each in Pickering, Barrie, Sudbury, Sault Ste Marie, including two in Ottawa with Indigenous peoples); three 3-hour dialogue sessions; and one first responder workshop.

The core objective of the 2019 PAR was to validate and build on the key findings from previous research. Most importantly, these are the public's perspectives on:

- the considerations and basic requirements that should be addressed in the NWMO's transportation plan;
- the principles and objectives that should inform the NWMO's transportation plan; and
- key concerns and questions about the transportation component of Canada's plan.

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**

**Final Report** 

January 28, 2020

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### 1. Background, Objectives and Methodology

### 1.1. Background

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 2043, careful planning takes time.

The NWMO has engaged stakeholders and the public in conversation for several years. To supplement this ongoing dialogue, in 2017 and 2018, NWMO commissioned public attitude research that identified the principles, values and objectives the public wish to see reflected in transportation planning. The organization's discussion document: *Planning Transportation for Adaptive Phased Management* (released September 2016), was the key resource for the design of the research.

### 1.2. Objectives

The 2019 research complements the NWMO's sustained dialogue with communities involved in the site selection process and interested citizens more broadly. The findings contained in this report, together with its previous research and ongoing dialogue with citizens, is meant to inform the development of a Transportation Planning Framework<sup>1</sup>.

The core objective of the 2019 research was to validate and build on the key findings from previous research. Most importantly, these are the public's perspectives on:

- + the considerations and basic requirements that should be addressed in the NWMO's transportation plan;
- + the principles and objectives that should inform the NWMO's transportation plan; and
- + key concerns and questions about the transportation component of Canada's plan.

The public identified the protection of the environment as a priority consideration for the development of the APM transportation plan emerging from the 2017 and 2018 research. Environmental protection (e.g., climate change) has also become a salient issue in Canada, as seen in the 2019 federal election. For these reasons, the 2019 research focus groups and dialogue sessions opened with participants' identification of the major challenges facing Canada, including its environmental challenges. Discussion of the environmental pros and cons of nuclear power followed. The purpose was to position the discussion of APM transportation planning within this relevant context, enabling the NWMO to understand the broader linkages the public makes between nuclear power, APM, transportation and the environment.

The 2019 research also expanded on previous work by 1) holding dedicated focus groups with youth, 2) conducting focus groups in Northern Ontario, and 3) hosting a workshop with first responders. Each of these dialogue sessions also included a table of youth.

Qualitative research findings are not generalizable to the study population in the way that surveys of probability-based samples of the population are. Rather, focus groups, and other qualitative research techniques, are critical to understand the feelings, values, and thoughts on which people's perceptions are based. They also reveal the language and imagery people bring to issues. Qualitative research helps uncover common ground and divergence, particularly on complex policy issues.

It is also important to note that the research provides an aggregated view of participants' perspectives, not individual views of research participants.

### 1.3. Methodology

The research methodology consisted of three mini-dialogue sessions of three-hours each, 10 two-hour focus groups, including two with Indigenous participants, and one three-hour workshop with first responders. All session and focus group participants were randomly recruited members of the public. Locations for the research sessions, identified in Sections 1.3.1 and 1.3.2, were selected to involve a cross-section of people with different experiences, including living in communities both in Northern Ontario and Southern Ontario, and larger and smaller sized communities. The NWMO coordinated the invitation of first responders to the workshop. All the research was conducted in Ontario.

The first responder group, the focus groups and dialogue sessions examined the same issues, though the latter incorporated small group deliberation. The first responders' workshop also incorporated emergency responders' experiences involving the transportation of dangerous goods.

<sup>&</sup>lt;sup>1</sup> Note: the term "framework" is used throughout this report to describe the NWMO's guiding document for transportation planning, to be released in 2020, and because this term was used in the sessions.



The core issues covered in the 2019 Public Attitude Research were:

- + broad societal and environmental challenges facing Canada;
- + knowledge and awareness of nuclear waste and its management;
- + perceived challenges and opportunities of transportation planning for used nuclear fuel;
- + identification of key points (i.e.., factors, considerations) to address in used fuel transportation planning;
- + feedback on potential principles and objectives to guide transportation planning;
- + opinion on whether NWMO is on the right track when it comes to transportation planning;
- + advice for moving forward with transportation planning; and identification of lingering questions.

#### 1.3.1. Mini-dialogue sessions

Three mini-dialogue sessions (approximately 3 hours in length) were held during the last week of September 2019 in Toronto, Scarborough and Mississauga. Each session gathered approximately 20 people from a variety of communities across the GTA. Participants were randomly recruited based on several socio-demographic indicators (i.e., 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 a mix of participants with open and skeptical attitudes towards nuclear power (see Appendix A for research participant screening criteria).

Participants were assigned to small groups of 4-5 people to ensure demographic and attitudinal diversity at each table, in addition to one dedicated youth table.

An H+K facilitator guided participants through a mix of individual reflection, table brainstorming exercises and plenary discussion to address the study issues. An NWMO official was available to provide some context and respond to questions, when required and appropriate. Informational videos and handouts were used throughout. The dialogue session guide, presentations and handouts/worksheets are appended to this report (See Appendix B).

#### 1.3.2. Focus groups

Ten two-hour long focus groups were conducted in mid-October 2019, with two each in Pickering, Barrie, Sault Saint Marie and Sudbury. Two focus groups were also held in Ottawa with Indigenous peoples (First Nations and Métis).<sup>2</sup>

Each focus group had six to eight participants. They were randomly recruited using the same socio-demographic indicators and attitudinal screening as the dialogue sessions.

An H+K facilitator used a semi-structured moderator's guide to conduct the focus groups. As in the dialogue sessions, informational videos and handouts were used to provide participants with fact-based information on the issues discussed. The focus group guide and handouts/worksheets are appended to this report (Appendix C).

### 1.3.3. First responder workshop

A three-hour workshop with first responders was held in late November 2019. Nine firefighters from small to medium sized communities, most of whom were volunteers, participated. The approach taken and issues covered were consistent with the mini-dialogue sessions, with the exception being first responders discussed their emergency response experiences involving the transportation of dangerous goods, including specialized training and equipment.

<sup>&</sup>lt;sup>2</sup> NWMO conducted dialogue sessions in indigenous communities in parallel to the 2019 Public Attitude Research.

### 2. Detailed Findings

The focus groups, mini-dialogue sessions and first responder workshop were deliberative in nature: participants were provided with fact-based information at key junctures and given time to reflect individually (e.g., by writing down thoughts on paper) before discussing their views with others. While the topics covered were the same, 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.

### 2.1. Identification of Societal Challenges

### 2.1.1. Salient challenges facing Canada

Participants in the focus groups and dialogue sessions were asked to first identify and discuss the top challenges facing Canada. This broad question served as an icebreaker and provided context for subsequent discussion of more specific issues.

First responders came into their workshop knowing the topic of discussion, while the other research participants did not. The ice-breaker questions on societal challenges was not asked of first responders and the time reallocated to a discussion of training and experiences with the transportation of dangerous goods.

Across the sessions, the most frequently mentioned overall challenges facing Canada were:

- + the environment/climate change;
- + healthcare (i.e., access);
- + education (e.g., cost, student debt);
- + cost of living and income disparity;
- + affordable housing;
- + immigration (e.g., levels, processing/border control, integration);
- + the economy (e.g., job creation) and taxation;
- + reconciling/improving the lives of Indigenous peoples; and
- + transportation infrastructure.

The challenge of transportation infrastructure encompassed several aspects, including mass transit and traffic congestion for participants in the GTA and the poor state and inadequacy of roads for participants in Northern Ontario: "We have the worst roads in the province here." The challenge of improving transportation infrastructure was also more salient in Sudbury and Sault Saint Marie focus groups.

On the issue of climate change, several participants noted that the problem was international in nature in contrast to the other challenges on their list: "We talked about climate change on a different scale as it is larger than just Canada. [In our table discussion] we talked about how it is a global challenge."

The theme of continuity (or the challenge of achieving consistent and sustained approaches to public policies) surfaced during discussion of challenges, particularly with respect to the environment. Participants expressed concern that it was very difficult for government to address challenges that required long-term planning and sustained effort within Canada's political system and culture:

### "There are different ways of doing things but then during the next election cycle, it gets turned back. We're always going back to the drawing board on long-term issues and so it's hard to develop a long-term strategy."

Generally, youth identified similar challenges, but tended to place more emphasis on reconciliation with Indigenous peoples, education/student debt and the environment. Overall, they were also more focused on immediate issues revolving around finishing school, establishing a career, and finding direction.

The challenges articulated by Indigenous participants were almost exclusively focused on improving the quality of life of Indigenous peoples, (e.g., access to clean, drinking water, education) and justice and reconciliation issues (e.g., respect for rights and treaties, systemic racism).



### 2.1.2. Identification of the "Biggest Environmental Challenges" Facing Society

The focus groups and dialogue sessions sharpened the discussion from challenges overall to environmental challenges specifically. Once again, participants were asked to identity top challenges and think about the rationale for their choices.

While first responders were not asked this question, nonetheless, the environment surfaced as a theme throughout their workshop.

The most common challenges/issues identified by participants were:

- + reducing waste, particularly single-use plastics (e.g., lack of effective recycling programs);
- + addressing climate change/global warming/reducing greenhouse gas emissions (GHGs);
- + making large GHG emitters and "waste" producers more accountable (e.g., through regulations aimed at curbing emissions/waste);
- + water conservation;
- + need for more clean/renewable energy; and
- + Attitudinal barriers and lack of commitment among the general public (e.g., wasteful consumerism run amuck): "We are allowed one bag, or bin really, of garbage. Well people complained, and you even have some that are dumping their garbage in bins behind stores."

There was some debate among participants concerning the urgency of action on climate change and global warming. Younger participants were more likely to identify the need for urgent attention in comparison with the others.

Many participants also talked about the importance of persuading or "forcing" industry to play a greater role in protecting the environment, for example by compelling companies to develop less wasteful processes and/or acting with greater responsibility and care in how they deal with the waste they produce. Some used the word "accountability" to describe what they had in mind.

Related to the issue of industrial waste, some spoke of the need to focus on developing cleaner sources of energy. At this juncture in sessions, participants sometimes raised the topic of nuclear energy. Some saw it as a promising technology (e.g., no GHG emissions, "cheap"), while other participants expressed serious concern, including about nuclear waste: "I think the problem with nuclear is the waste, isn't it?" It wasn't long before many participants stated that they did not "know enough" about nuclear energy to make an informed judgement on the issue: "I learned what I know about nuclear from The Simpsons, you know the three-eyed fish, so I don't really know what to think."

### 2.2. Knowledge and Awareness of Nuclear Power, Used Fuel and The Perceived Environmental Pros and Cons of Nuclear Power

Acknowledging their self-professed lack of knowledge about the use of nuclear power to generate electricity, participants were asked to identify and discuss what they perceived to be this source's potential environmental benefits and drawbacks.

This question was posed to all research participants, including first responders.

In the focus groups people were asked to write down their ideas, while in the dialogue sessions and workshop, participants deliberated at their table and then shared their collective thoughts in plenary.

While participants were encouraged to consider the question from an environmental perspective, their responses suggested that many looked at the issue more broadly. The most commonly identified benefits and drawbacks of nuclear power are presented in the following table.

POTENTIAL BENEFITS	POTENTIAL DRAWBACKS
<ul> <li>low or no GHG emissions;</li> <li>relatively inexpensive to operate;</li> <li>reliable;</li> <li>can produce power continuously/"it's constant";</li> <li>less disruptive to the environment/smaller footprint</li></ul>	<ul> <li>Possibility of catastrophic incident/accident (e.g.,</li></ul>
(e.g., compared to oil and gas); and <li>Canada has a good nuclear safety track record.</li>	"Chernobyl", "Fukushima"); <li>having the deal with the "waste";</li> <li>relatively expensive to build; and</li> <li>public resistance/poor public image.</li>



The ensuing discussion generated almost as many questions as opinions from participants:

- + What were the chances of a serious accident?
- + Does it produce any GHGs? What about other forms of "pollution"?
- + Do power plants emit (low-level) radiation (e.g., absorbed by workers, areas surrounding power plants, wildlife)?
- + What is the nature of the "waste" and how is it dealt with?
- + Was nuclear energy truly less expensive to produce?

Participants agreed that Canadians' views of nuclear power, including their own, were shaped by a combination of fear, misconceptions, pop culture, along with some facts.

While a few participants opposed the use of nuclear power, most others, and especially youth, were either supportive or wanted to know more about the issue: "In weighing the benefits and drawbacks, we were so uninformed that we couldn't make a decision. We felt very uninformed on the subject."

The discussion to this point revealed that participants had greatly varying levels of knowledge about nuclear power and its use in Ontario and Canada. Collectively, some of their key assumptions were that:

- + Ontario gets a significant amount of its electricity from nuclear.
- + Nuclear power has been used in Canada since about the early 1970s.
- + The "waste" produced by nuclear power is hazardous and a major drawback of the technology. Probing revealed that some were thinking specifically about used nuclear fuel (e.g., "uranium"), while others had a more amorphous image (e.g., unspecified sludge) in mind.
- + The "waste" is no doubt being managed, but it is unclear exactly how. As in the past, the most common guesses include that the fuel is being "buried somewhere" (e.g., in northern Ontario, in an abandoned mine). Other guesses were that it is housed in some form above ground in cement storage facilities or shipped to another country.

As noted above, one of the specific issues that participants wanted to know most about was nuclear waste. This curiosity provided a segue to a presentation of Adaptive Phased Management (APM), Canada's plan for the long-term management of used nuclear fuel.

### 2.3. Transportation of Canada's Used Nuclear Fuel

#### 2.3.1. Initial reaction to APM: Canada's Plan

As background to inform the discussion of transportation planning, participants were provided with a description of the NWMO (e.g., non for profit organization established in 2002 through Canada's Used Nuclear Fuel Act), and shown a short video describing interim storage and APM (Canada's plan). Participants were invited to share their initial thoughts about Canada's plan before proceeding to a discussion of transportation.

Following this discussion, the facilitator provided additional fact-based information, including a brief overview of scope (i.e., potential modes and number of shipments over 40 years), and a short video that covered regulation and package design, testing and certification. Once again, participants were invited to share their thoughts.<sup>1</sup>

Participant reactions to APM were very consistent with those of past Public Attitude Research participants, including:

- + awe at the scale of the project;
- + surprise that a community in Canada would be willing to host the deep geological repository (DGR);
- + some surprise and concern that used fuel was being stockpiled at facilities; and
- + comfort in what they considered to be the plan's comprehensiveness and thoughtfulness.

There was also occasional surprise that the plan revolved around "burying" Canada's used nuclear fuel. For some, surprise was mixed with disappointment that a more sophisticated solution was not being used: "It just seems like if you've had all these scientists working on it, you'd have something better than just burying it underground."

Consistent with past research, the most common questions about APM posed by participants centered on cost, site selection, international comparisons (i.e., what "other countries are doing"), and safety. They also wanted to know if other options had been thoroughly explored (e.g., recycling). The adaptive nature of APM, whereby improvements in science and technology, as well as other areas, could be integrated into Canada's plan, reassured several participants: "I'm okay with planning to bury it for now, as long as we can do something else if a better technology comes along."

#### 2.3.2. Initial thoughts on transportation

A map featuring current interim sites and potential host communities prompted some participants to ask questions about transportation: How would the fuel get from current locations to the repository? What modes would be used? How long would it take to complete the transportation? Would shipments pass through densely populated areas (it looked like it would have to)? What organization would be doing the transporting (e.g., private or government)? What training would workers receive?



Participants received background information that included transportation timelines (e.g., shipments of used fuel would not begin until approximately 2043, transportation would take approximately 40 years to complete). They also received information about potential modes (i.e., rail and/or truck/road transportation). Responding to that information, some participants were taken aback by the length of time it is expected to take to transport all of Canada's used fuel to its end destination point. With respect to modes, some participants felt that rail would be less disruptive to the public and possibly safer (e.g., less chance of human error). However, the experience of the Lac Megantic derailment arose during conversation. In the end, participants were open to both modes and said they expected that "experts" would weigh the pros and cons of each, including the state of rail and road infrastructure.

In their discussion of the pros and cons of rail versus truck transportation, first responders recalled rail accidents that happened in locations without road access, and which thereby greatly slowed response time. On the other hand, they also identified a potential disadvantage of truck/road transportation: the possibility of massive disruption that would come in the event of a prolonged road closure, particularly in circumstances in which there is only one road in and out of a community or group of communities.

As with past research, participants were reassured after viewing the NWMO video on transportation packaging design, testing and certification. Participants were impressed by what they considered to be the strength and impermeability of the casks: "I think they said that it's made of steel 30 cm think. It's not going to crack." The testing made even more of an impression: "Well, I'm satisfied, especially seeing the crash with the train."

However, some skepticism did remain: "Did they test it with actual material?" "They said 200 meters for an hour or something, well if it goes 200 meters into water it's going to be in there for more than an hour." For the most part, participant's thinking about transportation began to broaden out from a focus on radiation-related safety and security to more other aspects, such as traffic disruption, congestion and potential impacts on local quality of life (e.g., commuting times, property values). They also spoke about the possibility of fatal accidents, caused not from a release of radiation, but rather by collisions involving "very heavy" transport trucks, driving on "terrible" road and rail infrastructure, in winter: "That truck is going to take a long time to stop."

Of note: the reactions and questions of first responders mirrored those of other participants. In terms of impact, the video led first responders to surmise that, in all likelihood, they would never have to deal with the release of radioactive material given the container's strong design: "After seeing that video I'm thinking that we would just have to worry about dealing with the accident part of the situation, getting people out and dealing with traffic." Notwithstanding the reassuring information provided by the video on packaging and certification, first responders agreed that they wanted to be prepared for any eventuality, including training, equipment, communications (e.g., with other emergency personnel and the public), and clear division of labour between the various agencies that may be called upon to respond: "All this needs to be figured out ahead of time."

### 2.4. Perceived Challenges and Opportunities of Transportation Planning

Prior to a detailed discussion of what NWMO's transportation plan should include, participants were asked to identify what they saw as some of the broad challenges and opportunities involved in planning. As part of their deliberations, they were asked to consider the following:

- The very long-term nature of the project (i.e., transportation won't start until about 2043);
- The fact that the project will span many generations of Canadians from planning to completion;
- The use of technology/science; and
- The fact that routes will go by and through many different communities across three provinces.

Collectively, participants identified specific challenges around safety, security and managing costs. They also pointed to economic benefits (e.g., employment opportunities, improvements to transportation infrastructure), and the development of new technologies, as opportunities. These elements would be consistent with what participants would later identify as elements of a transportation plan (e.g., the challenge of ensuring safety).

More broadly, however, two aspects: 1) the project's long timeframe, and 2) the need for a socially acceptable solution, were associated with both challenges and opportunities:



The Project's Long Timeframe		The Need for a Socially Acceptable Solution		
Challenges	Opportunities	Challenges	Opportunities	
Maintaining continuity and momentum (e.g., governments can	More time to "get the planning right".	It might mean that the process of informing and engaging with stakeholders and	The process of informing people and getting public acceptance will not be rushed.	
change direction).	More time to inform and engage with stakeholders	communities along the route will have to be	It also provides the	
Technology that was leading-edge in the planning phase may	the route.	several generations.	NWMO with the time it might need to assuage the concerns of those who	
become obsolete during implementation.	More time to allow course corrections and the adoption of new technologies/approaches.	The level of misinformation and misunderstanding (e.g., "hysteria") about	may initially reject what is being proposed.	
More difficult to manage project costs/stay on budget over a long period of time.		"nuclear" makes it harder for people to look at the issue pragmatically.	Provides an opportunity to educate/inform people on an issue they should be aware of regardless of what government or regulatory requirements may dictate.	

### 2.5. Key Points to Address in a Transportation Plan

Participants were asked to reflect on what a potential NWMO transportation plan for used nuclear fuel should include. They were encouraged to think in terms of what NWMO should "consider", "think about", "make sure of".

Dialogue session and workshop participants reflected on the question individually and then formulated a small group response to share in plenary.

Overall, results were consistent with those of past research. It is also important to note that the views of youth, first responders and Indigenous participants were in line with those of other participants, though first responders tended to focus more on emergency response planning.

As discussed later, the Indigenous people who participated in the research believed that the NWMO must do more than inform First Nations and Métis communities along transportation routes; consultation will be required. These participants also warned that such consultations needed to be "real" and conducted in good faith. Indigenous participants who participated in the 2018 research also shared this point of view.

Collectively, participants identified the following elements for inclusion/consideration in the NWMO's transportation plan.

**Safety** was the most frequently mentioned element. It was also considered to be a top priority. In discussing its preeminence, participants often explained that safety pertains not just to the public, but also to the environment (e.g., "delicate" ecosystems, animals, plants, water, air), and workers/employees. Protection of the environment was particularly salient for Indigenous participants, who often emphasized a more holistic perspective; "We don't make a difference between nature and ourselves, we are part of nature. So, you can't say people will be safe, but the environment might be hurt. It's the same." Also, several participants advised that the NWMO not limit its thinking around environmental protection to preventing and mitigating the release of radioactive materials, but also in the transportation itself (e.g., GHG emissions associated with the transportation program).

For participants living outside of the GTA (Barrie, Sudbury and Sault Saint Marie), safety concerns centered more on the potential for injury and loss of life through traffic accidents than the release of radioactive material: "It's not the radiation I'm worried about, those containers are safe. It's trying to stop a heavy truck like that in winter." Participants often linked this concern to the poor state of roads in their area, as well as to past accidents involving transport trucks. As part of this discussion, participants sometimes raised the issue of public inconvenience. For example, slowing down of traffic or road closures: "What happens if it's the only road in and out and its closed for hours or maybe even days?" Similarly, a few



participants wondered about potential negative impacts of closures, congestion and detours on local business and property values.

Ensuring that the plan minimizes its impact on the environment. As noted, the salient environmental concern that participants had vis a vis transportation pertained to the potential release of radioactive material into the environment. In addition to this, however, several participants, particularly youth, emphasized the importance of incorporating as much "green" technology as possible into day-to-day operations. This included reducing or eliminating greenhouse gas emissions from trucks, trains or any other vehicle that may be used, and more broadly looking at transportation planning through a "green" lens.

<u>Security</u> was also identified as a key element of transportation planning, though somewhat less frequently than in past research. The nature of security threats described by participants was also a bit different. In previous iterations of PAR, participants focused almost solely on "terrorism", whereas this year they were as likely to have civil disobedience and mischief in mind: "You are going to need security because people will be demonstrating and stopping traffic."

<u>Communication, education and engagement</u> were included on almost every participant's list. Consistent with past research, this aspect of transportation planning was deemed important for two, albeit quite different, reasons: 1) ethics, and 2) strategy. With respect to the former, there was agreement that Canadians, particularly those living in communities along the route, had a "right" to know about the project: "I would want to know. People have a right to know that this is coming through." Consensus also emerged on the strategic wisdom of proactively communicating with community members to obtain a critical mass of acceptance: "If you don't tell people about this, then it looks like you are hiding something." "If people find out about this, and they will eventually, and they don't have the sort of information we had here tonight, then they are going to imagine the worse and some will try to stop it."

It is worth noting that first responders also placed significant importance on this aspect of transportation planning. They shared the same views as other participants with respect to the strategy and ethical rationales for public outreach, but they also drew on their experiences responding to concerns and questions from the public. While they agreed that first responders and municipal officials would inevitably play at least some role in providing information to community residents, and that NWMO should help them prepare for that, they also thought that NWMO should proactively provide the public with information.

Participants raised other points for NWMO's consideration:

- + Some concern that providing "too much detail" (e.g., routes, travel times) could negatively affect security.
- + Agreement that information should be layered in terms of detail and complexity, ranging from as "short and simple" as possible (e.g., "a one-pager") to allowing the public to access NWMO's technical reports. Participants accorded NWMO the responsibility for letting the public know about the project and for making information available. They also assigned the public with some responsibility to seek out additional information: "Everyone in the community should get the one-pager, and then if they want to know more, they should be able to get information and ask questions." On this issue, younger participants thought NWMO could, and should, use social media to reach people directly. They also suggested that the organization adopt leading-edge communication approaches for reaching people, especially young people like themselves.
- + Indigenous participants suggested that members of First Nation and Métis communities could be hired to provide information to others on behalf of NWMO. They thought this would be an effective means to communicate, as well as a way for communities to receive some financial benefit from the project.

**Emergency response planning** was high on most participants' list of transportation planning considerations. This aspect included:

- + Conceiving of, and planning for, all potential emergency scenarios (e.g., traffic accidents, spills, security breaches).
- + Planning responses at all (geographical) points along routes.
- + Coordinating with local and regional agencies (i.e., to ensure that first responders have the information, training and equipment to respond effectively to various emergencies).
- + Developing an effective way to communicate with the public in the event of an emergency (e.g., evacuation).

In addition to the above points, first responders stressed the need for advance planning and preparation: "Once this was to be implemented, we would be notified when it's moving and where it's going, if it's in the dead of the night; the purpose of knowing that is better preparedness; instead of being reactive; What and who deals with it? In the event something was to happen, what teams, what is the division of labour? When you get a derailment, for us as first responders, you're fighting with roadblocks before you can even protect your community."

Participants identified other aspects for consideration as part of transportation planning, including:

<u>Drawing on international lessons learned</u> to ensure that Canada's transportation plan for moving used nuclear fuel is as good as possible: "They need to look at how other countries move this stuff and learn from that." "We don't want to be reinventing the wheel either."

<u>Ensuring that the plan is adaptive</u>. Given what participants understood to be long-term nature of Canada's plan, including the transportation component, several thought it was important to ensure that the transportation plan could accommodate



changes in science and technology. The most common example put forward by participants was self-driving vehicles, while others imagined drone-type technology.

<u>Training (and the use of contractors)</u>. In discussing the importance of "training", participants conveyed their hope that the entire transportation operation would meet the highest standards in areas such as employee qualifications, reliability/security screening, and training/certification. In short, they wanted the human resource component of the planning to reflect the extraordinary nature of the cargo: "This can't just be given to some trucking company; employees have to be carefully vetted, they are going to need specialized training." "Yeah, like who is going to drive these trucks?"

**Monitoring, tracking and auditing**. For participants, this included "keeping track" of containers (e.g., through GPS), evaluating/auditing procedures and processes and holding people "accountable".

### 2.6. Feedback and Potential Principles and Objectives to Guide Transportation Planning

Participants were asked to provide feedback on ideas for principles and objectives that could guide transportation planning. As background, they were told that these draft ideas had emerged from public dialogue. Participants were also told that actual transportation planning would be very detailed, and, that the handout provided for review represented high level thinking about what could shape that transportation planning process.

They were encouraged to think about three questions: How closely do the principles and objectives correspond to their own thinking? Do they find anything they read confusing, ambiguous or in any way problematic? Is anything missing?

Overall, participants' response was positive -- the principles and objectives were judged to be relevant, comprehensive, as well as clear/easy to grasp: "It has everything in it that we've been talking about." "I'm good with this. I think they did a good job." No one thought that the list of guiding principles was deficient.

Notwithstanding, participants did have recommendations for improved clarity and potentially missing elements as described below.

### 2.6.1. Missing Elements

Two potential lacunas were identified with respect to the objectives:

1) Effective communication with the public, especially with affected communities. Some participants thought that the objectives should include something about effective communication with the public, particularly with affected communities along transportation routes.

2) Respectful relations with Indigenous communities. Indigenous participants expressed disappointment that the objectives did not specifically include something about working positively and respectfully with Indigenous communities.

#### 2.6.2. Feedback on specific elements

The table below summarizes participants' feedback on specific principles and objectives. The principle of respect for Indigenous rights, treaties and land claims garnered most of the attention. This was true across all three streams of research.

PRINCIPLES
Safety should be the overarching principle guiding all APM planning and activities.
<ul> <li>Mirrors participant view that safety should be considered the most important element/principle of the transportation plan: "I liked that safety is overarching."</li> </ul>
Meet or exceed regulatory requirements for the protection of health, safety and the security of humans and the environment: The plan must meet, and if possible, exceed all 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.
<ul> <li>Many believed that all regulatory requirements should be exceeded (not simply met): "Why would you exceed some and just meet others?"</li> <li>A few felt that the reference to the "peaceful use of nuclear energy" is out of place: "Why is that in there?"</li> </ul>
Transparency is the key to building trust: Information used to make decisions about transportation planning must be readily available to the public.
<ul> <li>Reflects participants' views about salience of transparency and tight link to trust.</li> <li>A few reiterated that information should be reasonably accessible to a lay audience (i.e., an organization that does not make information accessible/understandable is not being transparent).</li> </ul>



Balancing adaptation and continuity: The transportation plan should be flexible enough to continuously incorporate the latest and best science and technology, while also maintaining continuity throughout changes in government.

- + Probing revealed that participants understood both concepts encapsulated by this principle, and that they resonate.
- + Some noted that while the principle of continuity is laudable, it cannot be forced onto governments: "I think it's a good principle because you don't want to spend a bunch of money on this to have a new government scrap it, but I'm not sure there is anything that can be done to prevent a government from doing what it wants. Look at what's happening in this province."

Respect for Indigenous rights, treaties and land claims: The plan must respect the constitutional rights of Indigenous peoples, reflect treaties, and consider that there may be unresolved claims between Indigenous peoples and the Government of Canada.

- + Easily the most noteworthy element.
- + Most reactions were positive, especially among youth and Indigenous participants. Comments mainly underlined the importance of respecting Indigenous peoples, especially given past wrongs (e.g., ignoring concerns): "We hadn't talked about this, but I'm glad it's there. Given where this is going, you are going to have to go through Indigenous land, so they have to be respected."
- + Some concern was expressed that it may not be possible to implement the project effectively if this principle was put into practice.
- + A few participants suggested that it was important for NWMO to respect all communities: "I think it's important to respect the rights of all communities."
- + For their part, Indigenous participants were happy (and some pleasantly surprised) to see it. They also thought it was well articulated, in that it addressed the right elements and did so clearly. However, several observed that history indicates that statements of intention don't always translate into deeds: "I'm glad it's there, but we've heard all this before."

Evidence-informed decision-making: The plan must be informed by the best relevant available knowledge, including science, social science, local knowledge, Indigenous Knowledge, and ethics. This includes identifying who needs to be part of decision-making and involving them throughout the process.

- + This was the least noteworthy principle.
- + Sparked questions about who will/should be "part of decision-making".

Responsible project management: The plan must be managed in a fiscally responsible way so that the cost of the project does not become a burden to current ratepayers or future generations.

- + Resonated with participants, though some expressed skepticism that a project of this magnitude could avoid cost-overruns.
- + Some emphasized the importance of ensuring that governments would never have to "bail-out" the power producers.
- + Some comment that the idea that the public won't have to pay for the project is a bit disingenuous since the it is fact being funded by ratepayers, who are essentially the public. Thus, any cost overruns will ultimately be borne by them.

#### OBJECTIVES

Safety: Protect the public and workers from and minimize hazards associated with managing used nuclear fuel

+ The objective of "minimizing" hazards resonated, but it was also thought by some to be aiming too low: "I think it should be to <u>eliminate</u> hazards."

Security: Ensure the security of facilities, materials and infrastructure

+ Resonated and was easily understood.

Environment: Ensure that the environment is protected over the long term.

+ This objective resonated with participants, especially younger people. Several people tripped over the term "long-term", given that the used fuel needs to be kept from entering the environment indefinitely. From this almost eternal vantage point, "long-term: can sound limited.

Project Finances: Ensure economic viability of the project, without compromising safety, security and the environment

- + Participants who commented in this objective thought that it echoed earlier exhortations that the pursuit of profit never trump safety and security.
- + Some suggested that the term "sustainability" replace "viability" since presumably the project has already been determined to be viable.



### 2.7. Moving Forward: IS NWMO on the Right or the Wrong Track?

Towards the end of the sessions, participants were asked to reflect on what they had learned and discussed and to indicate whether NWMO was on the right or wrong track in its transportation planning. Participants were also encouraged to share some of the thinking behind their judgement.

Consistent with past research, most participants judged NWMO to be on the right track in the way it was approaching transportation planning. Collectively, three reasons were put forward to substantiate this view.

- + The guiding principles and objectives resonated with participants because they reflected their own thinking on the issues.
- + The adaptive nature of the approach, along with international collaboration between countries, reassured participants that the best science and technology would always be used.
- + The informational videos and other facts reassured participants that public safety was being taken very seriously.

Only a handful of participants who thought NWMO was on the wrong track. They preferred to see the used fuel remain in interim storage until a "better" technology is developed.

A few participants indicated that they need "more information" before making a judgement about the direction NWMO was taking on transportation planning.

### 2.8. Words of Advice and Residual Questions from Participants

The last segment of sessions was devoted to obtaining participants' "advice" to NWMO for moving forward with transportation planning. Participants also had an opportunity to raise any outstanding questions they might have.

### 2.8.1. Advice

Inform/"educate" the public. As in past research, the most common piece of advice proffered by participants was for NWMO to "educate" and "communicate" with the public about the project, particularly communities along potential transportation routes. In support of this suggestion, many participants drew on their own experience, describing themselves as coming into the session knowing nothing or little about the topic but leaving with a reasonable amount of comfort with APM and transportation: "Make the public more aware of what you're doing. This is the first I ever heard of it and I consider myself well-read. It's important because it has a direct impact on communities and potential major safety and security issues, and the public should be aware."

Also consistent with previous public attitude research participants noted both strategic and values-based arguments for reaching out to the public. Strategically, they thought that acceptance was much more likely to be gained if residents living along transportation routes learned about the project from NWMO directly (or at least from a source informed by NWMO). The values argument was straight-forward: people living in communities along transportation routes had "a right to know."

The advice from Indigenous participants pertained mainly to how NWMO should consult/engage with Indigenous communities along transportation routes. There was strong agreement that consultations needed to be "legitimate" and involve the community as a whole (i.e., not limited to community leaders). They also stressed the importance of having accessible information for people, such as elders, to consider, for example by drawing on members of the community to "educate" other members. They also recommended the use of "visuals" as opposed to text.

<u>Continue to conduct research and cooperate internationally.</u> While the science and technology aspect of the project was generally impressive to participants, some encourage NWMO to keep pursuing improvement in innovations, with an eye to reducing risk to the public and the environment to zero.

**Prioritize safety.** As indicated earlier, the identification of safety as the overarching principle guiding all APM planning and activities resonated with participants. As part of their closing advice to NWMO, they encouraged the organization not to waver from this commitment: *"There's always going to be a temptation to cut corners to maximize profit."* 

#### 2.8.2. Residual questions

Some of the questions that participants were left with at the end of the sessions pertained to APM in general, while others were specifically about transportation. The most frequently cited questions were:

#### Question about project finances

- + Was transportation included in the cost/budget? What else was included?
- + Would the project require transportation infrastructure upgrades? And would NWMO pay for them?
- + Who would pay if the project went overbudget?
- + How are contributions to the fund that producer pay into calculated? How does NWMO know that the amount in the fund will be sufficient? Is inflation taken into account? Who looks after the fund/how is the money invested?



#### Questions transportation safety and security

- + How many emergency scenarios would be planned for? How many worst-case scenarios is NWMO planning for?
- + How will the shipments be protected? What is being envisaged?
- + Would it be possible to increase the number of shipments in order to get the used fuel to the DGR in fewer than 40 years?

#### Communications/education/engagement

- + How proactive does NWMO plan to be: "Do you push it out or do you expect people to go to your channels?"
- + Will NWMO be taking full advantage of social media, particularly to reach younger people?

#### Other questions

- + What happens if a "better" approach/technology than a DGR is developed? What happens to the funds that have been put aside to pay for the project?
- + How is nuclear waste transported and stored in other countries? What has been learned from those experiences?
- + If there are no plans to build new nuclear power plants and Ontario obtains most of its power this way, what will take the place of nuclear?

### 2.9. A Word on Population Sub-Group variations

The 2019 Public Attitude Research included a diverse cross section of the public, including dedicated groups with youth, Indigenous peoples and residents of northern Ontario/smaller urban centers. This year's research also gathered the input of first responders.

Overall, there was a great deal of commonality and consistency in views across all the sessions, regardless of composition. Most notably, there was much similarity in the elements that participants identified for inclusion in NWMO's transportation plan. Reaction to potential guiding principles and objectives were also consistently positive.

Notwithstanding these similarities, there were a few notable differences in the way youth, Indigenous, norther Ontario and first responder participants either looked at the issues or placed emphasis on certain aspects. These differences are summarized here:

NORTHERN ONTARIO RESIDENTS	YOUTH	INDEGINEOUS PEOPLES <sup>3</sup>	FIRST RESPONDERS
<ul> <li>Transportation safety concerns go beyond the release of radiation. Equal, if not greater, concern was expressed about traffic accidents.</li> <li>Specific concerns were raised about poor state of rail and road infrastructure.</li> <li>Also, some concern was voiced about related issue of inconvenience in the event of a long-term road closer (i.e., potentially the only route in and out of communities).</li> </ul>	<ul> <li>More aware of challenges faced by Indigenous peoples.</li> <li>More open to nuclear power as a potentially "green" technology.</li> <li>More importance placed on environmental protection: entire project should be "green" as possible (e.g., adopt green tech, minimize release of GHGs, minimize environmental footprint).</li> <li>Strongest proponents of reaching the public through social media (e.g., through short videos).</li> </ul>	<ul> <li>Initial discussion focused on issues of mutual respect, reconciliation, past wrongs and improving the quality of life of Indigenous peoples.</li> <li>More skeptical of government and private sector, especially the federal government and resource companies.</li> <li>Priority placed on environmental protection (e.g., water). View environment and people as one and the same.</li> <li>More conscious of impacts that contemporary decision-making can have on future generations (e.g., seven generation ahead).</li> <li>Stress the importance of having "real" consultation and dialogue between NWMO and</li> </ul>	+ More emphasis placed on emergency response planning.

<sup>&</sup>lt;sup>3</sup> NWMO conducted dialogue sessions in indigenous communities in parallel to the 2019 Public Attitude Research.



	Indigenous	
	communities.	

The extent to which the views of first responders matched those of general public participants was striking. For example, first responders placed the same high level of importance on informing/engaging communities along potential transportation routes, and for the same reasons. They posed the same questions and had many of the same concerns (e.g., about project continuity in the face of changing governments: "Will there be a way for future leaders to opt out of this agreement?"). Perhaps most significantly, the impact of fact-based information on the views of first responders mirrored the results of all NWMO's public attitudes research -- it was reassuring and helped to displace concern and doubt with pragmatism and acceptance: "At the beginning it was total fear. By the end, it was 'it's a nuclear one, don't worry about it."

First responders tended to speak with one voice on issues related to emergency response planning; they had consistent experiences, opinions and advice for NWMO, including:

**Training** is fairly consistent across "departments" (i.e., IFSDA), but can vary based on "budgets". Training covers incidents involving dangerous goods, including radioactive material. Everyone was familiar with CANUTEC. There was some agreement that any additional training could be incorporated into existing programs: "I think we need something, but we don't have to reinvent the wheel. Last year we took the operations of 'HASMAT-ing' and [the topic of radioactive material] was already in there." Key question: who will pay for any additional training and equipment related to APM transportation?

Advance planning is key. First responders said that they want to know ahead of time how to respond to the range of plausible scenarios (e.g., protocols, division of labour between agencies, communications). In essence, they wanted to be able to respond effectively and confidently: "We would need that assurance. We can tell a fuel tank is ruptured when it's leaking. This one, we wouldn't be able to see or smell. How would we be assured that it's safe?" They also thought that it would be helpful for first responders to know "when shipments are coming through" so that they can be prepared (e.g., have the right people working/on-call).

**On-going communications and engagement** between NWMO and first responders was recommended. First responders saw how their own views evolved and level of comfort increased over the course of the workshop. They thought that all affected first responders would benefit from the same type of "education". They also expressed appreciation for the opportunity to provide input into transportation planning and expressed the hope that it would continue, not only with their "departments", but with all affected first responders throughout the course of the project: "Education and on-going training. Both our services are volunteer, and retention is not always great. The next group, the volunteers coming in need to understand their respective roles…"



### 3. Conclusions and Emerging Themes

The research findings validated results from NWMO's earlier public attitudes research:

- + The rationale for moving from interim to long-term storage continues to be supported by participants, both from public safety and intergenerational fairness standpoints.
- + The elements that the public expect the NWMO's transportation framework to contain were confirmed.
- + The key questions and concerns raised by participants are consistent with what we have seen in the past.
- + Perhaps most notably, we continue to see the positive impact that fact-based information has in shaping views, in moving people from emotion to pragmatism, and, ultimately, in assuaging concern and easing acceptance.

Four themes emerged for the 2018 Public Attitude Research, including:

- + Informing and engaging with the public is key to social acceptance.
- + Transparency in APM transportation planning will build trust, which in turn is linchpin to social acceptance.
- + The importance of balancing continuity and adaptation; and
- + APM as a societal good.

These themes also permeated this year's APM.

In addition, the following themes surfaced in the 2019 APM:

### The key issue of safety takes on multiple dimensions as one moves from large to smaller urban centers and into northern Ontario.

The discussions with residents in Sudbury, Sault Saint Marie, as well as Barrie, suggest that people living outside of large urban centers have a broader view of transportation road safety. Whereas past research participants from large urban centers, such as Ottawa and the GTA, discussed safety almost uniquely in terms of preventing the release of radioactive material, participants outside of these locations placed significant emphasis on the safety risks posed by traffic accidents. These participants were particularly concerned about the weight of the trucks (and it impact on stopping times), poor road infrastructure and hazardous driving conditions.

#### People can only be informed if they have information that is accessible/understandable.

This theme emerged throughout the discussions but was most strongly advocated by youth and Indigenous participants. There was broad agreement that NWMO (and its surrogates) has a responsibility to make information about transportation as accessible as possible to a variety of audiences, including people with low English or French literacy levels.

Based on the two videos viewed during their session, participants thought that it was indeed possible to convey information on a complex topic in a manner that could be grasped by the average person. Participants suggested a layered approach to information dissemination, ranging for a one-page fact sheet to full technical reports (for those who might be inclined to peruse such things). Young people often suggested that social media, which allows people to access information in form or short videos, was an ideal way of informing the public. Indigenous participants suggested an interactive approach to informing community members (as opposed to leaving them to read a document). They also agreed that involving members of the community as information conduits/disseminators, would be wise.

#### The notion of adaptability in APM appears to resonate more clearly over time.

The issue of adaptability (i.e., the adaptive aspect of APM) seems more graspable and resonant to participants in 2019 than it was in 2017. It is reassuring to participants in general, but especially so among those who were skeptical about DGR technology as the permanent solution to the issue of used nuclear fuel. The advent of self-driving vehicles was mentioned in every session. While this example is directly relevant to transportation, participants may also see it a harbinger of the next wave of technological change. Given the very long-term nature of APM, participants were comforted by the notion that the project would adapt and evolve (i.e., that the project was not wedded to approaches and technology that may become out of date).

#### The potential guiding principles and objectives are close to achieving maximum resonance and clarity.

As noted in the body of this report, the reaction of participants to the potential guiding principles and objectives put before them was very positive overall. The feedback generated by the current set indicates that they are relevant, clear and comprehensive. In the eves of 2019 participants, only fine-tuning is required.

### The workshop suggests that first responders are receptive to hearing about the APM project and transportation and to work with NWMO and others on emergency response planning.

First responders were very keen to hear about APM and its implications for emergency response personnel and for their community/the public. While they have knowledge and training related to the transportation of dangerous goods, including some on radioactive materials, there was agreement that dedicated training/education was warranted, in part to help demystify the issue. The watch word for first responders was "preparation". They wanted nothing left to chance. They also wanted to be able to reassure community members with solid information: "I'm going to get asked about this at the grocery store, so I want to be able to have some good answers."



### Appendix A – Research Participants Screening Criteria

### NWMO Focus Group & Mini-Dialogue Recruitment Specifications

#### 1.0 Socio-demographics

#### Q1 Gender

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

#### Q2 Age

- 18 to 26: Approximate minimum 25%
- 26 to 50: Approximate minimum 40%
- 51 + : Approximate minimum 25%

#### Q3 Education

- Less than high school: EXCLUDE
- High school, community college, certificate: Approximate minimum 30%
- University degree: Approximate minimum 30%
- Q4 Household composition (i.e., children under 18 at home)
- Approximate minimum 25% with children under 18 at home

Q5 Household income

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

#### 2.0 Attitudinal Screening Survey

Q6 This two-minute survey seeks your opinions on energy production 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

- A. The federal government
- B. Pipeline companies
- C. Nuclear energy companies \_\_\_\_\_
- D. Airlines
- E. Your local police

Q7 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

- A. Transporting oil by pipeline
- B. Transporting propane by rail
- C. Transporting used nuclear fuel by truck \_\_\_\_\_
- D. Transporting chlorine by rail
- E. Transporting wood logs by truck

Q8 Please indicate whether you agree or disagree with each of the following statements.

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

- A. We need to invest more in public transit and less in building roads.
- B. I am very strongly opposed to nuclear energy \_\_\_\_\_
- C. Overall, pipelines are the best way to move oil and natural gas
- D. So-called alternative sources of energy, such as solar and wind, will never completely replace fossil fuels
- E. I think that nuclear power generation in Canada is safe \_
- F. Overall, I feel safe travelling on provincial highways.



#### 3.0 Additional Screening Questions

Q9 Do you work in any of the following sectors?

- Elected official (e.g., MP, MPP, member of municipal/local council) [EXCLUDE]
- Power generation (e.g., work at a power plant, provincial or local electricity utility) [EXCLUDE]
- Long-haul trucking [EXCLUDE]
- Engineering [EXCLUDE]
- Media [EXCLUDE]
- Federal or provincial government [EXCLUDE]

GROUP "A" ANTI-NUCLEAR (5% of Population) [EXCLUDED]:

 People who strongly who are "very strongly opposed to nuclear energy" (7 out of 7) OR

• People who average less than 2.0 out of seven on the AVERAGE

GROUP "B" CONCERNED/SKEPTICAL (40% of Population) [BETWEEN 8 AND 10]:

• People who average 2.0 to 4.0 out of 7 on the INDEX

GROUP "C" OPEN (55% of Population) [BETWEEN 12 AND 14]:

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

HOW TO CALCULATE THE AVERAGE:

The calculation is based on questions Q6, Q7 & Q8 on the highlighted statements only

- Add the ratings for all and divide by 4
- Please note we have to revise the scale for Q8 to the following
  - 1 = 7
    - $\begin{array}{c} \circ & 2=6\\ \circ & 3=5 \end{array}$
  - 3=5 • 4=4
  - 4=4 • 5=3
  - 5 = 30 = 2
  - **7**=1
- We need to add the ratings for those statements and divide 4. For instance
  - Q6 = 2 [C]
  - Q7 = 3 [C]
  - Q8 = statement 5 [B] AND 4[E]
    - 2 + 3 + 3 + 4 = 12 / 4 = 3 [THIS IS A "GROUP "B" CONCERNED/SKEPTICAL"]

### Appendix B – Dialogue Sessions Materials

### **Mini-Dialogue Sessions**

#### Final Process Outline (September 18)

- 20 participants
- 5 tables of 4 participants, including 1 youth table (assigned seating)
- Flip chart, large TV or screen to project 2 videos
- Approach to table work:
  - ✓ 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

#### 1. Introduction (15 minutes)

- Working together
- Housekeeping
- Two parts to discussion: 1) initial top-of-mind views, and 2) considered views based on information
- <u>Quick</u> introduction of participants (first name and where in GTA you are from)

## 2. Initial Top-of-Mind Views (Used Nuclear Fuel in the Context of Environmental Concerns) (35 minutes)

What are the top 5 challenges facing Canada and why? (Discuss and make list) What are the biggest environmental challenges and why? (Discuss and make list)

• SHARE IN PLENARY: (Probe: To what extent to people believe they have a responsibility to younger and future generations when it comes to dealing with environmental challenges? How much, if at all, does it factor into their thinking?)

Ontario gets about 50% of its electricity from nuclear power. Do you see any environmental benefits when it comes to nuclear power? What about challenges? (Discuss and make list)

- SHARE IN PLENARY (Plenary discussion + probing limited to asking about whether used nuclear fuel came to mind).
- Additional probe in plenary: How do you think used nuclear fuel is deal with? What is done with it in the short term and in the long-term?

#### 3. Who is NWMO and Stage Setting? (5 minutes)

- Description of NWMO and values (e.g., possibly using LS's video)
- Objective for the rest of the session: "To seek your input on questions and considerations for planning the transportation of Canada's used nuclear fuel."

#### 4. Canada's Plan for Used Nuclear Fuel and Transportation Planning (20 minutes)

Facilitator provides brief description, shows APM video and describes where the site selection process is at.

PLENARY: Initial thoughts + what stood out?

Facilitator provides a brief overview of Transportation Planning (and Regulation and Package Certification, including Package Design Video)

• PLENARY: Initial thoughts + what stood out?



#### 5. Unaided Feedback on the Development of the Transportation Plan (40 minutes)

Tables are asked to personally reflect on and then discuss in roundtable the following points:

What do you see as some of the challenges and opportunities (e.g., advantages) involved in planning for the transportation of used nuclear fuel? Points you might consider include:

- ✓ The very long-term nature of the project (i.e., transportation won't start until about 2043).
- The fact that the project will span many generations of Canadians from planning to completion.
   The use of technology/science.
- ✓ The fact that routes will go by and through many different communities across three provinces.
- SHARE IN PLENARY: List and Discuss Challenges + List and Discuss Opportunities

Tables are asked to personally reflect on and then discuss in roundtable the key points that should be addressed by/included in the Transportation Plan.

• SHARE IN PLENARY: Key issues to address and rationale

### 6. Feedback on (REVISED) Guiding Principles and Objectives for the Development of the Transportation Plan (35 minutes)

We have been doing this type of work with people for a few years from now. In front of you, you have a list of ideas that have come out of those discussions. Things that people think should drive the transportation planning process and things that they think the transportation plan should try to achieve. At your tables, take a look at what has been provided by other citizens, like yourself and reflect on a) how close they are to your own thinking; b) whether you think they are clear/appropriate; c) suggestions you may have, d) anything missing?

Table work: personal and group worksheet, with focus on appropriateness/resonance, clarity, comprehensiveness (i.e., anything missing), suggestions for improvement.

• SHARE IN PLENARY (e.g., point of convergence and divergence)

### 7. Final Thoughts (30 minutes)

Table work: personal and group worksheet: Is NWMO on the right track? What advice do you have as NWMO moves forward with transportation planning? Can you think of anything that the transportation plan needs to address but hasn't been mentioned yet? What are your two biggest questions about transportation planning?

• SHARE IN PLENARY (e.g., point of convergence and divergence)

#### 8. Close and Thanks

**Public Dialogue Session Slide Deck** 



September 24-26, 2019 GTA



### Questions

- How much of Ontario's electricity do you think comes from nuclear power?
- Ontario gets about 50% of its electricity from nuclear power.
- Do you see any environmental benefits when it comes to nuclear power? What about challenges? (Discuss and make list)

### 3

### Questions

- How much of Ontario's electricity do you think comes from nuclear power?
- Ontario gets about 50% of its electricity from nuclear power.
- Do you see any environmental benefits when it comes to nuclear power? What about challenges? (Discuss and make list)



### NWMO

- 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.

# Canada's Plan for Used Nuclear Fuel

### 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.

### Nuclear fuel cycle in Canada



Toronto, Ontario

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### **CANDU Reactor**

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





### 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



### **Adaptive Phased Management**





### 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





### Ideas for Principles and Objectives to Guide Transportation Planning

Safety should be the overarching principle guiding all Adaptive Phased Management (APM) planning and activities (including transportation). Additional principles that will guide transportation planning include:

- Meet or exceed regulatory requirements for the protection of health, safety and the security of humans and the environment: The plan must meet, and if possible, exceed all 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.
- **Transparency is the key to building trust:** Information used to make decisions about transportation planning must be readily available to the public.
- **Balancing adaptation and continuity:** The transportation plan should be flexible enough to continuously incorporate the latest and best science and technology, while also maintaining continuity throughout changes in government.
- **Respect for Indigenous rights, treaties and land claims:** The plan must respect the constitutional rights of Indigenous peoples, reflect treaties, and consider that there may be unresolved claims between Indigenous peoples and the Government of Canada.
- **Evidence-informed decision-making:** The plan must be informed by the best relevant available knowledge, including science, social science, local knowledge, Indigenous Knowledge, and ethics. This includes identifying who needs to be part of decision-making and involving them throughout the process.
- **Responsible project management:** The plan must be managed in a fiscally responsible way so that the cost of the project does not become a burden to current ratepayers or future generations.

As part of our planning process, NWMO will need to ensure that its decisions support achievement of a set of core objectives, which have also been the basis of dialogue with Canadians. These objectives are:

- Safety: Protect public and workers from and minimize hazards associated with managing used nuclear fuel
- Security: Ensure the security of facilities, materials and infrastructure
- *Environment:* Ensure that the environment is protected over the long term
- **Project Finances:** Ensure economic viability of the project, without compromising safety, security and the environment

### **Appendix C – Focus Group Materials**

### NWMO Public Attitude Research and Dialogue FINAL Focus Group Guide (September 25, 2019)

#### 1. 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. Initial Top-of-Mind Views (Used Nuclear Fuel in the Context of Environmental Concerns) (25 minutes)

- 1. To start, please make a list of the top 5 challenges facing Canada.
  - Moderator goes around table to hear lists and then probes rationale for choices.
- 2. Now, what would you say are biggest environmental challenges facing Canada?
  - Moderator goes around table to hear lists and then probes rationale for choices.

[Moderator shows Grid Watch App] and explains that Ontario gets about 50% of its electricity from nuclear power, and probes for reaction.

- 3. Do you see any environmental benefits when it comes to nuclear power? What about challenges?
  - [If waste/used fuel is raised, probe:] How do you think used nuclear fuel is deal with? What is done with it in the short term and in the long-term?

### 3. Introducing NWMO and Canada's Plan for Used Nuclear Fuel and Transportation Planning (20 minutes)

Facilitator provides brief description of NWMO, shows APM video and describes where the site selection process is at.

• Probe: What are your initial thoughts/what stood out?

Facilitator provides a brief overview of Transportation Planning (and Regulation and Package Certification, including Package Design Video)

• Probe: What are your initial thoughts/what stood out?



#### 4. Unaided Feedback on the Development of the Transportation Plan (25 minutes)

4. What do you see as some of the challenges and opportunities (e.g., advantages) involved in planning for the transportation of used nuclear fuel? What are some aspects of this project that make planning for transportation easier? What are some aspects of this that make planning for transportation easier?

Points we might consider include:

- The very long-term nature of the project (i.e., transportation won't start until about 2043).
- The fact that the project will span many generations of Canadians from planning to completion.
- The use of technology/science.
- The fact that routes will go by and through many different communities across three provinces.
- 5. Now, please take a few minutes to develop a list of key points that you believe should be addressed in NWMO's transportation plan. What does NWMO need to make sure of as it plans?
  - Moderator goes around table to hear lists and then probes rationale for choices.

### 6. Feedback on (REVISED) Guiding Principles and Objectives for the Development of the Transportation Plan (30 minutes)

We have been doing this type of work with people for a few years from now. In front of you, you have a list of ideas that have come out of those discussions. Things that people think should drive the transportation planning process and things that they think the transportation plan should try to achieve. Take a look at what has been provided by other citizens, like yourself and reflect on a) how close they are to your own thinking; b) whether you think they are clear/appropriate; c) suggestions you may have, d) anything missing?

- 6. [Participants use a handout to provide feedback.] Moderator probes for:
  - Overall reaction.
  - Missing aspects.
  - At level of individual principles/objectives: appropriateness/resonance, clarity, comprehensiveness, suggestions for improvement.

#### 7. Final Thoughts: Right/Wrong Track, Advice, Outstanding Questions (15 minutes)

- 7. Based on what you have seen and heard this evening, would you say that NWMO is on the right or wrong track? Why do you say that?
- 8. What advice do you have as NWMO moves forward with transportation planning?
- 9. Can you think of anything that the transportation plan needs to address but hasn't been mentioned yet? What are your two biggest questions about transportation planning?

#### Thank you very much for your participation!

**Focus Group Deck** 



October 2019 Ontario

### Did you know?

# Ontario gets about 50% of its electricity from nuclear power.

		16,973 MW	16,207 MW		581 tonnes	34 LOW	g/kWh	
ENE	RATION	- FUEL TYPE		GENERATI	ION - PLANT			
ċ	nuclear	62.7%	10,637 MW	>				
	hydro	23.3%	3,951 MW	>	62.7% (of total grid)			
1	gas	7.7%	1.307 MW	> POWER PL/	INT	output	capability	
8	wind			> TOTAL		10,637	10,647	
		4.4%	752 MW	BRUCE A-1		777	779	
	solar	1.6%	268 MW	BRUCE A-2		782	779	
•	biofuel	I 0.3%	58 MW	> BRUCE A-3		778	784	
1		import	1,044 MW	BRUCE A4		762	765	
	>	net	766 MW	BRUCE B.S.		0	0	

### NWMO

- Formed in 2002 as required by Nuclear Fuel Waste Act
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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.



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One fuel bundle . . .

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

### Nuclear fuel cycle in Canada



### **CANDU Reactor**

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





### 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





# **Adaptive Phased Management**









### **Overview**

- Within the next 25 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.



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

### Certifying package designs



### Learn more! www.nwmo.ca

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MAY 2015	Transportation of Canada's Used Nuclear Fuel Questions and Answers	Planning Transportation for Adaptive Phased Management	Working together to planning framework
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### **Appendix D – First Responder Workshop Materials**

#### First Responders Workshop

#### Final Process Outline (November 21, 2019)

- 10 participants
- 4 tables of 2-3 participants
  - Flip chart, large TV or screen to project 2 videos
- Approach to table work:
  - ✓ Step 1: Choose a reporter or alternate between yourselves
  - ✓ Step 2: Personal reflection individual worksheet
  - Step 3: Table discussion: capture main points on table summary sheet
  - Step 4: Report to the workshop

NB. Includes 20 minutes for health breaks and to serve lunch.

#### 1. Introduction (15 minutes)

- Thanks for coming today and I would like to thanks to [XXX] for helping us bring you together. Today, we are going to
  have an informal conversation about NWMO's approach to transportation and transportation planning. The goal is to
  understand your perspectives as emergency/first responders.
- Your input will be used to develop a draft Transportation Planning Framework and to inform NWMO's approach to working with first responders and communities.
- Your views are confidential (notetaking for research purposes).
- Two parts to discussion: 1) initial top-of-mind views, and 2) considered views based on information
- <u>Quick</u> introduction of participants (first name, type of first responder, years of service, location)

#### 2. Ontario's Power Supply and Top of Mind View (15 minutes)

• [Icebreaker] How much of Ontario's electricity do you think comes from nuclear power?

Ontario gets about 50% of its electricity from nuclear power. Do you see any environmental benefits when it comes to nuclear power? What about challenges? (Discuss and make list)

- SHARE IN PLENARY (Plenary discussion + probing limited to asking about whether used nuclear fuel came to mind).
- Additional probe in plenary: How do you think used nuclear fuel is dealt with? What is done with it in the short term and in the long-term?

#### 3. Canada's Plan for Used Nuclear Fuel and Transportation Planning (25 minutes)

Facilitator provides brief description of NWMO, shows APM video and describes where the site selection process is at.

• PLENARY: Initial thoughts + what stood out?

Facilitator provides a brief overview of Transportation Planning (and Regulation and Package Certification, including Package Design Video)

PLENARY: Initial thoughts + what stood out?

#### 4. Unaided Feedback on the Development of the Transportation Plan (35 minutes)

Tables are asked to personally reflect on and then discuss among themselves the following points:

What do you see as some of the challenges and opportunities (e.g., advantages) involved in planning for the transportation of used nuclear fuel? Points you might consider include:

- ✓ The very long-term nature of the project (i.e., transportation won't start until about 2043).
- ✓ The fact that the project will span many generations of Canadians from planning to completion.



- ✓ The use of technology/science.
- ✓ The fact that routes will go by and through many different communities across three provinces.
- SHARE IN PLENARY: List and Discuss Challenges + List and Discuss Opportunities

Tables are asked to personally reflect on and then discuss in roundtable the key points that should be addressed by/included in the Transportation Plan.

• SHARE IN PLENARY: Key issues to address and rationale

#### 5. Transportation Experience (30 minutes)

Now we're going to talk a little more specifically about your experience as emergency/first responders. Have you ever heard the term "transportation of dangerous goods"? (I came across it in the early 90s doing work for Transport Canada.)

Take a couple of minutes and write down any specific experiences that you have had (or know of) related to accidents involving dangerous goods.

• SHARE IN PLENARY: specific experiences

#### Probes:

- Do you get training for that type of experience? If so, what kind of training?
- Is there training specifically for radioactive materials?
- Are there other teams (e.g, hazmat teams) that get called in to deal with dangerous goods accidents? If so, what are their responsibilities compared to yours?
- Do you know of any resources available to you when responding to an accident?

Thinking about the information that has been provided today and your roles as emergency/first responders, what else would you like to know about the transportation of used nuclear fuel? What would make you feel comfortable/most prepared?

### 6. Feedback on (REVISED) Guiding Principles and Objectives for the Development of the Transportation Plan (30 minutes)

We have been doing this type of work with people for a few years from now. In front of you, you have a list of ideas that have come out of those discussions. Things that people think should drive the transportation planning process and things that they think the transportation plan should try to achieve. At your tables, take a look at what has been provided by members of the public and reflect on a) how close they are to your own thinking; b) whether you think they are clear/appropriate; c) suggestions you may have, d) anything missing?

Table work: personal and group worksheet, with focus on appropriateness/resonance, clarity, comprehensiveness (i.e., anything missing), suggestions for improvement.

• SHARE IN PLENARY (e.g., point of convergence and divergence)

#### 7. Final Thoughts (20 minutes)

Table work: personal and group worksheet: Is NWMO on the right track?

What advice do you have as NWMO moves forward with transportation planning? Can you think of anything that the transportation plan needs to address but hasn't been mentioned yet?

What are your two biggest questions about transportation planning?

SHARE IN PLENARY (e.g., point of convergence and divergence)

#### 8. Close and Thanks





November 28, 2019 Gravenhurst Ontario





# How we'll work together



Presentations + videos



Personal reflection, table brainstorming and reporting



Plenary discussion



# Table Work ...

- 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



# There are no bad ideas.



### Question

• How much of Ontario's electricity do you think comes from nuclear power?

### >> nwmo

### Did you know?

Ontario gets about 55% of its electricity from nuclear power.





# What do you think?

Do you see environmental **benefits** when it comes to nuclear power?

What about **challenges** or drawbacks?

- Personal reflection
- Roundtable discussion



### Question

• How do you think used nuclear fuel is dealt with? What is done with it in the short term and in the long-term?







### 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.

>>> nwmo

# Canada's Plan for Used Nuclear Fuel

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- Contains about 20 kg uranium

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

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### Nuclear fuel cycle in Canada







# Wet storage

 Used nuclear fuel initially very hot and highly radioactive

nwmo

- 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





**CANDU** Reactor

• About 5,000 fuel

bundles per reactor





# **Adaptive Phase Management**





# 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



# **Plenary discussion**



Initial thoughts... What stands out for you?



Do you have any questions or concerns?







### **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.



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



# **Certifying package designs**



### **Plenary discussion**



Initial thoughts...General reactions to the video



What else would you like to know?



# Developing the plan: recent transportation events

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



# Challenges and Opportunities Related to Transportation Planning

What do you see as some of the **challenges** and **opportunities** involved in planning for the transportation of used nuclear fuel?

- What things might make it more difficult to plan well?
- ♦ What things might make it easier to plan well?

# **Some Points to Consider**

The very long-term nature of the project.

- The fact that the project will span many generations of Canadians from planning to completion.
- The use of technology.
- The fact that routes will go by and through many different communities across three provinces.



# Key Points to Address in a Transportation Plan

Roundtable discussion





### The Transportation of Dangerous Goods

Take a couple of minutes and write down any specific experiences that you have had (or know of) related to accidents involving dangerous goods.

Personal reflectionRoundtable discussion



# The Transportation of Dangerous Goods

- Do you get training for that type of experience? If so, what kind of training?
- Is there training specifically for radioactive materials?
- Are there other teams (e.g., hazmat teams) that get called in to deal with dangerous goods accidents? If so, what are their responsibilities compared to yours?
- Do you know of any resources available to you when responding to an accident?



### Ideas for Principles and Objectives to Guide Transportation Planning

In front of you, you have a list of ideas that have come out of discussions with the public; things that people think should drive the transportation planning process and things that they think the transportation plan should try to achieve.

Have a look at what has been provided by other citizens, like yourself and reflect on a) how close they are to your own thinking; b) whether you think they are clear/appropriate; c) suggestions you may have (e.g., anything missing).





# Please reflect on and discuss the following:

- 1. From what you have seen, is NWMO's transportation planning on the right track?
- 2. What advice to you have for NWMO as it moves forward with transportation planning?
- 3. Do you have any questions about transportation planning that remain unanswered (and that need to be addressed in the planning)?
  - Personal reflection
  - Roundtable discussion







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