

January 5<sup>th</sup>, 2024

Standards Council of Canada  
55 Metcalfe Street, Suite 600  
Ottawa ON K1P 6L5  
Canada

*Subject:*        **Request for Proposal (RFP) # 2023-24**

This document represents an invitation to Bidders to submit their proposals to the Standards Council of Canada (SCC) for SCC is seeking a Supplier to develop a Technical Specification (TS) for the priority area: **Development of Technical Guidance to Advance Surface Temperature and Air Temperature Mapping in Canada.**

In accordance with the Statement of Work attached hereto as Appendix "B", SCC will issue a contract to the successful Bidder, establishing the pricing and terms / conditions under which the development of the above-mentioned initiative will be undertaken.

Proposals must be received by SCC no later than **16:00 hours, (4 p.m.) EST on Tuesday, February 6<sup>th</sup>, 2024.** It is the Bidder's responsibility to deliver their proposal prior to **the time/date of bid closing.** Proposals received after 16:00 hours will not be accepted.

**PROPOSALS ARE TO BE SUBMITTED ELECTRONICALLY TO [contracts@scc.ca](mailto:contracts@scc.ca)** by the time/date of bid closing (including the financial proposal).

- **ATTACHMENT 1 – Technical Proposal**

*NOTE: No financial information is to be included in ATTACHMENT 1*

- **ATTACHMENT 2 – Financial Proposal**

**Proposals that do not contain the requested documentation or deviate from the required financial format may be considered incomplete and disqualified.**

**SCC is not obliged to accept the lowest bid and/or any proposal.**

Questions with respect to the meaning or intent of this process, or requests for correction to any apparent ambiguity, inconsistency or error in the document must be submitted in writing to [contracts@scc.ca](mailto:contracts@scc.ca) and must be received by 12:00 hours (noon) EST on **Wednesday, January 24<sup>th</sup>, 2024.** All answers will be communicated to all potential bidders on the CanadaBuys website.

**Request for Proposal # 2023-24**

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**APPENDIX A – REQUEST FOR PROPOSAL – ACCEPTANCE FORM**

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**Proposal Submitted by**

\_\_\_\_\_  
**(Name of Company)**

\_\_\_\_\_  
**(Complete Address)**

**GST/HST Number** \_\_\_\_\_ **BIN Number** \_\_\_\_\_

Telephone Number: \_\_\_\_\_

Fax Number: \_\_\_\_\_

Contact Person: \_\_\_\_\_

Contact Email Address: \_\_\_\_\_

1. The Undersigned (hereinafter referred to as “the Bidder”) hereby proposes to the Standards Council of Canada (SCC) to furnish all necessary expertise, supervision, materials, equipment and other incidentals necessary to complete to the entire satisfaction of SCC or their authorized representative, the work described in the Statement of Work attached hereto as Appendix “B”.
  
2. The Bidder hereby proposes to perform and complete the work in accordance with the terms and conditions (at the place and in the manner) specified in:
  - (i) Appendix A - attached and entitled “Request for Proposal – Acceptance Form”;
  - (ii) Appendix B - attached and entitled “Statement of Work”;
  - (iii) Appendix C - attached and entitled “Technical Evaluation Criteria”;
  - (iv) Appendix D - attached and entitled “Financial Proposal”; and
  
3. **Period of Services**
  - (i) The contract award date is the date that the contract is signed by the Bidder and SCC.
  - (ii) The service start date is the date that the Bidder and SCC agree to commence the work.
  - (iii) The Bidder hereby proposes to perform the work commencing on the service start date and have work completed as established in Appendix B.

**4. Financial Proposal**

The Bidder hereby proposes to perform and complete the work as per the financials outlined in Appendix D: Financial Proposal of SCC RFP #2023-24, which represents the total financial proposal.

**5. Optional Modifications**

In the event that SCC requests the successful Bidder to proceed with any optional modifications or additional changes to the process, payment for this additional work will be based on the per diem rates quoted (see Appendix D of SCC RFP #2023-24).

Authorization to proceed with additional work will be provided by way of a contract amendment as per the established proposal.

## **6. Optional Years**

SCC may decide, at its discretion, to exercise an option by means of formal contract amendment, to extend the term.

## **7. Federal Goods and Services Tax (GST) and Harmonized Sales Tax (HST)**

The prices and rates quoted as part of the Bidder's proposal are NOT to include any provision for taxes.

## **8. Payment Schedule**

As a result of acceptance of the Bidder's proposal, SCC reserves the right to negotiate an acceptable payment schedule prior to the awarding of a contract and/or any amendments.

## **9. Appropriate Law**

Any contract awarded by SCC as a result of SCC RFP #2023-24 shall be governed by and construed in accordance with the laws in force in the Province of Ontario, Canada.

## **10. Tender Validity**

The Bidder agree(s) that their proposal will remain firm for a period of 90 calendar days after the **time/date of bid closing**.

**Signatures**

The Bidder herewith submits this bid in accordance with the requirements specified in the Request for Proposal documents.

SIGNED this \_\_\_\_\_ day of \_\_\_\_\_ 2023.

Per

\_\_\_\_\_  
NAME OF COMPANY

Per

\_\_\_\_\_  
(Signing Officer and Position)

**APPENDIX B – STATEMENT OF WORK**

**APPENDIX B: STATEMENT OF WORK**

<b>Project title</b>	<b>Development of Technical Guidance to Advance Surface Temperature and Air Temperature Mapping in Canada</b>
<b>Project Summary</b>	<p>This project, led by the Standards Council of Canada (SCC) and Health Canada (HC), will support the development of technical guidance to advance UHI mapping in Canada. This project will involve compiling best practice methodologies and data requirements for developing:</p> <ul style="list-style-type: none"> <li>• surface temperature maps, and</li> <li>• air temperature maps.</li> </ul> <p>To advance these efforts, the chosen SUPPLIER will conduct an in-depth analysis of existing surface and air temperature mapping methodologies, and bring together subject matter experts, and users of UHI maps to discuss use cases and corresponding best mapping methods.</p> <p>The main deliverable is a final report that summarizes key surface and air temperature mapping methodologies and data requirements, analyses each of the method’s strengths and weaknesses, and recommends the preferred methods for developing surface and air temperature maps in Canada.</p> <p>Please note this project is focused on <i>selecting the most appropriate data and methods</i> for producing surface and air temperature maps in Canada; the <i>production</i> of the corresponding maps is a separate project.</p> <p>This project is being conducted in tandem with a separate parallel project, <b>Development of Technical Guidance to Advance Heat-health Vulnerability Maps in Canada</b>, in which another SUPPLIER will develop pan-Canadian guidance for the preferred methods for creating heat-health vulnerability maps. The overarching purpose of these two workstreams is to produce pan-Canadian guidance for all three mapping types of UHI-related maps (surface temperature, air temperature, and heat-health vulnerability maps). As such, it is crucial that the selected SUPPLIERS for both projects be in regular communication with each other, in addition to SCC and HC, to ensure that the best practices produced are aligned with each other and are not contradictory.</p> <p>This project will advance efforts for developing a harmonized pan-Canadian approach to developing surface and air temperature maps. This project is a key first step in the future development of pan-Canadian UHI maps. The results of this work will be used to advance thinking on, and set a base, to move chosen methodologies through the standardization system.</p>



<p><b>Context</b></p>	<p>The Urban Heat Island (UHI) effect is a phenomenon where temperatures in urbanized areas are higher than those in surrounding non-urban areas, with average air temperature of medium to large cities in North America reaching up to 12 degrees Celsius higher than the surrounding countryside.<sup>1</sup> These differences of temperatures can be even greater when comparing the surface temperatures of an intra-urban UHI; for example, a difference of 17°C has been recorded between a park and a nearby parking lot in the Saint-Laurent borough in Quebec.<sup>2</sup> The warmer temperatures in urban areas have been widely attributed to anthropogenic sources, from the proliferation of buildings, roads, and other infrastructure in these areas, as well as activities such as transportation, building heating and air conditioning, industrial release, among others.<sup>3,4</sup></p> <p>Across Canada, extreme heat is occurring at a greater frequency and severity because of climate change, with high temperatures in the summer associated with increased mortality.<sup>5</sup> The health impacts from higher temperatures are already being felt across the country. For example, during prolonged extreme heat events (commonly known as "heat waves") in July 2009 in British Columbia (156 excess deaths<sup>6</sup>), and July 2010 in Quebec (280 excess deaths<sup>7</sup>), July 2018 in Montreal (66 deaths<sup>8</sup>) and in British Columbia and Alberta in the summer of 2021 (619<sup>9</sup> and 66 deaths<sup>10</sup>, respectively) from heat-related causes. The UHI effect, which can put vulnerable populations in urban areas at greater risk, contributed to a</p>
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<sup>1</sup> Health Canada. *Reducing Urban Heat Islands to Protect Health in Canada*. 2020.

<sup>2</sup> Cavayas, F. et Baudouin, Y. (2008). Étude des biotopes urbains et périurbains de la CMM. Conseil régional de l'environnement de Laval.

<sup>3</sup> Zhou, Decheng, et al. "Satellite Remote Sensing of Surface Urban Heat Islands: Progress, Challenges, and Perspectives." *Remote Sensing* 11, no. 1 (January 2019): 48. <https://doi.org/10.3390/rs11010048>.

<sup>4</sup> US EPA. "Heat Island Effect." Collections and Lists, February 28, 2014. <https://www.epa.gov/heatislands>.

<sup>5</sup> *Supra*, note 1.

<sup>6</sup> Kosatsky, T., Henderson, S. B., & Pollock, S. L. (2012). Shifts in mortality during a hot weather event in Vancouver, British Columbia: Rapid assessment with case-only analysis. *American Journal of Public Health*, 102(12), 2367-2371. doi:10.2105/AJPH.2012.300670

<sup>7</sup> Bustinza, R., Germain L., Gosselin, P., Bélanger, D., & Chebana, F. (2013). Health impacts of the July 2010 heat wave in Québec, Canada. *BMC Public Health*, 13(56). doi:10.1186/1471-2458-13-56.

<sup>8</sup> Lamothe, F., Roy, M., & Racine-Hamel, S.-É. (2019). Enquête épidémiologique -Vague de chaleur à l'été 2018 à Montréal. Direction régionale de santé publique du CIUSSS du Centre-Sud-de-l'Île-de-Montréal. Retrieved from [https://santemontreal.qc.ca/fileadmin/user\\_upload/Uploads/tx\\_asssmpublications/pdf/publications/Enquete\\_epidemiologique\\_-\\_Vague\\_de\\_chaleur\\_a\\_l\\_ete\\_2018\\_a\\_Montreal\\_version15mai\\_EUSHV\\_finale.pdf](https://santemontreal.qc.ca/fileadmin/user_upload/Uploads/tx_asssmpublications/pdf/publications/Enquete_epidemiologique_-_Vague_de_chaleur_a_l_ete_2018_a_Montreal_version15mai_EUSHV_finale.pdf)

<sup>9</sup> [https://www2.gov.bc.ca/assets/gov/birth-adoption-death-marriage-and-divorce/deaths/coroners-service/death-review-panel/extreme\\_heat\\_death\\_review\\_panel\\_report.pdf](https://www2.gov.bc.ca/assets/gov/birth-adoption-death-marriage-and-divorce/deaths/coroners-service/death-review-panel/extreme_heat_death_review_panel_report.pdf)

<sup>10</sup>

<https://www.bing.com/search?q=66+deaths+alberta+heat+dome+edmonton+journal&cvid=5fd96891d26040afa30d4f13d47b7d7c&aqs=edge..69i57j0l6j69i11004.10159j0j4&FORM=ANAB01&PC=U531>

proportion of these heat-related deaths. In general, the excess morbidity and mortality associated with UHIs is estimated at 20-25%.<sup>11,12</sup>

Temperature and heat-health vulnerability maps are important tools for helping users better understand the drivers of heat-related risks, measure their impacts, and help prioritize effective built environment and health interventions. These UHI-related maps help support interventions across a variety of sectors such as physical infrastructure, public health, building construction, urban design and urban and park planning.

To further advance Canada's work on UHI mapping, SCC, in collaboration with HC, is issuing a call for proposals for a SUPPLIER to develop Canadian guidance for the preferred methods for creating the following two types of UHI-related maps:

- surface temperature maps,
- air temperature maps.

This project is a separate, parallel project to a concurrent project for developing heat-health vulnerability maps.

The SUPPLIER will engage key stakeholders for input, including mapping experts and users, to identify their most pressing needs for the maps and make recommendations on the most appropriate methodologies in the Canadian context. The main deliverable is a final report that summarizes key mapping methodologies and data requirements, analyses each of the method's strengths and weaknesses, and recommends the preferred methods for developing the two types of UHI maps (surface and air).

There are various benefits to establishing uniform methods for developing baseline surface temperature, air temperature and heat-health vulnerability maps across Canada. These include facilitating effective comparison of heat-health exposure and vulnerability between and across communities and avoiding unnecessary duplication of work and thereby saving end users the expense of hiring costly consultants. This project could therefore help other organizations to free up financial resources to implement heat-health mitigation actions.

<sup>11</sup> Smargiassi, A., Goldberg, M. S., Plante, C., Fournier, M., Baudouin, Y. et Kosatsky, T. (2009). Variation of daily warm season mortality as a function of micro-urban heat islands. *Journal of Epidemiology et Community Health*, 63(8), 659-664. <https://doi.org/10.1136/jech.2008.078147>

<sup>12</sup> Bélanger, D., Gosselin, P., Valois, P. et Abdous, B. (2015). Neighbourhood and dwelling characteristics associated with the self-reported adverse health effects of heat in most deprived urban areas: A cross-sectional study in 9 cities. *Health & Place*, 32, 8-18. <https://doi.org/10.1016/j.healthplace.2014.12.014>

### THREE TYPES OF UHI MAPS

Here we provide more details about the three types of maps for which guidance will be developed:

#### 1. Surface Temperature Maps

The UHI that is measured by land surface temperature (LST) is termed surface urban heat island (SUHI). Surface temperatures represent heat energy given off by the land, buildings, and other surfaces. Surface temperatures can differ considerably from one building to another, depending on the physical properties of the materials and their exposure to the sun and sky<sup>13</sup>. Indeed, the effect of high albedo on reducing surface temperature is greater on sunny days than on cloudy days.<sup>14</sup>

There is a large amount of temperature variability contained within a single pixel of a satellite LST image. To overcome this limitation requires higher resolution data, more typically provided by platforms that operate at lower altitudes (e.g., aircraft, unmanned aerial vehicle (UAV)). That said, satellite data is the most commonly used to measure LST internationally with sufficiently high temporal and spatial resolution for many users.

The Landsat Thematic Mapper (high spatial resolution, with Landsat 8's thermal sensors having 100m spatial resolution) and Moderate Resolution Imaging Spectroradiometer (MODIS) (spatial resolution of 1km) are the two most commonly used satellite sensors for developing UHI maps.<sup>15</sup> For a comprehensive review of the different types of data sources and their methodologies, please see Zhou et al. (2019)<sup>16</sup> and Almeida et al. (2021).<sup>17</sup>

Surface temperature maps and SUHI can also be obtained from numerical analysis and prediction systems. In that context, surface temperature of roads, buildings walls and roofs, are estimated and predicted in real time at scales from a few hundreds of metres to a few kilometers, using a numerical representation of urban components and their interaction with the atmosphere.

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<sup>13</sup> US EPA. Reducing Urban Heat Islands: Compendium of Strategies Urban Heat Island Basics. Washington, DC: US Environmental Protection Agency (2008).

<sup>14</sup> Rosso, F., Pisello, A. L., Cotana, F. et Ferrero, M. (2016). On the thermal and visual pedestrians' perception about cool natural stones for urban paving: A field survey in summer conditions. *Building and Environment*, 107, 198-214. <https://doi.org/10.1016/j.buildenv.2016.07.028>

<sup>15</sup> *Supra*, note 2.

<sup>16</sup> Zhou, et al. "Satellite Remote Sensing of Surface Urban Heat Islands: Progress, Challenges, and Perspectives." *Remote Sensing* 11, no. 1 (January 2019): 48. <https://doi.org/10.3390/rs11010048>.

<sup>17</sup> Almeida, et al. "Study of the Urban Heat Island (UHI) Using Remote Sensing Data/Techniques: A Systematic Review." *Environments* 8, no. 10 (October 2021): 105. <https://doi.org/10.3390/environments8100105>.

## 2. Air Temperature Maps

Air temperature UHIs are formed when heat stored in urban surfaces and/or emitted from human activities is released into the air (US EPA, 2008). Air temperatures over North American cities are on average 1°C to 3°C warmer than those in the surrounding countryside on an annual basis, with temperatures in dense, highly urbanized areas reaching up to 12°C warmer when specific weather conditions are met, such as calm winds and clear skies (Oke, 1997).

Obtaining high resolution air temperature maps could inform numerous decisions, including the following examples: (1) where to locate and how to design outdoor sports facilities like soccer fields / stadiums, (2) in which parts of the city where seniors living alone may be most at risk from extreme heat, (3) areas of the city where outdoor workers or children are most at risk. Air temperature maps could supplement LST maps.

Several methods have been developed to produce air temperature UHI maps. These include:

- Stationary network of micro weather stations
- Weather sensors to mobile platforms roaming transportation (e.g., a cyclist, car, or even pedestrian)
- Crowdsourced citizen weather stations (CWSs)
- Numerical modelling

Air temperature mapping accuracies are influenced by (1) data source and variables, (2) number of available weather stations, (3) scale of spatial data aggregation, and (4) season and weather conditions.<sup>18</sup> Additional guidelines for measuring air temperatures are described in WMO's [Guidance on Measuring, Modelling and Monitoring the Canopy Layer Urban Heat Island \(CL – UHI\)](#).

## 3. Heat-health Vulnerability Maps

Maps can illustrate the location of populations vulnerable to heat and help decision-makers prioritize where to implement land-use planning actions and public health interventions. Heat-health vulnerability maps can be readily incorporated into municipal plans, policies, and actions to help target interventions. There are several types of heat-health vulnerability maps, including:

- A. **Maps of populations vulnerable to extreme heat.** These maps identify areas with a high number of people from populations vulnerable to heat, where priority interventions to reduce UHIs are

<sup>18</sup> *Supra* note 11

needed most. Such maps can have a gradient showing which blocks or neighbourhoods have higher density of populations considered vulnerable to heat. The specific locations of people vulnerable to heat can also be identified on maps. For example, maps can show the location of seniors' homes, homeless shelters, or even homes across a city without air-conditioning.

B. **Maps visualizing adaptation actions & services.** These maps, which identify adaptation actions or resilience characteristics, are sometimes called *community infrastructure maps*. For example, many cities map things like drinking water fountains, cooling centres, tree canopy cover, air-conditioned spaces, private businesses, and swimming pools. These maps can be used to direct citizens on where to obtain services on hot days or to help officials understand where gaps in service provision are located so that targeted interventions can be implemented. There are several examples of online GIS platforms where this information is crowd-sourced from community partners.

C. **Heat-health vulnerability indices.** Various health authorities and academic teams have developed heat-health vulnerability indices to determine the relative risk of heat-related illness or death during particular neighbourhoods of a city during heat waves. These indices combine a variety of data points - such as age, material deprivation, air conditioning access, and urban heat island effects - into a single score, for example, from 1 to 10. Effectively weighting the various indicators and validating the resulting index to ensure its a true representation of heat-health vulnerability is very challenging. The development of these indices can be time and resource intensive, and arguments will always persist over their accuracy. For these reasons, heat vulnerability indices will be excluded from this contract. The SUPPLIER selected for this project will therefore be asked to not summarize and analyse methods for developing heat-health vulnerability indices.

All the above maps and indices can be overlaid with hazard maps (e.g., maps of surface temperature, air temperature maps or the Universal Thermal Climate Index) to help target optimal location for implementing heat-health interventions.

Although there is presently no national level guidance on UHI mapping in Canada, other organizations and governmental departments (e.g., the Union of BC Municipalities, Environment and Climate Change Canada (ECCC), Vancouver Coastal Health, [Government of Quebec](#), among others) are advancing the development of UHI maps. This project will aim to build on the experiences of these different projects. Through this project and the related **Development of Technical Guidance to Advance Heat-health Vulnerability Maps in Canada**, the SCC and HC aim to advance the standardization of the development of baseline maps visualizing heat-health

	<p>vulnerability, surface temperature, and air temperature for all regions of Canada.</p> <p>We hope and encourage other organizations to build on the baseline layers which will be proposed through this project by developing their own additional mapping layers that are locally and regionally relevant. This project therefore aims to provide a solid foundation, and to enable others to build the more complex structures above.</p>
<p><b>Project Details</b></p>	<p>The following text describes the scope for the technical guidance:</p> <p>It is important to note that the aim of this project is to achieve a specific and practical focus – it is a first attempt to consolidate the existing literature on surface and air temperature mapping methods. The SUPPLIER should assess the available approaches both nationally and internationally to see what could be implemented and adapted to best fit the needs of the Canadian context. This project does not seek to devise new technologies or fill gaps in literature in the UHI mapping sector; the work to be completed is aimed to establish a preliminary working understanding and agreement on mapping methods for surface and air temperatures that may set the foundations upon which a potential National Standard of Canada may be built in the future.</p> <p><b><u>Guiding Principles for this Project</u></b></p> <p>The SUPPLIER will:</p> <ul style="list-style-type: none"> <li>• <b>Strive for agreement</b> – the SUPPLIER will work towards agreement across workshop participants for the types of mapping methodologies that are recommended. This includes weighing the potential technical requirements, stakeholder needs, best practices, and the financial costs a methodology might require. The SUPPLIER should demonstrate significant experience and excellence in navigating complex and technical stakeholder discussions to arrive at clear mapping priorities, arrived at through discussion and agreement.</li> <li>• <b>Meet user needs</b> – The SUPPLIER should recommend methods for producing heat-health vulnerability maps that meet user needs.</li> <li>• <b>Deliver evidence- and information-based recommendations</b> – the proposed methods should be based on the best available evidence and information. The SUPPLIER will develop a set of quality criteria to ensure that there is guidance provided for the minimum quality requirements a map should fulfill for accuracy and resolution purposes. Due to the continually evolving nature of the environmental impacts of climate change, adjustments to methodologies may be needed as more information becomes available.</li> </ul>

- **Ensure data accessibility** – the SUPPLIER will ensure that the data required to develop UHI maps through the methodologies that are recommended are (where possible) accessible and easily available to communities and organizations of all scales across Canada, while considering financial costs. When comparing methodologies, the SUPPLIER should identify existing resources and consider which methodologies can most efficiently utilize current data and tools in order to minimize the cost of production. The SUPPLIER will provide information on where and how all of the data and information required to produce a map can be accessed.
- **Ensure adaptability** – the SUPPLIER will develop recommendations for best practices that are accommodative and can be adjusted and expanded upon for the unique purposes of end users. The guidance should be applicable to mapping efforts for communities of diverse sizes and geographies. The resulting maps should be compatible with software platforms most frequently used by the end users; resulting mapping layers should be able to be overlaid onto other pre-existing GIS layers. The SUPPLIER should be far-sighted and keep in mind that their recommendations should stand the test of time and be able to continually be improved upon.

#### **Intended Users and Audience**

The distinct characteristics for each of the three mapping types make them more useful to certain target users and groups. Through stakeholder consultations in March 2023, key users and producers were identified for surface temperature and air temperature.

- For surface temperature maps, users include, but are not limited to: urban planners, park and forestry planners, public health officials, architects, private building/land owners, non-profit organizations, project evaluators, and municipalities. Potential producers include local municipalities, public health professionals, emergency management planners, academia, private partners, and research centers.
- For air temperature maps, users include, but are not limited to, urban planners, building designers, utility providers, air quality agencies, airport officials, park and forestry planners, and public health professionals. Producers will need expertise in meteorology and climatology for past (re-analysis), present (weather forecast), and future (modelling) mapping. Producers may be members of academia or government departments (e.g., ECCC).

It is critical that the technical guidance developed for UHI maps be in alignment with the needs of the audience, as well as the capabilities for producers to conveniently develop these maps.

### **Deliverables and Project Checklist**

The individual deliverables and activities comprising this project require skills and resources pertaining to a variety of different types of organizations. The SUPPLIER should note that they are encouraged to partner with external organizations to deliver certain parts of this project to a high degree of quality, if they themselves would benefit from additional support on specific tasks outside of their area of expertise, such as workshop facilitation.

The chart below summarizes the list of deliverables and activities required for the SUPPLIER to successfully complete the scope of this project:

Activity	Deliverable
1. Develop steering committee	A list of mutually agreed-upon steering committee members that will include HC (member) and SCC (observer).
2. Draft literature review and analysis	Rough draft of literature review
3. Revise literature review and analysis	Final draft of literature review
4. Conduct national workshop	Conduct a national workshop and provide SCC & HC with a workshop report summarizing findings
5. Draft final report	Rough draft of final report for revision
6. Provide final report	Address feedback from stakeholder committee members, SCC, HC, and other experts to provide Final Report in English.
7. Develop a Distribution and Outreach Plan	Approved distribution plan
Project Coordination: Steering committee meetings	Regular meetings led by SUPPLIER to update on progress. To be conducted once every two months.
Project Coordination: Meetings with Project Authority (SCC and HC) and SUPPLIER of parallel UHI mapping project (heat health vulnerability maps)	Regular meetings with project managers from both SUPPLIERS to update each other on progress and align key considerations.  To be conducted once a month as well as at critical junctures (project kick-off, pre and post-workshop, and project closure). SCC



	and HC will set these meetings at Project kick off.
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For the SUPPLIER's guidance, below is more detailed information on each of the components comprising the checklist above:

**Activity 1: Develop Steering Committee**

The SUPPLIER will form a steering committee consisting of experts from various fields, whom the SUPPLIER will consult with at key intervals throughout the project. When identifying experts, the SUPPLIER will ensure that both those who will develop the maps and those who will use the maps are well-represented and engaged throughout this process. In order to develop best practices that accurately reflect the expertise and experiences of producers and users alike, the SUPPLIER will convene re-occurring meetings with the steering committee at critical junctures of the project.

It is anticipated the steering committee will consist of 5-8 participants, in addition to SCC and HC. The steering committee should be convened a minimum of four times through the duration of the project to provide updates and seek feedback.

SCC and HC will provide some names of people who could join the steering committee, but the SUPPLIER will also be responsible for identifying potential participants.

*Deliverable:* A list of mutually agreed-upon steering committee members that will include HC (member) and SCC (observer).

**Activity 2: Draft Literature Review and Analysis**

The SUPPLIER will conduct a review of Canadian and international literature to identify the distinct methodologies for each of the two mapping types (i.e., surface and air temperature maps) based on the most current data and technology.

There is ample existing literature describing the technical details of urban heat islands (i.e., what are UHIs and their different types). As such, there is no need for the SUPPLIER to dedicate their efforts to mirror introductory background information already available to the public. Rather, the focus of the SUPPLIER's efforts should be on summarizing existing methodologies for UHI mapping and, analysing them based on the feedback of experts, stakeholders, and users regarding select evaluation criteria. Upon selection of a SUPPLIER, SCC will provide a preliminary scan of the current research that was conducted internally, as well as additional resources for reference.

The SUPPLIER will analyse and compare the different mapping methodologies compiled through the literature review.

To minimize redundancy and allocate time and resources to gaps in literature, where possible, the SUPPLIER will draw upon and ensure alignment with existing publications of similar purposes. For example, the *WMO Guidance on Measuring, Modelling and Monitoring the Canopy Layer Urban Heat Island (CL – UHI)* provides comprehensive guidance on air temperature mapping. As such, for air temperature mapping, efforts should focus primarily on adopting best practices in the Canadian context.

Additionally, as mentioned above, during the inter-SUPPLIER meetings held by both SUPPLIERS for the two separate workstreams for developing UHI mapping best practices, each SUPPLIER will provide progress updates to ensure that their work is in alignment and that their final deliverables will not contradict each other.

Key factors the SUPPLIER will consider when conducting the analysis include:

- **Technical requirements** – the SUPPLIER will consider the technological and resource requirements and range of expertise needed for the methodologies in question, as well as the ease of access to these data and tools, and whether these requirements are realistic and achievable for intended users and producers
- **Temporal parameters** – the SUPPLIER will consider what ideal temporal requirements would be. For example, should products be based only on current climatology? Is there a need for forecasting products that update in real time? Should future climates be represented? Should future climates be represented by all three mapping types or only a subset? The SUPPLIER should also consider if the temporal parameters should be different for each of the three mapping types.
- **Spatial parameters** – the SUPPLIER will consult with stakeholders to provide recommendations on what the ideal spatial requirements would be. For example, what geographic area are the maps intended to cover? How much of the surroundings of an urban area should be included? What should the resolution be? The SUPPLIER should also consider if the spatial parameters should be different for each of the three mapping types.
- **Level of difficulty and costs**– the SUPPLIER will clearly define the scope of map development and the level of difficulty in producing such a map by considering financial costs and the limits surrounding the availability of data (at both a community and national level), as well as the time required. The SUPPLIER should seek to identify best practices that can minimize the burden of cost on individual users, where possible, by drawing upon existing data and technologies that are easily accessible and cost-efficient to the public.

- **Producers** – the SUPPLIER will identify examples of who/which organizations have the expertise to potentially produce the maps.
- **Audience** – the SUPPLIER will identify potential target audiences and their respective needs for a UHI map (see Annex A).
- **Use cases** – the SUPPLIER will include use cases for both surface and air temperature maps and provide justification on which methods are most appropriate for the use cases.
- **Alignment** – the SUPPLIERS will ensure that the best practices developed from this project are consistent with existing international and Canadian guidance on UHI mapping. This includes the recently published [Guidance on Measuring, Modelling and Monitoring the Canopy Layer Urban Heat Island \(CL – UHI\)](#).
- **Evaluation Criteria** - the SUPPLIER will clearly indicate the key factors that the methodologies are using as input data sources to measure surface and air temperatures (see below for more details)

The SUPPLIER will develop visually accessible tables (one for each of the two mapping types), such as the one below, to consolidate the results of their analyses:

*Table 1. Analysis of mapping methodology based on evaluation criteria*

Methodology	Technical requirements	Temporal parameters	Spatial parameters	Level of difficulty and costs	Producers	Audience	Mapping process	Key factors

With guidance from the steering committee the SUPPLIER will conduct a cross-check of methodologies against variables of interest for the target audiences of each mapping type. In particular, for air temperature maps, the SUPPLIER should cross-check methodologies with the [existing international guidance](#) provided by the WMO. As a component of the literature review, the SUPPLIER will include an “analysis” section and a “discussion” section that details the SUPPLIER’s analysis of the methodologies.

The SUPPLIER will consult the steering committee to validate real-world applications for both mapping types (i.e., surface and air temperature maps). For example, surface temperature maps can be used to design thermally comfortable outdoor spaces (e.g., parks, playgrounds, streetscapes), measure the effectiveness of built environment interventions, and assess indoor temperatures, which would be useful to utility providers and various operations (transportation, electricity, etc.) that may have

temperature thresholds associated with their work. The SUPPLIER will organize these applications into a list of uses for each mapping type.

### **Thermal indices**

Experts have developed various thermal indices (or heat stress metrics) to describe the thermal comfort of the human body under different meteorological conditions, both indoors and outdoors (See "Thermal Indices" on page 400 of Oke et al. 2017 for more details). In addition to air temperature, these indices take into account various meteorological variables (like humidity, air speed, solar radiation and thermal radiation) and observed reactions of the human body to thermal stress (like physiological reactions and qualitative thermal measures of satisfaction and acceptability) to classify how the (micro)climate feels to the average person. Common examples used in Canada include humidex (Hildebrandt 2013), the Universal Thermal Climate Index (Jendritsky et al. 2012), Mean Radiant Temperature (Vanos et al. 2021) and ASHRAE Standard 55 (de Dear & Brager 2002). These, and many other thermal indices, are used for a range of applications from weather prediction, building design and operation, sports, recreation, tourism, epidemiological research and occupational health (Blazejczyk 2021).

It is beyond the scope of this project to summarize the various thermal indices or assess which of these thermal indices is most appropriate for use in applications related to protecting Canadians from exposure to extreme heat (including urban heat islands). However, the SUPPLIER is requested to consult with key stakeholders engaged in this project (through Activity 4: National Workshop, and interpersonal written and verbal communication) to discuss the relationship of thermal indices to this project and propose a short-list of key next steps.

To that end, during the National Workshop, the SUPPLIER should dedicate a portion of the surface/air temperature breakout session in Session 1 (Best practice methods for each mapping type) to discussing "thermal indices" as they relate to extreme heat and urban heat islands. In Session 2 (Plenary for attendees of Session 1), the SUPPLIER should incorporate the results of that initial conversation for the review of all attendees.

*Deliverable:* Rough draft of literature review and analysis for revision. The rough draft will be shared with the Steering Committee who will be provided two weeks to provide comments.

### **Activity 3: Revise Literature Review and Analysis**

Following comments from the Steering Committee, the Supplier will revise the Literature Review and Analysis. It is anticipated that this literature review and analysis will form a substantial portion of the overall final deliverable. Results from Activity 3 will be fed into Activity 4.

*Deliverable:* Final draft of literature review and analysis

### **Activity 4: Conduct National Workshop**

Following the literature review and analysis, the SUPPLIER will collaborate with the SUPPLIER of the parallel workstream (heat-health vulnerability mapping) to conduct a two-part pan-Canadian workshop to seek feedback from end users and input from methods experts. This virtual workshop will convene subject matter experts and methodologists across Canada to discuss what type of methodology is most desirable for standardization.

The perspectives of leading UHI mapping and modelling experts are critical to designing technical guidance that will be comprehensive, practical, and reflective of the most current literature and technology. HC and SCC will provide an initial list of workshop participants that will be complemented by the SUPPLIER's own list of suitable and experienced contacts. **See Appendix F for a draft agenda of responsibilities and deliverables for each SUPPLIER and each portion of the multi-part workshop.**

*Deliverable:* Conduct a national workshop pertaining two parts (see Appendix F) and provide SCC & HC with a concise workshop report summarizing findings.

### **Activity 5: Draft Final Report**

Following the workshop, the SUPPLIER will develop a final report that outlines the following:

Topic	Sub-Topic
Executive Summary	Overview of findings and recommendations
Introduction	Overview of the purpose of the project including background information and research process
Literature Review	Overview of the 2 mapping types including their: methodology, data required, level of difficulty, producers, audience, mapping process, and variables of interest  Examples of use cases in the Canadian context for the 2 mapping types

Workshop Summary	<p>Workshop summary including:</p> <ul style="list-style-type: none"> <li>- a participant list that shows balanced representation between public vs. private, and a diversity of users (i.e., non-profit organizations, municipalities, etc.) vs. producers,</li> <li>- a summary of feedback and overview of recommendations, and</li> <li>- key takeaways</li> </ul>
Analysis & Recommendations	<ul style="list-style-type: none"> <li>- Summary and analysis of feedback from stakeholder engagement and literature review</li> <li>- Key takeaways on the most appropriate methodologies and data requirements for each mapping methodology</li> <li>- Details on how the methodologies fulfill the distinct needs of the 5 target audience groups by: providing justification based on evaluation criteria (refer to Table 1), providing information on where and how all of the data and information required to produce a map (for each of the mapping types) can be accessed, and providing an example mock-up of a UHI map that has been developed using the recommended best practices, one for each of the mapping types</li> <li>- Recommendations for standardizing methodologies in the future</li> </ul>
Conclusion	Future areas of research and next steps
Bibliography	

*Deliverable:* Rough draft of final report for revision. The SUPPLIER will provide the Steering Committee the rough draft for comment. The Steering Committee will have three weeks to provide final comments.

**Activity 6: Revise final report**

Following comments from the Steering Committee, the SUPPLIER will revise the Final Report. Note, following delivery of the Final Report, SCC will complete a French translation as well as graphic design and layout to support dissemination.

*Deliverable:* Final Report in English

### **Activity 7: Develop a Distribution and Outreach Plan**

The SUPPLIER will be required to prepare a distribution and outreach plan to be implemented that outlines an understanding of the target audiences, methodology of communication and any additional required materials to ensure awareness, active distribution, and a greater understanding of the best practices for UHI mapping for each of the three different types of mapping by end users.

*Deliverable:* Approved distribution plan

### **Project Coordination**

In addition to the above activities, the SUPPLIER will be expected to coordinate with the Steering Committee through a minimum of four meetings, and opportunities for the Steering Committee to review and comment on the draft deliverables (as noted in the activities above).

Further, as noted, this project will be launched concurrently with a separate, parallel project that aims to produce pan-Canadian guidance on one additional mapping type: heat-health vulnerability maps. To ensure that the selected SUPPLIERS from both workstreams produce work that is harmonized and not contradictory, SCC and HC will organize monthly check-in meetings across entities (i.e., the two separate SUPPLIERS as well as SCC and HC).

### **Example UHI mapping projects**

Below are ongoing initiatives that we recommend the SUPPLIER use as resources in their research:

ECCC, who has been part of our stakeholder consultations, is conducting research that are relevant to UHI mapping. ECCC's High-Resolution Deterministic Prediction System (HRDPS) provides 48-hour forecasts throughout the country at a grid spacing of 2.5 km, 4 times a day. The model used to represent cities provides surface and air temperatures as well as maps of heat/comfort indices. Work is currently under way to add the urban component into analysis, which would allow for provision of current estimates of urban variables.

Vancouver Coastal Health created a series of maps that represent the vulnerability of communities to higher summer temperatures in the Central Vancouver area, which are publicly available at:

<https://storymaps.arcgis.com/stories/7bf7141bb6fd41fb9b61a02cfbc61ecd>.

The web platform includes surface temperature maps.

A research team from Université Laval's Department of Geography in early 2023 [launched an online interactive map](#) of the vulnerability and exposure

of the Canadian population to extreme heat waves. The online platform includes surface temperatures for many communities in Canada.

Additional resources for consideration include:

- Mills, Gerald, and Iain D. Stewart. The Urban Heat Island. 1st edition. Amsterdam: Elsevier, 2021.
- Research comparing different LST mapping techniques: <https://www.mdpi.com/2072-4292/11/1/48>
- U.S.-wide UHI heat-health vulnerability mapping tool: <https://geoxc-apps2.bd.esri.com/Climate/HeatVulnerability/index.html>
- Mapping Human Vulnerability to Extreme Heat: A Critical Assessment of Heat Vulnerability Indices Created Using Principal Components Analysis: <https://ehp.niehs.nih.gov/doi/full/10.1289/EHP4030>
- U.S. EPA UHI Mapping Guidance: <https://www.epa.gov/heatislands/measuring-heat-islands>
- Health Canada (2020) Reducing urban heat islands to protect health in Canada. Ottawa, ON: <https://www.canada.ca/en/services/health/publications/healthy-living/reducing-urban-heat-islands-protect-health-canada.html>

**Timeline**

Following the signing of the contract, the SUPPLIER is expected to complete all final deliverables within 12 months.



## **APPENDIX C – TECHNICAL EVALUATION**

## **APPENDIX C: TECHNICAL EVALUATION CRITERIA**

### **Technical Evaluation Process**

The technical evaluation for the development of guidance for urban heat island (UHI) mapping will consist of:

1. A determination of the compliance of each bid with the mandatory requirements stated in Part A, below. This phase will consist of determining compliance of submitted Proposals against mandatory requirements. Proposals meeting all the mandatory requirements will be considered for the second phase. Proposals that do not substantially comply with all mandatory requirements and / or are substantially incomplete, will be disqualified and not evaluated further.
2. Each proposal that meets the stated mandatory requirements will be evaluated against the point-rated technical selection criteria (Part B). This phase will consist of evaluating the (i) technical and (ii) cost merits of proposals, which meet the stated mandatory requirements, against the point-rated technical selection criteria. Bidders must achieve a minimum score of 70% (70 points of a possible 100 points) for the point-rated technical criteria as stated in Part B, below. Only proposals meeting these requirements will be considered.
3. In the financial evaluation, tendered prices of the qualified bids will be computed as stated in Appendix D: Financial Terms and Conditions.
4. The highest-ranked Respondent will be determined using the highest combined rating of technical merit (70 points) and cost (30 points).

An Evaluation Committee, consisting of at least three (3) SCC or SCC-appointed representatives, will be formed to assess all bids received in response to SCC RFP# 2023-24. The committee will be dissolved after the successful completion of their duties in selecting the Bidder with whom SCC will contract for the delivery of the Technical Guidance Development for UHI Mapping.

### **Part A: Evaluation of Mandatory Requirements**

Proposals will be assessed by the SCC Evaluation Committee to determine whether they meet mandatory requirements pertaining to:

- The Bidder, and
- The Project Team

Proposals shall not exceed 15 pages with 12pt font, excluding appendices.

## The Bidder

Each Bidder submitting a response to RFP #2023-24 must demonstrate to the satisfaction of the Evaluation Committee that:

- The bidding team must have at least one recognized expert for each of the mapping types covered in the call for proposals (e.g., surface temperature, air temperature, and heat-health vulnerability maps)
- The bidder has the technical competency to evaluate existing methodologies of mapping and the expertise to identify best practice methods for each mapping type
- The Bidder has an understanding of and connections with the target audience, proposed method(s) of communication, and any proposed complementary materials to facilitate greater awareness, understanding and application of the project across Canada.

## The Project Team

Each Bidder must agree to the following mandatory requirements for the Project Leadership Team:

- At least three (3) years of experience in UHI mapping.

As part of the proposal, the Bidder must include the following information for each Team Member (resource):

- a) Name of the proposed Team Member and the role for which they are proposed;
- b) A list of qualifications directly related to the requirements;
- c) Chronological work experience;
- d) A detailed list of relevant academic and professional attainments.

Only those proposals that are judged by the Evaluation Committee to have met all stipulated mandatory criteria will receive further consideration.

The Project Team must consist of at least on Project Leader, and at least one Team Member.

## Part B: Point-Rated Requirements

Each proposal must demonstrate to the satisfaction of the Evaluation Committee that all stipulated mandatory requirements can be substantiated through the evaluation of the point-rated requirements in the following four (4) categories, for which the respondent must include a response:

Category		Max. Points
I.	Project team experience in urban heat island mapping	55
II.	Distribution and outreach strategy	18
III.	Project schedule	17
IV.	Quality of the proposal	10
<b>Total Possible Points</b>		<b>100</b>

The point-rated requirements correspond to specific criteria, which have been identified as forming the basis for the accumulation of points in each of the four (4) categories. Each proposal **must include a response to each category.**

**70 of the possible 100 points must be achieved (70%) in order for the financial elements of the bid to be evaluated.**

The Evaluation Committee will assess the experience and competence of the Bidding Organizations, (“the Bidder”) with respect to RFP# 2023-24, in the development of standards solutions.

**I. Project team experience in urban heat island mapping**

The Bidder must provide examples that demonstrate the extent to which they meet each criterion. The same example may be used to meet various criteria but must be revised accordingly to highlight the context within which it applies. The basis for scoring each criterion is provided in the table below.

“Recent”, unless otherwise stated means within the last five years.

Criterion	Basis for Scoring	Possible Points
<p>I.A The Bidder is asked to provide three (3) recent examples that demonstrate that the Project Team has <b>experience in developing Surface Temperature UHI Map/s.</b></p>	<p>For each example, points will be awarded as follows:</p> <ul style="list-style-type: none"> <li>- up to four (4) points if the example somewhat demonstrates experience in the development of surface temperature UHI maps;</li> <li>- up to seven (7) points if the example convincingly demonstrates experience in developing surface temperature UHI maps for the use of various audiences and/or jurisdictions.</li> </ul> <p><b>Note:</b> If the Bidder provides more than three (3) examples, only the first three (3) examples will be scored in the order they appear.</p>	<p>21</p>
<p>I.B The Bidder is asked to provide three (3) recent examples that demonstrate that the Project Team has <b>experience in developing Air Temperature UHI Maps.</b></p>	<p>For each example, points will be awarded as follows:</p> <ul style="list-style-type: none"> <li>- up to four (4) points if the example somewhat demonstrates experience in the development of air temperature UHI maps;</li> <li>- up to seven (7) points if the example convincingly demonstrates experience in developing air temperature UHI maps for the use of various audiences and/or jurisdictions.</li> </ul>	<p>21</p>

Criterion	Basis for Scoring	Possible Points
	<p><b>Note:</b> If the Bidder provides more than three (3) examples, only the first three (3) examples will be scored in the order they appear.</p>	
<p>I.C The Bidder is asked to provide two (2) examples that demonstrates the Project Team has experience with the <b>successful oversight of projects of this nature.</b></p>	<p>For each example, points will be awarded as follows:</p> <ul style="list-style-type: none"> <li>- up to two (2) points if the example adequately demonstrates successful oversight;</li> <li>- up to four (4) points if the example convincingly demonstrates successful oversight.</li> </ul>	8
<p>I.D The Bidder should provide one recent example that demonstrates that the Bidder has experience synthesizing information gathered through both literature reviews and facilitated workshop(s)</p>	<p>The example should outline (a) the methodology and resources used for the literature review and its findings, and (b) the number and type of stakeholders, and (c) how the information was synthesized and how it was intended to be used by the client. Points will be awarded as follows:</p> <ul style="list-style-type: none"> <li>- Up to three (3) points if the example demonstrates the proposed Bidder has experience synthesizing information gathered through a workshop(s) and a literature review(s)</li> <li>- Up to five (5) points if the example demonstrates the Bidder has experience developing a report(s) by synthesizing information gathered through a workshop(s) or a literature review(s) for the purpose of identifying recommendations, guidelines, or best practices</li> </ul>	5

**II. Distribution and outreach strategy**

The Successful Bidder will plan and implement an outreach strategy to be approved by SCC in advance that will ensure appropriate engagement in the development of UHI mapping best practices and subsequently, increase awareness of the publication. Evaluation of each Bidder’s proposed outreach strategy will be based on the Bidder’s preliminary understanding of and connections with the target audience for the guidance developed.

In particular, the Evaluation Committee will assess the depth of the Bidder’s understanding of and connections with the target audience, proposed method(s) of communication, and any proposed complementary materials to facilitate greater awareness, understanding and

application of the best practices identified across Canada. The Bidder must provide examples that demonstrate the extent to which they meet each criterion. The basis for scoring with respect to each criterion is also provided in the table below.

Criterion	Basis for Scoring	Possible Points
<p>II.A The Bidder is asked to demonstrate an understanding of and connections with UHI developers and users.</p>	<p>Points will be awarded as follows:</p> <ul style="list-style-type: none"> <li>- up to three (3) points for a <b>breakdown</b> of the target audience into relevant organizational categories;</li> <li>- up to five (5) points for a <b>breakdown</b> of the target audience into relevant organizational categories, <b>listing up to two (2) active contacts</b> in some of the organizational categories with whom the Bidder has an active relationship (including the contact's name, title, and organization);</li> <li>- up to eight (8) points for a <b>detailed breakdown</b> of the target audience into relevant organizational categories, <b>listing up to two (2) active contacts</b> in each organizational category with whom the Bidder has an active relationship (including the contact's name, title, and organization)</li> </ul>	8
<p>II.B The Bidder is asked to provide an example of experience promoting awareness of UHI and capacity to provide easily understood guidance to stakeholders.</p>	<p>Points will be awarded as follows:</p> <ul style="list-style-type: none"> <li>- up to two (2) points for demonstrating experience promoting technical information on UHI;</li> <li>- up to two (4) points for demonstrating experience promoting technical information on UHI <b>and</b> developing complementary guidance materials</li> </ul>	4
<p>II.C The Bidder is asked to identify short-term activities for promotion and outreach to facilitate awareness, distribution and understanding of the final deliverable to the target audience.</p>	<p>Points will be awarded as follows:</p> <ul style="list-style-type: none"> <li>- up to three (3) points for an outreach plan with <b>minimal</b> detail or insight;</li> <li>- up to six (6) points for a <b>detailed</b> outreach plan that <b>demonstrates understanding of the needs and characteristics of the target audience.</b></li> </ul>	6

### III. Project plan and schedule

The Bidder is required to provide a proposed (preliminary) schedule for development of the Project so that the Evaluation Committee may assess whether the Bidder has a realistic and well-ordered plan for the coordination of development work within the 12-month window, from start to finish. Because the project has an accelerated timeline, further points will be given if the proposed project schedule can complete the development of the Project in a shorter timeframe. The basis for scoring the proposed schedule is provided in the table below.

Criterion	Basis for Scoring	Possible Points
<p>III.A The Bidder is asked to demonstrate that the Project team will use a development process that will result in products that are of a high technical quality, as well as relevant, well accepted, and implementable. This requires the Bidder to describe key steps relating to work plan.</p>	<p>Points will be awarded as follows:</p> <ul style="list-style-type: none"> <li>- up to five (5) points for a <b>basic</b> plan that identifies key details, deliverables, intended users and audiences, and key assumptions;</li> <li>- up to eight (8) points for an <b>adequate</b> plan that identifies the main details, deliverables, intended users and audiences, and key assumptions;</li> <li>- up to seventeen (17) points for a <b>thorough</b> plan, that includes details, deliverables, intended users and audiences, and key assumptions, and explains how they would contribute to the development of a strong best practices guide for the development of UHI maps.</li> </ul>	<p>17</p>

#### IV. Quality of the proposal

The Evaluation Committee will assess the quality of the proposal to determine whether the information organized within the proposal is presented in a clear and comprehensive fashion.

Criterion	Basis for Scoring	Possible Points
<p>IV.A The Bidder is asked to assure that material within the proposal is formatted, organized, and written in such a way as to make clear to the reviewer where responses to mandatory and point-rated requirements are located. The writing should also be concise, easy-to-read, and edited for typos.</p>	<p>Points will be awarded as follows:</p> <ul style="list-style-type: none"> <li>- no more than four (4) points if the proposal is poorly organized, difficult to read, and contains frequent typos;</li> <li>- up to seven (7) points if the proposal is generally well-organized but is somewhat difficult to read and contains some typos;</li> <li>- up to ten (10) points if the proposal is highly organized, concise, clearly written, and contains very few to no typos.</li> </ul>	<p>10</p>

## **APPENDIX D – FINANCIAL PROPOSAL**



## APPENDIX D: FINANCIAL TERMS AND CONDITIONS

These financial terms relate specifically to the obligations as detailed in Appendix B: Statement of Work. The estimated cost of this project is expected to be below a set threshold of \$100,000, excluding the Contingency Amount. Any and all figures referenced are in Canadian currency, pre-tax. Any and all associated taxes shall be the responsibility of the SUPPLIER to ensure appropriately recorded and remittance made.

All out-of-pocket expenses are to be pre-approved by the SCC Managing Authority.

All work shall be completed within 12 months of contract signature.

The figures referenced above shall be paid by SCC, electronically or by cheque made payable to the SUPPLIER within thirty (30) days of receipt of invoice(s) according to the following schedule:

Activity	Deliverable	Cost
1. Develop steering committee	A list of mutually agreed-upon steering committee members that will include HC (member) and SCC (observer).	
2. Draft literature review and analysis	Rough draft of literature review	
3. Revise literature review and analysis	Final draft of literature review	
4. Conduct national workshop	Conduct a national workshop and provide SCC & HC with a workshop report summarizing findings	
5. Draft final report	Rough draft of final report for revision	
6. Provide final report	Address feedback from stakeholder committee members, SCC, HC, and other experts to provide Final Report in English.	
7. Develop a Distribution and Outreach Plan	Approved distribution plan	
Project Coordination: Steering committee meetings	Regular meetings led by SUPPLIER to update on progress. To be conducted once every two months.	
Project Coordination: Meetings with Project Authority	Regular meetings with project managers from both SUPPLIERS to update each other on progress and align key considerations.	

(SCC and HC) and SUPPLIER of parallel UHI mapping project (heat health vulnerability maps)	To be conducted once a month as well as at critical junctures (project kick-off, pre and post-workshop, and project closure). SCC and HC will set these meetings at Project kick off.	
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Every federal institution is required to ensure that any member of the public can communicate with and obtain available services from an office or facility of that institution, or of another person or organization on behalf of that institution, in either official language shall ensure that appropriate measures are taken, including the provision of signs, notices and other information on services and the initiation of communication with the public, to make it known to members of the public that those services are available in either official language at the choice of any member of the public.

**Notes:**

1. *Contingency amount - As required there may be additional French language interpretation and/or translation tasks upon acceptance by stakeholder(s) or participant(s) of an active offer with respect to the Official Languages Act. These costs will be reimbursed based on actuals, and must be substantiated by the Supplier (e.g., through records of translator efforts/time) to a maximum of \$30K.*
2. *Any and all deliverables shall be accepted by SCC prior to any amounts being invoiced by the SUPPLIER, such acceptance not being unreasonably withheld.*
3. *End of Project Phase is based on the completion of the referenced stage; completion is deemed to be achieved once all the deliverables for the stage have been submitted by the Supplier and approved by SCC.*
4. *Project Completion occurs once the Supplier has completed all deliverables within the Scope of Work (see Appendix B) AND all invoices have been submitted.*

The financial proposal will be evaluated as follows:

$$p = y * \mu / z$$

Where

- p = points for the financial proposal being evaluated
- y = maximum number of points for the financial proposal
- μ = price of the proposal with the lowest price
- z = price of the proposal being evaluated

## **APPENDIX E – TARGET AUDIENCES AND USE CASES**

## **APPENDIX E: TARGET AUDIENCES AND USE CASES**

The SUPPLIER will use the following information as guidance as they develop recommendations on the most desirable mapping methodologies and illustrate how they fulfill the variables of interests per target audience group.

HC and SCC have identified five target audience groups that will benefit from UHI mapping guidance as they are implemented by technical experts, which are: (1) health and social sectors, (2) infrastructure and urban planning sectors, (3) orders of government, (4) the environmental sector, and (5) the public. Below are the key use cases of consideration for each target audience:

### **Health and social sectors**

- Identify populations and areas vulnerable to extreme heat to prioritize implementation of climate adaptation / mitigation measures and UHI-reduction actions
- Forecast extreme heat events
- Evaluate the effectiveness of UHI adaptation and reduction efforts

### **Environmental sector**

- Understand the impact of urban trees and vegetation on surface and air temperatures
- Measure the ecological services provided by urban trees
- Model ecosystem response and spread of invasive species
- Identify suitable locations for reforestation / tree planting efforts
- Determine the lifespan of trees, diversity of tree species, and vegetation coverage
- Determine the risk of cascading hazards such as wildfires and flash floods

### **Infrastructure and urban planning sectors**

- Understand the impact of urban heat on infrastructure such as housing, buildings, and bridges and the durability of materials
- Identify infrastructure that is most vulnerable to the effects of extreme heat
- Understand how climate change will affect indoor heat, energy consumption, and GHG emissions
- Combine multiple hazard data (e.g., flood and wildfire data) to inform multi-faceted risk assessments
- Understand the impact of the physical / spatial environment on the UHI effect to adapt urban planning
- Assess a community's vulnerability to climate change, as well as its adaptive capacity
- Use UHI mapping to inform municipal building and infrastructure plans, policies and activities

### **Various levels of government**

- Understand projected heat-related risks to help in developing effective federal, provincial and territorial policy and programs

- A uniform integrated risk index that can be adopted by all jurisdictions, similar to the Air Quality Health Index for a high-level understanding
- Be able to layer urban heat maps with other datasets relevant to the context and jurisdiction in question
- Understand end-user needs to develop useful UHI maps (higher levels of government tend to be producers, rather than users, of UHI maps)

#### **General public**

- Clear, accessible information to understand risks associated with extreme temperature where they live
- Current and projected information on local extreme heat events (e.g., an extreme heat forecasting system)
- The ability to locate critical resources such as cooling centres and shade structures
- The ability to identify adaptation/mitigation measures that can be undertaken at the individual and community level

**APPENDIX F – DRAFT AGENDA FOR A PAN-CANADIAN VIRTUAL UHI  
WORKSHOP**

## **APPENDIX F: DRAFT AGENDA FOR A PAN-CANADIAN VIRTUAL UHI WORKSHOP**

**Purpose:** Convene subject matter experts and methodologists across Canada to discuss what type of methodology is most desirable for standardization.

**Number of attendees:** 30 to 50

**Format:** Two virtual sessions, spread out over two different days. See below for roles and responsibilities.

**Flexibility:** SCC is open to changes to this draft agenda.

<b>Session # and Topic</b>	<b>Target attendees</b>	<b>Workshop Deliverable</b>	<b>Role of heat-health vulnerability SUPPLIER</b>	<b>Role of surface/air temperature SUPPLIER</b>
<b>1. Best practice methods for each mapping type</b>	Technical experts and methodologists (two breakout sessions; (A) for heat-health, and (B) the other for surface/air)	Deliverable #1. Table that lists the three mapping types and the recommended methodology for each type that would best fulfill the objective of the key use cases found in Workshop Session #1	<ul style="list-style-type: none"> <li>a. Organize, facilitate, and lead breakout Group (A) only (heat-health vulnerability)</li> <li>b. Produce heat-health vulnerability component of Deliverable #1</li> </ul>	<ul style="list-style-type: none"> <li>i. Organize, facilitate, and lead Group (B) only (surface/air temperature)</li> <li>ii. Produce the surface and air temperature mapping component of Deliverable #1</li> </ul>
<b>2. Plenary for attendees of Session 1 to review and provide feedback on deliverable #1</b>	End users of all three mapping types	Deliverable #2. Summary table (or report) that lists all three mapping types, their key uses, and the methodology best practices for each type as reviewed and agreed-upon by all attendees	<ul style="list-style-type: none"> <li>c. Organize, facilitate, and lead overall meeting</li> <li>d. Produce Deliverable #2</li> <li>e. Consult with the Surface/Air temperature supplier throughout.</li> </ul>	<ul style="list-style-type: none"> <li>iii. Support the heat-health vulnerability supplier in an advisory capacity</li> </ul>