

EDI in Action:

**A Comparative Analysis of the
Integration of EDI within the
Building Sector Strategies of
Climate Action Plans for Canada's
Major Urban Centres**

SSM1100 Research Paper

Osayuwame Ize-Iyamu

1007539567

Word Count: 11780

TABLE OF CONTENTS

INTRODUCTION4

LITERATURE REVIEW5

 Climate Planning Social Implications5

 Climate Action Plan Assessment6

 Defining Equity, Diversity and Inclusion8

 Conceptualization of Equity.....9

 Equity Themes.....10

 Conceptualization of Diversity.....15

 Diversity Themes.....16

 Conceptualization of Inclusion17

 Inclusion Themes19

METHODOLOGY20

 Research Design.....20

 Data Collection21

 Data Analysis.....23

RESULTS25

 Case Studies26

 Results of Comparative Analysis.....39

CONCLUSION AND RECOMMENDATIONS43

APPENDICES.....49

REFERENCES.....55

ABSTRACT

This research paper aims to explore how social vulnerabilities have been considered through the integration of Equity, Diversity, and Inclusion (EDI) themes within the building sector strategies of the climate action plans of four of the major urban centres in Canada: Toronto, Montreal, Vancouver and Calgary. The study is guided by the following research questions: how is EDI conceptualized in the literature?; how can these be used as a framework to assess the building sector strategies?; and what are the results from applying the EDI framework to the four major urban centres in Canada? To effectively answer these questions an extensive literature review was conducted to conceptualize equity, diversity and inclusion within the built environment and climate action planning and supplemented by four semi-structured interviews with city staff.

Through the inductive coding of the literature, there were five equity themes, three diversity themes and three inclusion themes that were extracted to form the EDI framework which was used to perform the comparative analysis of the building sector strategies. These themes include climate justice, environmental justice, distributional justice, procedural equity, recognitional equity, intergenerational/intragenerational equity, vulnerable populations, marginal groups, persons with disabilities, participation/engagement, accessibility and inclusive design. The scope of the research study covers new developments of residential buildings that were four storeys or higher, and non-residential buildings. The implication of this study provides a framework for policymakers, planners, developers, and AEC practitioners, to better integrate EDI consideration into the strategies of climate action plans for the buildings sectors, and other sectors critical to the low-carbon economy transition.

INTRODUCTION

The building sector has presented itself as an important industry to tackle through climate action plans and policies, as it is responsible for 18% of Canada's total greenhouse gas (GHG) emissions (Government of Canada, 2022). Many Canadian municipalities have cited the building sector as either being the leading industry or among the major sectors that contribute to their GHG emissions. For example, the City of Toronto released a *2021 Sector-Based Emissions Inventory (SBEI)* report that revealed the building sector was the largest source of GHG emissions at 30% of the community-wide emissions due to the natural gas heating from residential buildings (City of Toronto, 2021). Similarly, the city of Vancouver identified buildings as one of the main focuses of their climate change mitigation plan due to the sector's high GHG emission production (City of Vancouver, 2020). Hence, building sector strategies within climate action plans are critical to the transition to a low-carbon economy.

Municipal climate action plans usually propose various urban sustainability initiatives, without highlighting the need for degrowth or a shift in the capitalist system (Meerow et al., 2019), and are often presented in the form of climate mitigation, adaptation, resilience, strategic and/or implementation plans. Hess & McKane (2021) suggest that mitigation-adaptation relationships can be viewed as a trade-off in the allocation of limited resources and an opportunity to explore points of convergence. IPCC (2014) defined adaptation planning as 'the process of adjustment to actual or expected climate and its effects in natural or human systems'. There are numerous climate adaptation efforts that focus on supporting economic resilience, protecting environmental quality, and addressing social vulnerabilities (Fiack et al., 2021).

This research paper primarily aims to explore how these social vulnerabilities have been considered through the integration of Equity, Diversity, and Inclusion (EDI) indicators into the building sector strategies of the climate action plans of Toronto, Montreal, Vancouver and Calgary. These are the four major urban centres by population size, and the study focuses on the strategies that cover new developments of medium to high-rise residential that are four storeys and higher; and non-residential buildings that are industrial, commercial and institutional (ICI) developments. The paper is organized into the following sections: the introduction, literature review, methodology, results, conclusions and recommendations.

LITERATURE REVIEW

Climate Planning Social Implications

Many scholars have explored the concept of Equity, Diversity and Inclusion within climate action planning and urban planning, as more cities around the world develop climate change action plans. Shi et al. (2016) emphasize that the end results of these interventions should reduce the vulnerability of marginalized communities to climate risks, and increase their access to the services, infrastructure and livelihoods that are needed to sustain their wellbeing and opportunities for growth. In practice, these positive outcomes are often not experienced by these communities, rather there have been many studies that have brought attention to how planning schemes have reinforced inequalities such as locating toxic facilities near neighbourhoods that consist of mostly people of colour or housing policies that promote racial segregation (Chu & Cannon, 2021). Generally, areas that are most vulnerable to environmental burdens are less likely to receive investments in sustainability infrastructure that help to alleviate climate impacts (Mullenbach & Wilhelm Stanis, 2022).

Furthermore, due to the higher rates of exposure to these poor conditions, climate-related health risks are often highest for marginalized communities (Fiack et al., 2021). Therefore, the exclusion of equity, diversity and inclusion in the planning and development of urban policies, can result in the danger of ignoring or willfully neglecting the implications of the decision-making on those who are most vulnerable to the severe costs of any action or inaction (Klinsky et al., 2017).

Climate Action Plan Assessment

There have been other studies that have conducted a comparative analysis of climate action plans to assess the integration of equity and other related topics. Fiack et al. (2021) analyzed climate adaptation plans for U.S. cities to explore whether social equity issues were prioritized over environmental and economic goals, using the *just sustainabilities* framework. The authors main measures of the content were the incorporation of distributive justice, procedural and intergenerational justice; and sorted the data by *problem, goal and action*. Another approach was taken by Meerow et al. (2019) to analyze the integration of social equity in the goals, priorities, and strategies of resilience plans of Rockefeller Foundation member cities. The authors used a *tripartite framework* of equity which included distributional, recognition, and procedural dimensions for the comparative analysis.

Schrock et al. (2015) did a study of climate action plans of three cities that have different levels of equity orientation and analyzed the factors that influenced the inclusion of equity content. The authors used the three types of equity discussed by Bullard (1994) as a framework: procedural equity, geographic equity and social equity. This framework was used to measure the degree, quantity and quality to which equity was discussed. Like previous scholars, the content of the action plans was coded as either a problem, goal, or action based on how they were framed.

Alternatively, Chu & Cannon (2021) adopted a narrative review approach to search for targeted keywords to find relevant equity, inclusion, and justice indicators in the climate adaptation and resilience plans of ten of the largest U.S. Metropolitan Statistical Areas (MSA). A complementary approach was taken by Mullenbach & Wilhelm Stanis (2022) where a summative content analysis was conducted to identify the frequency, context and ways the keywords related to health, equity and justice, and parks/green space occurred in the climate action plans. The authors used NVivo version 12 to code the text fragments into the statement types and the content or topic areas discussed in the plans. The resulting types of statements include problems, goals, solutions, co-benefits, past successes, and planning process (Mullenbach & Wilhelm Stanis 2022).

Other scholars have investigated specific sectors covered within the climate action plans. Hess & McKane (2021) conducted a study of the 50 largest U.S cities' climate change mitigation plans, sustainability plans, and their corresponding implementation initiatives which incorporated sustainability and equity dimensions within the following six sectors: buildings, electricity, transportation, food and greenspaces, and air quality and transportation. In the buildings sector scope of this research, the authors focused on identifying goals and initiatives where marginalized households were supported in energy-efficiency programmes and objectives (Hess & McKane, 2021). Finally, Lioubimtseva & da Cunha (2022) examined 12 target areas that considered equity in the climate adaptation plans of small and mid-sized cities in the United States and France. These areas include green and blue infrastructure, housing, energy security, transportation infrastructure and services, utility infrastructure and services, emergency services, food security, water quality, air quality, community education, insurance access, and health and wellness.

To my knowledge, no one is yet to investigate the integration of EDI within the building sector strategies published within or independently from the climate action plans of the

four major urban centres in Canada. This research will focus on the cities of Toronto, Montreal, Vancouver and Calgary; that were chosen based on their large population size with the assumption that they would have a more sophisticated governance structure and resources to better address climate action planning. Schrock et al. (2015) believe that larger cities are more likely to experience poverty and inequality challenges while having populations that are diverse demographically, politically and socioeconomically; which these climate and sustainability plans are to address. Hence, the research question seeks to understand to what degree do the major urban centres in Canada integrate EDI in the building sector strategies of their climate action plans. The three research questions are as follows:

RQ1. How is EDI conceptualized in the literature?

RQ2. How can these be used as a framework to assess the building sector strategies?

RQ3. What are the results from applying the EDI framework to the four major urban centres in Canada?

Defining Equity, Diversity and Inclusion

Equity, Diversity and Inclusion have been defined by various scholars, and some of the definitions have further been developed by others to better fit within the context of a certain sector. Wolbring & Nguyen (2023) suggest that it is critical to understand what data is generated in the academic literature that uses EDI phrases or the associated policy frameworks, as this can be used to inform EDI practices. Hence, the various definitions of equity, diversity and inclusion outlined will be conceptualized in this research study (Table 1) to inform the inductive process of extracting the EDI themes from the literature on the built environment, climate change and urban planning; which will ultimately form the EDI framework for the comparative analysis.

Table 1. Conceptualizations of Equity, Diversity and Inclusion in Climate Action Plans

Terms	Refined Definitions	Theoretical underpinnings
Equity	The removal and absence of systemic barriers, biases and structural injustices to enact the practice of fair and equitable treatment so that all individuals have an equal and fair distribution of opportunities, resources, and environments free from climate hazards and risks regardless of the individual/group identity or background.	Braveman & Gruskin (2003), Bernstein et al. (2020), TIPS (2021), and Chu & Cannon (2021)
Diversity	Differences in race, colour, place of origin, religion, immigrant and newcomer status, ethnic origin, sex, sexual orientation, gender identity, gender expression, age, mental or physical abilities and characteristics, educational background, geographic location, first language, family status, organizational role and level, income, and communication style.	TIPS (2021), Loden and Rosener (1991)
Inclusion	The degree to which decision-making processes and procedures are transparent, accessible, accountable, and include intersecting identities, diverse and underrepresented voices, values, and viewpoints that are treated with respect and equally supported.	Mor-Barak & Cherin (1998), Bernstein et al. (2020), Chu & Cannon (2021) and TIPS (2021)

Conceptualization of Equity

Bernstein et al. (2020) defined equity as ‘the absence of systematic disparities and structural injustices between groups with different levels of underlying social advantage/disadvantage—that is, wealth, power, or prestige’; which was derived from Braveman & Gruskin (2003) original definition of equity in health. Another definition was created by Tri-agency Institutional Programs Secretariat (TIPS) which manages

several Canadian research programs, defines equity as 'the removal of systemic barriers and biases to enact the practice of fair and equitable treatment so that all individuals have equal access to and can benefit from the programs' (Government of Canada, 2021). Chu & Cannon (2021) formulated definitions that were derived from established political theories on distributive, procedural, and recognitional inequalities. The authors defined equity as 'the equal and fair distribution of opportunities, resources, and environments free from climate hazards and risks regardless of individual/group identity or background'.

The definitions of equity by Braveman & Gruskin (2003), TIPS, and Chu & Cannon (2021) were combined and reiterated to produce a single definition. It was important to retain the objectives of equity relating to eradicating barriers to create fair access to resources and orienting it in a more environmentally focused context. Hence, equity refers to 'the removal and absence of systemic barriers, biases and structural injustices to enact the practice of fair and equitable treatment so that all individuals have an equal access and beneficial distribution of opportunities, resources, and environments free from climate hazards and risks regardless of the individual/group identity or background'. This definition will be used in this research paper to extract equity themes that apply to the built environment and climate action planning.

Equity Themes

This section gives a broader discussion of the equity themes identified in the literature on climate planning. Scholars have suggested numerous means of addressing equity within the built environment and climate action planning, the following equity themes were extracted: climate justice, environmental justice, distributional justice, procedural equity, recognitional equity, intergenerational equity and intragenerational equity. All seven themes cover important aspects of equity such as the consideration of the

impacts of climate change and public health concerns; fair distribution of resources; equal participation; acknowledgement of injustices and the protection of current and future generations.

Climate Justice

Shi et al. (2016) suggest that climate justice should be integrated into infrastructure and urban design processes to highlight the social dimensions of urban climate adaptation. Generally, the focus is often heavily on the environmental dimensions, and how adaptation or mitigation strategies can positively impact these elements. Anguelovski et al (2016) argue that two types of injustices take place in the context of urban adaptation, namely acts of commission and acts of omission. Acts of commission occur when interventions negatively affect or displace poor communities while acts of omission happen when the outcomes protect and serve elite groups at the expense of those that are marginalized (Anguelovski et al, 2016). Hence, this theme will be used to analyze the building sector strategies to determine if the effects and benefits of proposed interventions were considered, and if subsequent modifications were suggested to account for varying outcomes.

Alternatively, Byskov et al. (2021) discussed climate justice from the lens of *Ethics principles*, which was defined as 'the conceptualization and delineation of what is right and wrong or good and bad'. Furthermore, the authors explained that the ethics and justice of adaptation and resilience is associated with the role of ethics in contributing to a more fair and just adaptation and resilience outcome, for example what is owed to people and future generations in terms of access and compensation after environmental change and natural resources depletion occur (Byskov et al. ,2021). This will also be factored in when examining the development projects, as this uncovers the motivation and whether rectifying historical injustices were prioritized.

Environmental Justice

Bullard (1996) defines environmental justice as 'the principle that all people and communities are entitled to equal protection of environmental and public health laws and regulations'. This implies that these laws and regulations should protect everyone from adverse environmental and public health issues, rather than favouring a certain group of people over the other. There have been many incidences where governments have failed to do this, leaving marginalized groups more vulnerable. Environmental injustices and inequities can be thoughtfully addressed through climate action plans, but the resulting development projects often cause adverse effects to marginalized communities such as climate gentrification (Mullenbach & Wilhelm Stanis, 2022).

In this study, the building sector strategies will be analyzed to identify the application of this theme to the research scope, which includes new building projects that cover mid- to high-rise residential and non-residential projects. Environmental injustices often occur due to the location of industrial plants and factories, so it will be of interest to determine how industrial developments are addressed. Furthermore, this theme differs from climate justice as it covers broader matters of public health and environmental concerns such as disease outbreaks, pollution and contamination of natural resources.

Distributional Justice

Distributional justice is defined as 'equitable access to goods and infrastructure, environmental amenities, services, and economic opportunities' in the context of urban resilience planning (Meerow et al., 2019). The authors further argue that equity does not occur simply from the distribution of material resources and opportunities, as sharing resources evenly may result in flattening identities and not recognizing the varying needs of individuals, especially politically underrepresented groups. Therefore,

this theme will apply to strategies that show that certain factors were assessed to ensure the access to the various interventions will be equitable.

Procedural Equity

Meerow et al. (2019) defines procedural equity as 'equitable participation in decision making processes'. In climate action plans, procedural equity broadens participation across municipal actors and the public, and should aim to go beyond simply consulting with communities affected by various environmental or socio-economic impacts (Shi et al., 2016). Hence, it involves public participation during the development phase; engagement initiatives to increase the recurring public participation in city governance; and targeted outreach to marginalized groups that are typically underrepresented through traditional public engagement efforts (Meerow et al., 2019).

A previous study by Malloy & Ashcraft (2020) that reviewed worldwide urban climate efforts found that even though some climate plans seemed to focus on justice and the distribution of rights in the adaptation efforts, there was little effort to address the structural systems that led to participatory inequality. Shi et al. (2016) suggest that adaptation efforts can be framed as a social justice issue to begin dialogues and facilitate new coalitions between non-traditional partners such as environment and planning departments, low-income and ethnic minority communities, and social and environmental justice advocacy group; with the aim to that promote equitable adaptation. This theme will be used to analyze the level at which various equity seeking groups were involved in the various phases of the climate planning process.

Recognitional Equity

Meerow et al. (2019) state that recognitional equity in the context of resilience planning involves acknowledging different intersecting identities of community members; promoting respect for various groups; and recognizing that historical injustices shape

these groups and the degree of vulnerability to shocks and stresses, access to resources, and involvement in decision-making processes. The building sector strategies will be reviewed to ascertain whether this theme was incorporated within the framing and development of the adaptation or mitigation effort.

Malloy & Ashcraft (2020) attribute the act of “recognition”, as the pathway that enables individuals and communities to be politically capable while giving them the power to decide the range of capabilities needed to improve their functions and values in climate adaptation. This further supports the importance of climate action plans to be more detailed about the interventions developed, the parties involved in the planning and development process, the ultimate decision makers and the various effects of such projects. Adaptation efforts that lead to justice and equity include institutional interactions that promote political capabilities, which facilitate processes that allocate real decision-making power to marginalized populations (Malloy & Ashcraft, 2020).

Intergenerational Equity and Intra-generational Equity

Intergenerational equity is supported by initiatives that protect the quality of the environment and support economic development simultaneously, as it considers future generations (Fiack et al., 2021). Schrock et al. (2015) argue that intergenerational equity tends to overshadow concerns for intra-generational equity in environmental and sustainability efforts, as less focus tends to be on contemporary inequities and issues. In this study, both intergenerational equity and intra-generational equity will be grouped together when identifying statements that consider these factors for simplicity, as climate action plans are generally structured towards achieving both short-term and long-term targets that could ultimately affect both present and future generations.

Conceptualization of Diversity

Bernstein et al. (2020) reworked Mazur's (2010) definition of cultural diversity, to define diversity as 'the representation, in one social system of people with distinctly different group affiliations of cultural significance'. TIPS defines diversity as 'differences in race, colour, place of origin, religion, immigrant and newcomer status, ethnic origin, ability, sex, sexual orientation, gender identity, gender expression, and age' (Government of Canada, 2021). Loden & Rosener (1991) define diversity as 'that which differentiates one group of people from another along primary and secondary dimensions'. The authors describe the primary dimensions as factors that significantly influence one's identity such as gender, ethnicity, race, sexual orientation, age and mental or physical abilities and characteristics (Loden & Rosener, 1991). Furthermore, the secondary dimensions are explained to be less visible and supplementary to the primary dimensions. They consist of one's educational background, geographic location, religion, first language, family status, work style, work experience, military experience, organizational role and level, income and communication style (Loden & Rosener, 1991).

The diversity themes that apply to the built environment and climate action planning, will be extracted from literature using the base definition of diversity by TIPS (Government of Canada, 2021), which has been expanded upon to include a broader description of abilities and additional secondary dimensions identified in the Loden & Rosener (1991) definition. This definition was selected due to its attempt to cover the different ways that diversity can manifest in. This has resulted in the following definition of diversity 'differences in race, colour, place of origin, religion, immigrant and newcomer status, ethnic origin, sex, sexual orientation, gender identity, gender expression, age, mental or physical abilities and characteristics, educational background, geographic location, first language, family status, organizational role and level, income, and communication style'.

Diversity Themes

The diversity themes extracted from the literature on the built environment and climate action planning include vulnerable populations, marginalized groups, and persons with disability. The three themes cover groups of people that fall into both primary and secondary dimensions which affect their susceptibility to environmental harms; systemic barriers; and spatial experiences within the built environment.

Vulnerable populations

Lioubimtseva & da Cunha (2022) argues that stakeholders' participation is often treated as a form of tokenism and vulnerable groups are rarely included in the participatory and decision-making processes. This is why it is critical for participatory equity to be done genuinely, by thoroughly engaging such communities throughout key phases of climate planning. Research has shown that the negative impacts of climate change have a greater effect on vulnerable populations, Byskov et al. (2021) explain this could be due to poorly planned adaptation and resilience strategies that ignore the vulnerabilities and inequalities affecting these groups. Furthermore, even when many types of stakeholders participate in the development of a plan, the most vulnerable groups, such as urban poor, immigrants, and other minority groups, are rarely, if at all, included in the participatory process (Lioubimtseva & da Cunha, 2022). This diversity theme highlights the building sector strategies that specify certain diverse groups in relation to climate change related interventions and conditions.

Marginalized groups

Similarly, Shi et al. (2016) recommend that transformative approaches need to be adopted to tackle structural risks and burdens experienced by marginalized communities. Hess & McKane (2021) refers to marginalized as the term used to refer to groups of people who are the intended beneficiaries of equity-related goals and

initiatives and have experienced marginalization, which was defined as 'structural aspects of inequality and how systems of inequality have been systematically created and maintained by dominant groups'. Cultural Diversity is also known as multiculturalism and defined as 'the presence of both ethnocultural diversity and equitable participation by all cultural groups in that society' (Berry, 2016). The author also states that the Canadian concept of multiculturalism aligns with this definition and refers to the 'maintenance of heritage cultures and identities, and the full and equitable participation of all ethnocultural groups in the life of the larger society.' Another EDI theme was demographic diversity, economic diversity and cultural diversity, which were generally embedded within the marginalized group umbrella.

Persons with Disability

Jackson (2018) suggests that there are three arenas to understanding disability within the built environments, they include: disability; human rights legislation about built environment accessibility; and people with disabilities' lived experience of neighbourhood accessibility. Unfortunately, a lack of understanding is still prevalent and individuals who have less visible impairments such as intellectual disabilities are often not considered, resulting in denied rights to access and community life (Sherman & Sherman, 2013).

Conceptualization of Inclusion

Bernstein et al., (2020) used Mor-Barak & Cherin (1998) definition of *inclusion-exclusion* to define inclusion as 'the degree to which individuals feel a part of critical organizational processes such as access to information and resources, involvement in work groups, and ability to influence the decision-making process'. TIPS describes inclusion as a logical step after diversity and equity are practiced and defines it as the 'inclusion of diverse and underrepresented populations, meaning that individuals must

be and feel valued, respected and equally supported' (Government of Canada, 2021). They further identify the following groups as underrepresented: 'women, racialized minorities, Indigenous Peoples, persons with disabilities and members of LGBTQ2+ (lesbian, gay, bisexual, transgender, queer, Two-Spirit, plus) communities' (Government of Canada, 2021). Chu & Cannon, (2021) define inclusion as 'the degree to which decision-making processes and procedures are transparent, accountable, and include diverse voices, values, and viewpoints.

The definition of inclusion by Bernstein et al., (2020) and Chu & Cannon (2021) were expanded upon with some elements from TIPS (Government of Canada, 2021) with the resulting definition of inclusion as 'the degree to which decision-making processes and procedures are transparent, accessible, accountable, and include intersecting identities, diverse, and underrepresented voices, values, and viewpoints that are treated with respect and equally supported'. It was critical to highlight that the term also covered the increased capacity to go beyond just participation but also access to information and decision-making processes.

Additionally, the essence of *intersectionality* was completely omitted originally, but this has now been added. Bowleg (2012) defines intersectionality as 'a theoretical framework for understanding how multiple social identities such as race, gender, sexual orientation, socioeconomic status, and disability intersect at the micro-level of individual experience to reflect interlocking systems of privilege and oppression (i.e. racism, sexism, heterosexism, classism) at the macro social structural level'. As individuals can belong to many underrepresented groups, it was essential that this was reflected in the definition.

Inclusion Themes

The three inclusion themes extracted from literature are participation/engagement, accessibility and inclusive design. They align with the definition of inclusion, and touch on the involvement of equity-deserving groups, their ability to receive resources or information, and navigate through the built environment with varying abilities. Therefore, the revised definition has been used to extract inclusion themes that apply to the built environment and climate action planning.

Participation/Engagement

Schrock et al., 2015 state that there is an opportunity for extensive engagement to strengthen the feasibility of climate action plan goals; the planning process; equity metrics, tracking, and supervision; cross-sector synergies; and connections with equitable, green job development. Therefore, the building sector strategies will be assessed on whether engagement is incorporated into their plans and the scope of the participation outlined in the measures.

Accessibility

Isa Mosca & Capolongo (2018) state that many people experience daily accessibility issues that are permanent, temporary, situational, or generated by their relation to the built environment. In addition to physical access, this term will also build on the Bernstein et al., (2020) definition and extend to resources and intangible items like information. Moreover, accessibility is regarded as a vital conceptual strategy for achieving social inclusion for all people (Tucker et al., 2022).

Inclusive Design

Zallio, M & Clarkson (2021) suggested that user journey mapping and post-occupancy feedback were ways for project teams to improve the inclusive design of buildings. The

authors developed an Inclusive Design Canvas Framework that works as a strategic design template during the early stages of the design process but does not address considerations of building systems. Others have touched on EDI through studies on universal design, inclusive design, design for all and accessibility (Van der Linden et al., 2016, Heylighen, A.,2008). In this study, inclusive design will highlight the consideration of groups that are most affected by both invisible and visible disabilities that can limit their ability to access and experience the built environment.

METHODOLOGY

Research Design

The research method is qualitative in nature and consists of both primary and secondary research to answer the following three research questions: how is EDI conceptualized in the literature?, how can these be used as a framework to assess the building sector strategies?, and what are the results from applying the EDI framework to the four major urban centres in Canada? The study conducted semi-structured interviews as primary research and an extensive literature review of academic and grey literature as the secondary research. The chosen participants for the interviews were selected based on their varying degrees of direct involvement as city employees, with the development of the building sector strategies of their municipalities' climate action plans. This primary research source was used to fill any information gap from the published climate action plans. The literature review of the academic sources was carried out to understand how Equity, Diversity and Inclusion were defined within the context of the built environment and climate action planning and to identify the recurring themes that can be then used as a framework to assess the building sector strategies of the climate action plans of the four selected cities. These climate action plans were used as the grey literature for this study. The research was exploratory as the coding was done through deductive and inductive methods.

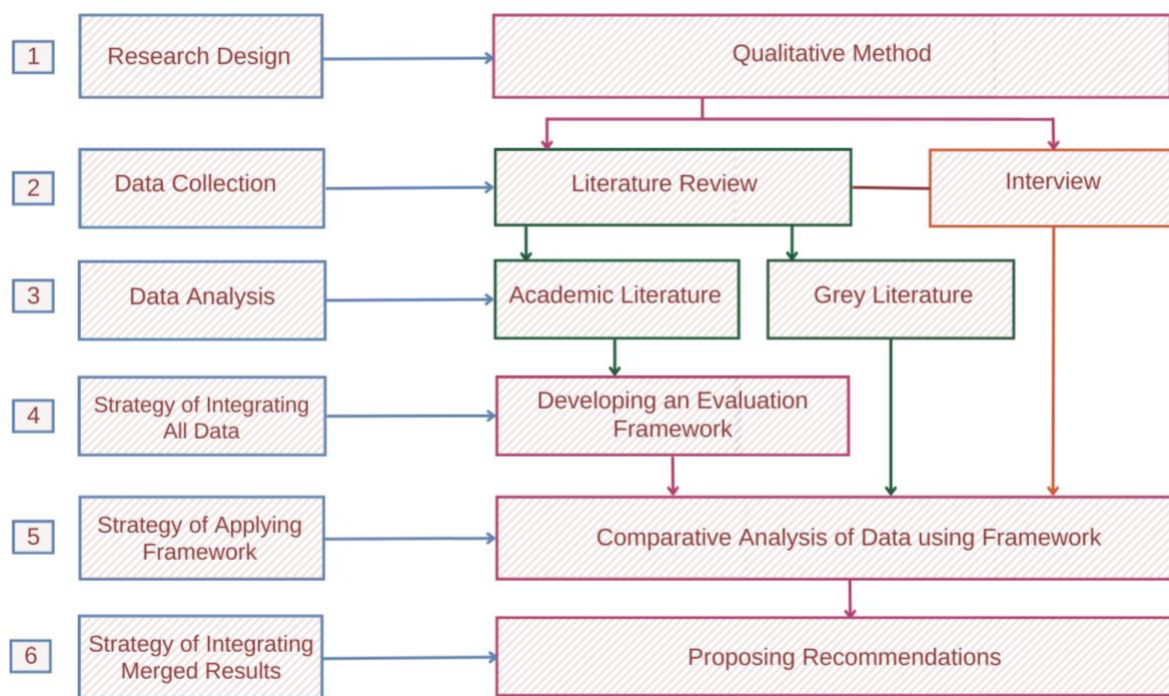


Figure 1. Diagram showing the Methodology process for the research study

Data Collection

The city officials were recruited for the interview through various methods. Initially, the official government websites were scanned for department emails, staff names and their contact information that were mentioned within the climate action plans, or on staff directories that identified the department's scope. After the first email attempt was unsuccessful with all four cities, further efforts were made to find more options on the city websites and personal networks to assist with connecting to the relevant government workers. After a few more attempts, interviews were successfully secured with three of the cities: one staff member from the City of Toronto (T1), one from the City of Vancouver (V2) and two from the City of Calgary (C1 and C2).

Participants were all sent out the information letter and consent form via email, and asked to review both documents and return the form once filled. The interviews were conducted virtually via Microsoft Teams or Zoom and averaged about 40 minutes for the video call. At the start of the interviews, all the participants agreed to have the calls recorded when asked for permission after proposing either a recording or written notes. Furthermore, the quotes extracted in this research study were in response to the following three open-ended interview questions:

1. What is your government's/city mandate to incorporate EDI in the climate action plan & green building strategies, if any?
2. What is your role in facilitating this?
3. What are the barriers and opportunities to achieve the EDI goals in this sector?

For the literature review segment, Google Scholar and the University of Toronto's (U of T) Libraries online portal were used as the databases to find academic literature. The search portal for the U of T's libraries database was filtered to display peer-reviewed articles. On both databases, search terms used consisted of "equity", "diversity" and "inclusion" combined with "and" after inclusion and "built environment" or entered individually with "built environment". Then "EDI" and "climate action plan" were searched for on both databases. This led to seventy-five articles after a skim through and the snowball method. Then, this number was further reduced to thirty-seven articles after the rest were deemed out of scope. In addition to this data collection method, experts on climate action planning, equity and justice within the author's academia network suggested a few key articles and authors, which led to thirteen more articles that covered the topics.

The grey literature consisted of climate action plans that covered mitigation, adaptation and/or implementation strategies for the building sector of these four major urban centres. The selected cities have varying formats, organization structures, naming conventions, boundaries, and definitions for various concepts within the building sector sections and the climate action plans. As a result, the research study's scope was restricted to the climate action plans that explicitly outlined strategies within a building sector section. It was then assessed if it covered new developments of non-residential and mid to high-rise residential buildings that were City-owned. These non-residential buildings include industrial, commercial and institutional (ICI) developments and these residential buildings had to be four stories or higher.

Data Analysis

The comparative analysis involved using the identified EDI themes from the literature review as the evaluation framework applied to both the building sector strategies within the climate action plans and the interview responses. Deductive coding was used early in the process to begin sorting the building sector strategies for themes that consider social factors that align with EDI. Afterwards, inductive coding was used after building out the EDI framework from the themes, and all the building sector strategies were reassessed again using the thirteen EDI themes and their indicators as a guideline (Table 2). This process helped to comprehensively identify if the strategies that incorporated the various elements of the themes.

All the building sector strategies from the climate action plans of Toronto, Montreal, Vancouver and Calgary were put in a spreadsheet and were colour coded to show which were excluded from the study, contained EDI themes or had none. The building sector strategies were found directly on the corresponding municipalities' websites, and statements that related to retrofit, renovations, existing buildings and city-owned

were excluded. Furthermore, the relevant strategies that integrated EDI themes were further coded to identify the degree to which the EDI themes were considered. For the strategies that fully integrated an EDI theme, they were assigned 1 point while a partial integration was assigned 0.5 point. The research tools used for this study include Zotero, Nvivo, Excel, MS Word and Canva. Zotero was deployed for the organization, citation and extracting of academic literature; Nvivo helped with coding some data and organizing the interview transcripts; Excel was used to primarily code the comparative analysis, MS Word was used to generate the transcribe of the interviews done on Zoom as MS Teams automatically provided the transcription, and Canva was used to plot the data to produce the findings in the form of graphs.

Table 2. The EDI Themes and Indicators that make up the EDI Evaluation Framework

Criteria	EDI Framework	Indicators
Equity Themes	Climate justice	statements that highlight the social dimensions of urban climate adaptations, such as the effects, outcomes or remuneration of interventions on marginalized groups or the reparation it brings.
	Environmental justice	statements that imply the intent to equally protect all people from adverse environmental and public health conditions.
	Distributional justice	statements that suggest fair access to goods, infrastructure, amenities, services, resources and opportunities.
	Procedural equity	statements that suggest equitable participation of underrepresented groups within the various phases of the planning and decision-making processes.
	Recognitional equity	statements that acknowledge diverse identities, recognize historical injustices impacts and promote respect for various these groups.
	Intergenerational equity	statements that seek to protect environmental quality as an obligation to future generations.
	Intragenerational equity	statements that consider contemporary inequities, issues and populations.

Table 2 Contd. The EDI Themes and Indicators that make up the EDI Evaluation Framework

Criteria	EDI Framework	Indicators
Diversity Themes	Vulnerable populations	statements that specify the targeted groups that the strategies aim to increase engagement, benefit and access to or reduce exposure to adverse climate conditions.
	Marginalized groups	statements that specify the targeted groups that the strategies aim to help remove structural aspects of inequality and systemic barriers.
	Persons with disability	statements that address disability, human rights legislation about built environment accessibility, and persons with disabilities lived experience of neighbourhood accessibility.
Inclusion Themes	Participation/Engagement	statements that highlight efforts to engage diverse groups in various processes related to the development and objectives of the climate action plan.
	Accessibility	statements that suggest measures to increase accessibility to the built environment, information and resources.
	Inclusive design	statements that suggest ways to design for all groups.

RESULTS

The building sector strategies of the climate action plans for Toronto, Montreal, Vancouver, and Calgary showed the integration of EDI in varying ways and degrees within the published strategies, the planning and development phases, and the implementation phases. The interviews were further used to fill any information gaps from the website, and helped with the coding process. All the strategies were analyzed using the EDI framework developed from the literature review (Table 2). This section will be organized into a detailed discussion of the results of each case study and a combined overview of the results from the comparative analysis performed.

Case Studies

Case Study 1: Toronto

The *TransformTO Net Zero Strategy* is Toronto's overarching climate action plan that was developed to reduce the GHG emissions at a community-wide scale in the city of Toronto to net zero by 2040 (City of Toronto, 2021). The City of Toronto established three overarching pathways to address the building sector strategies: Net Zero Existing Buildings Strategy, Net Zero Carbon Plan and Toronto Green Standard (TGS). To adhere to the scope of the research study which focuses on new developments of four storeys and higher, the EDI framework was applied to the building sector strategies of the TGS for *Mid to High-Rise Residential and Non-Residential developments*. The residential apartment buildings were categorized as being four storeys and higher, while non-residential buildings are industrial, commercial and institutional buildings. The TGS Version 4 was published in July 2021, and applies to new planning applications submitted on or after May 1st, 2022. It was first released in 2010, as a sustainable design and performance requirement for new private and city-owned developments and has gone through updates every four years with previous releases in 2014 and 2018 (City of Toronto, 2021). The TGS strategies were also organized in 3 Tiers, with Tier 1 being mandatory for all applications, while the other two are voluntary but linked to a refund program to incentivize adoption.

The study identified eight strategies that integrated EDI themes out of the forty-eight building sector strategies reviewed in TGS as shown in Figure 2. The outer chart shows that 16.7% of the building sector strategies integrated EDI themes. The inner chart visually shows the total amount of each EDI theme incorporated into the building sector strategies identified. The most frequently considered equity, diversity and inclusion themes in the TGS were distributional justice 19%, persons with disabilities 13.18% and accessibility 20.7% respectively. In terms of the overarching TGS requirement topic

areas, six of the strategies belonged to the Low emissions transportation, Cycling Infrastructure, and Pedestrian Infrastructure performance measures under the Air Quality requirement; the seventh one was outlined in the Resilience performance measure under the Buildings Energy, Emissions and Resilience requirement and the final strategy was part of Waste Collection and Storage performance measure which is a sub category of the Waste and the Circular Economy requirement.

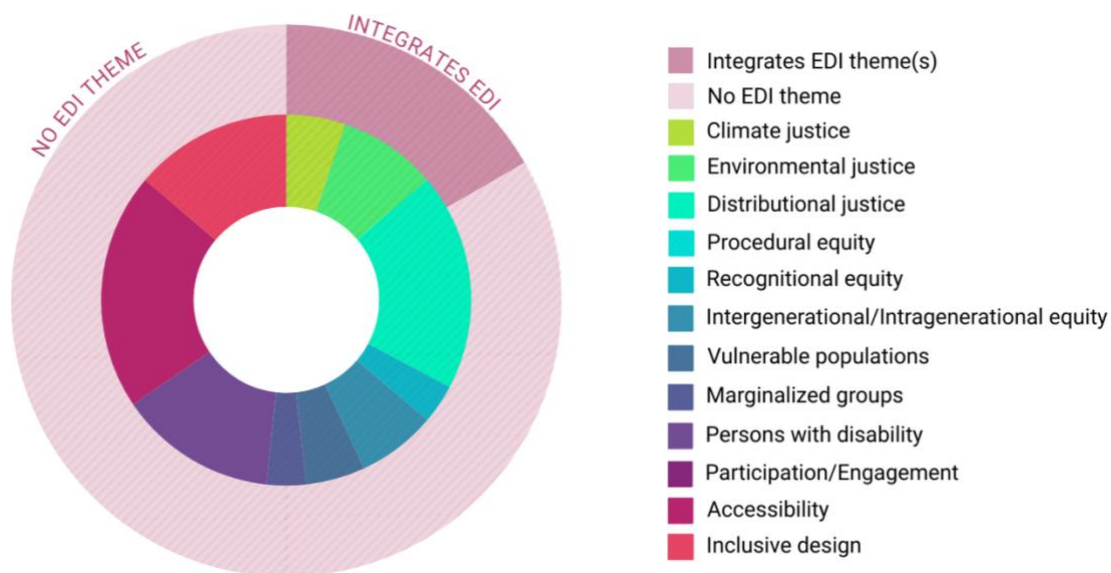


Figure 2. Showing an analysis of total building sector strategies that incorporated EDI themes and the extent at which each theme occurred in the Toronto Green Standard

The GHG 3.1 Refuge Area and Back-Up Power Generation was part of the Resilience Tier 2 performance measure and consisted of six fully considered EDI themes and one partially implied theme. The strategy outlines that a refuge area with basic amenities and back-up power for essential building systems should be provided for residential uses which would consequently serve as a temporary shelter for vulnerable residents during extended power outages. Themes of climate and environmental justice were indicated by the intent to use this adaptation intervention to propose ways to protect groups from extreme climate events and considered the negative impacts this could

have on public health and environmental conditions. Moreover, the equity of recognitional justice and diversity theme of vulnerable populations were shown by specifically stating which group requires additional accommodations to benefit from the amenity. The strategy also considered accessibility, distributional justice and intergenerational/intragenerational equity by highlighting the importance of the stated equity-deserving groups to have access to these resources and further mentioned that the power should be supplied to the ground floor or first two floors of the building, which will cater to the current residents and subsequently be used in future generations. The City of Toronto staff further expands on this:

... if we don't build them to be better performing buildings, then it will be a worse experience for the tenants that live in them over the long term. It'll be more expensive for the tenants or for the homeowners or whoever is occupying the buildings over the long term. And so, there is again, like a generational equity question in building better and building for climate resilience...(T1).

The distributional justice theme was executed partially due to the voluntary nature of this requirement since it is categorized as a Tier 2 measure. In addition to this, the requirement applies to only multi-unit residential high-rise buildings that are greater than twelve stories which can be problematic because the strategy is framed in a way that hints to consideration of mobility and health issues experienced by these vulnerable groups that live in these residents which alludes to people with disabilities and the elderly, as the strategy further states safe storage of medicine as an example of the basic amenities that this refuge space aims to provide. In the case of the elderly, they will likely be residents of multi-unit residential medium to high-rise buildings that are less than twelve, which means that these structures will not implement these features.

The AQ3.3 Weather Protection strategy was another action plan that considered seven themes, with statements that considered four EDI themes fully and three partially. The strategy stated that covered outdoor waiting areas should provide pedestrian comfort and protection from adverse weather conditions. Firstly, the equity themes incorporated include climate justice, environmental justice, distributional justice, and intergenerational equity/intragenerational equity. In addition to distributional justice, the inclusion theme of accessibility was highlighted due to intent of locating the structure outdoors to increase the ease of access to pedestrians. The short coming of this intervention is that the statement does not go into detail about the pedestrians that can be more susceptible to experiencing these weather events and what efforts are being addressed to ensure they can access these waiting areas, hence the diversity themes of vulnerable populations and marginal groups were coded as being partially incorporated. Additionally, the climate justice was coded as partial, because there was a missed opportunity to speak on the unpredictability and adverse risk of climate change & co-benefit to health that it will bring to equity-deserving groups that are socio-economically disadvantaged like the homelessness.

The AQ 2.3 Short-term Bicycle Parking Location, AQ 2.6 Publicly Accessible Bicycle Parking, AQ 3.1 Connectivity and AQ 3.2 Sidewalk Space building sector strategies all incorporated statements that fully considered four EDI themes, namely distributional justice, persons with disability, accessibility, and inclusive design. The diversity theme of persons with disabilities, and inclusion themes of accessibility and inclusive design were considered in these action plans because the strategies highlight that the infrastructures should have features such as being universally accessible, highly visible, context-sensitive, and located at-grade or on the first level of the building below grade. The intent to foster equitable access within this intervention indicated that distributional justice was critically important to address.

Finally, the following building sector strategies partially incorporated a single theme from the EDI framework: AQ 1.1 Single-Occupant Vehicle Trips and SW 1.2 Waste Storage Space. The diversity theme of marginalized groups was slightly indicated through the AQ 1.1 Single-Occupant Vehicle Trips strategy's intent to reduce reliance on personal vehicles by residents, patrons, and visitors. This strategy could have been framed to further identify the co-benefits such as the socio-economic implications on low-income groups, since it intends to support the increased access to public transit options which are more affordable. Similarly, the SW 1.2 Waste Storage Space strategy considers the equity theme of environmental justice partially, due to the lack of detail when stating that waste storage rooms should be easily accessible in residential uses and located in dedicated areas for waste haulers and building occupants. There was a missed opportunity to highlight the health and safety benefits of this measure to the various stakeholder groups that could belong to various equity-deserving groups. The performance measure simply stated that safe collection, storage, and disposal should be implemented for certain waste products.

Case Study 2: Montreal

In 2019, the City of Montreal announced its pledge at the UN Climate Change Summit and published the Montreal Climate Plan in December 2020. The City of Montreal's building sector strategies are contained in a dedicated chapter embedded in its climate action plan- *Montreal Climate Plan*, published in a downloadable pdf format. It has set its target to be carbon-neutral by 2050 and identified natural gas heating systems from residential buildings as the leading source of GHG emissions (City of Montreal, 2020). Although, Montreal also has a Montreal 2030 Citywide Strategic Plan that has been released, only the Montreal Climate Plan 2020-2030 is analyzed in this research study due to its clear coverage of the building sector strategies in a defined chapter. The strategic plan does not organize its action plans by sector.

The comparative analysis found that the Montreal Climate Plan consists of four strategies that incorporated EDI themes out of eight building sector strategies reviewed (Figure 3). The outer chart shows that half of the building sector strategies reviewed integrated EDI themes. The inner chart visually shows the total amount of each EDI theme incorporated into the building sector strategies reviewed. The most reoccurring equity, diversity and inclusion themes found in the building sector strategies of the Montreal Climate plans were climate justice and distributional justice; marginalized groups and accessibility respectively. Each of these themes were equally spread at 14.6% and this was attributed to being fully present in three of the four identified strategies.

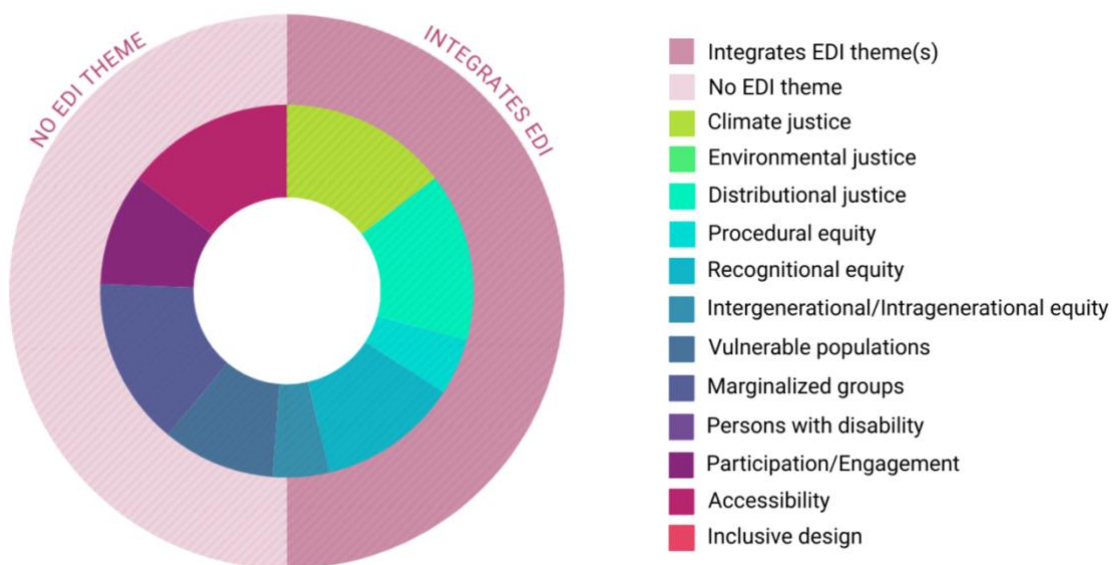


Figure 3. Showing an analysis of total building sector strategies that incorporated EDI themes and the extent at which each theme occurred in the Montreal Climate Plan

Montreal’s Action 29 to develop a collaborative approach to ensure respect for tenants’ rights was framed with statements that highlighted seven of the EDI themes fully, and one of the themes partially. The strategy integrated the equity themes of climate justice and recognitional justice; and diversity themes of vulnerable populations and

marginalized groups by explicitly mentioning these groups in the statement and acknowledging the historical injustices and socio-economic effects of the ecological transition on tenants that belong to these groups while promoting the respect for their rights. The action plan further considers marginalized groups and the equity theme of distributional justice by mentioning the intent to keep private and social housing affordable, hence ensuring access to these housing types. Action 29 also integrates inclusion themes of participation/engagement and accessibility by stating that the policy will make efforts to engage with these tenants to increase their awareness of Quebec's legislative framework and committing to ensure transparency by releasing public reports of the mobilization efforts and results. Finally, procedural equity was partially implied because the measure only stated that these tenants will have access of the progress and awareness of the laws, but it is not clear if there will be any direct involvement in any decision-making processes related to the adaptation of the rental housing stock to better suit these equity-seeking groups.

The City of Montreal's Action 24 to eliminate the use of heating oil in buildings incorporated six EDI themes fully and one partially. The diversity theme of marginalized groups; inclusion theme of accessibility and the equity themes of climate justice, distributional justice, and recognitional equity were indicated by directly stating that the tradeoff of the climate policy in relation to its likelihood to negatively affect low-income households and ensuring they can partake in this transition smoothly and avoid displacement. Furthermore, intergenerational/intragenerational equity was considered in this strategy as it addresses both contemporary issues while aiming to protect the environmental quality for future generations. Similarly, the inclusion theme of participation/engagement was partially implied but there is the opportunity to expand on whether there will be engagement efforts to attract the occupants of these low-income households to participate in determining a fair measure.

Action 25 of Montreal's Climate Plan is to adapt by-laws and support programs to improve energy efficiency and the resilience of all types of buildings (City of Montreal, 2020). This action was broken out into five strategies, and two of them integrated EDI themes. The first measure was concerned with improving the AccèsLogis program which finances social and community housing projects on the Island of Montréal; and incorporated five EDI themes fully and one partially in its framing. The EDI themes of climate justice, distributional justice, vulnerable populations, marginalized groups and accessibility are shown by the statement explaining the program aims to improve the energy efficiency and resilience of these housing types to climate change. Therefore, reducing exposure to adverse conditions and increasing access to high-quality residential developments which generally cater to groups more vulnerable to systemic barriers and climate change impacts. The equity theme of recognitional equity was partially addressed as the strategy highlighted that a revision will be done, which indicates that historical factors have been identified and requires updates to better provide for these targeted groups.

The second building sector strategy under this action plan consists of upgrading by-laws related to energy efficiency. This measure partially considers procedural equity and participation/engagement, as it stated that consultations will be carried out with the construction and real estate development communities which might include organizations that represent equity-deserving groups, but it is not explicitly disclosed.

Case Study 3: Vancouver

The City of Vancouver has set its targets to reduce its carbon pollution by half by 2030 and become carbon neutral by 2050 (City of Vancouver, 2020). The city stated that buildings are one of the main focuses of climate change mitigation action due to the sectors high production of GHG emissions. The *Vancouver Climate Emergency Action*

Plan takes a sectoral approach to setting its climate goals and addresses the building sector strategies through the Climate Action through Buildings webpage. Under this scope, the Zero Emissions Building (ZEB) Plan from the new homes and buildings resources was used for the comparative analysis. The City's Climate Change Adaptation Strategy (CCAS) was not used for this study because only the 2018 action plan contained a dedicated section for buildings, while the 2020 and 2024-2025 updates were organized by climate-related hazards.

The Zero Emissions Building Plan integrated 3 EDI themes within strategies out of the twenty-eight building sector strategies analyzed (Figure 4). The outer chart shows that 10.7% of the building sector strategies integrated EDI themes. The inner chart visually shows the total amount of each EDI theme incorporated into the building sector strategies identified. The legend shows the themes that are present and absent for ease of reference. The most frequently incorporated equity, diversity and inclusion themes in the ZEB plan were procedural equity 35.3, vulnerable populations 5.9%, and participation/engagement 47.1% respectively.

Firstly, 6.3 Capacity Building - Sharing knowledge incorporated three EDI themes in its framing as it stated that is proposing a Centre of Excellence for Zero Emissions Building to listen to the concerns of developers, designers, and builders that will work with City staff to resolve them and identify regulatory and permitting barriers. The inclusion theme of participation/engagement, and equity theme of procedural were indicated fully by expressing these efforts to engage with workers in this sector in this manner, then further revealed that there will be measures to better engage with groups that might not have been involved or represented in the past. The strategy did not explicitly mention examples of these target groups so recognitional equity was partially addressed initially, then after speaking to the respondent from Vancouver it was

learned that creative ways have been used to reach equity-deserving groups that work in these types of roles. The interviewee shared:

...They shared they have got problems with the code, and we said we do a lot of engagement and they have never expressed that. It was found that at the time, they actually never even came to our engagements...what we ended up doing is actually developing a relationship with one of the temples. Right. So, it's one of the Sikh temples and many of the builders who are active in Temple life invited us to the Temple for a meal to sit down with them and then to get the cacophony of their voices... (V1).

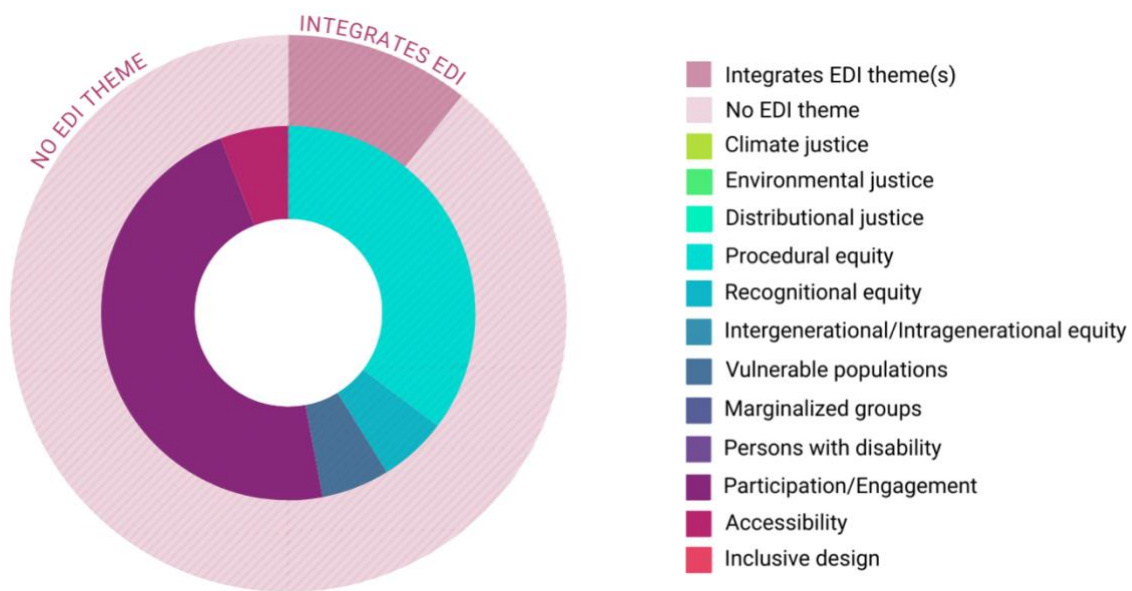


Figure 4. Showing an analysis of total building sector strategies that incorporated EDI themes and the extent at which each theme occurred in the Vancouver Zero Emissions Building plan

The second strategy is 6.4 Capacity Building - Removing Barriers which stated that there will be public education organized to increase the understanding of the quality of zero emissions buildings. This building sector measure fully considered participation /engagement as this plan is also connected to the Centre of Excellence for Zero

Emissions buildings, but missed the opportunity to state if the targeted groups would contribute to any planning or decision-making processes. Hence, procedural equity was coded as being partially considered. The final measure is 6.2 Capacity Building - Public Engagement which fully considers the inclusion themes of accessibility and participation/engagement. The strategy states that a communication program will be developed to engage the public and raise awareness and demand for zero emissions buildings and would be shared in different forms and mediums.

Case Study 4: Calgary

The City of Calgary set a target for a sixty percent reduction of its GHG emissions below 2005 levels by 2030 and net zero GHG emissions by 2050. In 2021, Calgary announced a climate emergency to support an accelerated response to climate change and acknowledge the urgency of the action required to lower emissions, then published the Calgary Climate Strategy a year later (City of Calgary, 2022). The municipality identified equity, inclusiveness, indigenous knowledge and reconciliation as part of the seven guiding principles of the climate plan. For this study, the buildings sector strategies in the Climate Strategy were reviewed jointly with the buildings chapter of the 2023-2026 Climate Implementation plan. There were four building sector strategies from the Climate Strategy and Implementation Plan, that integrated the EDI themes (Fig 5). The outer chart shows that 30.8% of the building sector strategies reviewed integrated EDI themes. The inner chart visually indicates that the most reoccurring equity, diversity and inclusion themes were distributional justice 15.4%, marginalized groups 13.5% and accessibility 15.4% respectively.

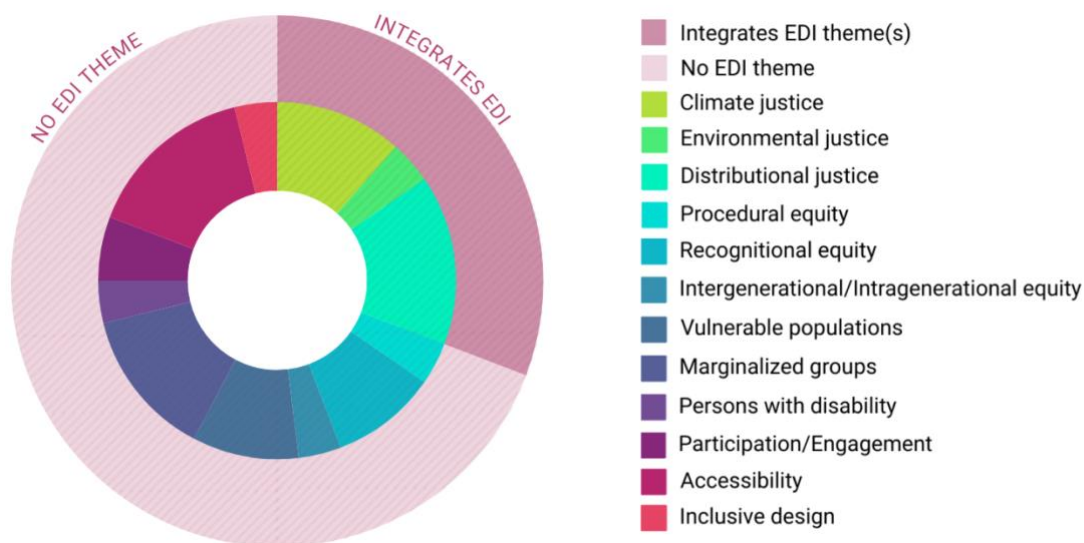


Figure 5. Showing an analysis of total building sector strategies that incorporated EDI themes and the extent at which each theme occurred in Calgary’s Climate Strategy and Implementation Plan

Two of the strategies were under Program 11 on improving access to climate-resilient housing. The first strategy is 11.1 to implement pilot projects in affordable housing projects which corresponded with the measure on “Developing climate-resilient private homes and buildings” in the Climate Implementation plan. The strategy fully incorporated the EDI themes of climate justice, distributional justice, vulnerable populations, marginalized groups, and accessibility by indicating that the measure is to support and track key pilot affordable housing projects that are energy efficient and climate resilient. Hence, facilitating increased access to these features will ultimately protect equity-deserving groups that live in this type of housing. However, this strategy was coded as the inclusion of vulnerable and marginalized groups was implied by citing measures for affordable housing, but the intent of the pilot projects pointed to economic motivators rather than social factors.

The second strategy is 11.2 to improve funding for climate-resilient housing for low-income earners, was also covered within the “Developing climate-resilient private homes and buildings” in the implementation plan. Here, all the themes from the EDI framework were fully considered as the measure aims to collaborate with funders and community members to support affordable and non-market housing. The diversity theme of marginalized groups, and equity themes of climate justice, distributional and recognitional equity, were shown here by directly acknowledging the targeted groups that face socio-economic barriers to accessing the infrastructure that is meant to protect them against climate change impacts. Also, themes of procedural equity and participation/engagement were shown by stating that community groups will be consulted to take part in this program. The EDI themes of environmental justice, intergenerational/intragenerational equity, vulnerable populations, and accessibility were further indicated in the statements about the potential of adequate, safe and accessible housing to increase climate resilience in equity-deserving populations. Thereby highlighting the importance of safeguarding the health of present communities from adverse climate conditions and ensuring these spaces are designed to accommodate all people including persons with disabilities.

The strategy of “Developing climate-resilient private homes & buildings” when reviewed as a stand-alone measure fully integrated climate justice, distributional justice and accessibility. Conversely, the themes of recognitional equity, vulnerable populations, marginalized groups, and participation/engagement were partially integrated. Finally, the strategy to “Build new buildings to a net zero emissions standard” in the Climate Implementation plan incorporated three EDI themes. The themes of distributional justice, marginalized groups and accessibility were indicated fully by the mention of affordable housing as a key service of this measure and the external collaboration with the Province of Alberta for support with the Affordable Housing net zero buildings pilot project.

Results of Comparative Analysis

Published Strategies

Assuming that the coverage of the building sector scope was the same across all four of the major urban centres, then it is noteworthy to discuss the results of the analysis in comparison to each other (Figure 6). Firstly, Montreal and Calgary were the only cities to have more than 30% of their building sector strategies integrate EDI themes while Toronto and Calgary both had less than 20%. Secondly, the most integrated equity theme was found to be distributional equity for the cities of Toronto, Montreal and Calgary, but was not present in Vancouver's building sector strategies. The three cities framed their strategies around fair access to climate adaptation interventions like higher performing resilient buildings, while Vancouver prioritized procedural equity over other equity themes.

In the case of diversity themes, Montreal and Calgary focused on marginalized groups the most, Vancouver prioritized vulnerable population while Toronto paid the most attention to persons with disabilities within their building sector strategies. In this study, the consideration of marginalized groups indicates an emphasis towards socio-economic and systemic barriers, while vulnerable populations are more geared toward reducing exposure to adverse climate events. Finally, the most considered inclusion theme was accessibility for all the cities. It is important to note that this study framed accessibility as the measure taken to reduce the limitations that occur when navigating the built environment or acquiring resources and information.

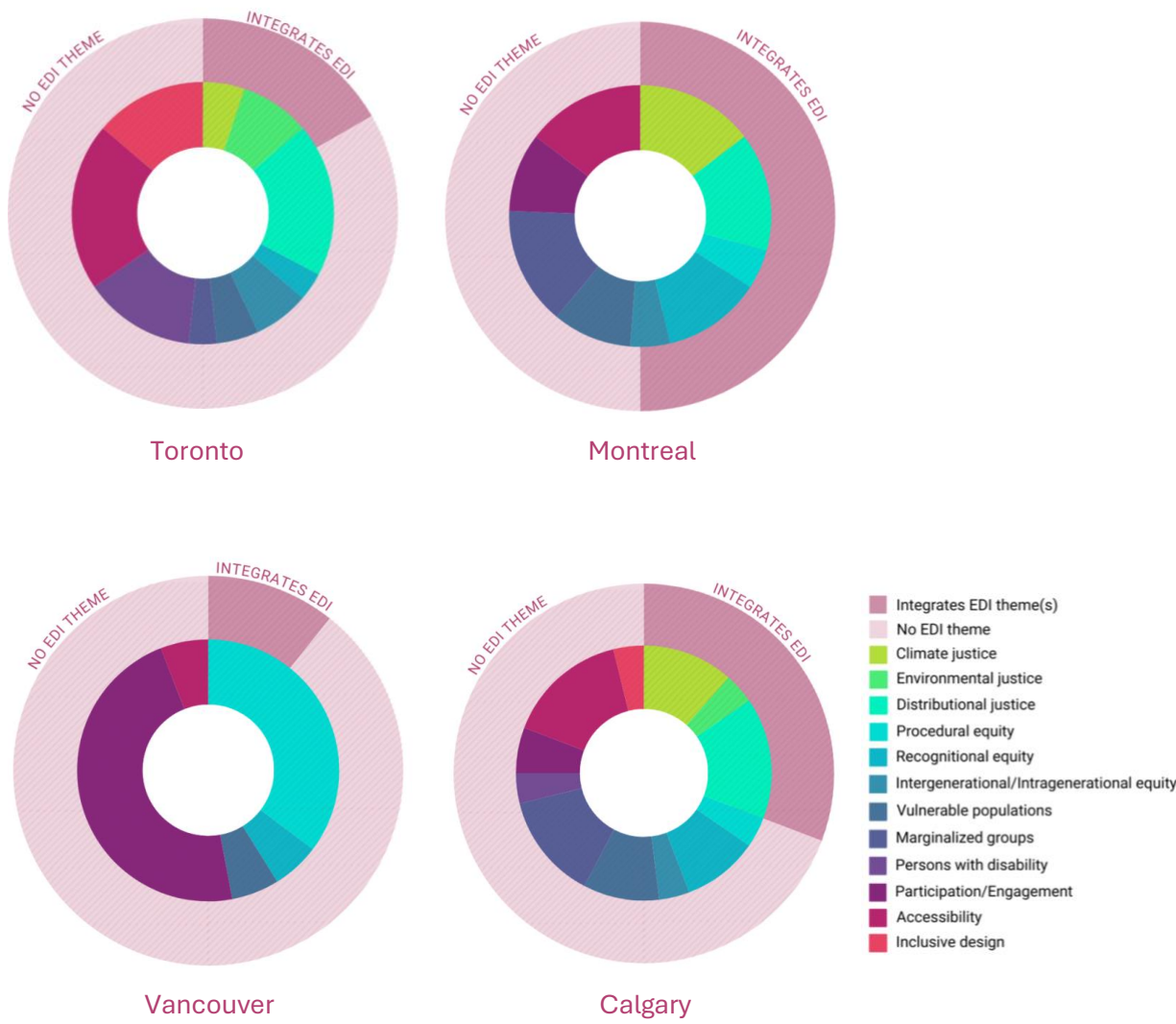


Figure 6. Showing an analysis of all the four major urban centres' building sector strategies that incorporated EDI themes and the extent at which each theme occurred in the Toronto Green Standard, Montreal Climate Plan, Vancouver's Zero Emission Building Plan and the Calgary Climate Strategy and Implementation Plan (Assuming that the coverage of the scope are the same)

Conversely, the equity themes that were least considered are procedural and environmental equity. Toronto, Montreal and Calgary addressed procedural equity the least compared to the other equity themes, while environmental justice followed closely behind with Vancouver not addressing it at all. Moreover, as this research scope covered the ICI developments, it was interesting to not find any strategy that directly addressed efforts to avoid historical injustices when it came to locating industrial facilities near equity-seeking communities. For diversity themes, all three cities integrated the theme of persons with disabilities the least, while Toronto has that as its highest diversity theme. Instead, Toronto focused the least on marginalized groups within its building sector strategies. Lastly, the findings show that Toronto and Vancouver have the highest percentage of their EDI theme within the inclusion theme, while Montreal and Calgary seemed to prioritize the integration of equity themes in their building sector strategies.

Planning and Development Phase

The initial phase of climate action planning generally involves the planning and development phase where climate risks are assessed to properly identify the vulnerability of communities, key internal and external consultations and working groups needed; framing of the climate plan objectives; and where further revisions are made when updates have been deemed necessary. All the climate action plans discuss the vulnerabilities caused by climate change and the building sector's GHG contribution to it. Generally, the identified vulnerable groups were identified within the overarching climate action plan either in the introductory pages or within supplementary resources and reports. The most visible and detailed identification was done by Calgary in its Calgary Climate Strategy, where it listed various primary and secondary dimensions of diversity that were impacted by social and institutional systems which ultimately influence an individual's lived experience, ability to reduce personal emissions and resiliency to environmental shocks. These dimensions include the differences in age, race, gender, ability, sexual orientation, income, immigration

status, culture, health status, and language. The City of Calgary also named equity, inclusiveness, indigenous knowledge and reconciliation as part of its guiding principles in the climate planning process. Another instance was done by Montreal, where it defined inclusivity as 'ensuring no one is left out and all benefit from the climate plan interventions' but did not expand on the groups that often tend to be excluded. Vancouver on the other hand, stated that its *Climate Emergency Action Plan* aims to give opportunity for a healthier, cleaner, safer, equitable, and resilient city through its response to climate challenge.

Implementation Phase

Lastly, the implementation of these building sector strategies covers the tracking, enforcement, and financing components. Using metrics to track these strategies' progress increases transparency and facilitates better governance of the degree to which EDI is incorporated. Calgary includes a monitoring and measurement subsection for each of the building sector strategies, where it shows the key performing indicators and intended results. For example, the number of impacted Calgarians engaged and number of households experiencing energy poverty serves as the KPI for the support of Calgarians impacted by energy poverty strategy. Furthermore, the results section reads as the intended outcome of the measure. Additionally, Montreal includes targets that broadly cover the mitigation and the resilience or adaptation efforts of the plan, but this can easily be missed as it is located at the very end of the document as the *Follow-up indicators* section (Montreal Climate Plan, 2020 p.108). In regard to how these climate action plans are enforced, Toronto mandates its Tier 1

performance measures and allows Tier 2 and 3 to be voluntary but provides financial incentives to encourage mass adoption through the *Development Charge Refund Program* (Toronto Green Standard, 2022). It is not clear the extent to which the building sector strategies are enforced in the three other cities.

CONCLUSION AND RECOMMENDATIONS

The findings from the study revealed there are several barriers that limit the integration of EDI within the building sector strategies. This has been shown by the framing of statements in the published reports, and current practices used for the development and implementation of the climate plans. Despite this, there are opportunities to adopt successful practices from other municipalities or sectors, to incorporate feedback from key industry players and members of equity-deserving groups. Additionally, the EDI framework developed in this study can be referenced for developing climate adaptation plans and strategies. This section proposes two high-level recommendations for municipalities that can benefit policy makers, city planners, developers, community groups, and architectural, engineering and construction (AEC) professionals; and areas where future research can be conducted.

Outreach and Access to Decision/Planning Processes

It appears that even the process of determining where to find an appropriate pool of people who belong to these targeted groups has been found to be difficult. Despite the City of Vancouver trying innovative ways to find underrepresented voices of key stakeholders, such as going out to a Sikh temple to get feedback from builders belonging to these groups, the initial scouting process has been believed to be challenging. The staff member shares:

...how do you find those voices actually, because you invite them but they don't come or you don't know even how to invite them. And again you have to be willing to accept that they are not a self-sorting voice right? Like they are a cacophony because they don't have an association...You have to do the extra work to boil their voices down for them, which is a lot harder for us because they

don't always agree but you again, you can generally find a goal. So that's one good example of how we began to do inclusion (V1).

Furthermore, the City of Toronto seems to have navigated this by leveraging internally established working groups. The interviewee from the City of Toronto explained that such consultations are made with City of Toronto employees (referred to as “the City” in the below conversion), who self-identify as belonging to the relevant equity-seeking group or groups. The respondent explained:

We engage with different work units, both within Community planning as well as the Anti-black racism team at the City, the Indigenous Affairs Office and a number of others as the City works on its consultation programs. So those teams have been established as City-wide groups and as resources for, you know, the division and for others to be able to tap into. That's one space that the City is taking on that work to establish these action plans and work teams that can actually help us implement it ...(T1).

Alternatively, the City of Vancouver and Calgary discussed that there are dedicated equity teams that work with the climate planning teams. The difference seems to be that the equity team at the City of Calgary is also responsible for the outreach and works within that division. One of the Calgary staff explains:

I have a colleague that's working specifically with communities and with climate resilience. The staff formed a working group that is filled with diverse people, and that working group is co-creating grants in the future. It'll be specifically for underserved communities to apply for grants to help with, like community and climate resilience projects (C2).

As shown, all cities are making genuine efforts to engage with these equity-deserving communities in various ways. Municipalities should go beyond the traditional engagement methods that have been used as outreach to involve equity-deserving groups in the planning and decision-making processes. Instead, more creative ways should be developed to get these communities actively involved. A combination of these approaches could lead to a more streamlined outreach process.

The dependency on only internal consultation can lead to filtered-down feedback, so it is important to also involve equity-seeking populations that are not employed by the city. Having a staff member who has been provided the resources to extensively develop effective outreach programs that reduces the burdens of that process from planners but also gives the opportunity for them to work directly with this groups when selected, will allow for a more positive experience. After the outreach phase, the extent of the participation or engagement is often not disclosed within many building sector strategies. To uphold the EDI themes, there should be increased capacity given to these underrepresented groups that will support equitable participation, whereby their voices are heard and allowed to take part in shaping policies and programs.

Partnerships with Other Jurisdictions

Climate resilient and sustainable buildings have been proven to help reduce GHG emissions and better withstand the effects of climate change but remain expensive due to not being mainstream and not widely adopted. Hence, excluding equity-seeking groups from accessing and benefitting from these climate adaptation interventions. This issue affects the four cities differently, as the City of Vancouver has an advantage in this regard. The staff explains:

...So, a lot of the innovation you see in sort of new construction and now existing building regulations comes out of Vancouver not because we're better than

everyone else, it's just because we have authorities that most local governments don't have i.e we can write our own building code and other communities are a lot more constrained by their provincial codes and sort of zoning and voluntary programs (V1).

In the case of the City of Calgary, there have been regulatory tools that have been used to navigate these provincial codes that might not uphold the same level of sustainability standards. They have put in place building priority streams to fast-track the building inspection and permitting processes. The respondent also discusses another measure they have put in:

In partnership with the climate and environment, which is its own division with the City, a new development plan and zoning bylaw is currently being drafted. So, climate is something that we're working to implement within our bylaws, a lot more, maybe deliberately. Rather than, sort of having the high-level policies that we had to fall back on, but just making requirements and that's kind of how the implementation plan is being done now (C1).

Similarly, the City of Toronto explains how this burden manifests itself, and how the city is responding. The interviewee explains:

There is a societal impact to pushing the industry forward, but I think that our focus has generally been on pushing the industry forward and making sure that green buildings can be built, and there is the necessary technology, knowledge within the workforce, products in the supply chain to make, so we can build to these standards... So, the economic development division and the environment and climate division are more focused on developing a new labor force within Toronto that will have these new skills, which didn't exist within the construction

industry, let's say a decade ago, but will be needed in the future. So, I think that is where there can definitely be more of an EDI focus (T1).

Although, the City of Vancouver has more freedom to make changes to its building code, the respondent shares the same concerns on societal implications of the regulation process. The staff discusses how they strategically make the transition period of policy adoption less burdensome on equity-deserving groups:

We think of those risks and opportunities, a lot of that is equity. We think the main challenge we have is making sure that our regulations don't have a material impact on housing affordability or security of tenure. I think where the emissions are, are therefore where you have incentives. This often starts with the people with the most means, because you are trying to get them to voluntarily do something before you regulate. (V1).

Finally, another reason why close partnerships with provincial and federal governments are critical, is because they can assist with the implementation phase through funding. One of the respondents from the City of Calgary said:

The first one that comes to mind is really the financial barrier, because often pursuing green building...costs more to meet climate objectives. So, with the technologies that we currently have and the sort of rate of adoption, it is more expensive to pursue developments or any sort of technology that is more high performing, and so immediately that's going to exclude people who have less means (C1).

From this analysis, there should be systems in place to align objectives between policies governed by other jurisdictions. These clashing goals can slow down the rate of widespread adoption of more sustainable building practices, materials and products and increase the burden on municipalities to lead the way even though they often have

limited resources. For municipalities to secure investments and gain support from provincial and federal governments, it is necessary to measure and track progress and map out the key performing indicators, so that there is a strong business case when presenting these objectives to these key stakeholders. Another way is gaining increased public support, which could lead to increased pressure on other jurisdictions to take action. Educating the public and equity-deserving groups about their rights, the various impacts of climate change, and the value of various climate adaptability interventions in the built environment.

Future Research

This paper aims to provide an EDI framework for policymakers, urban planners, developers, architectural and engineering practitioners, to better integrate EDI into the building sector strategies of climate action plans. Twelve EDI themes were extracted from literature and formed the framework used to conduct a comparative analysis of the building sector strategies from the climate action plans of four of the major urban centres in Canada - Toronto, Montreal, Vancouver and Calgary. The scope of the research study was limited to new mid to high-rise residential developments that were four storeys or higher; and non-residential buildings which consists of industrial, commercial and institutional developments.

For future research, the EDI framework could be used to perform a comparative analysis of other major sectors such as transportation, energy, waste and natural infrastructure. existing building strategies. Another approach would be to apply these themes to existing building developments and city-owned facilities as there were a few strategies that were not reviewed because they were outside of the study boundaries but integrated the EDI themes strongly. Also, this study focuses on equity, diversity and inclusion but there is a strong need for further research on justice, equity, diversity, and

inclusion” (JEDI), instead of embedding justice within equity. This is especially important due to the historical context within Canada.

APPENDICES

Table 3: Table showing Building sector strategies from TGS that were considered and excluded from research study

Building Sectors Strategies that integrated EDI themes	Building Sectors Strategies reviewed but had EDI theme	Excluded Building Sectors Strategies within the TGS
AQ 1.1 Single-Occupant Vehicle Trips	AQ 1.2 Electric Vehicle Infrastructure	N/A
AQ 2.3 Short-term Bicycle Parking Location	AQ 2.1 Bicycle Parking Rates	
AQ 2.6 Publicly Accessible Bicycle Parking	AQ 2.2 Long-term Bicycle Parking Location	
AQ 3.1 Connectivity	AQ 2.4 Electric Bicycle Infrastructure	
AQ 3.2 Sidewalk Space	AQ 2.5 Shower and Change Facilities	
AQ 3.3 Weather Protection	AQ 3.4 Pedestrian Specific Lighting	
GHG 3.1 Refuge Area and Back-Up Power Generation	All Strategies under the Buildings Energy, Emissions & Resilience except GHG 3.1 (7)	

SW 1.2 Waste Storage Space	All Strategies under the Water Quality & Efficiency (5)	
	All Strategies under the Ecology & Biodiversity (13)	
	All Strategies under the Waste and the Circular Economy except SW 1.2 (9)	

Table 4: Table showing Building sector strategies from Montreal Climate Plan that were reviewed and excluded from research study

Building Sectors Strategies that integrated EDI themes	Building Sectors Strategies reviewed but had no EDI theme	Excluded Building Sectors Strategies within Montreal Climate Plan
Action 24 Eliminate the use of heating oil in buildings	Action 28 Encourage sustainable construction by providing information and support	Action 26 Develop a funding program for building owners to support healthy and environmentally sound renovation
Action 25- Upgrading by-laws related to energy efficiency	Action 25- Improving by-laws governing resilience to climate change	Action 27 Improve the energy performance of large buildings via an energy consumption and

		GHG emissions rating and disclosure system
Action 25- Improving the AccèsLogis program.		
Action 29 Develop a collaborative approach to ensure respect for tenants' rights		

Table 5: Table showing Building sector strategies from the Zero Emissions Building that were reviewed and excluded from research study

Building Sectors Strategies that integrated EDI themes	Building Sectors Strategies reviewed but had no EDI theme	Excluded Building Sectors Strategies within the Vancouver Climate Emergency
6.2 Capacity Building - Public Engagement	3.1.1 Path One: High Performance Building Envelope and Ventilation Systems	3.5.2 GHG and Energy Targets - Detached Housing
6.3 Capacity Building - Sharing knowledge	3.1.2 Path Two: Neighbourhood Renewable Energy Systems	City Leadership - City Owned and Operated Civic Facilities

6.4 Capacity Building - Removing Barriers	3.2.1 Greenhouse Gas Intensity (GHGI - kg CO2e/m2 annually)	5.4.1 Catalyst Tools - Detached and Row House Developments*
	3.2.2 Thermal Energy Demand Intensity (TEDI kWh/m2 annually)	
	3.2.3 Energy Use Intensity (EUI)	
	All Stepping Down Emissions to Zero - GHG and Energy Targets strategies except 3.5.2	
	All Stepping Down GHG Emissions to Zero – Compliance with Targets strategies	
	Carbon Neutral New Buildings	
	5.1 Early and visible success will attract not only participants but partner commitments and program details can be refined over time.	
	Catalyst Approaches	
	Catalyst Tools	
	All Catalyst Tools for Targeted Building Types strategies except 5.4.1	
	6.1 Capacity Building - Generating knowledge	

Table 6: Table showing Building sector strategies from Calgary Climate Implementation Plan and Climate Strategy that were reviewed and excluded from research study

Building Sectors Strategies that integrated EDI themes	Building Sectors Strategies reviewed but had no EDI theme	Excluded Building Sectors Strategies within Calgary Climate Implementation Plan & Climate Strategy
11.1 Implement pilot projects in affordable housing projects (Developing climate-resilient private homes & buildings)	A1.1 Develop a mechanism to require that all new residential buildings establish and disclose a building energy label.	Program Pathway B: Existing buildings – Retrofit existing buildings to a net zero standard
11.2 Improve funding for climate-resilient housing for low-income earners ((Developing climate-resilient private homes & buildings)	A1.2 Develop a mechanism to require that all new commercial buildings participate in measuring and disclosing their energy performance through the City of Calgary’s Commercial and Institutional Building Energy Benchmarking program.	Program Pathway C: Energy poverty – Support Calgarians impacted by energy poverty
Build new buildings to a net zero emissions standard	A4.1 Develop process incentives to encourage net zero emissions residential and commercial buildings.	Focus Area C: Climate-resilient City-owned infrastructure
	A4.2 Develop financial incentives to encourage achieving higher energy performance standards for new residential and commercial buildings, in alignment with the	11 .3 Assess the climate resilience and energy efficiency of Calgary Housing Company’s existing housing stock and develop strategies to improve its resilience on a priority basis

	development of a Net Zero Emissions Building Standard.	
		Program 10: Retrofitting homes to be climate-resilient
		Building new city owned infrastructure to be climate resilient
		Reducing climate risk to existing city-owned infrastructure
		Support Calgarians impacted by energy poverty

REFERENCES

Anguelovski, I., Shi, L., Chu, E., Gallagher, D., Goh, K., Lamb, Z., Reeve, K., & Teicher, H. (2016). Equity Impacts of Urban Land Use Planning for Climate Adaptation: Critical Perspectives from the Global North and South. *Journal of Planning*

Education and Research, 36(3), 333-348.

<https://doi.org/10.1177/0739456X16645166>

Bernstein, R. S., Bulger, M., & Salipante, P. (2020). From Diversity to Inclusion to Equity: A Theory of Generative Interactions. *J Bus Ethics*, 167, 395-410.

Berry, J. (2016). Diversity and equity. *Cross Cultural & Strategic Management*, 23(3), 413-430. <https://doi.org/10.1108/CCSM-03-2016-0085>

Bowleg L. (2012). The problem with the phrase women and minorities: intersectionality-an important theoretical framework for public health. *American journal of public health*, 102(7), 1267-1273. <https://doi.org/10.2105/AJPH.2012.300750>

Braveman, P., & Gruskin, S. (2003). Defining equity in health. *Journal of Epidemiology and Community Health* (1979), 57(4), 254-258. <https://doi.org/10.1136/jech.57.4.254>

Bullard, R.D. (1996). Bullard Symposium: The legacy of American apartheid and environmental racism. *St. John's Journal of Legal Commentary.*, 9 (1996), pp. 445-474. <https://heinonline.org/HOL/LandingPage?handle=hein.journals/sjjlc9&div=23&id=&page=>

By-Law concerning GHG emission disclosures and ratings of large buildings. (2023, October 24). Montreal. Retrieved October 26, 2023, from <https://montreal.ca/en/articles/law-concerning-ghg-emission-disclosures-and-ratings-large-buildings-20548#:~:text=To%20become%20carbon%20neutral%20by,of%20energy%20their%20buildings%20use>

Byskov, M. F., Hyams, K., Satyal, P., Anguelovski, I., Benjamin, L., Blackburn, S., Borie, M., Caney, S., Chu, E., Edwards, G., Fourie, K., Fraser, A., Heyward, C., Jeans, H.,

Malloy, J. T., & Ashcraft, C. M. (2020). A framework for implementing socially just climate adaptation. *Climatic Change*, 160(1), 1-14.

<https://doi.org/10.1007/s10584-020-02705-6>

City of Calgary (2022). Calgary Climate Strategy. Retrieved October 26, 2023, from <https://www.calgary.ca/environment/climate.html>

City of Calgary (2022). Measuring Calgary's climate action. Retrieved February 26, 2024, <https://www.calgary.ca/environment/climate/climate-action.html>

City of Toronto (2016). TransformTO Reports & Resources. Retrieved February 23, 2024, from <https://www.toronto.ca/services-payments/water-environment/environmentally-friendly-city-initiatives/transformto/transformto-reports-resources/>

City of Toronto (2021). Sector-Based Emissions Inventory. Retrieved February 23, 2024, from <https://www.toronto.ca/services-payments/water-environment/environmentally-friendly-city-initiatives/transformto/sector-based-emissions-inventory/>

City of Toronto (2021). Toronto Green Standard. Retrieved October 20, 2023, from <https://www.toronto.ca/city-government/planning-development/official-plan-guidelines/toronto-green-standard/>

City of Toronto. (2021). Toronto Green Standard: Reports & Resources. Retrieved February 23, 2024, from <https://www.toronto.ca/city-government/planning-development/official-plan-guidelines/toronto-green-standard/toronto-green-standard-information-reports/>

City of Toronto. (2021). TransformTO Net Zero Strategy. Retrieved October 20, 2023, from <https://www.toronto.ca/services-payments/water-environment/environmentally-friendly-city-initiatives/transformto/nt/environmentally-friendly-city-initiatives/transformto/>

- City of Vancouver (2020). Climate Change Adaptation Strategy. Retrieved February 24, 2024, from <https://vancouver.ca/green-vancouver/climate-change-adaptation-strategy.aspx>
- City of Vancouver (2020). Climate Emergency Action Plan. Retrieved October 26, 2023, from <https://vancouver.ca/green-vancouver/vancouvers-climate-emergency.aspx>
- Chu, E. K., & Cannon, C. E. (2021). Equity, inclusion, and justice as criteria for decision-making on climate adaptation in cities. *Current Opinion in Environmental Sustainability*, 51, 85-94. <https://doi.org/10.1016/j.cosust.2021.02.009>
- Dale, A., Robinson, J., King, L., Burch, S., Newell, R., Shaw, A., & Jost, F. (2020). Meeting the climate change challenge: Local government climate action in British Columbia, Canada. *Climate Policy*, 20(7), 866-880. <https://doi.org/10.1080/14693062.2019.1651244>
- Fiack, D., Cumberbatch, J., Sutherland, M., & Zerphey, N. (2021). Sustainable adaptation: Social equity and local climate adaptation planning in U.S. cities. *Cities*, 115, 103235. <https://doi.org/10.1016/j.cities.2021.103235>
- Government of Canada (2021). Creating an Equitable, Diverse and Inclusive Research Environment: A Best Practices Guide for Recruitment, Hiring and Retention. https://www.chairs-chaires.gc.ca/program-programme/equity-equite/best_practices-pratiques_exemplaires-eng.aspx
- Government of Canada (2022, July). Greenhouse gas sources and sinks in Canada: executive summary 2022. <https://www.canada.ca/en/environment-climate-change/services/climate-change/greenhouse-gas-emissions/sources-sinks-executive-summary-2022.html>.
- Green Building Policies. (2022). City of Vancouver. Retrieved October 26, 2023, from <https://vancouver.ca/green-vancouver/zero-emissions-buildings.aspx>

- Hess, D. J., & McKane, R. G. (2021). Making sustainability plans more equitable: An analysis of 50 U.S. Cities. *Local Environment*, 26(4), 461–476.
<https://doi.org/10.1080/13549839.2021.1892047>
- Heylighen, A (2008) Sustainable and inclusive design: a matter of knowledge?, *Local Environment*, 13:6, 531-540, DOI: 10.1080/13549830802259938.
- IPCC. (2014). *Climate change 2014: Impacts, adaptation, and vulnerability*. Cambridge, UK: Cambridge University Press.
- Isa Mosca, E., & Capolongo, S. (2018). Towards a universal design evaluation for assessing the performance of the built environment. 256, 771–779.
<https://doi.org/10.3233/978-1-61499-923-2-771>
- Jackson, M. (2018). Models of Disability and Human Rights: Informing the Improvement of Built Environment Accessibility for People with Disability at Neighborhood Scale? *Laws*, 7(1), 10. <https://doi.org/10.3390/laws7010010>
- Khelifa, R., & Mahdjoub, H. (2022). An intersectionality lens is needed to establish a global view of equity, diversity and inclusion. *Ecology Letters*, 25(5), 1049–1054.
<https://doi.org/10.1111/ele.13976>
- Klinsky, S., Roberts, T., Huq, S., Okereke, C., Newell, P., Dauvergne, P., O'Brien, K., Schroeder, H., Tschakert, P., Clapp, J., Keck, M., Biermann, F., Liverman, D., Gupta, J., Rahman, A., Messner, D., Pellow, D., & Bauer, S. (2017). Why equity is fundamental in climate change policy research. *Global Environmental Change*, 44, 170–173. <https://doi.org/10.1016/j.gloenvcha.2016.08.002>
- Lioubimtseva, E., & da Cunha, C. (2022). Community Engagement and Equity in Climate Adaptation Planning: Experience of Small- and Mid-Sized Cities in the United States and in France. In B. Petersen & H. B. Ducros (Eds.), *Justice in Climate Action Planning* (pp. 257–276). Springer International Publishing.
https://doi.org/10.1007/978-3-030-73939-3_13

- Loden, M., Rosener, J.B., 1991. *Workforce America! Managing Employee Diversity as a Vital Resource*. Illinois: Business One Irwin
- Malloy, J. T., & Ashcraft, C. M. (2020). A framework for implementing socially just climate adaptation. *Climatic Change*, 160(1), 1-14.
<https://doi.org/10.1007/s10584-020-02705-6>
- Mazur, B. (2010). Cultural Diversity in Organisational Theory and Practice. *Journal of Intercultural Management*, 2(2), 5-15.
- McQuistan, C., Paavola, J., Page, E., Pelling, M., Priest, S., ... Venn, A. (2021). An agenda for ethics and justice in adaptation to climate change. *Climate and Development*, 13(1), 1-9. <https://doi.org/10.1080/17565529.2019.1700774>
- Méjean, A., Pottier, A., Fleurbaey, M. et al. (2020) Catastrophic climate change, population ethics and intergenerational equity. *Climatic Change* 163, 873-890.
<https://doi.org/10.1007/s10584-020-02899-9>
- Meerow, S., Pajouhesh, P., & Miller, T. R. (2019). Social equity in urban resilience planning. *Local Environment*, 24(9), 793-808.
<https://doi.org/10.1080/13549839.2019.1645103>
- Mikus, J., & Rieger, J. (2021). *Inclusive Design as a Market Differentiator: An Industry and Academic Perspective on Diversity-Driven Initiatives in Built Environment Design across North America, Europe, the UK, and Australia* (Vol. 282, pp. 13-31). IOS Press. <https://doi.org/10.3233/SHTI210381>
- Montreal (2020). *Montreal Climate Plan: Objective carbon-neutral by 2050*. Retrieved October 26, 2023, from <https://montreal.ca/en/articles/montreal-climate-plan-objective-carbon-neutral-2050-7613>
- Mor-Barak, M.E, and Cherin, D.A. (1998). A tool to expand organizational understanding of workforce diversity: Exploring a measure of inclusion-

exclusion. *Administration in Social Work.*, 22(1).

https://doi.org/10.1300/J147v22n01_04

Mullenbach, L. E., & Wilhelm Stanis, S. A. (2022). Climate change adaptation plans: Inclusion of health, equity, and green space. *Journal of Urban Affairs*, ahead-of-print(ahead-of-print), 1-16. <https://doi.org/10.1080/07352166.2022.2091449>

Schrock, G., Bassett, E. M., & Green, J. (2015). Pursuing Equity and Justice in a Changing Climate: Assessing Equity in Local Climate and Sustainability Plans in U.S. Cities. *Journal of Planning Education and Research*, 35(3), 282-295. <https://doi.org/10.1177/0739456X15580022>

Sherman, J., & Sherman, S. (2013). Preventing Mobility Barriers to Inclusion for People With Intellectual Disabilities. *Journal of Policy and Practice in Intellectual Disabilities*, 10(4), 271-276. <https://doi.org/10.1111/jppi.12052>

Shi, L., Chu, E., Anguelovski, I., Aylett, A., Debats, J., Goh, K., Schenk, T., Seto, K. C., Dodman, D., Roberts, D., Roberts, J. T., & VanDeveer, S. D. (2016). Roadmap towards justice in urban climate adaptation research. *Nature Climate Change*, 6(2), 131-137. <https://doi.org/10.1038/nclimate2841>

Statista (2022). Resident Population in 2022 by Metropolitan area .

<https://www.statista.com/statistics/443749/canada-population-by-metropolitan-area/>

Szapocznik, J., Lombard, J., Martinez, F., Mason, C. A., Gorman-Smith, D., Plater-Zyberk, E., Brown, S. C., & Spokane, A. (2006). The Impact of the Built Environment on Children's School Conduct Grades: The Role of Diversity of Use in a Hispanic Neighborhood. *American Journal of Community Psychology*, 38(3-4), 275-285. <https://doi.org/10.1007/s10464-006-9084-x>

Tucker, R., Kelly, D., Johnson, L., de Jong, U., & Watchorn, V. (2022). Housing at the fulcrum: A systems approach to uncovering built environment obstacles to city

scale accessibility and inclusion. *Journal of Housing and the Built Environment*, 37(3), 1179-1197. <https://doi.org/10.1007/s10901-021-09881-6>

Van der Linden, V., Dong, H., & Heylighen, A. (2016). From accessibility to experience: Opportunities for inclusive design in architectural practice. *NA*, 28(2). Retrieved October 5, 2023 from

https://www.researchgate.net/publication/284721709_From_accessibility_to_experience_Opportunities_for_inclusive_design_in_architectural_practice

Wang, F., He, P., Yuan, C., & Wang, S. (2020). Isolated or integrated? Evaluation of ageing-friendly communities in Old Beijing City based on accessibility, social inclusion and equity. *Indoor + Built Environment*, 29(3), 465-479.

<https://doi.org/10.1177/1420326X19896834>

Watchorn, V., Hitch, D., Grant, C., Tucker, R., Aedy, K., Ang, S., & Frawley, P. (2021). An integrated literature review of the current discourse around universal design in the built environment—Is occupation the missing link? *Disability and Rehabilitation*, 43(1), 1-12. <https://doi.org/10.1080/09638288.2019.1612471>

Wolbring, G., & Nguyen, A. (2023). Equity/Equality, Diversity and Inclusion, and Other EDI Phrases and EDI Policy Frameworks: A Scoping Review. *Trends in Higher Education*, 2(1), 168-237. <https://doi.org/10.3390/higheredu2010011>

Zallio, M., & Clarkson, P. (2021). On Inclusion, Diversity, Equity and Accessibility in Civil Engineering and Architectural Design. A Review of Assessment Tools.. *Proceedings of the Design Society*, 1, 2297-2306.

<https://doi.org/10.1017/pds.2021.491>

Zallio, M. & Clarkson, P. (2021). Inclusion, diversity, equity and accessibility in the built environment: A study of architectural design practice, *Building and Environment*. <https://doi.org/10.1016/j.buildenv.2021.108352>.

Zallio, M., & Clarkson, P. J. (2022). The Inclusion, Diversity, Equity and Accessibility audit. A post-occupancy evaluation method to help design the buildings of tomorrow. *Building and Environment*, 217, 109058-.
<https://doi.org/10.1016/j.buildenv.2022.109058>

Zapata, M. A., & Bates, L. K. (2017). Equity Planning or Equitable Opportunities? The Construction of Equity in the HUD Sustainable Communities Regional Planning Grants. *Journal of Planning Education and Research*, 37(4), 411-424.
<https://doi.org/10.1177/0739456X16657874>