Co-production of a local climate solution:

A community informed experiment to address heat risk of vulnerable populations in the Southwestern Ontario region

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INTRODUCTION

Overview of climate-related health risks and vulnerability assessment report and co-designed community heat risk reduction solution

In 2023, Southwestern Public Health (SWPH) in partnership with the University of Waterloo's Climate Institute, conducted an in-depth assessment of climate-related health risks and vulnerabilities for SWPH. The report highlighted climate risks specific to the southwest region of Ontario and range of health impacts of climate change on local vulnerable populations. The report proposed a series of recommendations to improve climate resilience in the community. A key message was the need for partnership led and community informed tangible actions which can directly reduce risk and promote long term adaptation capacities amongst vulnerable populations.

A second phase of the partnership between SWPH and the Climate Institute focused on designing an experiment to operationalize and implement selected recommendations from the vulnerability assessment

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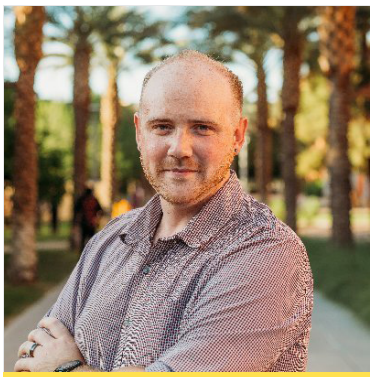
report. Specifically, to address extreme heat risks of selected vulnerable populations in the region.

This initiative would require building local capacities of local organizations, partners and the local community to better understand the risk and contribute to the design of a solution guided by the recommendations of the assessment report.

The experiment methodology was designed using a team-based approach involving multiple organizations. This methodology was developed and previously tested in multiple cities by the TRANSFORM research team at the University of Waterloo. The TRANSFORM project is supported by a network of researchers committed to building capacity to accelerate their transition to sustainable and resilient cities, and informing policies that help shape inclusive, and competitive low-carbon communities. The research team developed an experiment model to map out and plan how to design, implement and amplify the impact of multi-team climate solutions. This approach includes integrating technical and social activities, creating a step-by-step process for implementing climate innovations.

In the following sections, we explain how a community heat risk reduction and climate adaptation solution was co-produced through collaboration with partners, community participants, researchers, health experts and students. The result is a climate solution which is expected to serve as a visible example of climate action in the region of Oxford County, Elgin Country and the City of St. Thomas.



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BACKGROUND: SWPH VULNERABILITY ASSESSMENT REPORT

Accelerated climate change is leading to increased impacts on communities and are expected to continue posing significant risks to human health and well-being. Public health plays a critical role in reducing climate-related health risks. Addressing these risks requires a focus on enhancing the resilience of communities and systems through long term adaptation strategies. To better understand health-specific risks and vulnerabilities, public health agencies across Canada and around the world are conducting climate change and health vulnerability assessments. The data and evidence in these reports help guide public health action.

SWPH has already taken steps to address climate-related health impacts and reduce risks through strategic collaboration with a broad range of partners across the public, private, and non-profit sectors. Additionally, local initiatives, such as tracking heat- and cold-related emergency visits and hospitalizations, and establishing RAVE Alerts, represent proactive measures to protect vulnerable residents. However, much remains to be done, and the climate change and health vulnerability assessment report created for SWPH describes in further detail the most vulnerable populations in the southwestern region. These vulnerable populations are identified by a number of criteria, including their higher levels of exposure to hazards associated with climate change, their socio-economic circumstances, and by their age, gender or race.

The most vulnerable populations in the SWPH region identified by the climate change and health vulnerability assessment include:

- Amish communities
- Low-German Speaking Mennonite Communities
- Immigrants
- Indigenous Communities
- LGBTQ2S+ Community
- International Agricultural Workers
- Older Adults
- Outdoor Workers/Outdoor Farm Workers
- People Experiencing Homelessness
- People Living Below the Poverty Line
- Women, especially single-parent households

The vulnerability assessment underscored the urgency of addressing climate change impacts on health, particularly for vulnerable populations, and emphasized the importance of proactive measures to enhance resilience and promote equity. Overall, the report serves as a vital resource for understanding and mitigating the health risks posed by climate change in the SWPH region. The report can help to guide policymakers, public health and partners in implementing effective adaptation and resilience strategies to safeguard community well-being.

The seven key recommendations from the vulnerability assessment include over 100 concrete actions to guide SWPH and local partners in implementing climate adaptation strategies to reduce health risks posed by a changing climate.

The seven key recommendations from the SWPH's vulnerability assessment:

1. Develop a comprehensive and co-produced risk reduction and prevention strategy for extreme weather conditions.
2. Review and enhance coordination mechanisms with area municipalities on land use planning.
3. Build and strengthen partnerships with agencies, organizations, and individuals beyond jurisdictional boundaries.
4. Create a communications plan to share up-to-date data on health risk information with recommendations.
5. Establish a monitoring and evaluation framework to assess the impact of climate actions and interventions.
6. Promote and advocate for social capital building activities.
7. Develop a climate-compatible sustainable food system strategy.

These recommendations call for a strong focus on knowledge sharing and translation to enhance equitable climate adaptation solutions. They also highlight the importance of expanding the scope of partnerships to harness complementary skills, resources, and capacities. In addition they emphasize the value of utilizing available tools to inform evidence-based decision-making within SWPH.

The main challenge is operationalizing and implementing the recommendations. It is important to ensure that SWPH projects and initiatives are informed and incorporate climate- and risk-focused activities into their design. The experimentation model and methodology developed by the TRANSFORM project, applied by the Waterloo Climate Institute, presented a way to turn the vulnerability report into a practical action plan. In the following sections, we explain the process of shifting from understanding risk to actively governing and investing in disaster risk reduction and climate adaptation.

The work conducted in this experimentation is an example of moving from technical to social solutions which deliver on the needs of the community, with and for the vulnerable populations in our region.

EXPERIMENTATION AS A MODEL FOR PILOTING LOCAL CLIMATE SOLUTIONS

Experimentation activities can be designed as a governance approach to sustainability, creatively trialing new ways of "organizing, doing, relating, and, in this way, generating alternative (forms of) innovative solutions with the potential to address contemporary urban challenges" (Frantzeskaki et al., 2018). In this approach, experimentation unfolds through a collaborative decision-making process. Individuals or organizations work together to identify and define a problem, design and test a potential solution, and enable joint learning, knowledge sharing, and co-production. The expected result is not only the solution to the problem, but also the social learning opportunity during the process.

In practice, experiments involve concrete trials with a defined origin and endpoint in time, space, and scope (Hilden et al., 2017). While the outcome may be uncertain, information and knowledge are generated, contributing to a deeper understanding of the challenge, and the success or failure of a particular approach. Lessons emerge even in failed attempts, shaping the decision-making sequence and parameters for future tests or challenges. In the context of sustainability and climate adaptation, this is essential for developing the capabilities to undertake new solutions.

Understanding the spectrum of possibilities in sustainability practice is crucial for innovation. Therefore, undertaking collective experimentation activities which lead to actionable knowledge, requires incorporating each participant's implicit knowledge of the community and the challenges, and for researchers to find a way to make it explicit and useful through the collaborative research process (Wittmayer and Hölscher, 2018). This effort is central to the experimentation process.

In the SWPH and the Waterloo Climate Institute partnership, researchers played a key role in helping actionable knowledge emerge from the interactions among multiple actors sharing diverse forms of knowledge, experiences, and practices. Researchers became part of the team, bringing a learning-focused approach driven by sustainability science.

When using experimentation, a key feature is to focus on place-based approaches, ensuring localized values and needs are being addressed (Bulkeley, 2023; Nguyen, Davidson, & Coenen, 2020). In practice, experimentation provides a framework to identify the place-based tools, materials, and people needed to drive change (Evans, Karvonen, & Raven, 2016).

Experimentation also creates opportunities for social learning. By encouraging the sharing of diverse perspectives and ways of knowing, it fosters opportunities to create greater innovation and creative solutions that might otherwise be overlooked. Additionally, social learning helps build stronger relationships and a sense of community.

This, in turn, can enhance the social acceptance of the proposed solutions, as people are more likely to support initiatives that reflect their input. The benefit, therefore, of using an experimentation approach is as much finding a solution to the problem, as it is the social learning opportunity during the unfolding of the process.

CO-PRODUCING A CLIMATE SOLUTION: HEAT RISK

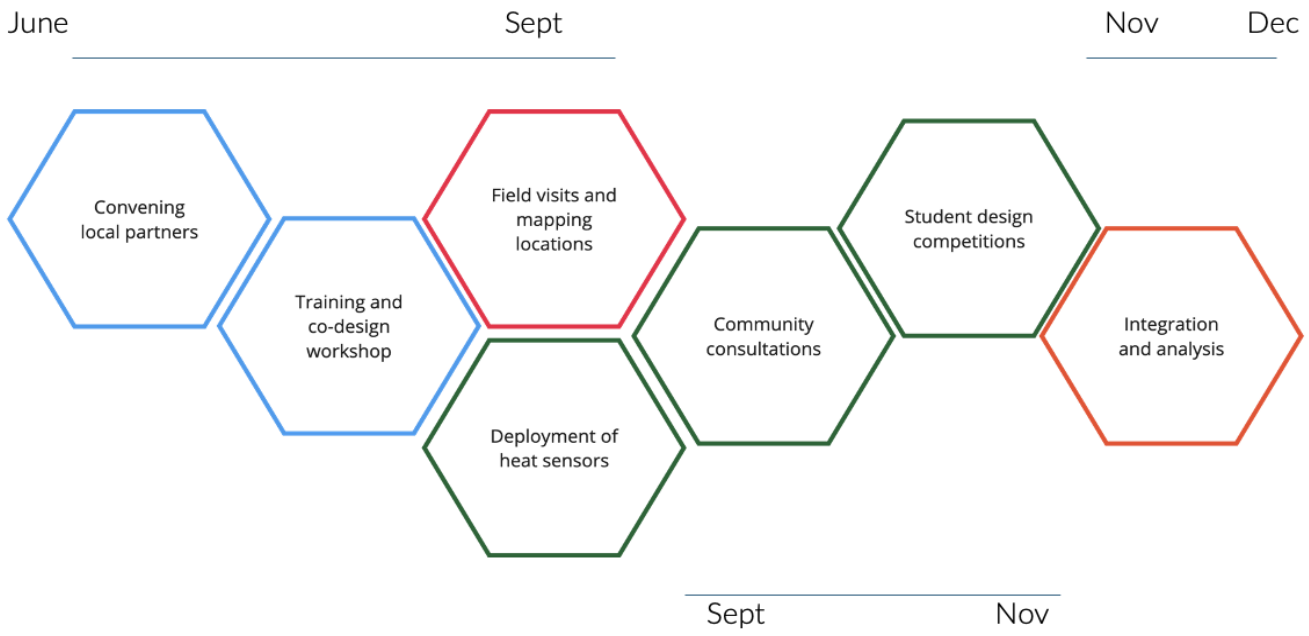
SWPH invited the Climate Institute to provide a second phase of support which focuses on 1) building capacity to implement actions from the assessment report and 2) guiding the implementation of an experiment (or pilot project) which would include support for monitoring implementation and impact. SWPH requested to focus this experiment on an action related to preparing for extreme heat, in line with recommendations from the assessment report.

The workshop to review the vulnerability report and kick off an action/experiment was organised by the Climate Institute in close collaboration with the Environmental Health team at SWPH. Throughout the planning process, the project team held extensive discussions with community partners to understand their vision for the cooling center's design and purpose.

Community partners emphasized the importance of:

- structural integrity and durability,
- a welcoming environment that fosters community connection,
- and features that strengthen people's relationships with the natural environment.

These priorities informed the next phase: the deployment of heat sensors to strategic locations in the community to generate a baseline of heat conditions and the launch of a student pitch competition hosted by the Climate Institute team at the University of Waterloo, challenging students to propose innovative design ideas for a community cooling center based on community criteria.



Co-design sequence of activities June to December 2024

1. CONVENING LOCAL PARTNERS

SWPH and the Waterloo Climate Institute invited key organizations in the Southwestern region to participate in a combined capacity-building and experimentation program over the period from June to December of 2024. This program would focus on applying the knowledge gained in the vulnerability assessment to the co-design of an evidence-based pilot experiment design to implement some of the actions recommended in the report. The organizations would engage in a two-day training workshop to begin the design of the experiment. The first day focused on building an understanding of the health risks posed by climate change and the main outcomes of the Climate and Health Vulnerability Assessment. On the second day, the participants applied that knowledge to the co-design and launched a pilot experiment to advance multiple areas of action recommended in the Vulnerability Assessment Report related to the impacts of extreme heat.

In undertaking this approach, SWPH sought to directly include vulnerable populations identified in the vulnerability assessment report in meaningful ways to make decisions in ways that would ensure the partners designed an equity-informed solution. This process began by assembling the multi-organization team to design, deploy and monitor this experiment. The participating organizations were free to choose their level of involvement in the program, with varying degrees of engagement, offered:

- ***Bi-weekly check-ins:*** Virtual sessions held from July to December helped maintain momentum and engagement of the team in the experiment. During the sessions, the core group leading the experiment would provide updates to the broader team, and participants with specific tasks shared progress, barriers, and experiences.
- ***Core implementation activities:*** These included key tasks that directly contributed to the experiment's main objective or deliverable of the experiment, such as research, planning, field visits, oversight, as well as different types of actions.
- ***Amplification activities:*** Participants identified and carried out activities to promote the experiment and extend its impact., This included sharing findings, expanding the use of research outputs, involving new participants and stakeholders, and engaging diverse e communities to highlight the process of implementing a climate solution.
- ***Knowledge mobilization and social media activities:*** The depth and scope of these efforts varied, but a coordinated approach among all organizations to share updates on the process and the lessons from this pilot with the broader community of stakeholders in the region, would strengthen the outcomes of the initiative. This was planned during the session.

In the following sections, we present the milestones and key steps in the experiment and capacity building process that shaped the final design.

2. TRAINING AND CO-DESIGN WORKSHOP

In June of 2024, the Waterloo Climate Institute facilitated an initial two-day training and experiment design workshop. This capacity building activity and experiment methodology was designed by the TRANSFORM research team at the University of Waterloo. The TRANSFORM project is supported by a network of researchers committed to building capacity to accelerate their transition to sustainable and resilient cities, and informing policies that help shape inclusive, and competitive low-carbon communities.

The team developed a model to map and plan for designing, implementing and amplifying the impact of multi-team climate solutions (DiBella and Burch 2025*). This process includes a design to plan for weaving financial, technical and social activities to develop a unique emerging sequence for implementing climate innovations.

The objectives for the two-day workshop included:

- Provide an overview of climate change and disaster risk reduction concepts.
- Familiarize participants with the SWPH Climate Vulnerability Assessment Report.
- Present participants with the concept of sustainability experiments and real examples.
- Apply the methodology for team-based experiment design and planning by working collaboratively to design a climate adaptation experiment for the SWPH region.
- Launch the SWPH experiment.

There were approximately 22 participants from 14 organizations that participated in the workshop. Most of the participants were from departments in SWPH. Below is a list of all the organizations who participated. By the end of the workshop, we had assembled a multi-organization team that will support and lead the design, deployment, and monitoring of the experiment. The organizations who attended the workshop included:

- Oxford Coalition for Social Justice
- Medavie Elgin
- Ingamo Homes
- Various Oxford County senior's groups.
- Ontario Federation of Agriculture
- Elgin Federation of Agriculture
- City of St. Thomas
- Elgin County
- Social Planning Council Oxford
- Municipality of Dutton Dunwich
- United Way Oxford
- West Elgin Community Health Centre
- SWPH - Environmental Health
- SWPH - Chronic Disease & Injury Prevention
- SWPH - Emergency Preparedness
- SWPH - Communications

3. SELECTED EXPERIMENT: OUTDOOR COOLING SPACE

At the end of the workshop, the participants selected an outdoor cooling space (the cooling hub) as the experiment design. The outdoor cooling space would support building community, incorporate nature-based elements, and be designed to be easily deployed to multiple locations in the region. The SWPH team and partners will identify the testing locations and select the target communities for the pilot. Each of the test communities will engage in an engagement process to inform the design of the outdoor space. The design of the experiment drew on the pathway mapping and amplification of climate solutions methodology (DiBella and Burch 2025*) designed to combine technical and social activities to design a climate intervention in local communities. This would serve as the roadmap for the team to work through the design, engage community members, and ensure a combination of knowledge and experience would be part of a learning process for participants.

The selected experiment idea and the process would then also contribute to developing a comprehensive and co-produced risk reduction and prevention strategy for extreme weather conditions. In addition, the process would provide a learning opportunity for SWPH to build and strengthen partnerships as well as establish a monitoring and evaluation framework to assess the impact of its climate actions and interventions. Finally, it will ensure the design will promote and advocate for social capital building activities in the community.

All of the results from the workshop align with the key recommendations from the vulnerability assessment report.

Experiment Pathway Model (DiBella and Burch 2025*)

4. FIELD VISITS AND MAPPING OF LOCATION

The SWPH staff conducted a series of field visits to observe the locations and features of existing parks, playgrounds and recreation spaces, as well as the characteristics of the surrounding areas. This included examining areas with higher-density housing, other existing infrastructure, and the accessibility features of the spaces. The goal was to decide where to strategically place a series of heat sensors throughout the region to collect baseline heat data for evaluating the changes in temperature in the cooling space.

Utilizing Ontario marginalization index maps the lead team were able to pinpoint recreational areas and spaces that were in areas of higher marginalization. These maps look at the following:

- **Household and dwelling indicators:** Measure types and density of residential accommodations, and certain family structure characteristics, such as % living alone and % dwellings not owned.
- **Material resources indicators:** Measure access to and attainment of basic material needs, such as % unemployment and % without a high school degree.
- **Age and labour force indicators:** Describe % seniors (65+), the dependency ratio (the ratio of seniors and children to the population 15-64) and % not participating in the labour force.
- **Racialized and newcomer populations Indicators:** Describe % recent immigrants and % who self-identify as a 'visible minority' (as defined by Statistics Canada).

The SWPH used the field visits and data from the index maps to select the locations for deploying a series of heat sensors for creating a baseline of high temperatures in specific spaces, such as parks, plazas and playgrounds where the cooling hub could be located.

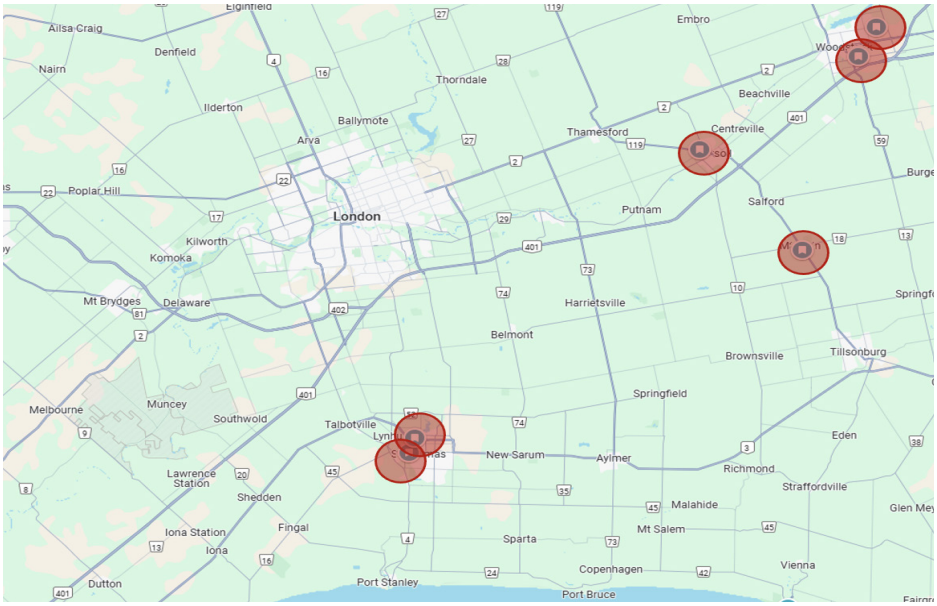
5. DEPLOYMENT OF HEAT SENSORS

A technical feature of the experimentation process was to generate a rigorous baseline to measure the effectiveness of the cooling center. The SWPH team wanted to collect heat data from potential cooling center locations across the region.

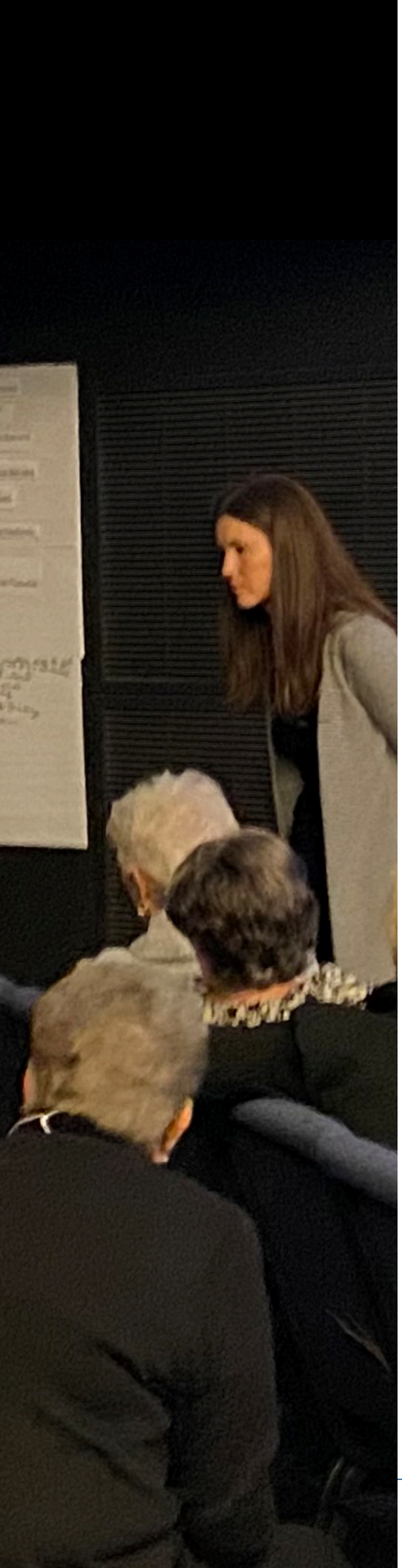
In collaboration with Dr. Peter Crank from the University of Waterloo, the team deployed eight heat sensors in early July, strategically placing them to capture temperature data from different sites and understand which areas experienced the highest temperatures at specific times. When the sensors were retrieved in mid-September, one of the devices had been removed and one contained unusable data. Data from the six functioning sensors still provided valuable insights to help determine optimal cooling center locations and operating hours.

The heat sensors provided the baseline heat data (See annex 1) necessary to measure the impact of the cooling spaces in the following year. This data collected will act as an evaluation parameter for implementation of the experiment in SWPH.

Sensor Location	Address
Cowan Fields	Cowan Fields, 1495 Devonshire Ave. Woodstock ON N4T 0B3
Mount Elgin	Mount Elgin Library, 333204 Plank Line Mount Elgin N0J 1N0
Waterworks	Waterworks Park, 2 S Edgeware Rd, St Thomas, ON N5P 2G8
West Lake Evans	West Lake Evans Park, 30 St Catharine St, St Thomas, ON N5P 2V8
West Elgin	West Elgin Community Health Centre, 153 Main St SS 1, West Lorne, N0L 2P0
Ingersoll	Garnett Elliott Park, Wonham St N, Ingersoll, ON
Port Burwell	Port Burwell Memorial Park, 22 Brock St, Port Burwell, Ontario



Heat sensor locations



6. COMMUNITY CONSULTATIONS: INTEGRATING VULNERABLE POPULATION PERSPECTIVES

During the project the SWPH team actively engaged with vulnerable populations throughout the region. These engagements were primarily organized and proposed by community partners, who leveraged their established and trusted relationships with these groups. This approach was crucial for fostering open dialogue and ensuring that the voices of these populations were heard.

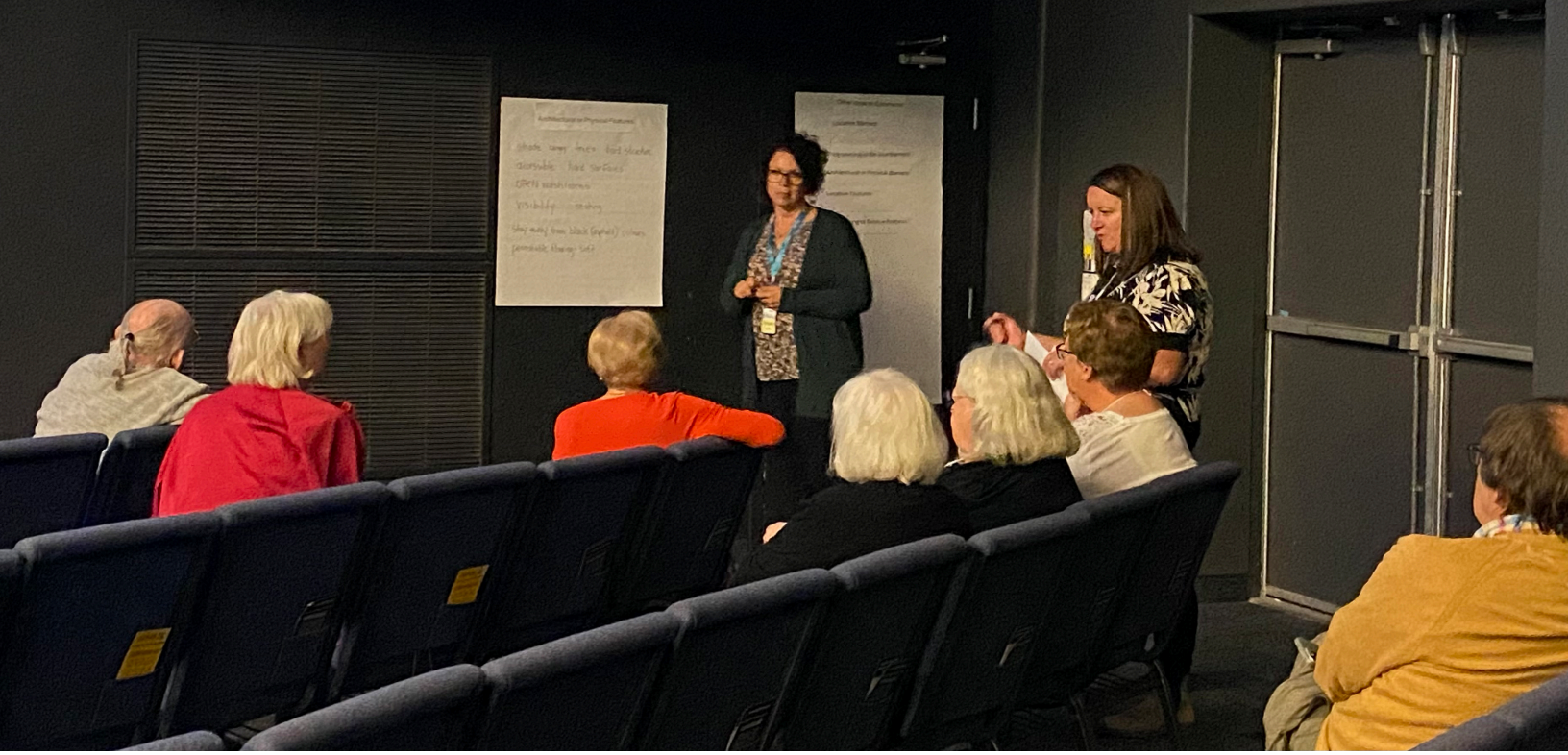
Through a series of focus groups, the SWPH team was better able to understand the features, programs and services, and locations that would attract members in the community to an outdoor cooling centre. This process was particularly focused on two key groups identified in the Vulnerability Assessment: older adults and parents of young children.

Elderly individuals often face unique challenges during extreme heat events, including mobility limitations and increased health risks. Meanwhile, parents of young children may be particularly concerned about the health and safety of their children during heat waves. By involving these populations in the engagement process, the SWPH team and community partners aimed to gather insights that would inform the design and resources offered by the cooling space.

A total of three (3) sessions were held with older adults. The total number of older adults who participated was approximately 32. An additional three (3) sessions were held with parents of young children with approximately 15 participants in total.

During these sessions, the SWPH moderator diplayed the group discussion questions on poster boards. The moderator started the session by giving a brief overview of the concept of nature-based cooling spaces/hubs. Following the overview, the moderator posed each question eliciting participants to write ideas, short phrases, or images on post-its or share ideas verbally with the moderator. SWPH used qualitative thematic analysis to analyze the data collected from the focus groups and the community group consultation.

From the consultations, the following preferences were identified:



Preferences: Older Adults:

Physical Features:

For physical features in the cooling hubs, older adults wanted built-in features such as seating options that were wheelchair accessible. Additionally, they noted the need for a variety of cooling options, including shade, misting systems, and portable cooling options. They also expressed a desire for an overall age-friendly design, including features such as ramps. Older adults did not want a cooling space with accessibility barriers (such as excessive stairs). They also had concerns regarding safety and homelessness; these safety concerns cited the need for proper security, a general desire to feel safe, and a preference for lack of encampments in the space.

Programming:

Older adults wanted programming in the cooling hub that included both facilitated and non-structured activities. They also expressed a preference for music to be incorporated into the space. As for programming that would not be appealing, some older adults mentioned programming that was unscheduled, had cost barriers or accessibility barriers (i.e., not considerate of hearing impairments).

Location:

One of the main features that older adults wanted in a cooling hub was vehicle accessibility, including the ability to access the space via public transit. They also expressed a preference for having the space include elements of nature and greenspace, such as being located near natural water, a forested area, where there is an existing park, or to incorporate a community space for gardening. This group also mentioned that cooling hubs to be fairly distributed across the region in areas of high need and not just in the main city center locations, so that they would be located where people who need them can use them. When it came to what older adults did not want in a cooling hub, there were concerns regarding people who experience homelessness or who use substances being close to the site.

Preferences: Parents of Young Children

Physical Features:

For physical features in the cooling hubs, parents of young children wanted to see age-friendly design elements, such as safe climbing spaces and low heights. Another desired feature for this group was cooling elements, including shade structures and misting systems. This group also emphasized the importance of seating and specific ground cover, such as rubber or non-slip surfaces. Some of the physical features that this group did not want included a lack of fencing/barriers for their children and poorly designed play equipment.

Programming:

Parents of young children desired that programs and services be available in the space, including a variety of structured and non-structured activities, as well as various types of outdoor play equipment. Additionally, there was a noted desire for music to be incorporated into the space and for there to be specific scheduling for activities occurring.

Location:

Parents of young children noted a preference for locations that had features including walkability and the proximity to downtown locations. Additionally, this group also favoured locations that felt safe to visit. Interestingly, libraries were cited by this group as locations that encapsulated things they would like to see in the cooling hub spaces. Access to the cooling space via vehicle (including public transit, private vehicle and other motorized vehicle) was also noted as a preferred feature for a location to have. When speaking about what they did not want in the cooling space, they broadly referenced safety concerns, including the need to have the location feel safe, as well as locating it away from specific locations (i.e., away from downtown and away from high school/elementary schools).

Overall, the consultation process contributed to a collaborative approach which supports an approach that considers that adaptation efforts were grounded in the lived experiences of those most affected by extreme heat.

7. STUDENT DESIGN COMPETITION: TECHNICAL DESIGN

An additional technical element of the experiment was a visual design component. The experiment lead team organized a student design competition aimed at harnessing the ideas and creativity of young people in delivering on local climate solutions. Launched in mid-October, the competition concluded with a winner announced at the end of November. The winning design will serve as the basis for the final design of the cooling space, which will be built and deployed by the summer of 2025.

This approach aimed to incorporate the creativity of the student community and expand the participatory element of the co-design process. The technical aspects of designing a functional cooling center—such as integrating energy-efficient systems—required expertise in fields like architecture and engineering, allowing students from these disciplines to bring specialized knowledge to the project. The call required the design of a modular outdoor community cooling space with a sustainable cooling system that would reduce heat risk stress and provide a social space for the target vulnerable populations.

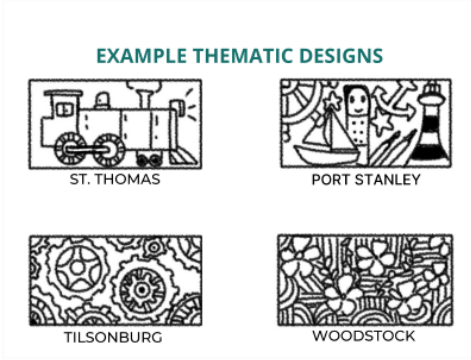
The student teams were required to propose designs which incorporated a sustainable energy-efficient cooling system that would be easy to install, a structure which could hold 15+ people comfortably for multiple hours, and contributed to people's well-being by incorporating nature, edible gardens and/or welcoming site atmosphere. Additionally, the designs could be installed and use the reconversion of existing municipal outdoor structures (such as gazebos or band shells) to create the cooling space or be designed based on a modular space which could be easily set up in municipal spaces (i.e., parks, courtyards) and take down for the winter.

The student competition phase of this project partnership focused on a technical design to support a pilot project (experiment) to address extreme heat. The winning design would then be part of the final design proposal for the health board. The call resulted in ten submissions illustrated in the following table:

THE GARDENING WELL: PASSIVE COOLING

Marisa Gianmarco, Meaghan Roberts and Celia Zeng
School of Architecture and School of Architectural Engineering

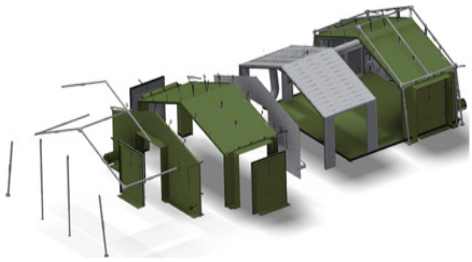
This design utilizes Stacked Effect to cool this accessible communal space. Adaptable for urban and rural settings, this wooden structure provides accessible seating options for everyone to enjoy the views of the vertical garden and surrounding environment.



RECREATIONAL COOLING SPACE

Chelsea Dickson, Sam Goncalves-Horton and Rodney Guan
School of Environment - Planning

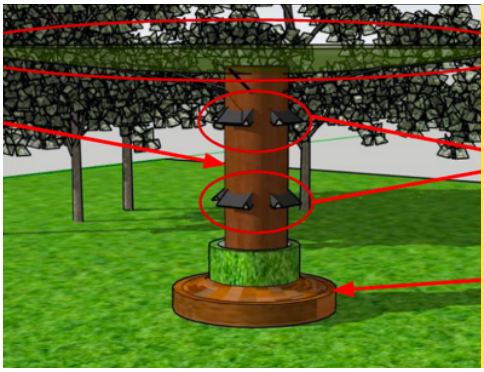
Merging the concepts of sun sails and green walls, this space creates an enclosed 'wind tunnel' providing cooling for the community. This low tech solution can be easily assembled and disassembled, and fosters community engagement by integrating a community art installation.



EMERGENCY COOLING CENTRES

George Yuan
School of Public Health

Taking inspiration from the Red Cross and Canadian Armed Forces, this soft-walled modular shelter provides a short-term cooling space. Utilizing semi-rigid flooring to keep dirt, pests, and dust from infiltrating the space, this design can be used for extreme heat or cold environments.



URBAN GROVE

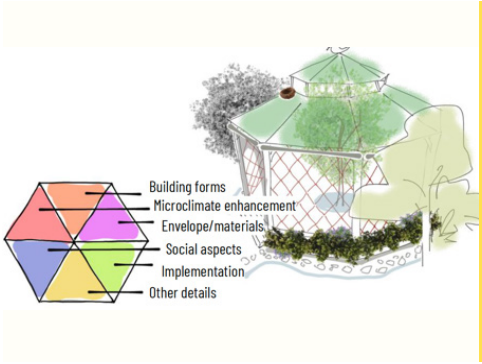
Hanan Navqi and Hashir Tahirkheli
School of Urban Planning

While this design blends in with surrounding trees, it aims to utilize a fan ventilation system to cool folks sitting along the base of the design. With no enclosing elements, this structure ensures that there is high visibility of people who are accessing the space, making this design safe for the community.

SOCIAL COOLING SPACE

Ashley Juraschka and Joanna Rywak
School of Civil Engineering

Merging solar-panel technology with a rainwater collection system, this space offers a cool gathering space that is accessible for all and offers a source of potable drinking water. This modular design can be easily scalable and foster local partnerships for locally sourced materials.



MICROCLIMATE GAZEBOS

Leslie Jiayi Liu

School of Environment - Planning

Upgrading current gazebos within the community, this design aims to bring in more natural elements as a passive cooling system. By adding a rainwater system around current gazebo structures, it increases flood resiliency, while also using this water to upkeep the surrounding biodiversity.

ADIABATIC COOLING

Ann Chen and Maeve Wang

School of Architecture

Using an adiabatic cooling system, this space provides shade and ventilation for folks who come across this space. Having the main structure be the cooling system enveloped by clay balls and native plants surrounding the structure, this outdoor space provides a unique environment for people to gather and gain closer relationships with nature.

DAWN, NOON AND EVENING COOLING

Mathew Song

School of Civil Engineering

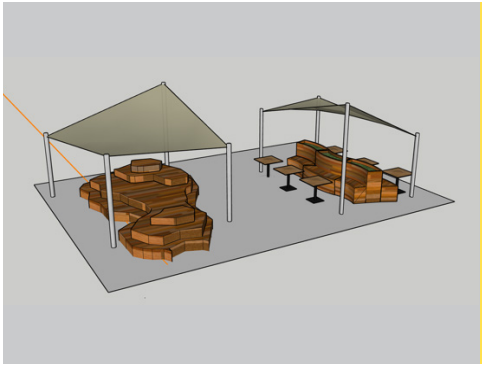
This wooden structure offers an eye-catching space for people to gather and children to play in. Using bright coloured seats to attract children to play, while offering shade, allows families to safely enjoy the outdoors.

BIOMIMICRY

Katie Traynor

School of Environment - Planning

The design of the cooling space is inspired by biomimicry architecture which draws on nature's cooling mechanisms. This includes using wood structures with a shape to provide partial shade cover and incorporating new solar technologies for powering cooling fans and water systems.



TERRA FLOW

Emily Schrader and Sarah Fencott

School of Environment and Business

Integrating built in games and various seating options, this cooling space hopes to foster creativity and community while mitigating extreme heat risks. Building native garden beds within the seating options also provides a closer relationship with nature.

SELECTED DESIGN

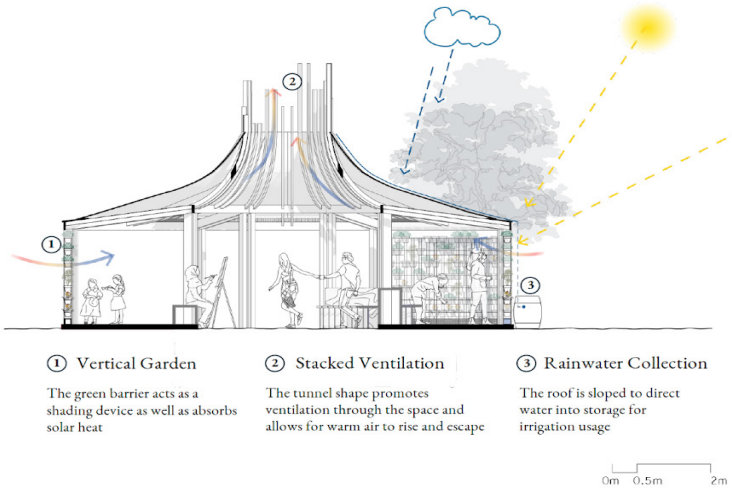
The analysis of the technical designs and community preferences for the cooling hub provided a guideline for selecting the final render for the experiment. "**The Gardening Well**" design was selected as the top submission. This cooling space/hub aligns with the requirements for a social space that incorporates nature-based elements and passive cooling, offering a low-cost environment for elderly people, parents of young children, and other community members. It provides a space for outdoor community activities during the summer. This is a crucial dimension in promoting mental health and well-being, particularly in the context of rising temperatures and the increasing climate-related stress in the region. Further, the heat sensor data and selected locations will be evaluated against the design, to select the ideal location for deployment of the first "***Gardening Well***".

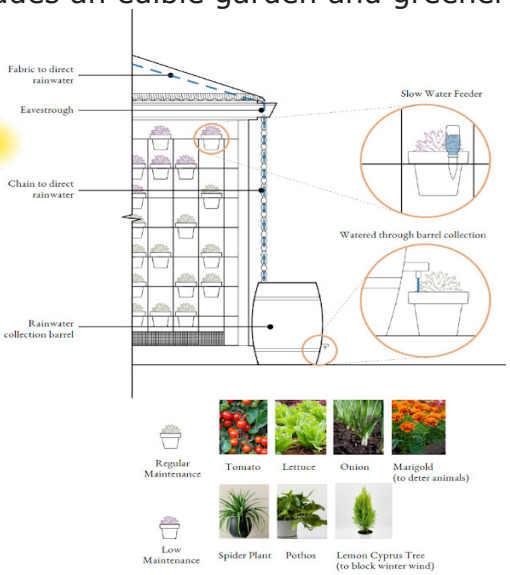
TECHNICAL FEATURES

- Incorporates a sustainable energy-efficient cooling system
- It's a structure which can hold 15+ people comfortably
- Contributes to people's well-being and mental health
- Incorporates nature, edible garden
- Design based on a modular space which could be easily set up in municipal spaces (i.e., parks, courtyards) and taken down for the winter.

SOCIAL AND NATURAL FEATURES

- Can house facilitated and non-structured activities
- Has accessibility and seating for older adults
- Includes play area for children
- Has a design all spaces are visible from all angles for safety features
- Materials and design contribute to natural elements to reduce temperature inside the hub
- Includes an edible garden and greenery





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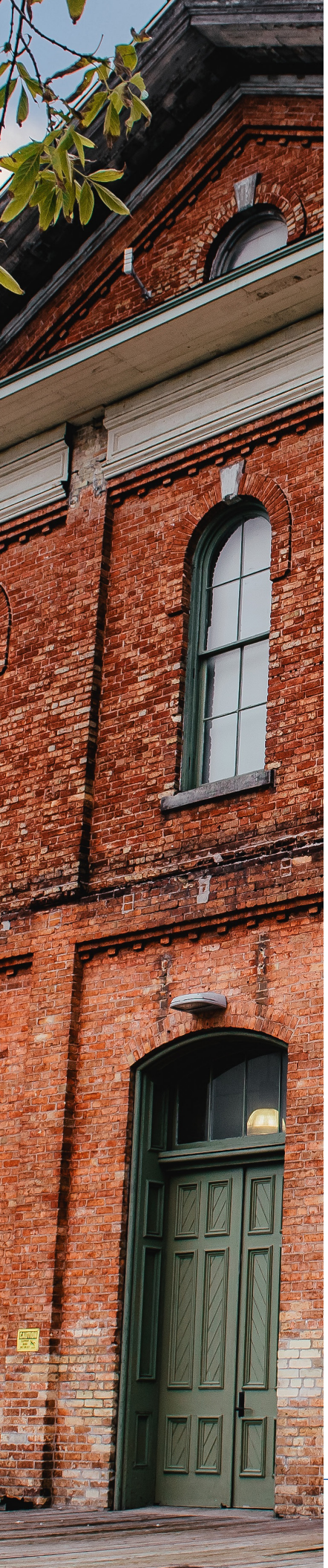

CONCLUSIONS

The process of experimentation led to several valuable lessons that can enhance future community collaboration efforts. First, having diverse perspectives significantly improved SWPH outcomes. By incorporating unique viewpoints, knowledge, skills, and strengths, the SWPH unit gained a better understanding of the community needs we aimed to address, which fostered innovation in our solutions.

Additionally, the importance of ongoing and clear communication between partners became evident. The SWPH team learned to be flexible in how information flows, adjusting meeting schedules and frequency as needed. This adaptability allowed the leading team to explore ways to engage partners at the most meaningful times, although balancing time constraints and competing priorities was sometimes challenging. Establishing who would like to be involved and when from the outset would further enhance collaboration.

Finally, building relationships emerged as a critical component. Investing time in understanding each partner's mandates and motivations will lead to improved collaboration and help foster a shared vision for our work. Further, developing strong relationships will enable us to leverage individual strengths and interests, resulting in more meaningful engagement from all partners involved.

Similarly, the team found that a single project or initiative can incorporate and address multiple recommendations from the vulnerability assessment report. This can set the basis for expanding the work into the implementation of the next series of the recommended actions. As the impacts of climate change increase, it is imperative that observable and usable solutions be tested in our communities. This will require flexibility and creativity informed by science in order to grapple with the complexity of the challenges health units will face in the future.

Recognizing the potential of new partnerships and community support for these types of local solutions provided the team with a concrete example of rapid implementation and the possibilities of co-creation for addressing specific health risks associated with a changing climate in our community.

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