



City Powers and the Governance of Urban GHG Emissions in the U.S. and Canada

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KEY FINDINGS:

1. City governments in the U.S. and Canada have maintained and accelerated their climate change commitments, even when support from state, provincial, and federal governments has dwindled.
2. Interdepartmental, intergovernmental, and intersectoral collaboration and coordination are central to achieving deep reductions in urban GHG emissions and should be institutionalized.
3. Collaboration within and between city departments is also necessary for implementing climate change mitigation policies, and cities continue to experiment with organizational strategies for achieving this.
4. Accelerated action on urban climate change mitigation requires metrics of success that are transparent, democratic, and support accountability.
5. Different strategies will work differently or be more relevant in different contexts, and this may not map neatly onto national contexts. Taking on the key sources of urban emissions—energy generation, building energy efficiency, and transportation systems—requires nuanced and tailored collaborations that center community voices.

OVERVIEW

Reducing urban greenhouse gas (GHG) emissions is critical to meeting larger climate change targets. Cities are responsible for as much as 75 percent of fossil fuel CO₂ emissions due to high levels of energy use and consumption plus fossil fuel-intensive transportation systems (IPCC 2014).

In both the U.S. and Canada, cities have also been leaders since the late 1990s and early 2000s in setting ambitious and accelerating GHG emissions reduction targets, even when state, provincial, and federal commitments have lagged or even reversed. For example, 130 U.S. cities and 21 Canadian cities committed to net zero GHG emissions ahead of the 26th Conference of the Parties to the UN Framework Convention on Climate Change. While many of the early urban leaders on climate change were large and liberal cities, a growing number of small and typically more conservative cities—such as Dallas, Texas and Anderson, South Carolina—are now also committed to reducing their GHG emissions. In many ways, climate change commitments and initiatives by city governments are a lesson in perseverance in the face of varied constraints, revealing the ability and commitment of cities to act on this critical issue despite political and institutional obstacles. However, the development and implementation of policies and programs able to significantly reduce, or even eliminate, urban GHG emissions have been hard to come by. Urban climate change governance has more often produced “random acts of greenness,” rather than the broad, systemic changes that many believe are needed (Fitzgerald 2020).

The implementation gap in cities—the distance between commitments and achievements—is perhaps

unsurprising given that city governments do not always have the power and authority needed to change the social and technical systems responsible for urban GHG emissions. In the U.S. and Canada, the powers held by city governments over the sources of their GHG emissions vary considerably both within and between the two countries, particularly in the domains most relevant to climate change mitigation: energy generation, building energy use, and transportation.

This paper outlines some of the ways these differences in local power and authority arise and shape urban climate change governance in the U.S. and Canada, focusing specifically on efforts to increase the use of renewable energy resources, decrease energy use in buildings, and provide and promote public transportation. Understanding this variation can help stakeholders and policymakers better evaluate, support, and accelerate the commitments and progress of cities on reducing urban GHG emissions. The role of city, state/provincial, and federal governments in reducing urban GHG emissions does, and will, vary between emissions sources, between cities, and between countries.

Going forward, I offer three key lessons to draw from experiences so far with reducing urban emissions:

1. Supportive state/provincial and federal policies are always valuable and increasingly needed for city-level initiatives to yield results;
2. Interdepartmental, intergovernmental, and intersectoral collaboration and coordination is critical and should be institutionalized; and
3. The metrics of success built into urban climate change governance must reflect principles of transparency, democracy, and accountability.

URBAN CLIMATE CHANGE CONTRIBUTIONS IN THE U.S. AND CANADA

Cities and CO2

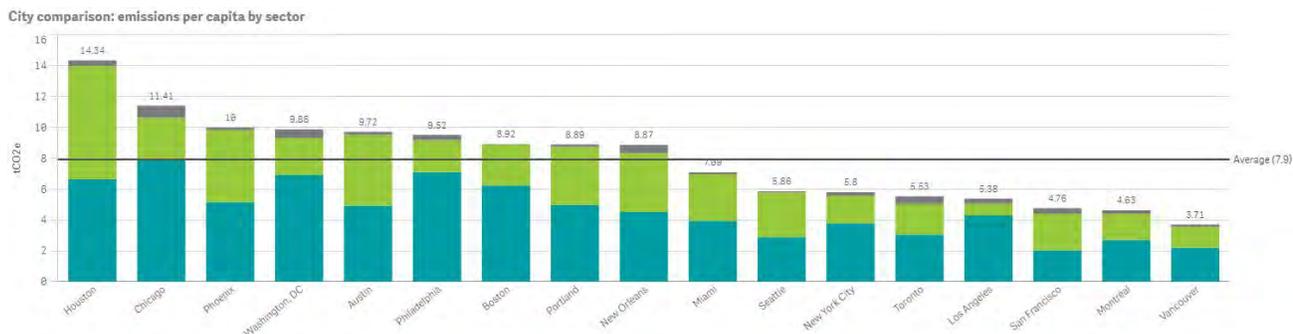
Urban areas are major contributors of GHG emissions due to their concentration of people, economic activity, infrastructure, and consumption.

These contributions vary between and within cities (Figure 1). Large North American cities, such as New York City and Los Angeles, often have lower GHG emissions per capita than their country’s average due to higher density and the opportunities that this provides for public transit and economies of scale. However, North American cities are up to five times more carbon intensive than cities elsewhere due to relatively high energy use and use of personal vehicles for transportation (Figure 1; Paravantis et al. 2021; Sovacool and Brown 2010). The distribution of GHG emissions contributions also varies within cities and regions. For example, wealthy residents are responsible for more GHG emissions than poorer residents due to higher levels of consumption (Meirelles et al. 2021) consume less fuel for transportation and less energy for cooling/heating in per capita terms. This hypothesis is also called Brand’s Law. However, as cities get bigger, denser and more resource-efficient, they also get richer, and richer inhabitants consume more, potentially increasing resource demand and associated environmental impacts. In this paper, we propose a method based on scaling theory to assess Brand’s Law taking into account greenhouse gas (GHG, and suburban areas have higher emissions than downtown cores (Jones and Kammen 2014).

The vast majority of urban GHG emissions come from energy used in buildings and for transportation (Figure 1). The emissions intensity of building energy use is determined by both the demand for energy (and the efficiency with which buildings can meet that demand) and the carbon intensity of the city’s energy supplies. Reducing GHG emissions from buildings is therefore a joint effort to improve energy efficiency and increase the use of renewable energy resources. The emissions intensity of a city’s transportation sector is similarly determined by supply and demand: both the distances people travel (e.g., down the street or across town) and the carbon intensity of their travel mode of choice (e.g., bicycle, bus, or personal vehicle). In some cities, industrial vehicles or boats can comprise a large share of transportation GHG emissions. As with building energy use, reducing GHG emissions from transportation includes both reducing the distance people need to travel and shifting travel to less carbon-intensive modes.

Urban GHG emissions are the product of a complex set of technologies and infrastructures, from the layout of the subway system to the city’s position in a regional energy grid to the age of its building stock. They are also the product of complex policies and behaviors governing land use, development, and mobility. Significantly reducing, or in some cases eliminating, these emissions requires reconfiguring cities in fundamental ways (Hughes and Hoffmann 2020). While a daunting task, a growing number of North American cities have set their sights on such a goal, often in the absence of state or federal requirements to do so.

Figure 1: Per capita, sector-based emissions for C40 cities in North America.



Source: C40 Greenhouse Gas Emissions Interactive Dashboard. Data from the most recent inventory year reported and includes BASIC emissions reporting levels.

High Ambitions in (and for) Cities

Cities in the U.S. and Canada have been at the forefront of the urban response to climate change. Toronto hosted the first international meeting on climate change (the World Conference on the Changing Atmosphere) in 1988 and became the first jurisdiction to develop a GHG reduction target and plan. Toronto and Vancouver are both founding members of the C40 Climate Leadership Group, an international network of large cities committed to acting on climate change. David Miller, former mayor of Toronto, served as the second President of the C40 from 2008–2010. Eleven of the largest cities in the U.S. are members of the C40 Climate Leadership Group, including New York City, Los Angeles, Boston, Chicago, San Francisco, and Seattle. Former mayor of New York City Michael Bloomberg chaired the C40 from 2010–2013.

Beyond the C40, there are more than 300 Canadian municipalities in the Federation of Canadian Municipalities' Partners for Climate Protection program, representing more than 65 percent of the Canadian population (Federation of Canadian Municipalities 2017). Nearly half of the membership of the Green Climate Cities (GCC) program run by the transnational organization Local Governments for Sustainability (ICLEI) comes from the U.S; member cities represent 25 percent of the U.S. population (75 million people) and 47 U.S. states (ICLEI 2015). There are also efforts to foster coordination and collaboration on climate change mitigation between U.S. and Canadian cities via The Cities Initiative, a network of 120 mayors founded in 2003 by Mayor Richard Daley of Chicago. This group committed to collectively reducing 30 million tons of equivalent CO₂ by 2020. While global targets (such as 80 percent emissions reductions by 2050) often serve as the benchmark for city governments, many have chosen to go beyond these goals to pursue "zero net carbon" futures.

Local commitment to climate change action has largely persisted in the U.S. and Canada in times when state/provincial and federal governments have reversed course.

During the Trump administration, when the U.S. pulled out of the Paris Agreement, nearly 300 local governments signed the "We're Still In" pledge, committing to uphold the goals of the Paris Agreement within their jurisdiction. In Ontario, even as Premier Ford repealed the province's carbon pricing program, many cities maintained, or even increased, their ambitions to reduce GHG emissions.

Cities are placing increased attention and emphasis on the justice and equity dimensions of meeting their climate change goals. Some cities—including New York City, Boston, and Los Angeles—have gone so far as to rebrand their climate change plans as a Green New Deal. These "third wave" urban climate change plans reflect both the effort and success of community and grassroots organizations and shifting global discourses around just and equitable cities (Bulkeley 2021).

A growing body of research identifies at least four distinct reasons why city governments pursue climate mitigation policies in the absence of any requirement to do so (Hughes 2019). First, they may seek to capture co-benefits of climate change mitigation such as cost savings and air pollution abatement. They may also see an opportunity to rebrand and reposition the city and its leaders as progressive, which can increase investment in the city and aid policymakers seeking higher office. Third, local elected officials may see an opportunity to please constituents supportive of climate action, or to act on their own concern about climate change, in the absence of state/provincial or federal leadership. Finally, city governments may see their own commitments and actions as collectively able to increase pressure on other levels of government to develop policies of their own. Indeed, coalitions such as the Mayors National Climate Action Agenda in the U.S. are designed explicitly with the goal of lobbying for stronger federal climate policies.

The challenge facing urban climate change governance today is in making faster and more meaningful progress toward meeting the GHG emissions reduction goals cities have set for themselves. In Canada, ICLEI members "have undertaken more than 800 GHG-reduction projects

that represent more than C\$2.3 billion in investment and 1.8 million tonnes in annual GHG reductions” (Federation of Canadian Municipalities 2015). The C40 reports that member cities have over 9,000 different actions in place to respond to climate change, with at least half of these targeting the city as a whole (Arup 2015). However, only 12 percent of ICLEI Canada members report implementing their climate action plan, and less than 10 percent of ICLEI’s U.S. members have completed all five milestones (Reams, Clinton, and Lam 2012). Even in California, where the state government

requires local governments to complete a Climate Action Plan, implementation lags. A survey of thirty-four large cities in California conducted by students at the University of California, Santa Barbara shows an average implementation rate of 35 percent; and only one-third of the cities were able (or perhaps willing) to report the emissions reductions they had achieved as a result of their efforts (Qin et al. 2014). While cities have made good progress, they face the challenge of scaling up (Hughes, Yordi, and Besco 2018), moving from “random acts of greenness to” to “Greenovation” (Fitzgerald 2020).

VARIATIONS IN POWER AND AUTHORITY CREATE A FRAGMENTED URBAN CLIMATE CHANGE GOVERNANCE LANDSCAPE

The structural and systemic changes necessary for steep reductions in urban GHG emissions create governance challenges for city governments. Meaningfully—or completely—reducing urban GHG emissions requires a whole-of-city approach that includes deep changes and transformations to urban infrastructures and economies (Hughes and Hoffmann 2020).

Even when city governments wish to pursue such transformations, they likely lack the power and authority to carry them out on their own. This challenge is not unique to climate change governance—there are a range of policy domains that city governments are engaging in that stretch and challenge the limits of their authority (Sapotichne and Jones 2011; Schragger 2016). But the distributions of local powers and authorities relevant specifically to climate change mitigation vary by policy domain both within and between countries.

There are several ways the powers and authorities of city governments can be limited. In the U.S. and Canada, states and provinces are constitutionally responsible for determining the formal powers of cities: their taxing powers, regulatory powers, and planning requirements.

Governments at both the national and subnational levels can affect funding availability and financial incentives for city governments. Cities typically rely on intergovernmental transfers for some portion of their annual budget, and more especially for large, capital-intensive projects. National and subnational financial structures, such as bond markets and rating systems, can also determine the availability of capital to city governments (Peterson 2020). Finally, the ability of city governments to meaningfully alter their carbon-intensive trajectory can be shaped by the broader political-economic environment, such as tax policies and other incentives developed by other levels of government that shape the behavior of private actors in the city (Fitzgerald 2020).

Understanding the operation and distribution of these powers specific to urban climate change mitigation can help better define the opportunities and limits facing city governments and identify the best ways to evaluate, support, and forward urban climate change mitigation goals. This paper outlines some of the key sources of variation within and between the U.S. and Canada in the policy domains of energy generation, energy efficiency, and transportation. These represent the three largest sources of urban GHG emissions and are typically central to urban climate change mitigation plans. But the authority city governments bring to these domains varies significantly.

ENERGY GENERATION: Increasing the Use of Renewable Energy Resources

Renewable energy resources are often central to a city's plans to reduce GHG emissions. New York City's goals include carbon neutrality and 100 percent renewable energy by 2040; Los Angeles aims for 100 percent renewables by 2045. The city of Ann Arbor, Michigan aims for 100 percent renewable energy by 2030. In Canada, Toronto and Vancouver have likewise set goals for moving away completely from fossil fuels. Even Edmonton, the capital of Canada's oil-producing region, has set a "long-term goal" of carbon neutrality and recently hosted the Change for Climate Global Mayors Summit. Shifting a city's energy sources away from fossil fuels presents a very different challenge for different cities, depending on how they are situated in a regional energy system and the authority they have over the choices made about that system.

Authority over energy generation varies significantly within and between the U.S. and Canada. Some cities, particularly in the U.S., are supplied by a municipally-owned energy utility, while others purchase their energy from private or regional providers. In some cases, such as Ontario and Quebec, the energy system is governed by the provincial government. States and provinces may have policies in place that support or reinforce local climate mitigation goals, such as Community Choice Aggregation (CCA) programs or Renewable Portfolio Standards (RPSs). Federal governments may similarly have facilitative policies and regulations, such as incentive programs for renewable energy sources. Each governance arrangement creates its own challenges and opportunities, often requiring that city governments develop strategies to coordinate and collaborate with energy utilities and their regulators.

In the U.S., there are nearly 3,000 energy utilities that provide electricity to communities. The U.S. Energy Information Administration classifies these into three ownership types: investor-owned utilities (private),

publicly owned or managed utilities, and cooperatives. While investor-owned utilities represent the smallest number of utilities of the three types, they are large and serve three out of every four utility customers in the country (US EIA 2018).

The predominance of investor-owned utilities in the U.S. creates a policy challenge for cities that want to increase their use of renewable energy. Climate-minded cities are approaching this challenge in different ways. Ann Arbor, Michigan purchases from DTE Energy, an investor-owned utility serving 2.2 million people in southeast Michigan. Around 15 percent of the utility's energy supplies come from renewable sources, but Ann Arbor has committed to 100 percent renewables by 2030. The city's strategy for achieving this goal includes Community Choice Aggregation (CCA), programs that "allow local governments to procure power on behalf of their residents, businesses, and municipal accounts from an alternative supplier while receiving transmission and distribution services from their existing utility provider" (City of Ann Arbor 2020). The city is also targeting onsite and community renewable energy generation, which they estimate would reduce emissions by around 4 percent. While these are viable and innovative ways to increase renewables, state legislation in Michigan currently prevents CCA. Ann Arbor is working with other Michigan communities to lobby the state legislature for policy change (Perkins 2021).

In some cases, particularly in the U.S., city governments may own and operate their own energy utility. While this gives city council and the mayor significant latitude to set targets and prioritize renewables, it introduces a different political dynamic around rate setting, which can be critical for supporting new investments and projects. The Los Angeles Department of Water and Power (LADWP) is the largest municipally-owned utility in the U.S., serving 1.4 million customers. Unlike their private counterparts that are regulated by the California Energy Commission, increasing electricity rates for the LADWP requires approval from the Los Angeles City Council.

Far from a routine administrative exercise, raising electricity rates has proven to be a political flashpoint for the city, pitting residents against organized labor and testing the durability of the emerging labor-environment coalition behind the city's climate change initiatives. While a central motivation for electricity rate increases has been financing the programs and infrastructure necessary to reduce the use of fossil fuels and increase energy conservation, securing these rate increases has required an alignment of environmental, labor, and social justice advocates; mechanisms for differentiating between the needs of the central city and the more suburban areas; and a complete restructuring of the means by which the utility is held accountable to ratepayers.

The reluctance of Los Angeles city councillors to approve electricity rate increases stems from frustration with the utility's lack of transparency and distrust among the city's residents of the LADWP's powerful labor union. Former Mayor Anthony Villaraigosa was re-elected in 2009 and in 2010 the LADWP was in need of a new rate increase. In November 2008, the city upped its goals for solar power with the introduction of SolarLA, aiming to increase solar from zero to 20 percent of the city's energy supply by 2017. The LADWP estimated that to meet its renewable energy goals, it needed to increase electricity rates by 5–8 percent per year through 2020, for a total of \$250 million. Villaraigosa actively campaigned for the rate increase, making the case publicly for an 8 percent renewable energy surcharge that would be dedicated to renewable energy projects. Villaraigosa billed the rate increase as a way to bring jobs to the city (Steinhauer 2010). Council initially rejected the increase, citing concerns about how the funds would be spent and the challenge of asking customers to pay more during a recession. Leading up to a second vote on April 15, Villaraigosa and the LADWP threatened city council with bankruptcy, claiming the LADWP would not be able to transfer its usual portion of collected fees to the council's general revenue fund (Zahniser and Willon 2010). Council was furious over this threat, but ultimately passed a 4.5 percent increase with an eight to five vote. The battle prompted city council to

put a charter amendment to a popular vote, which would establish an Office of Public Accountability and Ratepayer Advocate in the LADWP to "provide independent analysis and assessment of Department actions with respect to water and electricity rates." It passed with 78 percent of the popular vote. While rate increases have since been easier to come by for LADWP, there are still concerns among the public about corruption and transparency at the utility.

Municipalization—the process of transferring privately held assets and services to public ownership—is an option for cities currently purchasing energy from an investor-owned utility but are interested in increasing their use of renewable energy. This approach was considered by Ann Arbor but rejected due to potential delays and costs. These concerns are reflected in Boulder, Colorado's attempt to municipalize its energy utility. The city spent ten years and \$29 million in an effort to form its own electric utility for the purpose of meeting its renewable energy goals (100 percent "clean electricity" by 2030). In 2020, Boulder officially ended this effort when funding ran out and there was little evidence that successful municipalization was imminent (Sakas 2020).

For many Canadian cities, including Toronto, the provincial government owns and manages the energy grid. This can be an opportunity or a challenge for a city's climate change mitigation goals, but places decision making outside the realm of city authority. For example, in 2002, Ontario Premier Ernie Eves pledged to shut down all coal-fired power plants in the province and reached this goal in 2014. This transition away from coal at the provincial level has helped Toronto stay on track to meet its own GHG emissions reduction goals. Canadian provinces are currently required by the federal government to have comprehensive climate action plans and meet a federal benchmark on carbon pricing. While some provinces have been slow to meet these requirements, they stand to increase the ability of Canadian cities to meet their own climate change goals.

ENERGY EFFICIENCY: Building Retrofits

For most cities, energy used in the built environment comprises a large share of GHG emissions. In the U.S. and Canada, reducing this energy demand requires deep energy efficiency retrofits to existing residential and commercial buildings (Jermyn and Richman 2016). Energy efficiency is often a very attractive approach to reducing GHG emissions because it can be very cost effective and provides additional benefits such as reduced energy bills, improved living conditions and air quality, and employment opportunities. Energy efficiency programs can also address social inequalities associated with older building stocks and energy poverty. Some have argued that energy efficiency can be justified solely on the basis of the social and health benefits it provides (Golubchikov and Deda 2012). The challenges facing energy efficiency retrofits are the long time scale over which returns on investments sometimes accrue and the need for retrofits to take place at scale in order to have a significant impact on urban GHG emissions. In response, many cities have developed innovative policy and governance approaches to energy retrofits that include novel financing mechanisms in Toronto (Hughes et al. 2018) and social enterprise program BUILD in Winnipeg.

Building codes play a large role in setting standards and incentives for energy efficiency retrofits (Fitzgerald 2020). However, while building codes are foundational to urban built environments, city governments have varying levels of authority over their content. In some cities, like New York City, the city government develops and adopts a municipal building code as long as it is at least as strict as the state's. Indeed, revising the city's building code to integrate and reflect the city's climate change mitigation goals has been one of New York City's greatest climate policy successes. The City of Boulder is incrementally increasing energy efficiency requirements for residential and commercial buildings with the ultimate goal of having a Net Zero Energy code by 2031. In other cases, states are taking the lead on setting building energy use standards, such as California's plan to have net zero energy building codes by 2030.

There are, however, cities that lack the explicit authority to create their own building codes, particularly ones that increase restrictions and requirements. In the U.S., even in some "home rule" states like Massachusetts and North Carolina, states that generally shift governing power to local governments, municipal building codes are not allowed to be stricter than the standards set by the state. In Canada, this is more common: few cities have the authority to develop a municipal building code and the strength of energy efficiency programs depends on standards set at the provincial level.

Regardless of who controls the codes, stakeholder buy-in is crucial for realizing energy efficiency and deep building energy retrofits. Building owners, for instance, must have the resources, tools, and knowledge needed to carry out the modifications. City government leadership and intervention is needed to generate this sort of knowledge, investment, and stakeholder collaboration.

The LADWP has learned to frame energy efficiency initiatives as good for business and jobs to build support from key stakeholder groups in the city. This framing is particularly important when moving from setting an efficiency target to giving money to the particular projects needed to meet the goals. Energy efficiency programs use more labor and less capital than developing new sources of energy, including natural gas, and the jobs that are produced are more likely to be local. As a result, business groups in the city, such as the LA Business Council and Chamber of Commerce, as well as workforce development interests and tradespeople, have all been supportive of the city's efforts to improve energy efficiency.

New York City has generated stakeholder collaboration and buy-in differently, by creating advisory groups to provide policy recommendations. The Green Codes Task Force, which the city used to guide the process of greening the city's building codes to facilitate emissions reductions, is a prime example. The task force led a collaborative process to help overcome the challenges of conflicting viewpoints and different starting points, and to build technical expertise into the process. They also

leveraged outside funding from private foundations, law firms, and the state government to support their efforts. The real estate industry was a particularly important stakeholder in this process. Ultimately, the Green Codes Task Force's work and involvement in the policy-making process created a coalition of invested stakeholders and decision makers committed to the city's climate change goals and programs.

Toronto similarly found framing and coalition building key to passing important local legislation for energy efficiency. Toronto's Home Energy Loan Program (HELP) provides homeowners with very low-interest loans for retrofits that improve energy efficiency. City councillors sponsoring the program presented it as a revenue-neutral job-creation effort that would save taxpayers money and help residents who couldn't otherwise afford energy efficiency upgrades. Councillors and stakeholders met for one year with a volunteer consultant with knowledge of the U.S. Property-Assessed Clean Energy Programs. The initial bylaw had the written support of a coalition of labor unions, environmental groups, civic organizations (Civic Action, Toronto Board of Trade), the Toronto Real Estate Board, and energy utilities (Hydro and EnBridge). It was passed unanimously by city council. Mayor Rob Ford, not known as a friend to environmental programs, signed the bill because of the large and influential coalition of supporters and the fact that it saved taxpayers money.

TRANSPORTATION: Expanding Public Transportation Systems

For North American cities in particular, reducing GHG emissions from transportation systems is critical to meeting climate change mitigation goals. Transportation-related fossil fuel use can make up as much as half of a North American city's GHG emissions. But reducing these emissions presents a significant policy challenge for city governments in both Canada and the U.S. Shifting transportation systems toward public and active modes of transit can require substantial capital

investment and planning authority, both of which are often limited at the city level.

In both Canada and the U.S., city governments typically play a role in managing local bus networks, bike lane systems, and infrastructure maintenance, but funding for new public transportation projects is relatively centralized. Fares are not a viable revenue source for capital investments, and city governments are often reluctant (or unable) to use general funds for transit systems. City governments also have limits on their borrowing abilities that state, provincial, and federal governments typically do not. Funding new public transportation projects and infrastructure therefore relies heavily on support from state, provincial, and federal governments. In the U.S., regional Metropolitan Planning Organizations (MPOs) help determine how funding is allocated, and most have not made explicit commitments or plans to incorporate climate mitigation goals in their decision making (Mullin, Feiock, and Niemeier 2020). Similar structures exist in Canada, such as Vancouver's regional TransLink, but the exact arrangements vary.

While the authority of city governments in Canada is generally more limited than in the U.S., Canadian cities often play a larger role in public transportation. For example, Toronto owns and operates a network of subways and streetcars through the Toronto Transit Commission, and Calgary Transit owns and operates bus rapid transit and light rail services in the city. In these cases, city council has the authority to plan for and authorize new public transportation projects. However, expanding public transportation through new subway and light rail lines requires significant capital resources, which can lead to a list of unfunded, but city council-approved, transit projects.

New York City, one of the most powerful city governments in North America, has often struggled to implement its climate change policies due to limits on its authority over public transportation in the city. Congestion pricing was one of former Mayor

Michael Bloomberg's signature initiatives following the release of the city's climate change plan in 2007. The plan would have charged drivers to enter the central business district during peak hours and used the revenue to invest in public transit. However, it required approval from the state legislature and there were concerns from the public and the legislature that congestion pricing would disproportionately affect poor communities that commute by car to Manhattan (American Road & Transportation Builders Association 2013; Schwartz et al. 2009). The City's relatively opaque decision-making process behind the proposal did little to address residents' concerns, who were quite distrustful of the regional Metropolitan Transportation Authority (MTA) and "understand that the mayor of the city has little to do with the MTA, and when Bloomberg promised improved mass transit during congestion pricing, they did not believe him" (Chronopoulos 2012:199). In the end, the state legislature did not approve the project, despite a funding commitment from the federal government, only to reverse course in 2019 in order to address financial distress at the MTA that began following the 2008 recession and is now accelerating during the COVID-19 pandemic (Goldbaum 2020).

The need for state and provincial government support for the kind of transformative transportation investments that would reduce urban GHG emissions can be a major political hurdle in both Canada and the U.S. The last several mayoral elections in Toronto have produced a range of blueprints for transit expansion in the city, but it is only with a recent federal commitment of more than \$26 billion that these proposed projects can now move forward. In the U.S., some cities have sought to generate revenue on their own to support new transit projects.

In some states and provinces, lawmakers are seeking to further limit city powers over transportation. When Nashville began to plan for bus rapid transit (BRT) lanes and new light rail, the Tennessee Senate proposed legislation (funded by the Koch brothers) that would ban bus rapid transit in the state. While unsuccessful, the Tennessee legislature did pass legislation in 2014 that requires state approval for BRT projects using dedicated transit lanes. A similar story has unfolded in Indiana. In 2014, local Indianapolis voters approved a 0.25 percent tax rate increase dedicated to new public transit projects in the region. The Indiana state legislature subsequently passed legislation that would require state approval of future transit projects, and has frequently been a roadblock to implementing transit plans for Indianapolis. Increased state involvement is likely to lead to greater disparities in transit access as well as hinder climate change goals. Recent investigations by the Washington Post have found that federal rail projects serving minority communities were more likely to fail or to not be approved, in part because they "rely on transit agencies, cities and states to envision and implement projects" (Lowe, Reckhow, and Benjamin 2021).

Urban-provincial tensions over public transit are also rife in Canada. In 2019, Premier Doug Ford announced plans to shift planning, building, and maintenance of Toronto's public transportation system up to the provincial level. The plan was met with resistance from some city councillors and residents and ultimately dropped in exchange for the city's support—and reallocation of funds—for the "Ontario Line," a subway line serving areas west of Toronto and included in the federal government's recent transit funding package. In both countries, cities are increasingly looking to engage directly with the federal government on transportation, potentially bypassing state and provincial governments and politics.

ACCELERATING URBAN CLIMATE CHANGE MITIGATION IN THE U.S. AND CANADA

City governments in the U.S. and Canada have maintained and accelerated their climate change commitments, even when support from state, provincial, and federal governments has dwindled. There are real challenges to implementing these goals, some of which are the product of fragmented power and authority in the areas of energy generation, building energy efficiency, and public transportation.

The increasing integration of equity and justice in urban climate change planning is likely to challenge these relationships further. Financial strain due to the COVID-19 pandemic may make it difficult for city governments to maintain or increase their own investments in climate change mitigation. Going forward, there is an urgent need to identify and pursue the political, institutional, and financial strategies that can support accelerated urban climate change mitigation efforts.

First, research and experience have consistently shown that supportive state/provincial and federal policies are always valuable—and increasingly necessary—for urban climate change mitigation. As cities look to scale their mitigation efforts, legislative and financial support from higher levels of government are likely to be necessary. For climate advocates, this shifts the site of urban climate change policy toward state legislatures, provincial legislative assemblies, and federal legislative and regulatory bodies. The politics of urban GHG emissions in these forums are very different than in city governments, and we should expect that (and study how) different actors, framings, and resources will be successful in these spaces.

Building and leveraging public support can be a useful strategy for demonstrating the value and demand for a city's climate change mitigation goals. The Toronto Environment and Energy Division (EED) and The Atmospheric Fund (TAF) are working together to generate greater buy-in from the community, holding a series of public consultations and planning for more. Just over 1,000 residents have participated in these early consultations. The hope is that demonstrating strong public support, and acknowledging the city's other priorities, might facilitate implementation of the city's climate change plan, TransformTO, beyond piecemeal funding allocations from city council and better make the business case for the initiatives they do move forward with. "We need a political constituency to support work like TransformTO, which means it has to be relevant to a broader set of people... So, we need to talk about jobs, lower bills, quality of life, a better city for your children, to get a larger group to the table. We need to talk about things of interest to them."¹ TransformTO explicitly endeavors to facilitate learning across divisions, connect the city and community in the climate change mitigation effort, and mobilize external resources to support local projects.

Framing and prioritizing projects may shift as cities navigate their own financial strains and the challenges of securing support from their state/provincial and federal governments. In Toronto, where support (even local elected officials) has tended to be lukewarm, the mitigation projects that get funded typically have a strong business case and multiple demonstrable benefits.² Similarly, in Los Angeles, where environmental programs were cut following the 2008 recession, it is no surprise that Mayor Eric Garcetti is emphasizing the economic development opportunities presented by the emerging "green economy." These cities' experiments will help identify and mobilize the coalition necessary for more transformative urban GHG emissions reductions.

1 Personal interview, The Atmospheric Fund, June 22, 2016.

2 Ibid.

Second, interdepartmental, intergovernmental, and intersectoral collaboration and coordination are central to achieving deep reductions in urban GHG emissions and should be institutionalized. Collaboration and coordination of all kinds are central to governing urban GHG emissions, in part because of the fragmented authority structures that surround them. Centering social justice and community needs will continue to stretch policy boundaries for city governments, and require new collaborations, skills, and resources. City governments view this broader coalition building as necessary for more transformative climate change policy. In some cases, such efforts are already underway and include expanded coalition building between a city and its region, with local economic development interests, and with groups working for social justice.

This broader coalition building presents a challenge: it is increasingly necessary for implementing urban climate change policies but uncharted political territory for many city governments. Achieving more transformational outcomes may require even more focused, expanded coalition-building efforts on the part of city governments. This is perhaps the most important role city governments can play in governing climate change: serving as the facilitator and builder of the coalitions necessary to transform cities and achieve climate change goals. Coalition building allows city governments to mobilize the necessary resources and actors to support major transformations. Building a broad, stable, inclusive coalition for climate change mitigation policy requires a policy agenda that reflects participants' interests. Cities must integrate climate change mitigation as part of a broader agenda for equitable urban prosperity, but expanded coalition building may also introduce new tradeoffs and policy challenges.

To support and forward urban climate change policy ambitions, greater attention should be given to the opportunities for, and challenges of, this broader coalition building.

Collaboration within and between city departments is also necessary for implementing climate change mitigation policies, and cities continue to experiment with organizational strategies for achieving this. When cities integrate and institutionalize interdepartmental collaboration—by creating a new unit or an official coordinating structure—they are more successful with

implementing sustainability policies (Krause and Hawkins 2021; Schwartz 2016).

Finally, accelerated action on urban climate change mitigation requires metrics of success that are transparent, democratic, and support accountability (Hughes, Giest, and Tozer 2020). Transformative climate change mitigation is not a policy agenda that can be, or should be, developed and implemented by urban elites or outside the sphere of public awareness and engagement. Achieving net zero cities, for example, requires changing people's neighborhoods, behaviors, and consumption patterns in very meaningful ways and shifting perceptions of the role and aims of their local government. Ultimately, it may be the wealthiest who will see their lifestyles and neighborhoods change the most, as this is often the group responsible for a greater proportion of urban GHG emissions (Marcotullio et al. 2014). Relying on a business case for climate change mitigation may hide the need for the city to make tradeoffs, particularly in terms of large infrastructure investments. It can also trigger what has been called "climate gentrification" (Cole et al. 2017) in facilitating "green" projects that are accessed by, and beneficial to, a select group of urban residents at the expense of poorer or marginalized populations. The processes, tools, and data used to track and evaluate progress on urban climate change mitigation must center residents' needs and experiences.

Ultimately, a central lesson to be learned from analyzing and comparing experiences with urban climate change governance in the U.S. and Canada is that different strategies will work differently or be more relevant in different contexts, and this may not map neatly onto national contexts. There is no simple answer to the question "what role do city governments play in reducing urban emissions?" State/provincial and federal governments can, and should, learn from, engage with, and support the ambitions of cities. Many cities have already proven to be innovative and persistent actors on climate change, able to persevere through political upheaval outside their boundaries.

Taking on the key sources of urban emissions—energy generation, building energy efficiency, and transportation systems—requires nuanced and tailored collaborations that center community voices.

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City Powers and the Governance of Urban GHG Emissions in the U.S. and Canada

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