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Mobilizing the Recommendations in *Thermally Comfortable Playgrounds*

Engagement Summary Report

Prepared by

KENNEDY CONSULTING

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Standards Council of Canada

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Canada

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We gratefully recognize the time and expertise shared members of the core advisory team to shape the engagement process:

- Marla Desat (Standards Council of Canada)
- Dr. Eric Kennedy (Bucknell University)
- Dr. Heather Olsen (National Program for Playground Safety)
- Gregory Richardson (National Research Council Canada)
- Alexandra Rutledge (Health Canada)
- Dr. Jennifer Vanos (Arizona State University)

Comments

Questions and comments about this report may be directed to infrastructure-environment@scc.ca

Français

Ce document est également disponible en français.

EXECUTIVE SUMMARY

What?	This report summarizes the results of an engagement process to discuss ideas to mobilize the recommendations found in a recently published report by the Standards Council of Canada (SCC), in collaboration with the National Program for Playground Safety (NPPS), called *Thermally Comfortable Playgrounds*. (Note: the recommendations are summarized in Appendix B). Thermal comfort means the perceived and actual temperatures of a play area and equipment. Improving thermal comfort can mean adding shade (natural or constructed), changing materials, and many other design choices that increase time spent playing and reduce the risk of heat stroke, sunburn, skin cancer, and acute burns. (Section 1)
Why?	Advancing the recommendations in *Thermally Comfortable Playgrounds* could have many benefits (described in Section 1), including: • Reducing vulnerability to heat-related injuries for children • Increasing thermal safety and comfort for users of all ages • Contributing to reducing childhood obesity rates by allowing children to play outside during all seasons, and be active for longer
When?	The engagement was completed between January and March 2021.
Who?	The engagement process brought together sixteen experts from Canada and the United States (as listed in Appendix A and described in Section 2).
How?	The engagement process involved a webinar, online surveys, focus groups and ongoing communication. (Section 2)
Where?	Due to travel restrictions imposed by COVID-19, all of the engagement was conducted virtually.
What We Heard	Participants generously shared their visions for the future of playgrounds in a changing climate, their perspectives on target audiences, and their sense of possible tools and guidance that could be funded to propel the recommendations in *Thermally Comfortable Playgrounds* (as summarized in Section 3). The three recommendations presented in Section 4 - • Targeted outreach for standards users • Raising awareness with top stakeholders; and • Developing a conformity assessment activity - represent ideas for tangible future action to address extreme heat in recreational spaces, especially ways for SCC to expand the impact and uptake of *Thermally Comfortable Playgrounds*. The myriad of other ideas in Appendix C may be of interest to researchers and policymakers interested in urban planning, childcare, climate change and/or adaptation.

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1. CONTEXT

1.1 Mobilizing Recommendations

This report summarizes the results of an engagement process that brought together experts from Canada and the United States (as listed in Appendix A and described in Section 2) to discuss the integration of thermal comfort considerations into playground design and operation, under a changing climate.

The recommendations presented in Section 4 represent ideas for future work (or research) to address extreme heat in recreational spaces, especially ways for the Standards Council of Canada (SCC) to expand the impact and uptake of a recently published report *Thermally Comfortable Playgrounds*.

The SCC conducted this engagement process with the intent of identifying areas of future research and/or work – by practitioners in many related sectors - to address extreme heat and thermal comfort in recreational spaces. As is best practice for SCC, the findings of the process are being published publicly, in full, with the hope that the information collected from subject matter experts across a variety of sectors will prove useful to others exploring the intersection of thermal comfort, climate change adaptation, playgrounds, parks, and/or public areas.

Based on the suggestions and ideas that emerged through this process, SCC has prioritized actions that it can take to advance the findings in *Thermally Comfortable Playgrounds*; these are included in Section 4 of this report.

About *Thermally Comfortable Playgrounds*

The *Thermally Comfortable Playgrounds* report, published in July 2020, collects the latest research and practical knowledge into one document. It draws upon a literature review and a survey of experts while summarizing design practices and site features that create safe and comfortable playgrounds for all seasons of play. The report considers factors such as natural and artificial shade features, material and colour selection for equipment and surfaces, and playground equipment placement before presenting a set of evidence-based recommendations that can be included in equipment and design standards.

Development of the report was facilitated by research conducted by the National Program for Playground Safety, whose work was supported by the Standards Council of Canada's Standards to Support Resilience in Infrastructure Program, and with guidance from the Climate Change and Innovation Bureau at Health Canada.

A snapshot of the recommendations is included in Appendix B.

1.2 About Thermal Comfort

What does "thermal comfort" mean?

The report describes thermal comfort as "the condition of mind that expresses satisfaction with the thermal environment. It is dependent upon the environmental factors of sun exposure, air movement, humidity, and air temperature, as well as behavioural factors of clothing and physical activity. Thermal comfort is also affected by psychological factors of experiences, expectations, and length of exposures, among others."

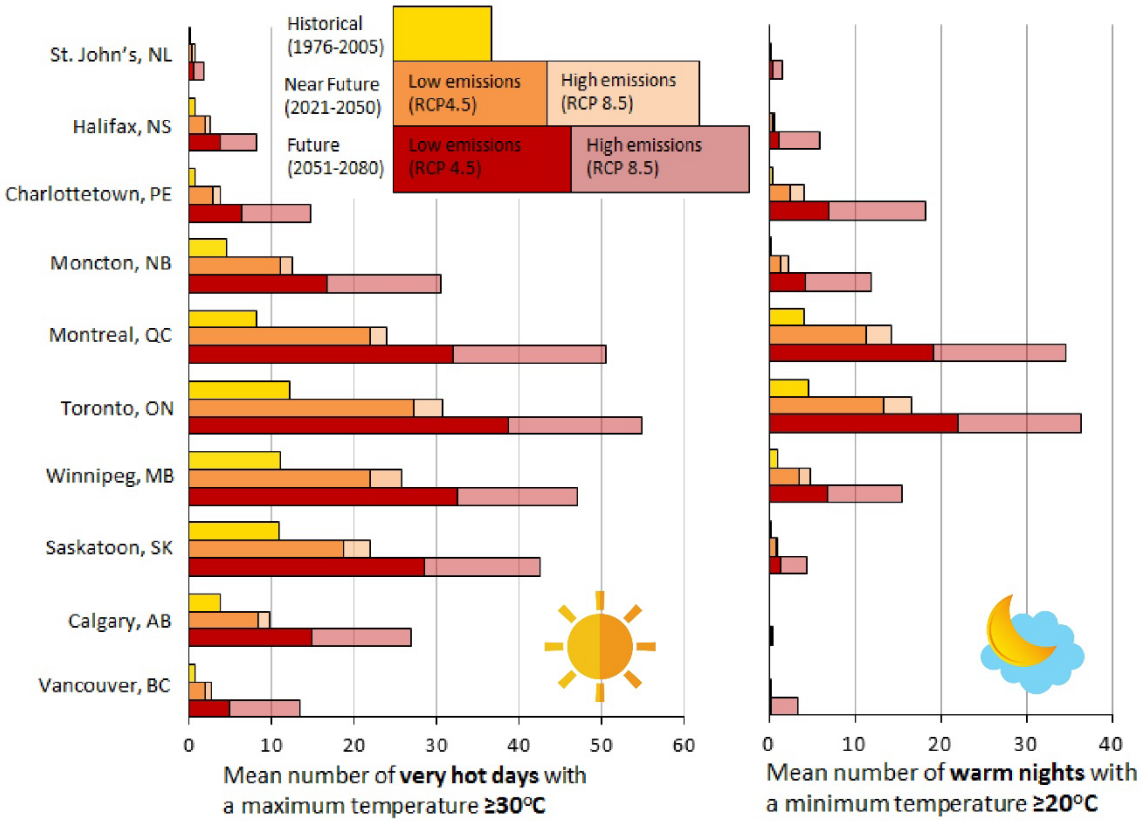
The report focused on children, primarily, because "children are particularly vulnerable to hot ambient environments and heat stress compared to adults due to various age-related factors." The intent of the research and recommendations is to make playground spaces comfortable and welcoming for all ages, during all seasons. This sentiment was echoed in the engagement process - there was a call for safe, inclusive outdoor spaces for all Canadians regardless of age.

Benefits of Focusing on Thermal Comfort

Thermal comfort in playgrounds means the perceived and actual temperatures of the play area and the equipment. Improving thermal comfort can mean adding shade (natural or constructed), changing materials, and many other design choices that increase time spent playing and reduce the risk of heat stroke, sunburn, skin cancer, and acute burns. Advancing the recommendations in *Thermally Comfortable Playgrounds* could have many benefits, including:

- Reducing vulnerability to heat-related injuries for children (sunburns and burn injuries, for instance).
- Increasing thermal safety and comfort for users of all ages.
- Contributing to reducing childhood obesity rates by allowing children to play outside during all seasons, and be active for longer periods of time.
- Increasing children's activity and creativity by providing opportunities for unstructured play.
- Providing opportunities for children of various ages and abilities to play and improve their cognitive function by installing natural playgrounds.
- Preparing for the effects of climate change, including a projected doubling in the number of hot days and nights in many parts of Canada by about 2040 (Figure 1).

Figure 1. Climate modelling indicating that Canadian communities will get much hotter in the coming decades [1]



1.3 Role of the Standards Council of Canada

About the Standards Council of Canada

Established in 1970 as a federal Crown corporation, the Standards Council of Canada (SCC) is Canada's voice on standards and accreditation on the national and international stage. SCC works closely with a vast network of partners to promote the development of effective and efficient standards that protect the health, safety and well-being of Canadians while helping businesses prosper.

[1] Chart produced by Maria Malik, Health Canada, based on data from the Climate Atlas (https://climateatlas.ca). Reproduced with permission from the authors of Health Canada (2020) *Reducing urban heat islands to protect health in Canada: An introduction for public health professionals*. Ottawa, ON. https://www.canada.ca/en/services/health/publications/healthy-living/reducing-urban-heat-islands-protect-health-canada.html

The mandate of the SCC, as described in the Standards Council of Canada Act, is to promote efficient and effective voluntary standardization in Canada, and, in particular, to:

- promote the participation of Canadians in voluntary standards activities;
- promote public-private sector cooperation in relation to voluntary standardization in Canada;
- coordinate and oversee the efforts of the persons and organizations involved in the national standardization network;
- foster quality, performance and technological innovation in Canadian goods and services through standards-related activities, and
- develop standards-related strategies and long-term objectives,

SCC and Thermal Comfort

SCC is involved in advancing thermal comfort because SCC plays a strategic role to help connect government priorities like climate change with the standardization system. Canada's climate is changing, and impacts like floods, wildfires, coastal erosion, permafrost thaw, heat waves and other weather-related events are already having significant impacts on our society and the economy. Many of today's buildings and much of Canada's infrastructure are designed, built, and operated according to standards that were written based on historical climate date. As the climate changes, standards need to be revised, and new standards need to be developed, to respond to these changing hazards and impacts.

To address this gap, since 2016, the SCC's Standards to Support Resilience in Infrastructure Program has led the development of standards and related guidance to help communities, businesses, builders, and infrastructure operators adapt to a changing climate. This Program is part of a suite of federal activities on climate change adaptation. From flood risk assessment frameworks to standards for fire-resilient planning, SCC has worked with a range of partners to deliver practical, made-in-Canada guidance to enable the design, construction and maintenance of buildings and infrastructure that can better withstand the climate conditions of the future.

Addressing thermal comfort in playgrounds is one way for SCC to directly address climate change adaptation challenges related to heat and community infrastructure. SCC's support for the development of the *Thermally Comfortable Playgrounds* report created a compilation of the latest scientific knowledge from the literature and experts in the field. The report included a ready-to-use annex of recommended design guidelines, which has been incorporated as an informative annex in the standard CAN/CSA-Z614-20 *Children's playground equipment and surfacing*. This standard is used across Canada by municipalities and provinces for the design of playgrounds.

This engagement process (as described in more detail in Section 2), served to bring SCC together with subject matter experts to generate additional ideas to mobilize the recommendations included in *Thermally Comfortable Playgrounds.*

2. ABOUT THE PROCESS

2.1 Process

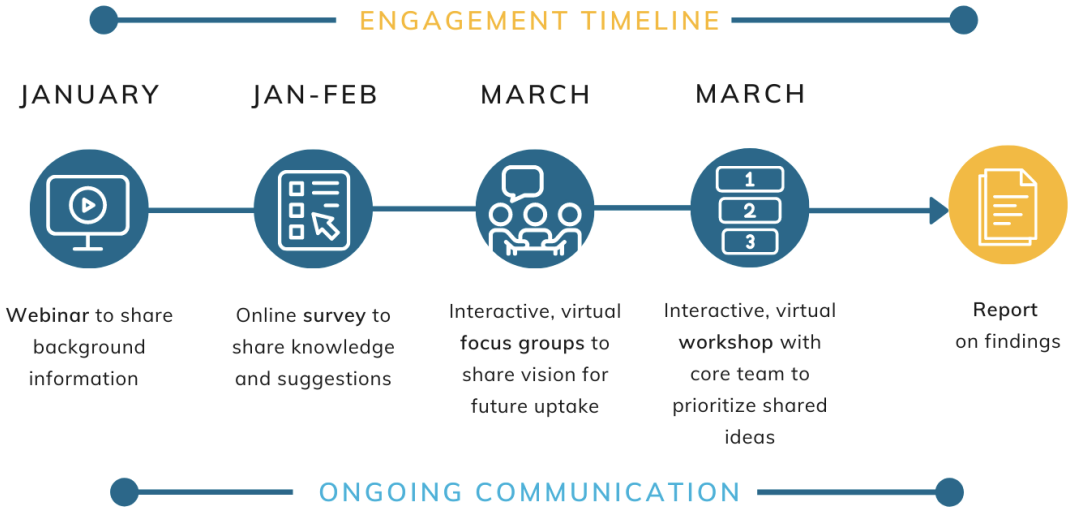
Sixteen subject matter experts were engaged in a multi-step, virtual process between January 26 and March 10, 2021; all participants were:

- Provided with written **background information**, an invitation to participate, and ongoing updates and reminders via email;
- Invited to participate in a one-hour **webinar** to provide an overview of the process and background information on *Thermally Comfortable Playgrounds* and SCC's role in climate change adaptation.
- Invited to share expert knowledge and suggestions, as well as their level of involvement with the report, via an online **survey;** and
- Invited to participate in one of two virtual, interactive **focus groups** to share their ideas for advancing the recommendations found in *Thermally Comfortable Playgrounds*.

Additionally, core team members (see below for list) were invited to participate in a final, virtual, priority setting **workshop** to identify actionable priorities for the SCC. The insights shared during the engagement process described above are included in this publicly available **report** in the interest of sharing other possible areas for the uptake of Thermally Comfortable Playgrounds, across sectors.

Figure 2. Summary of the engagement process and timeline

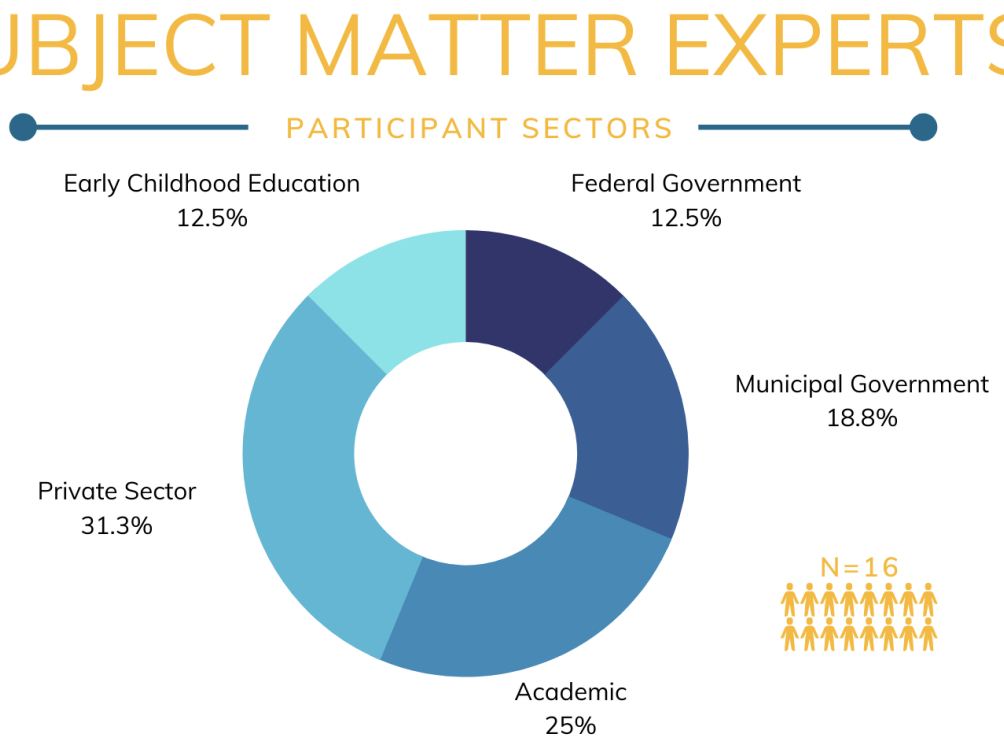
PROCESS SUMMARY



2.2 Participants

A range of **subject matter experts** from industries, sectors, and organizations associated with Canadian playgrounds were invited to participate in the process (Figure 3). A list of participants is included in Appendix A.

Figure 3. Summary of the sectors represented by the subject matter experts involved in this process



The process was hosted by the **Standards Council of Canada** (SCC) and led by Marla Desat, Sector Specialist, Standards Council of Canada.

In addition to the host and invited sector-based participants, there was an identified **core team** of *Thermally Comfortable Playgrounds* report authors. The core team had an integral role; they:

- Provided input to shape the engagement process;
- Presented background material during the webinar;
- Participated as active listeners during the focus group discussions; and
- Shared ideas during a final, priority setting workshop.

The core team members are:

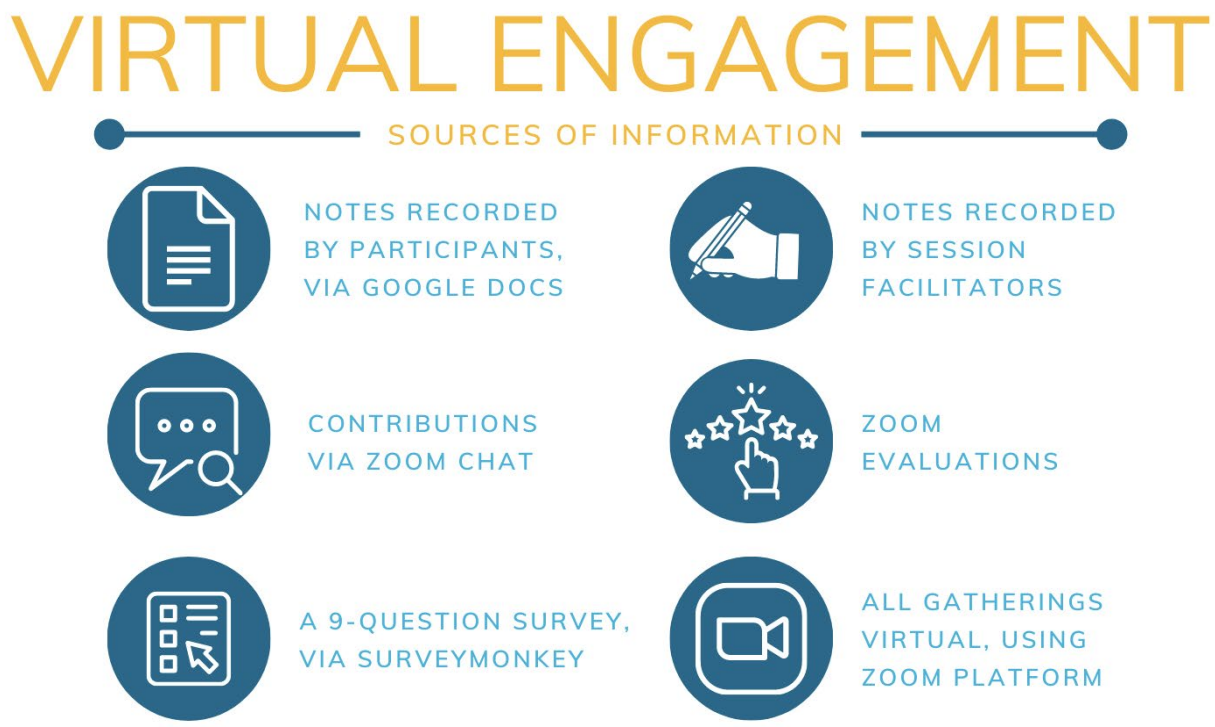
- Dr. Eric Kennedy (Bucknell University)
- Dr. Heather Olsen (National Program for Playground Safety)
- Gregory Richardson (National Research Council Canada)
- Alexandra Rutledge (Health Canada), and
- Dr. Jennifer Vanos (Arizona State University)

The process was planned, facilitated, and recorded by Kennedy Consulting.

2.3 Sources of Information

Given the physical restrictions imposed by the COVID-19 pandemic, all participant engagement for this process was entirely virtual. Operating within the Zoom platform and using SurveyMonkey and Google Docs as information gathering tools, the project team utilized multiple methods to gather information from participants (Figure 4).

Figure 4. Sources of information that fed into the summaries of "What We Heard" in Section 3



3. WHAT WE HEARD

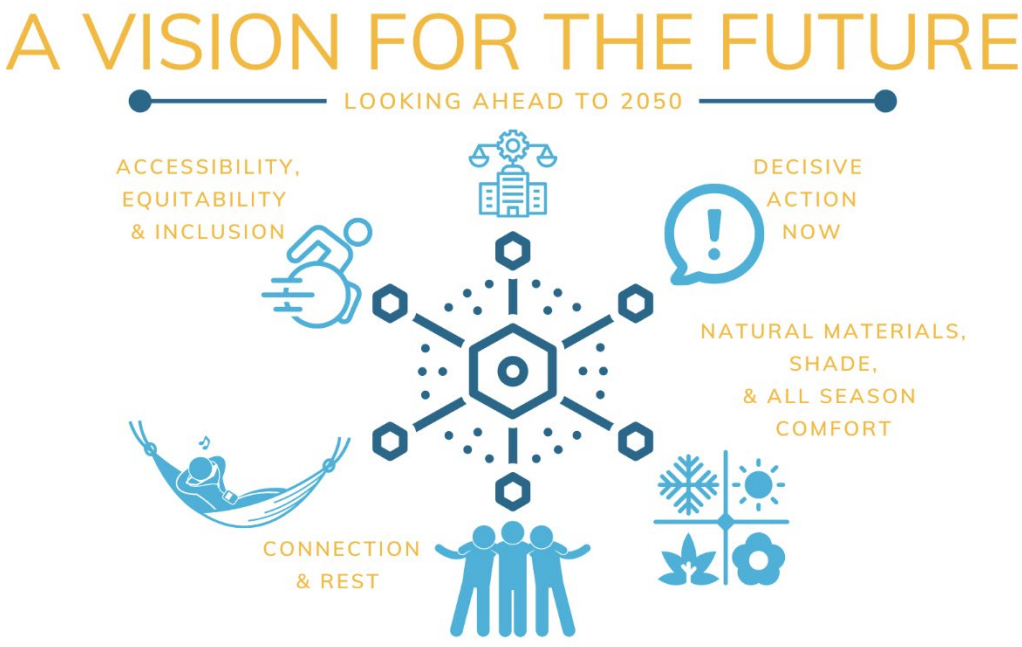
Information received during the engagement process has been summarized and presented in four sections: Vision (3.1); Audiences (3.2); Suggested Tools and Guidance (3.3); and Suggested Priorities (3.4). Notes from the focus groups, survey, and core team workshops are included in Appendix C under the same four themes.

3.1 Vision

Participants were asked about their vision of playgrounds and outdoor spaces in 2050, and what would be needed to get there (Appendix C.1). Some of the themes that emerged (Figure 5) included: parks as places for community (re)connection; the importance of accessibility, equity, and inclusion for people ranging in age and physical abilities; an insight that there may be a push, nationally, for more childcare, and that as a result, play may shift by 2050; the need to rest and play; comfort for all users despite increases in temperatures; the use of more natural/nature-mimicking materials, loose parts, green canopies, shading, and/or water features; the need for action today to create our desired future, and, as one participant said:

> "I would hope that in 2050 we have taken a more holistic approach to design where we are creating spaces that encourage people of all ages and abilities to come together. We do this by making our spaces meet the needs of the community while taking care to incorporate creature comforts which includes thermal considerations. When we focus on the creation of beautiful spaces people come together through play and community is created."

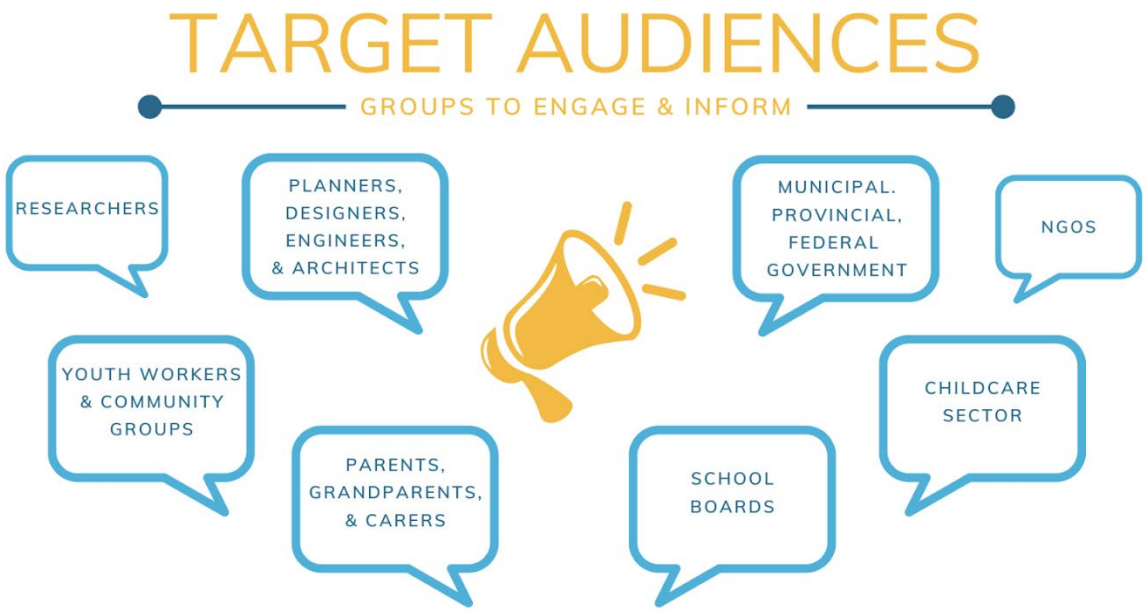
Figure 5. A high-level summary of the visions expressed by participants



3.2 Audiences

Participants were asked, “Who needs to be informed about this work to make sure it is applied?” and “Who are the various audiences who would benefit from further outreach about the report?” The responses were very wide-ranging and included a spectrum of audiences across the lifecycle of a playground - from municipal policy makers to people that procure playgrounds to designers to installers to users, monitors, researchers and beyond - as illustrated in Figure 6. One focus group participant noted that: “I believe that we need to provide the information to agencies that deal with community planning as the future design of communities is being impacted greatly by climate change.” A full list of recommended audiences is included in Appendix C.2.

Figure 6. Target audiences for the recommendations in Thermally Comfortable Playgrounds, as reported by participants



3.3 Suggested Tools and Guidance

Participants were asked "What other tools and guidance are needed to advance the report's recommendations?" The suggestions ranged from design standards, such as, "Some base level requirements that should be followed when designing outdoor spaces. I would love to see it added to something like a building code for outdoor spaces, but until such time as that can happen, there should be some sort of perceived level of requirement used in park design" to practical evaluation tools such as "A checklist or a form that walks people through the process of evaluating existing and potential playground parks for thermal comfort. Not everyone in smaller communities and organizations will have the resources to conduct such a detailed analysis" to a list of ideas for future research and suggestions for education and outreach. Another participant noted, "It's important to get "desktop ready" data, tools, and information to help plan and budget for thermal comfort and to make sure the considerations don't get removed from the plan when they may be low on budget (trees seem to always be the first to go!)"

One concept that was raised for a number of tools was customization (or varied levels or tiers) that could be created to adapt one tool to various audiences (with varying levels of technical understanding).

All of the suggested tools and guidance are listed in Appendix C.3 and are summarized in Figure 7, below.

Figure 7. Summary of suggested tools and guidance to advance the recommendations in Thermally Comfortable Playgrounds

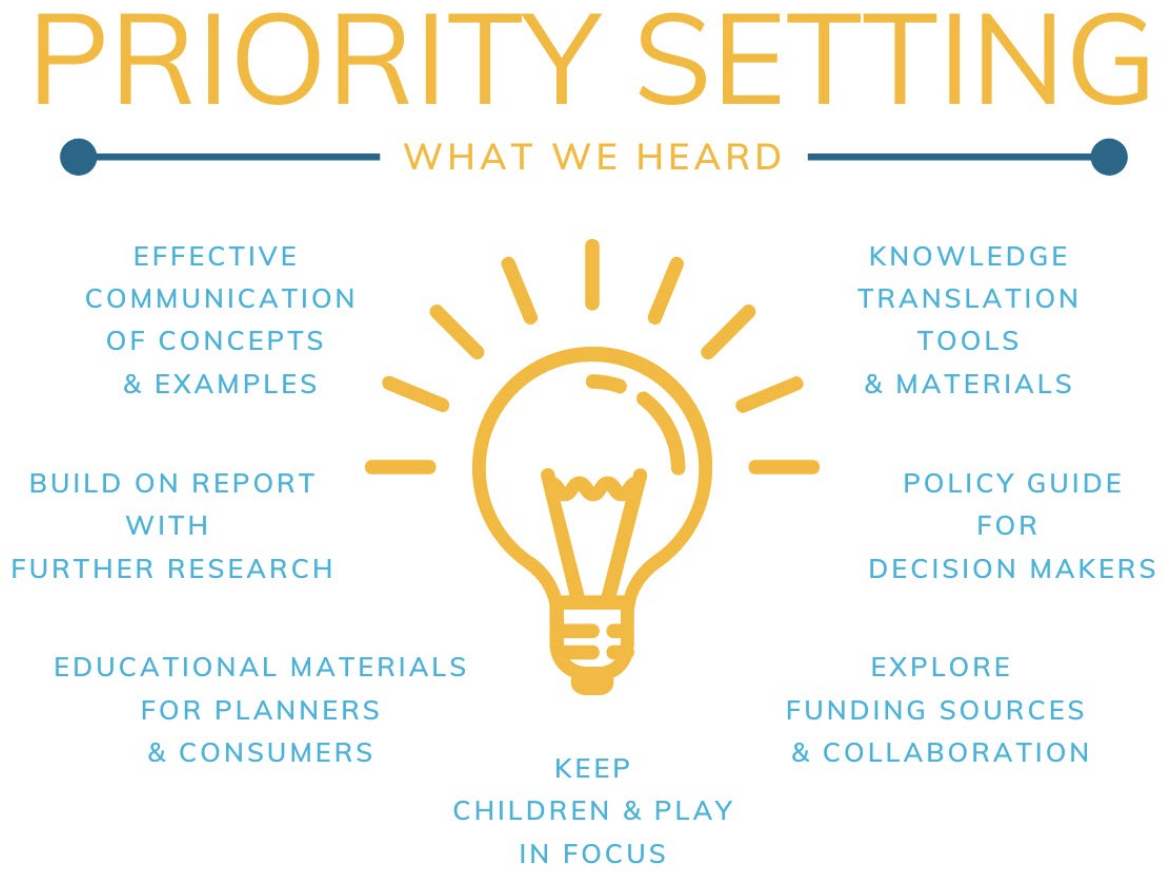
3.4 Suggested Priorities

Participants were asked to reflect on everything they had heard, and to share their sense of one top priority to mobilize thermally comfortable playgrounds. Participants' ideas fell into a few main categories:

- Delivering outreach and education, including an idea for "Educational materials to inform consumers/planners/designers about concerns and heat mitigation practices;"
- Influencing policy, for instance, "A policy guide to influence upstream municipal policy;"
- Providing technical guidance and skills;
- Conducting additional research; and
- Securing funding.

These ideas are illustrated in Figure 8 and all of the recorded priorities are listed in Appendix C.4.

Figure 8. Summary of priority actions to advance the recommendations in Thermally Comfortable Playgrounds



4. PRIORITIES FOR SCC

The Standards Council of Canada is actively working to integrate meaningful climate change adaptation into standardization. While the *Standards to Support Resilience in Infrastructure Program* ends on March 31, 2021, there is more work to do. Feedback from stakeholders on the work we have completed to date will shape our future activities on climate change. Working towards a vision of thermally comfortable playgrounds across Canada in 2050 is part of SCC's vision for our next suite of activity, and will include the continuation and expansion of collaboration with partner organizations.

SCC has reviewed the input from subject matter experts via this engagement process, and with a lens on its own mandate, has included some forward-looking ideas for a vision, focus areas for target audiences, and three top priorities for action. SCC is hopeful that the information contained in this report will also help other organizations and institutions to identify their own priorities for action to mobilize the recommendations in *Thermally Comfortable Playgrounds.*

4.1 Vision

Within its mandate, the Standards Council of Canada can contribute to achieving thermally comfortable playgrounds through projects that support the development and use of standards and related guidance for the development, planning, construction, and maintenance of recreational and community infrastructure, like playgrounds and parks, so that consideration is given to thermal comfort and the effects of heat waves and other climate change impacts.

4.2 Target Audiences

Given the breadth and depth of the topic, and range of subject matter experts that were present, many possible audiences for coordinated work on thermally comfortable playgrounds emerged (Section 3.2). For the Standards Council of Canada, it will be important to focus on audiences that can: (1) work alongside it to fulfill its mandate; and/or (2) be most responsive to the messaging about the importance of thermally comfortable playgrounds. For the SCC, this means a targeted focus on tools and guidance to reach:

- People who design playgrounds (including landscape architects, municipal planners, designers, and private firms)
- People who use playgrounds (caregivers, childcare workers, and members of the public)
- People who pay for playgrounds (including childcare centre owners, school boards, parent councils, municipalities, and others) (Figure 9)

Figure 9. Target audiences for SCC

4.3 Priority Tools and Guidance

During the engagement process, subject matter experts shared their sense of the tools and guidance necessary to mobilize the recommendations included in *Thermally Comfortable Playgrounds* (summarized in Appendix B). SCC has reviewed the input, and with a lens on its own mandate, has included three recommendations for its future work on this topic:

- Targeted outreach for standards users
- Raising awareness with top stakeholders
- Developing a conformity assessment activity

All three of these concepts align, directly, with SCC's mandate (as described in Section 1) and contribute to creating climate-resilient infrastructure. These actions can also create co-benefits that are often not identified, quantified, or monetised, including:

- Promoting an active and healthy lifestyle
- Creating common spaces for outdoor recreation and community building
- Contributing to inter-agency collaboration
- Reducing inequality through access for all

A descriptive roadmap for these ideas is included in Table 1.

Table 1. A roadmap for SCC to mobilize thermally comfortable playgrounds

SCC PRIORITY	DESCRIPTION	AUDIENCE	TIMING
Targeted outreach for standards users	Training and education resources could be developed to further encourage and support the use of the *Thermally Comfortable Playgrounds* report, and the elements of the report incorporated as an informative annex in the standard CAN/CSA-Z614-20 *Children's playground equipment and surfacing*.	Playground design professionals who are already using the CAN/CSA Z614-20 standard	Medium term
Raising awareness with top stakeholders	Targeted outreach to raise awareness among key stakeholder groups will increase the potential impact of the *Thermally Comfortable Playgrounds* report by reaching stakeholders who can ensure its recommendations are implemented.	Landscape architects, policy and decision makers, and operators of Heat Alert and Response Systems	Short term
Developing a conformity assessment activity	Conformity assessment is the act of measuring how closely a standard is being applied in practice. A spectrum of possible activities, from toolkits, checklists, inspections, playground ratings, and professional certifications could be considered. A pilot, case study, or further engagement is recommended to determine the most appropriate activity.	Municipalities, school boards, inspection bodies	Long term

APPENDICES

Appendix A: List of Participants

	NAME	ROLE	ORGANIZATION	SECTOR	SURVEY	FOCUS GROUP
1	Andrew Henderson	Owner, Henderson Play; Member of CSA Z614 technical committee	Henderson Play	Private: Commercial Playground Sales	✓	
2	Scott Belair	Owner and Founder, Reliable Reporting; Member of CSA Z614 technical committee	Reliable Reporting	Private: Building and Playground Inspection	✓	
3	Daniel Rainham	Associate Professor, Health Promotion and Sustainable Health Systems	Dalhousie University	Academic	✓	
4	Shelley Wagner-Trombley	Sales Representative, ABC Recreation; Member of CSA Z614 technical committee	ABC Recreation	Private: Sales & Inspection		1
5	Peter Ashmore	Early Childhood Educator; Member of CSA Z614 technical committee		Early Childhood Education	✓	1
6	Teresa Hendy	President, Hendy Institute; Member of ASTM technical committee	The Hendy Institute	Private: Playground Maintenance & Safety	✓	1

	NAME	ROLE	ORGANIZATION	SECTOR	SURVEY	FOCUS GROUP
7	Sylvie Melsbach	Educator/Technical Director; Member of CSA Z614	Le Regroupement des centres de la petite enfance de la Montérégie (RCPEM)	Public Early Childhood Education		1
8	Scott Liebelt	Engineering and Product Development Manager; Member of ASTM technical committee	BCI Burke	Private: Playground Manufacturing & Development		2
9	Jill Curley	Heat Expert	City of Calgary	Municipal Government	✓	2
10	Joan MacDonald	Parks Capital Project Coordinator	City of Calgary	Municipal Government	✓	2
11	Ken Farr	Manager, Science Integration	Canadian Forest Service	Federal Government		2
12	Birgit Isernhagen	Officer, Program Planning & Evaluation, Health Hazard Response	City of Ottawa	Municipal Government	✓	2
13	Jennifer Vanos	Assistant Professor, School of Sustainability	Arizona State University	Core Team; Academic		1
14	Heather Olsen	Executive Director, National Program for Playground Safety	National Program for Playground Safety	Core Team; Academic		1 & 2
15	Gregory Richardson	Senior Policy Analyst	Health Canada	Core Team; Federal Government		2
16	Eric Kennedy	Associate Professor, Biomedical Engineering	Bucknell University	Core Team; Academic		2

Appendix B: *Thermally Comfortable Playgrounds:* Summary of Recommendations

The report includes 11 key considerations for playground design on pages 32-34:

Thermally Comfortable Considerations for Playground Design

1. Identification of expected times of peak utilization of the playgrounds and volume of traffic.
2. A shade study should be conducted to identify availability of shade from existing manmade structures as well as natural options such as trees, natural features, land forms, and other vegetation.
3. Wind roses or weather radials should be used to understand weather patterns
4. Water access is an important consideration for all playgrounds.

Advocacy Efforts and Future Research

1. Develop a working group to investigate thermal comfort and safety during all seasons of play.
2. Disseminate information about safe playground best practices, injury and illness prevention, and thermally comfortable playgrounds to keep the public attention on the issue.

Research Efforts

1. Quantify factors that influence playground usage.
2. Quantify the effect and influence of design features and elements on the four environmental components of thermal comfort – particularly in different climate zones
3. Investigate playground surfacing materials for their performance in balancing demands for impact attenuation, accessibility, and influence on playground thermal comfort.
4. Develop methodology to collect and disseminate localized playground environmental conditions.
5. Develop tools and resources for cooling and greening of playgrounds.

Appendix C: Participants' Notes

C.1 Vision Statements

Vision statements, as written by participants, with some light editing for clarity, in alphabetical order:

- A consumer agency that can provide technical support to help consumers plan, maintain safe and healthy playgrounds.
- A need for people to come together and create a national action plan (as was done in the 1990s for safety) with programming money to tackle all of these different ideas.
- A vision that every (or at least many) childcare centres and outdoor play spaces have a mini cool island, nested/co-located within a larger neighbourhood school or park ("park cool island"). One of the important, but difficult, opportunities for childcare expansion in the coming years will to be able to access more of our existing/local green spaces, including parks.
- All children have access to safe and healthy playgrounds in their communities.
- Areas where there is not equity and where there are not legacy forests, you need to be careful about new play areas; engineering is almost never done, and green infrastructure gets damaged when hard infrastructure is put in.
- Children and families visit playgrounds and the duration of stay is long – creating benefits.
- Combinations of natural and humanmade components.
- Create "natural outdoor play & learning environments that are multi-purpose with obvious co-benefits.
- Create play spaces that are comfortable in hot and/or cold environments.
- Every child chooses to play outside.
- Playgrounds across the country are green, convivial (and a little wild) . Ultimately, the goal as developing lively, comfortable, safe and imaginative spaces to encourage children to play and be physically active.
- Using more natural materials and hopefully getting away from some of the synthetic materials.
- The important thing is what can we do now?
- More loose-parts play where the play can move to a more comfortable location in shade.
- In 2050 we have taken a more holistic approach to design where we are creating spaces that encourage people of all ages and abilities to come together. We do this by making our spaces meet the needs of the community while taking care to incorporate creature comforts which includes thermal considerations. When we focus on the creation of beautiful spaces people come together through play and community is created. Through community we learn the appreciation of different cultures.
- More accessible & inclusive, decrease the "over-engineering" of play spaces, bring kids back to nature, find innovative & localized solutions driven by community input.
- More emphasis on natural/nature mimicking play areas rather than playground structures (for example, my kids will spend hours with a pile of dirt, and after a few minutes on a 'playground' tend to come back.) Need to ensure play spaces incorporate both, as this will also add to thermal comfort (because there are fewer heated materials).

- More places to rest that are shaded as heat zaps people's energy.
- More structured shade or shade sails over play areas including water play areas.
- More tools and resources to help consumers make good decisions for playgrounds.
- More water features incorporated: splash pads, fountains, mist makers to walk under to cool off.
- Parks are places to create community connections.
- Playgrounds and outdoor spaces are spaces for community connections. They are places where community members - children, families, neighbors- meet and connect.
- Playgrounds and play spaces are comfortable and users/visitors don't want to leave.
- "Reconnect" the playground/outdoor play, natural play, child friendly city groups with more shared understandings and goals regarding outdoor play.
- Routes to parks/schools that are shaded (for example, sidewalks, pathways, bike lanes).
- Site-specific, purpose-designed green canopies genomically selected to respond to cumulative climate effects , long-term retention and user needs.
- The awful possibility of thinking about 2050 is that we may not be able to play outside.
- The idea of decision trees - what if we could make a pull-down menu that could be used for any location and localized decisions. There's no one size fits all solution and it's a huge challenge. How about if it went one step further and showed directly in arrow form, what your challenges would be if you chose certain design specifications. It could also illustrate co-benefits.
- Thermally comfortable playgrounds are located in every community and accessible for all children.
- These spaces will be used by kids/parents/grandparents that will be better protected with hats, water, sunscreen, they will be better informed on identifying their own heat stress levels and how to mitigate any heat related illnesses
- Thinking about and using the right language to get into the planning process (routes, nodes, corridors) to make sure that trees don't get left to last, so that pathways, bike lanes and sidewalks between spaces don't get left behind - make trees a primary consideration.
- Tons of education; for example, many people don't realize that many children with disabilities that take certain medication have interactions with the sun or the heat - they either can't be in direct sunlight, or they don't sweat properly, so there needs to be lots of spaces to be able to play but still get out of the sun. So, a park is not built for inclusion if a large segment can't use the park effectively since there is no shade. Adults and grandparents need shade, too, as well as kids, when they take a break from playing. Instead of shade being an add-on, it needs to become a standard for planning.
- Trend toward natural play areas and naturalized parks.
- Using trees that grow fast and provide shade may be good in the short term, but they may need to be replaced more often.
- Wealthy families with cars can travel with shade and protection, but kids are mostly restricted by geography. Developing tools to ensure equity and inclusivity in play spaces and the ways that kids travel and get to play spaces is critical.
- What can we do now so that we're more adapted for the future? There are so many co-benefits to play spaces and they can be expanded even more to include accessibility and inclusivity (gender, age, physical, medical). We have the tools to push in that direction of full inclusivity and use.
- While thinking about the future, what can we do now, with what we have?

C.2 Target Audiences

Target audiences, as written by participants, with some light editing for clarity, grouped under thematic headings:

Municipal audiences

- Councillors
- Buyers/purchasers for municipalities
- Engineers
- Facility operations
- Landscapers
- Landscape Architects
- Municipal nurseries
- Planners working on the following: Official Plan, Parks Master Plan, and parks design
- Parks managers
- Public Health Units

Childcare-related

- Childcare centres: administrators and early childhood professionals
- Childcare licencing agencies
- Child and youth agencies
- Early childhood professionals, in general
- Early childhood professional associations
- Policy makers for childcare spaces and infrastructure investments

School-related

- Parents
- School boards and trustees
- School administrators: Principals and teachers
- School/parent councils (as they are often tasked with developing/redeveloping playgrounds)

Public/user audiences

- Grandparents/seniors
- Parents
- Children
- Youth workers
- Playground users/visitors
- Community groups (for example, Lions Club)

Provincial and Territorial Ministries and Agencies

- Parks & Campgrounds

- Family Services
- Child and Youth Services

Federal Government

- Health Canada
- Climate Change
- Infrastructure
- Finance

Those involved in the playground lifecycle

- Playground planners and designers
- Engineers and equipment and surfacing manufacturers
- Purchasers
- Playground owner/operators/decision makers/consumers
- Playground inspectors
- Landscape Architects
- Architects
- Professional associations for landscape architects, arborists and urban foresters (for infrastructure maintenance)
- Organizations/People who have already downloaded Thermally Comfortable Playgrounds and/or CAN/CSA-Z614-20
- Authors - Researchers

Non-Governmental Organizations (NGOs)

- Lawson Foundation
- Outdoor Play Canada

Notes and Observations from Participants about Audiences

- There are important differences (and similarities) between play spaces in these different sectors and that is important (meaning childcare centres and municipalities; private and public).
- Important to connect to both the traditional playground sector and the natural playground sector - play and play spaces are more than the “limited” understanding/meaning of playground (playground equipment zone).
- Integrating (safety/thermal/design) recommendations into playground design happens early in the process.
- Play spaces necessarily involve many different members of the community who in turn require very different resources and information.
- The audience for standards is different than the report: do efforts need to be made to make sure the other audiences are reached with the report and/or other complimentary (non-standard) information?
- If we find there are people that are not using the report, how do we get to them?
- Investigate who has purchased the new standard and focus attention on them as an audience: Are they engineers? Architects? Landscape architects? Other?

- Making sure that those who use the standard have the latest information and also have materials and build awareness for those who *don't* have access to the standard, but need to know *enough* to ask that it be addressed in the project.

C.3 Suggested Tools and Guidance

Suggested tools and guidance, as written by participants, with some light editing for clarity, grouped under thematic headings:

Providing guidance on building tools and materials

- Technical tools to embed in the software used by playground designers.
- Integrate considerations for natural features and thermal comfort or shade into RFQ/RFP requirements to advance these recommendations.
- A document that identifies what types of surfaces produce heat that should be avoided for certain elements of a play space, but of interest for a place that warms the water for wading.
    - An example: since during a large period of the year babies cannot play freely outside (clothing constrains freedom of movement) for us it becomes very important for them to be able to sleep in the open air all year round. Hence the importance of having tools that help us to think about how to build an extension to the building that will allow them to sleep in the cooler summer and winter. In fact, materials can have versatile qualities.
- It's really important to remember potential separation between equipment, surfacing, and surrounding environments. The relative impact of materials on equipment may be very different from the material selection for surfacing.

Providing guidance on vegetation

- Vegetation selection guide
- Guidance related to plant and tree species to use in different geographic areas
- Guides to tree silvics, horticultural guides, climate-specific guidance (e.g. current plant hardiness data and maps)

"A building code for outdoor spaces"

- A minimum standard of guidelines for developing play spaces, not just play structures.
- Some base level requirements that should be followed when designing outdoor spaces. I would love to see it added to something like a building code for outdoor spaces, but until such time as that can happen, there should be some sort of perceived level of requirement used in park design.
    - What organization has the legitimacy to be able to produce this? Landscape Architecture associations, architecture associations, and then the municipal administrators' associations, once produced.

"Planning decision-making guide"

- A planning decision making guide to help consumers make good, informed purchasing or maintenance decisions.
    - Playgrounds are influenced by equipment, play elements, surrounding landscape, vegetation, playground surfacing material, accessibility requirements, safety requirements. There is a lot to consider, and consumers are not aware of this important topic.
- Planning toolkit
- Tip sheet or a guidance document
- A "how to get maintenance buy-in"

Policy-related

- A tool on influencing policy around thermal comfort

Make use of Appendix A from the *Thermally Comfortable Playgrounds* report

- Develop a shareable presentation that can be tweaked, by audience, to explain the report and the standard.
- The Appendix A in the report is a good start. The awareness and tools it offers can be impactful.
- Transform the technical report into a handbook or a guiding tool.
- Expand the recommendations to address artificial sports fields.
- Continue to build in and expand content in standards and codes.

Shareable/customizable tools

- A presentation tool/resource that people could use/adapt in their presentations to decision makers at all levels, in both French and English.
- Create a virtual tool to share examples of best practices – including tools, photos, and designs
- Create a software-based shade guide tool using GIS
- Think about the different audiences and create resources/tools that can be customized.

- Create an online access point for new information and solutions (including Pinterest-like photos); perhaps Outdoor Play Canada would be a good host?
- A checklist or a form that walks people through the process of evaluating existing and potential playground parks for thermal comfort. This could allow people in smaller communities and organizations to have the resources to conduct such more detailed analysis.
- Developing an online tool/application with a flow diagram. It could include a decision trees with pull-down menus to identify: location/season/temperature/contingency/conditional wind roses. The hard data would be analyzed, and could show users the results.

- Toolkit with guidance for:
    - People developing RFPs
    - Landscape architects designing playgrounds for clients
    - Volunteers greening their kids' playgrounds
    - Technical guidance and rating for equipment/materials
- It's important to get "desktop ready" data, tools, and information to help plan and budget for thermal comfort and to make sure the considerations don't get removed from the plan when they may be low on budget (trees seem to always be the first to go!)

Communication pieces for park users

- Communicate to various audiences in a way that meets their immediate needs.
    - An example might be signage that speaks to the air temperature in a park and gives a related potential surface temperature. This could give guidance to parents as to burn potential. This is done in dog parks to let dog owners know that asphalt surfaces can burn their dogs' paws.

Training

- Accrediting playground designers: design a training course to offer "certified thermal comfort playground designers" certification.

Communication/outreach, generally

- Outreach to the different audiences - creating an understandable message to the different groups.
- Plain language guidance materials for a range of stakeholders, including (grand)parents, teachers, playground designers, equipment manufacturers, etc.
- Knowledge translation tool: Facebook and Twitter messages, high level key messages to be used on websites, and more detailed information for subject matter experts (planners, foresters, etc.), something for community groups
- Education and awareness
- Messaging that goes beyond comfort to the acknowledgement that it is a safety concern.

Additional research

- Sensitivity information: There are recommendations about "what" works, but the extent to which each of them influence the outcome (improved thermal comfort) may be less known. More information to know how much practices help to change the environment can go a long way towards prioritization
- Better information on trade-offs: we are undoubtedly asking for trade-offs when encouraging a potential investment in changes - what information is available to convey what the end users are interested in
- Materials/surfaces:

    - Poured-in-place (PIP) rubber is needed for inclusion and different particle sizes can make a difference in temperatures; also, adding flecks can have a cooling effect. A study on this would be helpful.
    - Investigate equipment materials and playground surfacing materials. Technical guidance is needed to help guide that information. There would be use in having research on technical information to give companies concrete information (for example, to be able to say item X produces the heat this way and/or having knowledge of preferred colors or paints can provide information to the manufacturer.)
    - Further study on the manufacturing of materials and surfaces (engineered wood vs artificial turf, etc.) will give much needed information on building for universal access.
    - Further study on the interplay between surfaces, both natural and artificial
- Decision-making processes:
    - Study how playgrounds are designed now (sit with the planners and designers and research), design tool, then with committed teams, go through tool, work with research team before/after usage.
    - Additional research to figure out where in municipal decision-making process they make decisions about cooling amenities (or thermal comfort in general) - current research is underway in Tempe by Dr. Vanos
- What environmental features can positively influence increased play for children during all seasons?

Scoping questions for focused action

- Playgrounds vs. (and) play spaces:
    - Play does not necessarily = playground equipment.
    - Clarify the difference and connection between playgrounds and play spaces - parks, school yards, childcare yards. The playground equipment area - the playground is a small part of the play space but takes up too much focus and money. Suggest refocusing and integrating them (as in the Australian tour[2] example.)
    - It was interesting in the images you shared that there were trees everywhere but the playspaces were in open clearings/clearcuts. Parents often don't see the adjacent forest/"wild zones" as playspaces, though children often do but may be limited to the formal playground as "the (safe) place we play in". Shifting this perception is an important work in progress.

- Seasonality: All temperatures/all seasons are important - need outdoor spaces all year round.
- Location and equity considerations: Consider play in every neighbourhood area - schools, parks, childcare, housing developments.

Notes and Observations

[2] As part of the interactive focus group, participants were shown a virtual photo tour of diverse playgrounds.

- We need to guard against the commercialization of play/playgrounds and the creation of too many destination playgrounds.
- Difficult to answer it entirely. According to the characteristics of the climate of our environment the thermal comfort can take different considerations.
- Additional comment on "public awareness" - if people don't know about it, they aren't asking for it - so why would it be implemented?
- I was wondering if anyone had considered integrating the new Thermal Comfort Guidelines like London has? https://news.cityoflondon.gov.uk/city-corporation-introduces-the-worlds-first-development-guidelines-on-thermal-comfort/
- Every audience has a different need, and every audience needs a different approach and messaging; how the technical report is delivered to different audiences varies widely.

C.4 Suggested Priorities

Suggested tools and guidance, as written by participants, with some light editing for clarity, grouped under thematic headings:

Communication, education, and dissemination (for various audiences)

- Knowledge translation materials - Twitter, Facebook, key messages for websites
- Effective communication of the concept, of the current state of knowledge, and a few best practices as examples.
- Guidance and information to raise awareness
- Education - for everyone!
- Dissemination
- Educational materials to inform consumers/planners/designers about concerns and heat mitigation practices
- Practitioner training - teaching how to evaluate this in the field
- Targeted education and outreach for the people who use the standard
- Outreach to top stakeholder groups to raise awareness of work - landscape architects, policy-setters, decision makers (including heat alerts)

Build on the report

- Suggest getting this report in the hands of decision-makers, or at the very least the conclusion and Appendix A (Recommended Guidelines for Delivering Thermally Safe and Comfortable Playgrounds), as they give important information.
    - Many people don't want to take the time to read through the entire document.
- Encourage a modest revision of the report's Appendix A (which was created with significant time pressures) to include some new ideas and possibilities.
- Contact the agencies and individuals who have purchased the new version of the CSA Z614 standard and to seek ideas on their understanding of the informational annex, gather questions they have about the informational annex on thermal comfort
- Develop CSA Annex/Appendix A into a standalone piece with some (even many) pictures and illustrations that could be widely accessible online and hopefully open to frequent revision/additions as new good practice and evidence emerges.

    - For example, The Natural Learning Institute in North Carolina publish a number of infosheets including one on shade. These are informal and accessible.
    - A revised Guidelines could then be used then in many settings - as an article in various publications reaching our many audiences, teaching material, background or follow up reading to presentations again for many audiences.

Policy

- A policy guide to influence upstream municipal policy

Scoping

- Keep children and child's play at the front of the conversation.

Research

- Investing in research.
- Collaborative research and engagement between multiple stakeholders.
- Ensure that standards, guidelines, policies, etc. align with the science around adaptation, healthy physical activity, and needed investments for the future.

Funding

- Green the playgrounds
- Close gaps and answer questions around best practices, dissemination, knowledge exchange, and implementation.
- Advance knowledge integration, including practitioner training, design guides, planning toolkits.
- Test products (for example, equipment, surfacing material) to evaluate whether or not the product/material is influencing the temperature of the environment.

Tools

- An online tool/app for playground designers that provides step-by-step guidance based on user input. It could display season/wind/temperature/shade/contingency/conditional wind roses . There would be hard data analysis behind the scene and it would and show results to users.
    - Some of the more general guidance for volunteers could stem from the more technical guidance
- A tool to reflect on how playgrounds can be evaluated for thermal comfort and to find ways to test the concepts (toolkit for evaluation?). How can we ensure outdoor play areas are safe and thermally comfortable?
- A tool to help to reflect on the positive and negative elements that can be in the playspace (surface, types of trees (shade in summer and lets the sun pass in winter), etc.)
- Thermal comfort field testing tool kit
- A tool to certify "thermally comfortable playground equipment and materials"

Other

- A national or international workshop agreement/framework on thermal comfort in playgrounds.
- A national or international engagement plan to create change
- A conformity assessment activity - inspection or certification on thermal comfort - could be certifying professionals, could be an inspection standard for rating playgrounds.
    - May need to start with pilots and case studies here.