

# Transformational Climate Action Ideation and Backcasting Workshop

January 16, 2023  
10 am- 1 pm

Summary Report

Photo by Warren Wong on Unsplash

## ACKNOWLEDGEMENTS

### Territory

I gratefully and respectfully acknowledge that I live, work, and play on the ancestral and unceded territories of the Lil'wat and St'at'imc Nations. In my work and travels throughout Turtle Island, I acknowledge the ancestral and unceded territory of all the Inuit, Métis, and First Nations peoples who call this land home. Furthermore, I acknowledge the land on which much of the student work was undertaken was on the traditional territory of many nations including the Mississaugas of the Credit, the Anishnabeg, the Chippewa, the Haudenosaunee and the Wendat peoples and is now home to many diverse First Nations, Inuit, and Métis. We also acknowledge that Toronto is covered by Treaty 13 with the Mississaugas of the Credit.

### Gratitude to Funders, Partners and Workshop Participants

This project was made possible through generous funding and support from Mitacs and SI Canada. In addition to the students whose research are at the heart of this project, I wish to thank the following individuals for their contributions:

- Jo Reynolds
- Andrea Nemptin
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- Maryam Mohiuddin Ahmed
- Daniella Balasal
- John Robinson
- Cecilia Fernandez
- Stewart Dutfield
- Mary Pickering

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## Executive Summary

This workshop summary report presents the proceedings of a hybrid in-person and virtual workshop that took place on Jan. 16, 2023, as part of a Mitacs-funded project called Communicating Transformational Climate Actions. In attendance were representatives of the University of Toronto (Kim Slater and John Robinson), the City Of Toronto's Environment and Climate Division (ECD) (Cecilia Fernandez, Stewart Dutfield), Social Innovation Canada (Andrea Nemtin, Jo Reynolds), and the Atmospheric Fund (TAF) (Mary Pickering).

The purpose of the workshop was to discuss the findings emerging from research projects completed by University of Toronto students in community engaged learning (CEL) classes over the past seven years. Many of the projects were completed with strong involvement by City and TAF representatives who acted as "clients" identifying research questions related to real-world pressing climate challenges, and to whom students ultimately directed recommendations.

In the lead up to the workshop, Kim completed a synthesis of findings and recommendations to identify high potential actions that might be further developed for real-world application.

At the workshop, participants selected what they felt was the most promising intervention – social equity focused financial mechanisms for advancing neighbourhood scale climate action that keeps wealth in communities – to further explore by way of a backcasting exercise. The exercise began with "painting a picture of the future" and then an exploration of "how we want to get there."

In painting the picture of this idea, the following key insights emerged:

1. The importance of de-risking and normalizing equity-based climate investments to make climate action investment ready.
2. There's a need to find ways of scaling and aggregating smaller initiatives and creating municipal-scale funding systems and programs
3. Reinvesting equity in publicly available funds is part of retaining and generating wealth for communities.
4. It's essential to solve the right problem and recognize that not everything should be seen as an investment that requires a return. Some things are (or should be) part of government expenditures, which are financed by taxes (e.g., roads). The creation of a large government program to install heat pumps could follow this approach.
5. There is a need for continual assessment of who benefits from policies and programs. To shift power, there should be an equity return that goes to communities (wealth to community).

To generate community wealth through integrated climate solutions that reduce emissions and build resiliency, the following enablers were identified:

1. New narratives
2. Social capital and partnerships
3. New evaluative measures that illuminate equity dimensions and impacts
4. Complementary policies
5. Adoption of tools

This report contains details of the entire conversation and the materials provided in advance to support that conversation (i.e., a workshop brief containing summaries of the projects, a synthesis and evaluation of their findings).

On February 15, 2023, the idea that was explored at the workshop for equity-focused green finance mechanisms was pitched to the Climate Advisory Group (CAG) for further consideration. With its multi-stakeholder and multi-interest composition, CAG seems particularly suited to creating an affordable housing narrative that captures the intersection of equity and social justice with climate action in the housing sector.

We also see potential in our proposed Urban Climate Action Living Lab (UCALL) (pending funding) operationalizing this idea, and will be pitching this idea to related stakeholders.

The findings and insights of this workshop and body of student work will also inform a low carbon workshop series tackling barriers and surfacing multi-sectoral solutions that UCAP is leading in partnership with the City of Toronto and several University of Toronto Institutional Strategic Initiatives (ISIs) over the coming year.

Finally, the journal *Buildings & Cities* is in the process of commissioning short feedback papers on the editorial and paper we published that drew on findings discussed here and was funded by Mitacs. Academics, practitioners, or people in policy / regulation, will be asked to comment and provide their perspective, which is not only an opportunity for them, but stimulates further thought, discussion and engagement with some issues raised by students and workshop participants.

Upon reviewing this workshop summary report and the [full project report](#), a follow-up meeting should be scheduled to explore next steps. The final project report for Mitacs and partners contains fulsome details of the objectives, methodology and research findings as well as a communications plan and products including all student project one-pagers.

## Mitacs Project Overview

**Description:** an 8-month project funded by Mitacs and SI Canada in partnership with U of T to synthesize, evaluate, prioritize, and communicate transformational climate actions drawn from student research projects. The results will inform a backcasting workshop with partners to advance 1-3 climate actions.

**Objective:** to harvest and share lessons (with academic and non-academic audiences) and insights from the University of Toronto's community engaged learning (CEL) projects, primarily those for which the City and TAF were "clients" informing the research questions and study parameters (i.e., GLA2029, GLA2000Y/H).

**Rationale:** to derive as much value as possible from student research in service of advancing the TransformTO goals.

**Methods:** literature review, document analysis and synthesis, evaluation, partner interviews, and backcasting workshop.

**Audiences:** participating partners at the University of Toronto, the City of Toronto, The Atmospheric Fund, SI Canada as well as urban climate action researchers and practitioners stand to benefit from the lessons and insights drawn.

**Products:** 1-page summaries / case studies of student projects (40), 2-4 in-depth case studies (publication ready), 1 peer reviewed paper published in the journal *Buildings and Cities*, a communications plan, workshop plan and summary report, and final report to Mitacs.

# Student Projects

## Summary

- 12 GLA2029 projects (2022) - existing buildings, new high-performance buildings, and product gaps, EVs, procurement, GHG implications of planning decisions, evaluating pollinator program, communication, indoor air quality
- 7 GLA2000 (2018, 2019, 2020, 2021) – TO green bank, sustainable finance and energy, HERD, decarbonization through electrification, business case for heat pumps
- 1 EESC34H3 (2020) – Urban agriculture
- 20 GLA2000 (2017) – waste, green infrastructure, financing low carbon resilience, renewables, consumption-based emissions, carbon pricing, integration of energy systems

**Total:** 40 projects. Of these, 35 had the highest relevance to the acceleration of TransformTO and lent themselves to the creation of one-page summaries. Six 1 pagers that strongly exemplify the recommendations are provided here.

## Methods

After analyzing the contents of the papers, noting the jurisdictions most frequently scanned, frequently recommended climate interventions /actions and their characteristics, as well as common obstacles and opportunities for action, Kim evaluated the recommendations using the following framework.

### Evaluation Framework

- Feasibility
  - Can the recommended action/intervention be implemented with available resources, time, training, and materials
- Support/Validity/Relevance
  - Do key actors view the recommended action/intervention as relevant, appropriate, fair, and potentially effective?
- Successful Cases
  - Is there evidence of the intervention producing /deep / wide / durable changes in other contexts?
- Co-benefits/SDGs
  - Do the actions tackle multiple issues, co-benefits, SDGs, and interrelated systems? (“full cost accounting” and “complex systems framing”)

- Adaptability
  - Is there sufficient flexibility built into intervention procedures to accommodate diverse needs and learning, while being nimble in the context of complexity /uncertainty? Are proposed recommendations applicable across multiple domains /emissions producing sectors? (“DEI” and “adaptive sustainability”)
- Scalable / Potential Impact
  - Is there evidence that the proposed intervention can be scaled out /up / deep? (“transformation fidelity” “interconnectedness momentum”)

### High-Potential Recommendations

The result of that evaluation was a set of 10 recommended actions or interventions, three of which the UCAP team felt were particularly promising (marked with an asterisk), that were then presented to partners at the City, TAF and SI Canada in a three- hour workshop (Jan.16, 2023):

- One stop shop\*
  - An information hub for all climate action programs in the city.
  - Could include user-centered decision-trees, pathways, and a concierge service to help users navigate and access rebates, grants, and related goods and services.
  - A gateway to incentive packages that include financial benefits/ subsidies + convenience incentives (e.g., free, or subsidized installation of a heat pump).
- Equity-focused training program for contractors\*
  - An equity-focused program for contractors that includes skills and ambassador training (e.g., re: types of heat pumps on the market, how to install, and information on rebates to share with clients)
  - Supported through public-private or quadruple helix partnerships (E.g., City / TAF/ Unions / Building industries / TCBN / Humber / U of T).
- Municipal green finance\*
  - Develop and pilot a range of financial products to support green infrastructure, as well as equity-targeted lending and granting schemes supporting lower income folks in retrofitting their dwellings.
- Net zero retrofit passports, roadmaps, tech primers
  - Mandate or incentivize owners to conducting energy audits and tune-ups
  - Documents stay with building and inform the resale value



- Bulk purchasing program with fast-tracking of permits
  - Wholesale pricing of a large quantity of heat pumps, EV bikes
  - Supported through a public-private partnership
- EV sharing economy venture
  - Launch peer-to-peer platform to allow EV drivers to sell the use of their at-home charging stations to the public on a per charge basis.
- Parking cash out and commuter benefits laws
  - Offer incentives to businesses to convert parking spots to support low emissions vehicle (LEV) / secure bike storage and provide commuter benefits (e.g., free / discounted transit passes) to employees
- Social equity indicators and evaluation embedded in all climate programs
  - Creation of a citizen advisory committee to oversee results and recommend changes
- Broaden and strengthen data ecosystems for better decision-making
  - Bring together diverse datasets to better understand synergies and trade-offs, and inform communication strategies that build awareness
  - Set up data sharing agreements for interagency data sharing
- Legal and organizing strategies inducing stronger regulations by Province
  - EG Building Code, broaden grid electrification, phase out natural gas

See appendix for sample one-pagers of student projects referencing these top ideas.

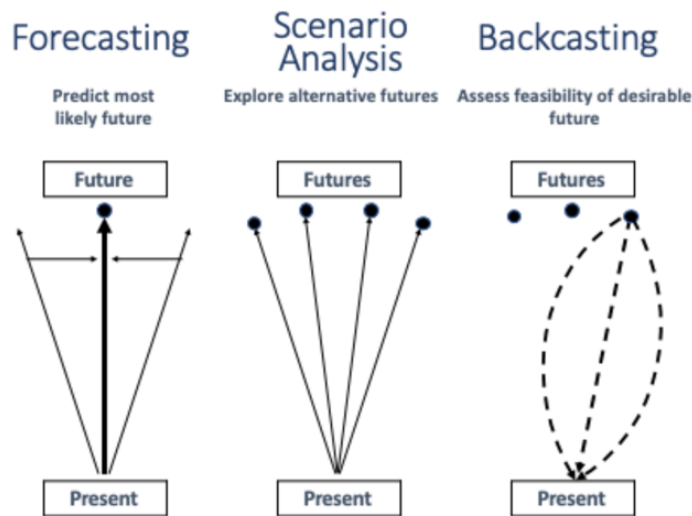
# Workshop

On Monday January 16, 2023, the UCAP team hosted a hybrid (in-person and virtual) workshop of representatives from SI Canada, the Environment and Climate Division (ECD) of the City of Toronto, and The Atmospheric Fund (TAF) at the University of Toronto. A total of seven people participated. See list of participants in Appendix C.

## Objectives

- Inform participants (City staff, SI Canada) of Mitacs project and progress
- Review actions & recommendations drawn from student projects
- Choose top priority actions and recommendations
- Guide participants through a backcasting exercise to determine how one of those actions / recommendations could best be implemented
- Evaluate this approach to exploring implementation issues
- Identify next steps, and additional actions to pursue this agenda

## Process



- Kim shared a workshop brief with participants prior to the workshop. The brief contained project objectives, progress, top recommendations, and a subset of representative student work.
- The workshop opened with a PowerPoint presentation providing an overview of the project and backcasting approach
- Participants discussed the list of 10 recommended actions, and explored opportunities for tweaking, combining and/or adding ideas. Each participant voted on their preferred idea(s), and one was selected for the backcasting exercise:  
*Financial mechanisms that embed social equity programming and indicators.*

- Participants were guided through a backcasting exercise whereby they were invited to:
  - Paint a picture of the future (2040) contemplating external factors (e.g., political, economic, social, technological, environmental, and legal- PESTEL) and a fully operational and effective social-equity focused green bank contributing to the realization of the TransformTO goals.
  - Explore how to realize that future, identifying essential steps along the way.
  - Conversation was captured by Kim in a Miro board.



## Discussion

### ***Rationale for selecting intervention- a municipal bank embedding social equity programming and indicators***

- While there was general support for all three of the top ranked recommended ideas / actions (“interventions”), ultimately participants selected the idea they felt had the greatest potential for advancing social equity, while aggregating and accelerating climate action at scale.

### ***Backcasting Session #1: Paint a picture***

- **Future goal: Innovative Financing System with Social Equity indicators deeply embedded**
  - Communities most vulnerable to climate impacts in Toronto are benefiting financially and socially from investments in climate action. What climate is shaped by those goals...what kind of future would work for vulnerable communities (that has climate action built in that fits their aspiration)?
  - Normalize what now seems risky
  - Financing innovation that changes the rules of the game
  - Need a systems-perspective
  - Need large financial institutions to invest in small / local OR find ways of aggregating smaller projects...or create intermediary orgs to help...need to be organizing
  - Getting stuck - a public bank is a tactic/ tool
- **Big Questions:**
  - How do we invest in a more equitable future?

- Infrastructure bank. Can't find projects to finance AND banks still invest in fossil fuels. How to de-risk / re-incentivize right action?
  - How to overcome (perceived) barrier of risk?
  - What's the criteria for success? \$ doesn't flow.
- **Potential Obstacles:**
    - Feds struggle to think at municipal scale
    - A lot of work needed to make an innovation "financeable" There's a need to make investments investment-ready
- **Potential Opportunities**
    - 500 b non-profit fund...most interesting. For profit (40 years affordable) CHMC only needs 10...something around impact...impact / outcomes financing. Valuing impact. Money is about returning social environmental value to society. **Toronto doesn't need much \$ to make \$**
    - What about green equity bonds for individuals?
    - Need to seed levy etc. and then scale

### ***Backcasting Session#2: How do we get there?***

#### **5 key things for getting there:**

1. Look at demand side (more important than supply side: sources / availability of capital); need to make investments ready to receive funding (as fossil fuel investments typically are), to de-risk and normalize equity-based climate investments (other side of the coin would be to make fossil investments riskier)
2. Find ways to scale and aggregating smaller initiatives; CIB has had trouble getting money out the door: it operates at the wrong scale for municipal climate action: there is a need for municipal-scale funding systems and programs
3. Allow for public availability fund
4. Recognize that not everything should be seen as an investment, requiring a return, some things are simply part of government expenditures, which are financed by taxes (e.g., a large government program to install heat pumps)
5. Need continual assessment of who benefits from policies and programs. In principle, there should be an equity return that goes to communities (wealth to community), and ultimately shifts power.

#### **Enablers:**

1. Narratives:

- Communicate - no you won't freeze to death in the winter, stranded on the highway with an EV
- Communication actions: e.g., with respect to Feed in tariffs (FITs) - narrative really spun negatively...rather than an investment in the future. Need to better tell the story of the benefits. Best to think in advance of policy driven opportunities...need mechanisms for creating community wealth. Understand the barriers for getting financially involved.
- Objective around which a narrative gets formed: EG Community-scale energy systems better than Feed In Tariff...need stories that appeal to people
- Crucial implementation piece= constructing narratives that bring people together (neighbourhood and city scale)...of what doing these 4 things would look like and play out in their lives
- Compelling narrative - we can invest now and create wealth. Strengthen community resilience to climate impacts - specifically around power outages. Save our neighbours during power outages.
- Transition is going to be a lot of work. Market transformation will have some bumps and require adaptations and learning...need tenacity to persevere...political commitment
- Pay attention to resident concerns. Noisy heat pumps, etc. These are real issues for people. Need to be dealt with + push through. Narrative -> climate is changing, and this is needed.
- How to counter residents appropriating environmental narratives. Multi-community to research project to address concerns
- (green financing for] Affordable housing narrative offers a frame for a narrative around these issues...

## 2. Social Capital: Partnerships, Multi-sectoral Collaborations

- Building the social capital necessary to enact change
- SI Canada community labs: two different stages of innovation (local pilot + scale). Different type of entity/ dual prong approach
- Building relationships + institutional innovation
- Greater Toronto Hamilton Area- United Way Purpose Financing- working in these realms- Sandra
- Toronto Community Benefits Network model worth exploring (community benefits agreements)
- There is a feasible community energy system scheme arising in St. Jamestown - great opportunity
- Building community wealth in St. Jamestown ...connect with key players
- Leadership piece to engage mutual funds -> they have a lot of data > how to cut through data smog? Insurance

## 3. New evaluative measures

- Need to change our measuring sticks (e.g., climate leaders should reflect community diversity)
  - The way we measure climate actions need to make visible new kinds of leadership and community capacity
  - What are the signposts?
  - Need additional indicators to capture things like community capacity
  - Criteria: what is the appetite / possibilities for success? Look at whole system interactions...Need to recognize assumptions and orthodoxies...criteria for investment that weaves PESTEL
4. Complementary policy bits and pieces.
- Should help to de-risk investments in climate.
5. Tools
- social and spatial mapping

### **Considerations and Questions**

- City is costing out impacts of different climate scenarios on city infrastructure and response (operational)
- We might align some of this work with the new federal Retrofit Accelerator program - intermediaries to accelerate retrofit of affordable housing
- Investing a mid-term or future impact? Refer to Impact Canada work. What happens if we do an upstream intervention? What's it going to cost if we "DON'T do it? Climate action is getting more expensive...Retrofits you can link revenue source with impact
- Existing green bonds do try to convey social benefits as well as climate....(e.g., investment in libraries and reframe as warming spaces) ESG is about risk reduction NOT impact
- where do we need municipal green finance?
- What role should CAG be doing? Re-do exercise, how do we connect to challenges of today?
- Where are the fleshy areas where we can drive equity + climate?
- People don't get excited about things they can't see-> retrofits? What would be very tangible, applied, tactical? Solar rooftops
- so much to be worked out there. For example, housing providing a suite of services. E.g., A community housing provider I'm aware of has about 100 residential properties - how do you finance upgrades to these properties. Resilience, cost savings, communications.

### **Models and Multi-solving Ideas**

- Raven- transitioning housing on reserve to heat pumps...driver of community wealth  
Toronto Community Housing Models is a great place to start. Subsidize the transition for low income
- 20-year commitment re: SolarShare helped to de-risk?
- Affordable housing in areas where new immigrants are residing...NIA great opportunity for helping vulnerable pop and community wealth by energy system backup + job benefits. Imagine if we had a community bond for ESG interested investors would invest in buying community energy system in NIA half of equity would be reinvested into community
- We could be ganging up distributed energy resilience, back-up power, and EV capacity in vulnerable neighbourhoods.
- Back-up energy benefit - energy resilience - for vulnerable populations is a great theme
- Should think about internet back up as a resilience piece too
- Model: a community bond, invested through a philanthropic org. goes to equity investments in the community, for vulnerable, climate, resilience, etc.
- System nudges
- Investment vehicle needed

### **Next steps**

- Need a stakeholder map and roles that might contribute to the intervention. Might include a scenario underneath it and description of how it's going to impact people
- Create "How might we statements..." for each stakeholder
- Another workshop?
- Development of narratives to enable new financial mechanisms
- Strengthening / expanding social capital and partnerships work with other actors / researchers / practitioners working on community wealth and in related areas

The final project report for Mitacs and partners contains fulsome details of the objectives, methodology and research findings as well as a communications plan and products including student project one-pagers. It is available [here](#).

# Appendix - Sample One-Pagers of Student Projects

## UNDERSTANDING THE SOCIAL EQUITY IMPLICATIONS OF DECARBONIZATION IN EXISTING BUILDINGS

GLA2029H - 2022

### OBJECTIVE

To deepen understanding of the anticipated equity impacts of the ExB Strategy, particularly with respect to equity-deserving/denied groups; Persons with disabilities, women, racialized groups, Indigenous peoples, LGBTQ2S+, undocumented workers, immigrants, refugees, persons with low income, youth, vulnerable populations such as seniors, victims of violence, persons with low literacy, persons who are homeless and under-housed and residents in Neighbourhood Improvement Areas

### AT A GLANCE

#### Challenges

- Affordability
- Split incentives
- Retrovictions and forced displacements
- Workforce development for retrofits

#### Opportunities

- Co-benefits
- Empower tenants and building owners
- Partnerships with community groups

#### Jurisdictions Scanned

- Vancouver, BC
- St. Louis, MO
- New York City, NY
- Washington, DC
- Los Angeles, CA
- Boulder, CO

#### Insights

- The consideration of how the ExB's nine Key actions impact the livelihood of equity-deserving groups should be incorporated at each stage.
- Risks of co-benefits must be mitigated
- Informational barriers and few financial incentives for retrofits are problems that contribute to the landlord-tenant dilemma.
- Many landlords and equity-deserving groups lack awareness of the long-term cost-savings and co-benefits retrofits offer, or the financial support available to them.



### BACKGROUND

To meet City Council's climate policy of achieving net zero GHG emissions by 2040, the Environment and Energy Division (EED) developed the Net Zero Existing Building (ExB) Strategy containing nine actions to improve equitable access to sustainable, safe, and durable buildings. While The City of Toronto has an Equity Lens policy, more work is needed to prioritize equity-deserving groups and groups with the highest needs and ensure that fairness and inclusiveness are considered when designing and implementing the programs and policies of the Strategy's nine key actions.

### METHODS

- Literature review (academic + grey)
- Jurisdictional scan
- Feasibility Analysis

### RECOMMENDATIONS

#### Adopt a simple and transparent methodology to track sustainability and equity measures

Go beyond mandatory reporting requirements within the ExB Strategy Action #1 (e.g., GHG reductions) and measure sustainability and equity.

#### Implement a targeted approach to the grants and financial programs offered to equity-deserving homeowners and building-owners of low-income housing

The city should consider grants and finance options that are specifically marketed towards equity-deserving groups to increase program uptake.

#### The City of Toronto should partner with unions and other relevant organizations to provide green job training and other relevant skills for equity-deserving groups

This would foster skill development to improve employability in the ever-growing green economy.

#### Ease the retrofit process by creating a reliable Retrofit Accelerator Program that provides a "one-stop-shop" for landlords and/or buildings owners

Similar to Vancouver's Landlord BC, The City should partner with existing landlord advocacy groups such as the Ontario Landlords Association to create a reliable and trusted "one-stop-shop" Retrofit Accelerator Program.

#### Create a Sustainability Tenant Advocacy Board

To help mitigate the risk of retrovictions and unlawful tenant displacement.

Read the full report [here](#).



# INNOVATIVE RETROFIT PROGRAMS JURISDICTIONAL SCAN

GLA2029H - 2022

## OBJECTIVE

Using a matrix and risk scale, scan jurisdictions with innovative retrofit programs, determine feasibility, and identify ways Toronto could adapt and adopt key learnings.

## AT A GLANCE

### Barriers

- Lack of homeowner awareness and capacity
- Confusion regarding programs and rebates

### Opportunities

- Advance multiple co-benefits (equity, employment)
- Leverage partnerships with organizations and educational institutions
- Create user-friendly tools and tailored solutions
- Communicate steps and pathways
- Retrofitting networks / alliances

### Jurisdictions Scanned

- St. Johns, NFL
- United States
- New York, NY
- Germany
- Singapore
- Ireland

### Insights

- Consistent and clear communication between government programs and external private sector partners is vital
- Collecting and compiling accessible exemplary data on existing building retrofit projects is crucial to monitoring program efficiency.
- Important to coordinate and connect retrofit programs to avoid overlapping efforts and to make offerings less overwhelming to navigate.
- Ensure disadvantaged communities are included in Toronto's retrofit strategy



## BACKGROUND

Existing buildings represent 57% of greenhouse gas (GHG) emissions in the City of Toronto. To achieve the Net-Zero target by 2040, Toronto must leverage existing, evidence-based solutions to reduce GHG emissions from existing buildings.

## METHODS

- Literature review (academic + grey) / jurisdictional scan
- Constructed a matrix to rank cases and determine which ones are most relevant to Toronto
- Interview with subject-matter expert

## RECOMMENDATIONS

### Require building owners to conduct energy and emissions audits and tune-ups to inform net zero retrofit roadmaps.

To be effective, integrate long-term perspectives, provide concrete details for each step, tailor solutions to homeowners and user-friendly tools.

### Provide support to reduce the complexity, costs and time associated with building retrofits.

Increasing support and resources for retrofit projects should be prioritized

### Build awareness and capacity of building owners to undertake emissions reduction measures.

This can be supported through networks or alliances (of local businesses), toolkits, partnerships and win-win style campaigns.

### Support workforce development and training.

Train for Trades provides an innovative framework that can inspire a similar retrofit program focused on social justice, equity and inclusion.

Read the full report [here](#).

# SCALING AND DELIVERING CLIMATE SOLUTIONS

GLA200 - 2021

## OBJECTIVE

To provide the City of Toronto with key considerations and recommendations for scaling up the delivery of clean heating solutions to 400,000 single family homes in Toronto through an equitable approach.

## AT A GLANCE

### Challenges

- Lack of awareness
- Difficulty quantifying financial benefits
- Lack of trained contractors and assessors
- Nascent market

### Opportunities

- Provincial and federal funding support
- Public-private partnerships
- A role for the City in coordinating scaling.

### Jurisdictions Scanned

- New York City, NY

### Insights

- A market-based approach is the best option to scale and deliver climate solutions.
- To establish a market for clean heating solutions, the City should work with suppliers, contractors, and other stakeholders to build a local supply chain for different green technologies.
- Establishing green technologies as the norm, rather than the alternative, is essential to increase demand.
- Financing mechanisms must be available from all levels of government to ensure energy transition is equitable.
- A robust communications strategy is needed to provide information and encourage homeowners to undertake retrofits



## BACKGROUND

The City of Toronto has committed to reach 65 percent emissions reductions by 2030 and net zero by 2040. To reach this target, close to half a million buildings need to be retrofitted to achieve higher performance. Current retrofit programs run by the city, though delivering both environmental and economic benefits, must be greatly scaled up to realize all their potential.

## METHODS

- Literature review (academic + grey)
- Interviews with subject matter experts in the building industry

## RECOMMENDATIONS

### A multi-pronged approach: a bulk buying program

The bulk purchasing program (i.e., purchase 100,000 over 4 years) must be supported by and work in tandem with other policies such as sunset clauses, the existing building strategy, and new building regulations, and might entail pressuring the Province of Ontario to alter the building code to require green mechanisms to be invested in and implemented.

### Establish a bulk purchasing program through public-private partnerships

This would ensure the supply of heat pumps is available for single family homeowners that are interested in transitioning to clean heating solutions in a way that also bolsters demand and eases financial constraints. A fast track program that will enable developers and homeowners to receive the permits necessary for their home retrofits, especially to achieve their target by 2040.

### Implement a subsidization program

Supporting lower income family homeowners.

### Undertake a comprehensive communications strategy

This would provide information and resources on the bulk purchasing program and financing mechanisms to the public.

Read the full report [here](#).

# SWITCHING THE CURRENT: INCENTIVING EV ADOPTION

GLA200Y - 2016

## OBJECTIVE

To draw on learnings from other cities to make recommendations to the City of Toronto to promote and incentivize electric vehicle uptake among city residents, with a focus on passenger plug-in electric vehicles.

## AT A GLANCE

### Barriers

- Grid capacity
- Prohibitive cost of EVs
- Range anxiety, climate factors
- Lack of rapid charging infrastructure
- Opportunity cost (EVs contribute to congestion, traffic accidents, require road maintenance, parking etc.)

### Opportunities

- EV market is growing, more options at different price points
- Funding from prov. and fed gov't
- Leverage TGS and local policy tools

### Jurisdictions Scanned

- Berlin, DE
- Chicago, IL
- Los Angeles, CA
- New York City, NY
- Oslo, NO
- Seattle, WA
- Vancouver, BC

### Insights

- Offer supply and demand side solutions (charging stations, incentives, shared models, leading by example)
- In the absence of Building Code changes, other regulations are needed to enable EV uptake
- Integration / intermodal projects like integrating EV car share into public transport have demonstrated success



## BACKGROUND

To meet its GHG emissions reductions target of net zero by 2040, the City of Toronto has set a goal of 30 per cent of registered vehicles in Toronto being electric by 2030.

As of 2020, about 33% of the City's total emissions result from transportation, the majority of which are emissions from single passenger vehicles. A broad-based switch to EVs, could lead to substantial emissions reductions, among other benefits.

## METHODS

- Assess the feasibility of increased EV adoption in the city.
- Assess Toronto's current EV policy suite in order to understand the context in which any of our proposed policies might take place.
- Survey global EV policies at the municipal level.
- assess the appropriateness of the policies from our survey of global policies in the Toronto context.

## RECOMMENDATIONS\*

### Update the TGS requirements for EV charging infrastructure

Use TGS Tier 1 and Tier 2 to require new mid- and high-rise residential buildings to 'rough-in' increasingly higher % of EV Ready infrastructure

### Congestion Management Incentives

Offer parking convenience incentives for EVs, including possible fee reductions or exemptions. Explore integration of EVs with existing plans for autonomous/connected vehicles and commute time-shifting.

### EV Sharing Economy Venture

Launch a competing proprietary platform to allow EV drivers to sell the use of their private charging stations to the public on a per charge basis.

\*Recommendations were updated as follows: 1) current TGS requirements surpass recommendation and 2) green fleet recommendation was removed as it has already been met

Read the full report [here](#).

# SUSTAINABLE COMMUTING: WORKPLACE SUPPORTS

GLA200Y - 2019

## OBJECTIVE

To gain a better understanding of how companies and organizations located in Toronto are incentivizing their employees to use more sustainable modes of transportation, and what motivates them to do so.

### AT A GLANCE

#### Barriers

- Lack of shower / changing infrastructure
- Small businesses rent -> no control over infrastructure
- Provision of free parking
- Lack of incentives
- Lack of employee engagement
- In office working

#### Opportunities

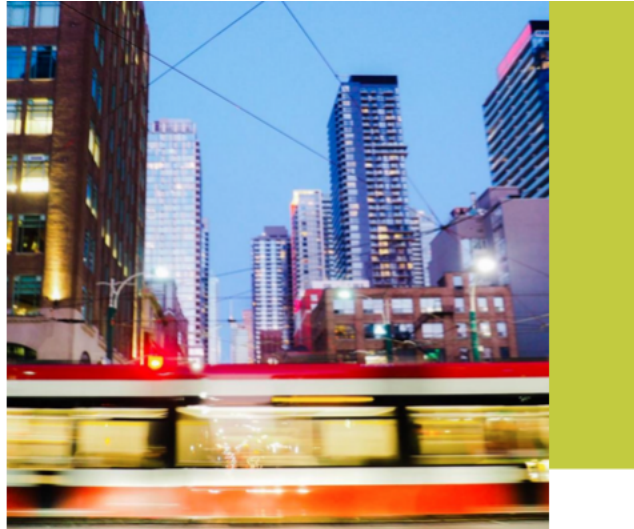
- Engage landlords -> convert parking space to bike/shower /changinginfrastructure
- Corporate discounts for green commute
- Flexible /hybrid work

#### Companies + Jurisdictions Scanned

- Blackberry
- California 1992 Parking Ordinance
- San Francisco 2008 Commuter Benefits
- Seattle, WA
- Calgary, AB

#### Insights

- Best to take a holistic approach, which is cross-mode and includes multiple actors
- Better incentives and infrastructure are not enough as long as free parking remains
- Incentives and infrastructure need to be complemented with continuous engagement



## BACKGROUND

In Toronto, transportation generates approximately one-third of all local greenhouse gas emissions, and the City seeks to significantly decrease this number over the next 30 years. Also, a vast majority of 'Torontonians' describe transportation as one of the most salient issues, and congestion is one of the primary reasons contributing to this perception. Toronto's congestion issues can be explained by the inefficient use of the roads, as 56% of people commute by car alone

## METHODS

- Survey + interviews to glean Toronto-based employers' practices of incentivizing their employees to use sustainable modes of transportation
- Identification of the local best practices
- Recommendations based on the main findings/key takeaways of the survey and online research

## RECOMMENDATIONS

### An Integrated Approach: Infrastructure, Incentives and Engagement

Getting the individual out of the car, combination of offering the right infrastructure, incentives as well as engagement

### Adoption of Parking Cash Out and Commuter Benefits Laws

Decrease employer-offered free parking + increase number of employees receiving commuting benefits

### Increasing the visibility of biking as a relevant mode of transportation with systematic data collection

Collect data to help with planning and managing of bicycle infrastructure and to observe trends

Read the full report [here](#).

# INTEGRATION OF CLIMATE IN ASSET MANAGEMENT PROCESSES

GLA2029H - 2022

## OBJECTIVE

To undertake a jurisdictional scan of local governments and identify best practices with respect to incorporating climate change into the management of water, waste and transport-related assets. Recommendations are intended to support the development and implementation of the City of Toronto's corporate-wide Climate Lens program.



## AT A GLANCE

### Challenges

- Department siloes
- Lack of public data
- Cost

### Opportunities

- Integrating mitigation and adaptation actions
- Co-benefits (e.g., increase asset lifespan)
- Circular Economy
- Nature-based solutions (e.g., urban forests)

### Jurisdictions Scanned

- Barrie
- Chicago
- Auckland
- Sweden
- Hong Kong
- Berlin
- Germany
- Prince Edward Island
- Australia

### Insights

- There is a need to integrate climate goals into level of service reports, and adapt infrastructure to meet climate-induced challenges.
- Significant investments are needed to upgrade Toronto's infrastructure
- Many metrics used to evaluate levels of services are not indications of success, but merely completion.

Read the full report [here](#).

## BACKGROUND

The City of Toronto's Environment and Climate Division (ECD) seeks to facilitate the development and implementation of a corporate-wide Climate Lens program that helps equip city asset managers with the necessary training, information, tools and resources to create plans that address greenhouse gas (GHG) emissions and risks city assets will face due to the effects of climate change. Asset management (AM) planning as defined by the government of Ontario is 'an ongoing and long-term process that allows municipalities to make the best possible investment decisions for their infrastructure needs.' Through this Climate Lens, the City hopes to spark an organisational culture shift to ensure climate considerations are present in capital projects and AM planning, to ensure their compliance with Toronto's GHG reduction goals and climate risk adaptation needs.

## METHODS

- Literature review (academic and grey)
- Jurisdictional scan and review of best practices

## RECOMMENDATIONS

**More collaboration between partners and stakeholders across the public, private and non-profit sectors is necessary to bridge the gap between ambition and action.**

Multi-level collaboration between municipal departments, private corporations and civil-society, is needed to prevent reductionism and address the multi-dimensional challenges that climate change brings.

**Anticipate future needs of the city and its citizens is a crucial aspect of forming climate sensitive AM plans.**

Toronto should work to incorporate climate and population projections into its climate-related levels of service standards, as laid out in various reports published by the city.

**Implement more rigorous data collection strategies to core asset systems in Toronto**

This will allow the city to better implement, enforce and track progress on service levels and climate initiative, as well as adapt strategies, better react to unforeseen events, and evaluate if the ultimate outcomes were achieved.

# APPLICATIONS OF HYDROGEN: IN SUPPORT OF TRANSFORMTO

GLA200 - 2021

## OBJECTIVE

To explore the feasibility of green hydrogen - produced through electricity generated from renewable sources - in helping the City of Toronto achieve its emissions reductions goals.

## AT A GLANCE

### Barriers

- Maturity of hydrogen technology
- Supply of green hydrogen
- Hydrogen efficiency
- Prior investments into alternatives
- Logistical and infrastructure costs

### Opportunities

- Long haul transit
- Use in generators to add resilience to grid
- Niche industry applications

### Jurisdictions Scanned

- Aberdeen
- Copenhagen
- San Francisco
- Tokyo
- Oslo
- Seattle
- Vancouver

### Insights

- Ontario's energy grid is becoming increasingly dirty, as natural gas replaces more sustainable energy sources.
- Given Toronto's unique context and geography, there is simply not a strong enough case to be made for the large-scale integration of hydrogen technologies in the city.
- At this point in time, investments into hydrogen should not be prioritized. Rather, opportunities to electrify GHG emitting processes should be pursued to fulfill the city's larger TransformTO goals.



## BACKGROUND

Hydrogen has become a potential new weapon in the fight against climate change – a fuel touted by many governments, Canada included, as a major solution in their respective emissions reductions' goals. Ontario is also eager to release a provincial hydrogen strategy and has been engaging in discussions with stakeholders to determine the shape that such a strategy would take.

## METHODS

- Literature review (academic + grey)
- Interviews with subject matter experts
- Jurisdictional scans

## RECOMMENDATIONS

### Lobby the provincial government for broader grid greenification.

The province's move away from a clean and sustainable energy production system presents a hurdle for City to realize its climate goals. Opportunities to advocate for the phase out of natural gas should be explored.

### Collaborate with the federal and provincial governments on investments into the small application areas described here

Toronto should leverage potential co-investment opportunities with the federal and provincial governments, both of which are interested in embedding hydrogen in Canada's energy make-up, to provide incentives for these industries to make the switch to hydrogen. This could come in the form of negotiated subsidies for on-site electrolyzers, joint infrastructure investments, or policy and regulatory support.

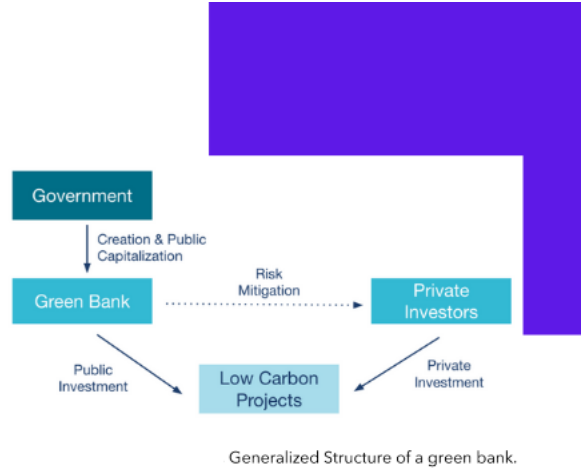
Read the full report [here](#).

# CONCEPTUALIZING A TORONTO GREEN BANK

GLA2000y - 2020

## OBJECTIVE

To explore the opportunity for and associated challenges of leveraging capital to scale climate solutions through an official municipal green bank.



## AT A GLANCE

### Barriers

- Operational and governance barriers related to City debt levels, risk acceptability, and project criteria
- A limited amount of long-term debt finance available for climate change projects and an insufficient flow of capital to achieve the necessary rate of retrofitting in the existing buildings sector.

### Opportunities

- Partnership
- Diverse finance streams (e.g., bonds, carbon taxes, system benefit charges private funding)

### Jurisdictions Scanned

- London's Mayor's Energy Efficiency Fund
- Connecticut's Green Bank
- New York Green Bank
- Montgomery County Green Bank

### Insights

- Green banks are able to scale solutions by leveraging additional private capital at ratios as high as 8:1 and on average at ratios of 4:1.
- Large and small banks, and the municipal, provincial, and federal governments would likely have the highest impact and influence on a potential Toronto green bank.
- Setting up a municipal green bank in Toronto will better position the City to overcome the governance and operational challenges that the City currently faces, while allowing it to scale solutions to get closer to investing the required capital to meet 2050 net zero targets.

## BACKGROUND

TransformTO is Toronto's climate action strategy, under which the City supports efforts to retrofit buildings through loan programs and local improvement charge financing. As the need to accelerate the pace of retrofitting increases, the City is interested in understanding opportunities that exist to resolve the constraints and barriers to improve and scale current efforts.

## METHODS

- Jurisdictional scan and review of best practices

## RECOMMENDATIONS

### To allow for program and incentive stability, the City should set up a green bank via a legislative mandate

A legislative mandate allows for the fund to be written in the constitution, preventing it from short-term political preferences.

### The Toronto Green bank would benefit from operating as a quasi-public corporation.

This would help to dissolve tensions in public-private development arrangements, and create a framework where a capacity for understanding both market and regulatory mechanisms exists.

### Focus on bonds, philanthropic grants, and private investments when considering adding to their initial capital.

This would help to overcome applicability constraints

### Utilize a minimum of three financing products

Depending on the current gap in the financing landscape, a green bank has the potential to offer several different products such as co-investment loans, credit enhancements, warehouse loans, direct loans, or the specialized loan programs PACE.

### Adhere to three pillars for market development

They are: User Friendly Product Design, Transparency and Simplicity, and Centralized Administration

### Apply best practices across the nine design elements proven to be successful for green bank creation.

They are: bank creation, partnerships, diverse funding sources, diverse financial products, market development, projects and objectives, good governance, embedding mechanisms for measurement and verification, sustainability.

Read the full report [here](#).