7.1 Towards a Regenerative Future

> Trent is a place where students, the community, and diverse ecosystems can thrive. We recognize that sustaining the current status quo is not enough. The goal for the Symons Campus is to have as many positive impacts as possible.

The concept of **regenerative design** goes beyond minimizing impact and maintaining current conditions to applying principles of enriching, enhancing, and restoring our environment. This concept directly contributes to the guiding principles of this Plan:

Learning and Discovery
An opportunity to lead in research and practice, setting a global example by integrating places and buildings that are designed to reverse their impact and have a net-positive benefit. These indoor and outdoor places can be used to demonstrate and test regenerative systems and concepts.

Environmental Resilience and Integrity
A two pronged approach that seeks to preserve, avoid, and/or mitigate impact on existing natural features, as well as restore and enhance biodiversity across the Campus by restoring existing features and infusing nature within the built environment.

Economic Resilience, Leadership, and Innovation
An opportunity for Trent and it's business community to reimagine the regenerative use of our resources. Using circular business models and clean technologies, Trent can employ fewer resources and extend the life of products and services through re-use and adaptation.

Social Resilience, Community, and Inclusivity
An opportunity to connect and amplify initiatives that address social needs in a systemic and holistic way, under a community-led vision.

Life in the Circle

The circular system can be represented as a doughnut. The inside of the doughnut represents the lower limit of prosperity needed by Trent for a socially resilient and inclusive existence. This involves good health, social networks, and participation. This is the social foundation needed for a thriving society: a foundation which can be reinforced, both on-campus and locally.

The outside of the doughnut represents the ecological limits of the planet, which must be respected. Examples are climate change and a decline in biodiversity. This is the ecological ceiling, which must be considered in order to achieve the same broad prosperity.

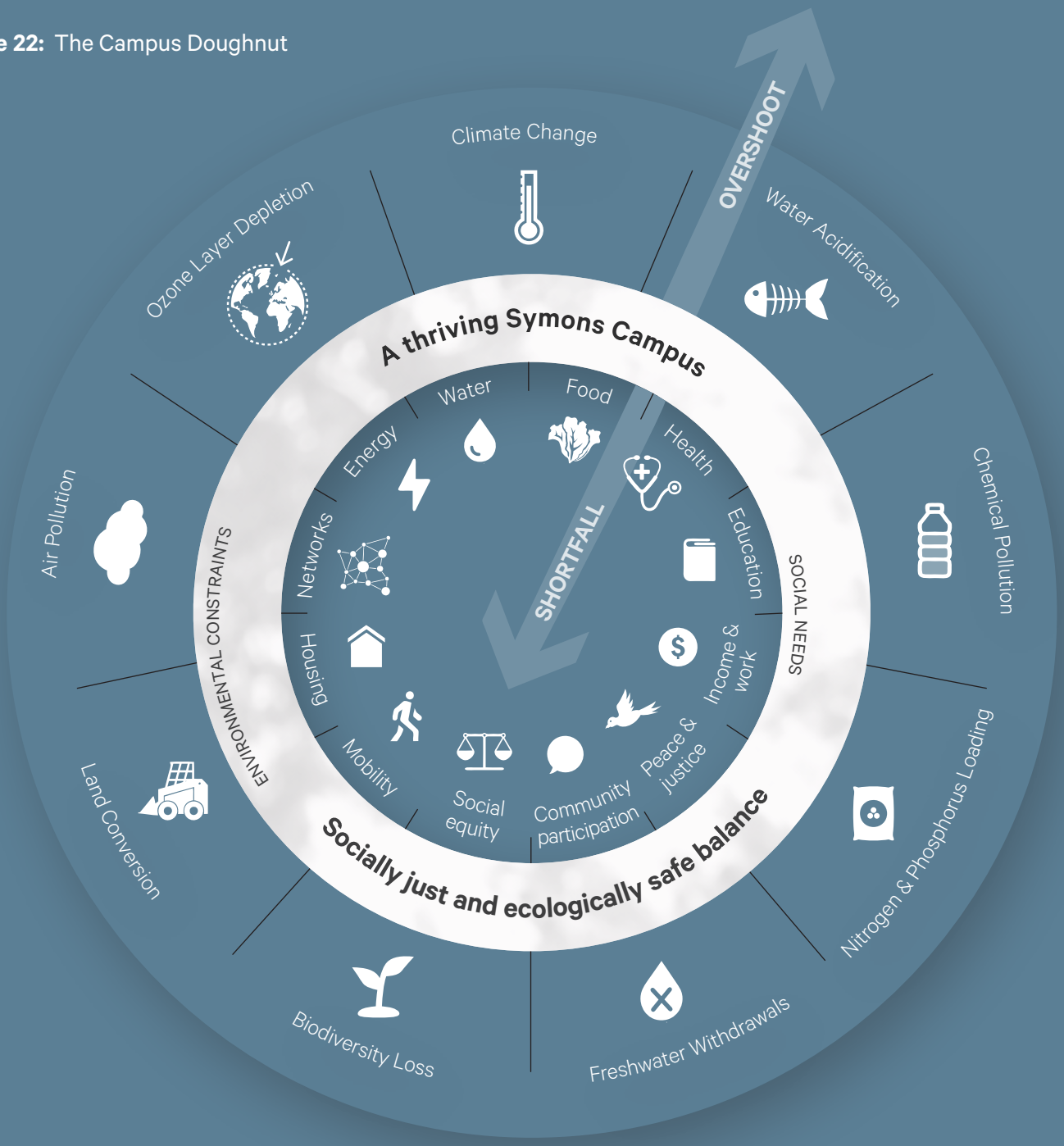
Between these two sets of boundaries lies a doughnut shaped space that is both ecologically safe and socially just: a space in which everyone can thrive.

The doughnut model was developed by Kate Raworth, a British economist working for the University of Oxford and the University of Cambridge. At the request of the City of Amsterdam, she wrote a framework which offers universal principles and a roadmap. These ensure the integrity of the ideas as they are put into practice. Some of the principles by which any initiative that seeks to practice ideas of circularity include:

- **Seeing the big picture.** Recognize the potential roles of different participants and their synergies.
- **Thinking in systems.** Be alert to triggers, feedback loops, and tipping points.
- **Being regenerative.** Aim to work with and within the cycles of the living world. Share, repair, regenerate, steward.
- **Aiming to thrive rather than to grow.** Ensure that growth serves the work rather than drives it.

Learn more about the doughnnut online at: doughnuteconomics.org/

Figure 22: The Campus Doughnut



Case studies in regenerative design:

Absorb carbon through reclaiming biomaterials; Forensics Building at Trent University

Collect and process rainwater through utilizing vertical helophyte filters
Source: Blumberg Engineers

Recover food and human waste to create fertilizer for food production
Source: True Leaf Market

Recycle nutrients from a closed-loop aquaponics system for food production
Source: Bio Aqua Farm

Restore materials from old industrial metals to wooden panes and glass

Generate a local smart grid for the efficient usage of solar energy
Source: Deceuvel

Regenerative Design

> The University Districts will be designed to respond to anticipated changes in climate and to minimize, and where possible avoid, the environmental impact of new development. They will be designed with the foresight to ensure adaptability of a thriving campus for current and future generations, integrating the following system elements of water, ecology, carbon, energy, place, health, materials, and waste.

General Guidelines

WATER

- Incorporate natural water flows to work in harmony with the site and its surroundings.
- Meet water needs through captured precipitation or other natural closed-loop water systems, and/or by recycling used project water.
- Utilize purifying systems without the need for chemicals.
- Where possible, treat stormwater and water discharge (including grey and black water) through reuse, a closed-loop system, or infiltration.
- Utilize best practices for controlling runoff from construction sites, collecting sediment, and monitoring construction. These measures should be developed in consultation with the Michi Saagiig Consultation Liaisons and in coordination with Otonabee Conservation and the City.

ECOLOGY

- Prioritize retention of existing features, landscapes, functions, and ecosystem services across the landscape, wherever possible.
- Integrate connections, corridors, and buffers to create microclimates and sheltered areas for animal, plant, and human life to move seamlessly through the University Districts.
- Infuse naturalized landscapes and ecologically supportive features and areas into new and existing developments across the Symons Campus.
- Incorporate Low Impact Development Standards which promote biodiversity gains. Stormwater management design considerations that provide gains to wildlife habitat include vegetated swales, rain gardens, bioswales, natural landscaping, sediment control devices, permeable pavement / surfaces, and detention areas.
- Prioritize preserving and enhancing natural features through design. Mitigate, replicate, or compensate for features or functions where impacts cannot reasonably be avoided. Strive for net benefit for the system through actions taken.
- Consider and plan for land permeability, tree canopy, habitat resilience, and diversity.
- Assess environmentally sensitive features including riparian areas (e.g., wetlands, streams, or ponds), and provide operational / management strategies.
- Utilize best practices for avoiding or minimizing disturbance to surrounding areas during construction. These measures should be developed in consultation with the Michi Saagiig Consultation Liaisons and in coordination with Otonabee Conservation and the City.

CARBON

- Encourage private vehicle use and emission reduction measures through shared parking, parking allocation/size, electric vehicle charging stations, and visible/secure all-weather bicycle parking.

ENERGY

- Ensure energy needs rely on a supply of clean, renewable energy without the use of combustion, where possible. Maximize passive heating and cooling strategies through optimizing orientation and site layout, natural daylight, natural ventilation, and thermal mass.
- Incorporate low energy concepts through ventilation and heating, waste water recovery systems, low energy lighting, energy efficient appliances, and smart controls and metering.
- Seek green building certifications including LEED, The WELL Building Standard, The Living Building Challenge, or other new or custom programs.

PLACE

- Provide historical, cultural, Indigenous Traditional Knowledge, ecological, and climatic studies that thoroughly examine the site and context.
- Involve residents, First Nations, Indigenous peoples, community stakeholders, and end-user groups in the process.
- Integrate residential and employment spaces with collective cultural, recreational, and productive facilities to achieve a synergetic balance.
- Provide co-located spaces and/or access to spaces for different age groups and/or life stages (e.g., childcare and daycare spaces, playgrounds and recreational spaces, home-based business opportunities, adult care or assisted living space, outdoor gathering space, indoor community amenity space, and independent senior living space).
- Integrate or connect to an existing or planned amenity (e.g., bicycle facilities, micro mobility designated parking areas, transit route / stop, grocery store, shopping/retail, park, trail entrance, etc.).
- Mark heritage designation or protection on- and off-site, and/or encourage the adaptive reuse of heritage features.
- Design for the adaptability of built space, and consider how they may host new uses and activities as campus and community needs evolve over time.

HEALTH

- Deliver thoughtful and intentional buildings and spaces that foster health and wellbeing.
- Uniquely connect to the place, climate, and culture through place-based relationships.
- Encourage active mobility by providing attractive intermodal options for travel, with supportive facilities.
- Provide sufficient and frequent human-nature interactions to connect people with nature directly, integrating environmental features, light and space, and natural shapes and forms. Projects may contain methods for tracking biophilia at each design phase.
- Provide an environment where the healthiest and most nutritious choice is the easiest choice.

MATERIALS

- Opt for materials that are low in embodied carbon, recycled, and bio-based.
- Where possible, use locally sourced materials.
- Consider the full life-cycle: During design, consider appropriate durability in product specification. During construction, include product optimization and collection of wasted materials. At end-of-life, include a plan for adaptable reuse and deconstruction.

WASTE

- Integrate provisions for recycling and organic waste facilities or programs (e.g., options for reuse, recycling, and composting).

New Forensics Crime Scene Facility at Trent University, Canada's first zero-carbon building certified by the International Living Future Institute