

Complete, Compact, Energy Efficient Rural and Urban Communities: Exercising Authority, Accepting Science, Meeting Commitments, Cutting Costs, Maximizing Benefits

Recommendations for Strengthening UBCM Climate Action Recommendations

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SUMMARY

<u>Recommendations from the UBCM Special Committee on Climate Action recommendations</u> have merit. They are also inadequate to meet local and provincial climate action targets nor build the resilient, prosperous and equitable communities aspired to by the UBCM Special Committee on Climate Action.

The following recommendations focus on the paramount authority of local government: land use—a sector acknowledged by science, the B.C. government and local governments themselves as critical in cutting carbon and strengthening resilience. Land use strategies minimize costs, maximize co-benefits, including more fiscally sustainable local governments. They offer the best opportunity for a resilient COVID recovery. Land use planning is currently absent in UBCM recommendations and provincial and local government action. The dominant approach to land use planning in B.C. and beyond is—inadvertently—a major contributor to the largest and most stubborn GHG sector—transportation—as well as residential building GHGs, and the steady loss of terrestrial carbon from permanent forest and ecosystem loss. B.C.'s vehicle stock is growing at twice the rate of the population. Under current trends, B.C. will have double the number of vehicles its roads by 2040, undermining commitments to manage carbon and congestion locally and provincially. Local and provincial policy inadvertently favours unsustainable land use and makes smart growth more challenging, despite the immense benefits. Analysis and action is necessary to strengthen the policy context so we can build a better climate, better communities and a better B.C.

Business Case for Complete, Compact Rural and Urban Communities

There are five compelling reasons for integrating land use into the UBCM recommendations.

- 1. Acknowledging Science: Technical fixes are essential but inadequate for meeting local, provincial, national and IPCC GHG reduction targets. The IPCC underscores the critical role of local land use planning in driving reductions in the largest and most stubborn sector: transportation.
- 2. Exercising Authority, Accepting Responsibility: The paramount authority of local governments is land use. Car-oriented, greenfield growth is a major contributor to carbon, congestion and a wide range of other costs, including reduced resilience to climate change impacts and unsustainable civic infrastructure costs. Local governments, with provincial support, can exercise their authority to reverse these trends.
- **3. Respecting Taxpayers & Reducing Costs:** Sustainable land use is amongst the most cost effective, local GHG management action, generally making versus costing money. Complete, compact, centered land use generates transit ridership and revenue, and reduces the costs of other climate actions.
- 4. Maximizing Co-Benefits & Mapping a Resilient Recovery: Sustainable urban land use offers the greatest co-benefits of any climate action, including public health, affordability, equity, civic infrastructure cost management, habitat and farmland protection and resilience to climate change impacts. Sustainable land use should be central to a resilient COVID recovery, reducing some of the most acute vulnerabilities laid bare by the pandemic.
- 5. Fulfilling Commitments: Under the Climate Action Charter, local governments committed to "creating complete, compact, more energy efficient rural and urban communities." The B.C. Government shares this Charter commitment and has additionally committed, under CleanBC, to identify and use land use measures to meet its emissions gap. These commitments have yet to be met.

Opportunities for Strengthening UBCM Climate Action Recommendations

The following sector-by-sector recommendations build on existing UBCM recommendations, matching a local response with the magnitude of the challenge while building more resilient, prosperous, equitable communities. These recommendations focus on the unique authority and influence of local governments.

The UBCM Special Committee on Climate Action is encouraged to strengthen recommendations with the following measures.

- 1. Building recommendations focus on addressing the fundamental mismatch between the province's housing stock and its demography with plummeting occupancy in single family homes, a disproportionate share of whom are seniors who, even if they are lonely or low income, are less likely to have a secondary suite or a home share.
 - A. The provincial government should diversify residential energy climate action conservation spending to upgrades that increase household occupancy.
 - B. The provincial government should build non-profit housing capacity to support home sharing and secondary suite management.
 - C. The provincial government should incentivize attractive, affordable, net-zero, pre-fab wood laneway homes.
 - D. The provincial government should enable local governments to require new single and semi-detached homes to be secondary suite ready and local governments should embrace the opportunity, along with provisions to increase liveability and accessibility.
 - E. Local governments should maximize secondary suite and laneway housing options that manage housing and transportation carbon, building on the leadership of many local governments across BC.
- 2. Transportation recommendations focus on the largest and most stubborn GHG sector, locally and provincially, and highlight the central role land use can play in cutting carbon, congestion, and personal and public transportation costs.
 - A. The provincial government, local governments and BC transit authorities should develop a framework for integrated transportation and land use plans that meet shared goals to manage congestion, safety, carbon and personal and public transportation spending.
- **3.** Resilience recommendations focus on the central role land use can play in reducing vulnerability to climate change impacts and building adaptive capacity.
 - A. The provincial government and BC local governments should build on the local climate action innovation driven by GHG Targets, Policies and Actions in OCPs and RGSs. OCPs and RGSs should require similar climate vulnerability assessments and adaptation policies to manage vulnerabilities.
 - B. The provincial government and BC local governments should collaborate on the development of a toolkit that lays out how land use policies and plans—a central authority of local governments—can be used to mitigate climate change risks.
- **4. Governance recommendations** focus on fulfilling historic commitments to strengthen land use policy and governance and genuinely renew a cornerstone commitment in the Climate Action Charter.
 - A. The provincial government and BC local governments should fulfill their shared commitments under the Climate Action Charter for "creating complete, compact energy efficient rural and urban communities" and the Provincial government should fulfill its commitment under CleanBC to identity land use initiatives to meet the emission reduction gap in the province's updated climate action plan.

THE BUSINESS CASE FOR COMPLETE, COMPACT RURAL AND URBAN COMMUNITIES

UBCM Climate Action recommendations have merit. They are also inadequate to meet local and provincial climate action targets nor build the resilient, prosperous and equitable communities aspired to by the Climate Action Committee. These recommendations focus on the paramount authority of local governments: land use–a sector that has been acknowledged by science and local and provincial governments themselves as critical in driving deep GHG reductions. Land use strategies also minimize costs, maximize co-benefits and offer the best opportunity for a resilient COVID recovery.

There are five compelling reasons for integrating land use into the UBCM recommendations.

1. Acknowledging Science

The watershed IPCC 1.5°C report has catalyzed interest in deeper and more meaningful climate action, including a groundswell of local climate emergencies and renewed local climate action commitments. Beyond the headline-making conclusions of 40-60% reductions by 2030 and carbon neutral by 2050, the most germane conclusion for local governments was the central role of sustainable land use planning for meeting GHG reductions to avert dangerous climate change:

"effective urban planning can reduce GHG emissions from urban transport between 20% and 50%." IPCC 1.5°C Report, 2018

This is not the first time the IPCC has endeavoured to inform local governments of their strategic role. The Fifth Assessment Report concluded:

"Thousands of cities are undertaking climate action plans, but their aggregate impact on urban emissions is uncertain... Current climate action plans focus largely on energy efficiency. Fewer climate action plans consider land-use planning... Effective mitigation strategies involve packages of mutually reinforcing policies, including co-locating high residential with high employment densities, achieving high diversity and integration of land uses, increasing accessibility and investing in public transport..." IPCC, AR5, Mitigation WG, SPM, 2014

This observation may not hold true in B.C. where local government leadership is demonstrated in many sectors, notably EV market transformation and the central contribution in crafting the world's most innovative building energy policy framework: the BC Energy Step Code. Even this leadership, nevertheless, will overwhelmingly be reflected in future GHG reductions vs reductions to date.

SFU Renewable Cities Executive Director Alex Boston has served scores of local governments with modelling and mapping to inform and quantify GHG reduction opportunities. Repeatedly, land use strategies are amongst the top measures *within the local government toolkit* for driving the deepest GHG reductions. While typically adopted, land use policies and actions are rarely implemented.

The IPCC's transportation focus is partially motivated because it is the largest and fastest growing sector in much of the world. Even in Europe where GHGs are dropping, transportation GHGs remain stubborn. In B.C., while GHGs in most sectors are dropping, road transportation is the largest sector and has grown 11% since 2007, faster than any other sector (see Figure 1).

Given the size of the road transportation sector—the largest share of community GHGs by far—it will be impossible to meet any defensible provincial, local or national targets, let alone IPCC 1.5°C recommended reductions, by 2030, without deep integration of urban land use.



Figure 1: BC GHG Activity and Targets Boston, SFU Renewable Cities with BC Government data, 2019

Technical fixes are essential, but will be insufficient. Given the rapid growth in B.C.'s total vehicle stock *and* the relatively slow rate at which vehicles turn over, the total number of fossil fuel vehicles on B.C. roads will continue to grow until the mid 2030's.¹ By 2040, there will still be more fossil fuel vehicles on B.C. roads than when CleanBC was launched and significantly more than when Climate Action Plan 1.0 was tabled in 2007 (see Figure 2).



Figure 2: BC Fossil Fuel & EV Stock Evolution & Expansion

Boston, SFU Renewable Cities with BC Government, NRCan, Stats Can, Electric Mobility Canada data, 2020

¹ It takes 20 years to turn over 80% of vehicle stock. 100% turn over takes 30 years. Under current policies, fossil vehicles will be still be around by 2070.

If vehicle growth rates continue along the historical trend, B.C.'s challenge will not only be carbon but spiralling congestion. The number of passenger vehicles (light trucks, SUVs, vans and cars) on B.C. roads in 2040 will be double what they are today and three times as when Climate Plan 1.0 was tabled in 2007. Increasing highway and road lanes and budgets will not solve congestion, this will exacerbate the problems. When the twinned Hwy 99 was opened in 2009, it cut five minutes off peak commute times from Squamish to Greater Vancouver. Today a commute at peak takes longer than prior to 2009 and Squamish now has traffic jams.

Effective land use planning can cut the vehicle growth rate and transportation sector GHGs—as underscored by the IPCC—*and* cut congestion. "Cutting congestion" is a CleanBC commitment that it is not being fulfilled due to two interconnected drivers: sustained highway expansion and unsustainable land use.

2. Exercising Authority, Accepting Responsibility

While local governments fulfill many important functions, amongst their top authorities is land use planning. The cardinal municipal planning agenda is the OCP: a land use plan. If there is a sector where local governments should act, it is the sector where they have the most authority and influence, as underscored by the IPCC.

While many factors contribute to the rapid growth in transportation GHGs, a really important one is the rapid growth in vehicle stock and total driving. Every year, average commute distance and time grows, as ring after ring of population and job growth are added to our urban regions. B.C. communities are becoming more and more car dependent as a disproportionate share of growth is going into cardependent neighbourhoods. B.C.'s passenger vehicle growth rate is twice the rate of population growth.





As well as rising transportation GHGs, the implications of sustained greenfield development are broad:

- Rising rates of obesity, correlated to a drop in neighbourhood walkability for a rising population share
- Rising civic infrastructure deficits due to the infrastructure intensive land form (further discussed below)
- Rising commute times and congestion
- Rising transportation costs (the second largest household expenditure after housing and can be higher than housing in some bedroom communities)
- Rapid agricultural land loss (the single biggest driver of agricultural loss is urban growth. B.C. lost 3% of agricultural land in the first decade of the century (Stats Can))
- Rapid permanent forest loss (after energy development, urban growth is the biggest driver of permanent forest loss with significant, long term carbon and climate implications (NRCan))
- Rising vulnerability to climate change impacts, e.g. increased flood risk from reduced permeability and development in vulnerable areas, increased fire risk with rising suburban neigbourhoods interfacing forests, additional biodiversity stresses with habitat fragmentation, increased extreme heat risk due to greenspace loss

3. Respecting Taxpayers & Reducing Costs

Complete, compact community design is amongst the most cost effective GHG management measure. In fact, it is generally a negative cost, making versus costing money.

Public transit can and should be vital to driving reductions in carbon. Transit is extremely expensive and ineffective in low density, highly distributed urban fabric *sometimes costing a \$10, \$20 or even \$30 subsidy per passenger boarding on BC Transit or TransLink service.* The extent to which transit can contribute to GHG reductions fundamentally lies in the complete compact *and centred* nature of urban growth. There are bus routes in B.C. that are money makers, generating more revenue than they cost. These routes run through and along complete, compact nodes and corridors.

In some cases, notably large urban regions with rapid transit, transit infrastructure expansion can and is facilitating low density, distributed development (i.e. sprawl) that will, in turn, increase not decrease congestion and carbon. When homes are put far from jobs and jobs are put far from homes, car use, congestion and carbon rises. Despite billion-dollar head starts, projects like this are not projected to ever generate enough revenue to pay for operating costs, putting upwards pressure on fares and downwards pressure on service expansion.

Complete, compact, centred communities reduce the cost of other climate action opportunities. In the Netherlands today, for example, virtually no public subsidies are going into EV charging infrastructure. With high numbers of EVs on the road, EV chargers in medium to high density mixed-use neighbourhoods are money makers. Private or public sector investors generate revenue with each use. The higher the density, the higher the frequency of use, and the higher the profit. Chargers in low density neighbourhoods are money losers. B.C. will never have the urban form of the Netherlands, but the more complete, compact urban development we build, the lower the price tag for climate action.

Not only do climate action costs drop in complete, compact, centred communities, so do other key municipal costs. Focussing growth is indispensable in shrinking growing municipal infrastructure deficits. A large portion of civic infrastructure is linear, e.g. roads, water, sewage, stormwater. Single family neighbourhoods may have 30 to 50 metres of linear civic infrastructure per household while medium density neighbourhoods may have 10 metres and high-density neighbourhoods even less. Most B.C. municipalities are not generating the revenue in taxes, development cost charges and utility fees to operate, maintain and replace this infrastructure. Focussed growth can reverse this deficit.

4. Maximizing Co-Benefits & Mapping a Resilient Recovery

Over and above the GHG per tonne cost effectiveness, sustainable urban land use has the greatest co-benefits of any climate action, many of which, if monetized, further increase cost-effectiveness. Many have been addressed above. In summary:

- Reverse rising rates of obesity correlated to reduced neighbourhood car dependence
- Reverse rising civic infrastructure deficits correlated with housing and employment intensification
- Grow transit ridership and revenue with complete, compact development on transit lines
- Reduce congestion, increasing walking, cycling and transit
- Improve affordability in housing and transportation, accounting for 30% and 20% respectively of average household income in B.C.
- Provide unique housing security for seniors and young people, transforming the startling mismatch in today's demography and housing stock from challenge to opportunity
- Protect agricultural land, disappearing at an unprecedented rate due to urban growth patterns
- Protect forest proximate to cities, protecting valuable terrestrial carbon sinks and habitat

• Reduce vulnerability to climate change impacts, e.g. reducing flood risk and urban heat island effect with greenspace protection, reducing forest fire risk by limiting growth interfacing forests, reducing biodiversity stresses with habitat protection, improving food security undermined by farmland loss

COVID has laid bare many acute vulnerabilities. It has also thrust B.C. and Canada into acutely tight fiscal constraints. Now, more than ever, it is important to identify strategies that are fiscally shrewd and advance solutions that contribute to a more resilient future.

2. Fulfilling Commitments

Along with the BC government, virtually every local government signed the Climate Action Charter. The most significant commitment agreed to under the charter that would have impact on local and provincial GHGs is:

"creating complete, compact, more energy efficient rural and urban communities." B.C. Climate Action Charter, 2007

It would be untrue to suggest complete, compact community development is not happening in B.C, it is. However, in urban regions, big and small, growth patterns can be summed up in three trends:

- 1. High density nodal intensification in many communities
- 2. Plummeting populations in existing single-family neighbourhoods due to demographic change in virtually every B.C. community
- 3. A disproportionate share of medium to low density greenfield growth, expanding the urban footprint in virtually every urban region (including communities with shrinking populations)

Trends 2 and 3 effect >90% of residential land and are major contributors to the size and growth of transportation GHGs (Figure 1, shown above).

Ultimately, local governments are not meeting their Climate Action Charter commitment and no effort has been made since 2007 to examine and update the local and provincial policy and planning context that makes it easier and more attractive to distribute, low density growth versus focus growth. This has significant GHG implications, but also substantial impacts on public health, congestion, commute times, civic infrastructure deficits, high cost transit, transportation and housing costs, agricultural land loss.

Local government alone are not responsible for these trends. Provincial and federal government infrastructure programs, for example, inadvertently subsidize greenfield growth with transportation projects that facilitate growth into forest and farmland. The provincial policy context for local governments makes greenfield development is easier and more attractive than intensification.

The BC Government committed under CleanBC to identify sustainable land use initiatives to help fill the emissions gap. The BC Government has not fulfilled its CleanBC commitment to address the land use gap nor its shared commitment with local governments under the Charter of *"creating complete, compact, more energy efficient rural and urban communities."*

To build better communities, a better climate and a better B.C., it is an urgent priority for B.C. local governments and the Province to begin to collaboratively fulfill these land use commitments.

OPPORTUNITIES FOR STRENGTHENING UBCM CLIMATE ACTION RECOMMENDATIONS

Local land use plans supported by provincial government policy play a massive role in community greenhouse gas emission activity and the resilience of our communities to climate change impacts.

The following recommendations build on existing UBCM recommendations-sector by sector-matching a local response with the magnitude of the challenge while building more resilient, prosperous, equitable communities. These recommendations focus on the unique authority and influence of local governments.

Land use plans can build better communities, a better climate and a better B.C. Currently local land use planning supported by provincial government policy inadvertently undermines progress. Fulfilling historic local and provincial commitments to strengthen land use policy and governance can reverse these trends.

The UBCM Climate Action Committee is encouraged to strengthen its recommendations with the following measures.

1. Buildings

No strategy to drive GHG reductions and resilience in buildings is complete without recognizing the profound

mismatch in today's housing stock with our demographic conditions and the implications: social isolation for seniors, affordability for seniors and young adults, and residential carbon intensity.

Half of B.C.'s housing stock is single detached homes. A half century ago, most were occupied by families of four. Today, most are occupied by solos and couples, and this share is rapidly rising. As of the last census, B.C. had more one person occupied single detached homes than three, four, five or more. The fastest growing single detached household is a solo. Solos are primarily a function of attrition: the children have left home and a spouse has died. Indeed, 60 per cent of solos in single detached homes are people over 60. Despite their disproportionately large presence, seniors are less likely to have secondary suites or become home share hosts even if they are lonely or low-income.



(because most housing GHGs are driven by space heating), increase

utilization rates of existing housing, and more readily meet the need for new affordable rental housing, avoiding demand for unnecessary, new building construction.

When these hidden housing solutions are situated proximate to jobs, services and transit and in walkable neighbourhoods, the benefits in cutting transportation carbon, costs and congestion are even more dramatic. In B.C., while 30% of average household revenue goes to housing, almost 20% goes to transportation. People living in walkable, transit-supported neighbourhoods close to jobs spend less on transport, are more active and have healthier weights. Affordability will not be solved by focussing exclusively on housing. In fact, many lowincome households in suburban and rural areas spend more on transportation than housing. No amount of transit extended into suburban and rural areas will alter this high-cost, high-carbon transportation dynamic.



Boston, SFU Renewable Cities with Stats Can data

Fundamental solutions involve intensifying housing close to jobs, services and transit in walkable neighbourhoods. Suites, laneway homes, additions and home sharing can be part of the solution.

While municipalities have undertaken incredible innovation to enable diverse types of secondary suites, coach houses and home sharing, many social, institutional and policy barriers constrain the supply and diversity of options. A suite of key barriers include the capacity for seniors to take on landlord responsibilities or become home share hosts, access to capital for minor retrofits, social acceptance of secondary suites and home sharing, and perceived and legitimate legal risks.

A range of highly cost-effective local and provincial solutions can hurdle these barriers, including strategies that build the capacity of pre-fabricated wood building manufacturers in forest dependent communities who have been hit by a triple whammy: COVID, the softwood lumber war and declining fibre due to climate-exacerbated insect infestations and forest fire.

B.C. has 850,000 single-detached homes. If just 10 per cent were incentivized to add another household, it could generate 85,000 new affordable housing units, increasing revenue for 85,000 homeowners, and cut at least one quarter of a million tonnes in GHG reductions annually.

These solutions are viable across the vast majority of B.C. in rural areas, small towns and big cities, as the underlying demographic and housing fundamentals are the same. Some of the most innovative accessory dwelling unit policies, no less, have been born in small towns.

Recommendations:

- A. The provincial government should diversify residential energy conservation/climate action spending to consider occupancy. Provincial and energy utility conservation spending should be extended to upgrades to establish a secondary suite or accommodate a home share.
- B. The provincial government should build nonprofit housing capacity to support home sharing and secondary suite management. Building the capacity of non-profits to support home sharing, secondary suite and laneway home management on behalf of seniors can dramatically and cost-effectively hurdle the unique barriers that seniors confront.



Figure 5: BC Housing Stock and GHGs by Dwelling Type Boston, SFU Renewable Cities with Stats Can, NRCan, BC Hydro data

C. The provincial government should incentivize attractive, affordable, net-zero, pre-fab wood laneway homes. These homes can be placed into the backyards of interested British Columbians in return for agreements for long-term, affordable rental housing. This policy can help drive demand for growth and innovation in pre-fabricated, net zero building manufacturing: an important growth sector for secure, stable, value-added jobs in forest-dependent communities, and an essential strategy for B.C. to enable the entire province to get to the top of B.C.'s step code.

- D. The provincial government should enable local governments to require new single and semi-detached homes to be secondary suite ready, and local governments should embrace the opportunity along with provisions to increase liveability and accessibility. Making new single and semi-detached homes secondary-suite ready is a marginal cost during construction and increases the likelihood interested homeowners will accommodate a suite in the future. Secondary suite ready requirements include pre-wiring and plumbing to accommodate bathroom and kitchen and ceiling and/or wall assemblies that are fire and sound proof. To maximize liveability, new single detached and semi-detached homes with secondary suite-ready units should be granted additional height allowances, placing units at/or close to grade, allowing occupants to enjoy natural light and enter with few or no steps, improving accessibility for seniors and people with disabilities.
- **E.** Local governments should maximize secondary suite and laneway housing options that manage housing and transportation carbon, building on the leadership of many local governments across B.C. All local governments should permit at least one accessory dwelling unit on single detached parcels. On single detached parcels proximate to commercial areas and frequent transit, two accessory dwelling units in addition to the primary residents should be considered.

2. Transportation

As underscored by the IPCC in the 1.5°C report and the Fifth Assessment Report (see "Science" above), urban land use is a critical local government responsibility and highly important in driving deep reductions in the largest and most stubborn GHG sector. It is <u>not</u> possible to meet IPCC, national, provincial and any legitimate local GHG reduction targets by 2030 without integrated transportation and land use planning. Current road *and* transit spending priorities and associated land use plans are paving the way for a high cost, high carbon, high congestion future in B.C.

Recommendation:

A. The provincial government, local governments and BC transit authorities (i.e. BC Transit and TransLink) develop a framework for integrated transportation and land use plans associated with existing and new infrastructure and service spending that is consistent with CleanBC commitments to integrate land use planning into climate action and cut congestion, and specifically, meet shared performance objectives to reduce congestion, carbon, personal and public transportation spending, and personal and private property damage, mortality and injury from vehicular accidents.

3. Resilience

No local or provincial strategy to strengthen community resilience to climate change is adequate without central consideration of how land use planning strengthens adaptive capacity and reduces vulnerability. How we manage urban land use can dramatically increase or reduce our greatest risks, including: forest fire, coastal, fluvial (riverine) and pluvial (surface) flooding, food security, urban heat island, fresh water accessibility, biodiversity and social cohesion.

Recommendations:

A. The provincial government and BC local governments should build on the climate action leadership and innovation that has been driven by the inclusion of climate action requirements in OCPs and RGSs (i.e. reduction targets and policies and actions to meet them) by requiring in OCPs and RGSs climate vulnerability assessments and adaptation plans to manage vulnerabilities. Given the central importance of

land use in managing community climate risks, OCPs are RGSs are exceedingly appropriate planning processes for the consideration of vulnerability assessment and adaptation planning.

B. The provincial government and BC local governments should collaborate on the development of a toolkit that lays out how land use policies and plans – a central authority of local governments -- can be used to mitigate climate change risks.

4. Governance

No meaningful governance reform and Climate Action Charter renewal is adequate without the addressing the sustainable land use imperatives that are a cornerstone to the Charter and meaningful contributions to local climate change mitigation and adaptation actions.

Recommendation:

A. The provincial government and BC local governments should fulfill their shared commitments under the Climate Action Charter of "creating complete, compact energy efficient rural and urban communities" and that the Provincial government fulfill its commitment under CleanBC to identity land use initiatives to meet the emission reduction gap in the province's updated climate action plan. These processes should include a robust review of the local and provincial policy and planning context that has inadvertently created barriers to complete, compact community development that support low carbon, resilient, equitable, prosperous and fiscally secure municipalities, and instead facilitate high carbon, high cost, distributed urban form. This review should include strategies to strengthen provincial transportation infrastructure policy to meet shared goals to manage carbon, congestion, civic infrastructure costs and personal and public transportation costs.

FOR MORE INFORMATION

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Renewable Cities, a program of SFU Morris J. Wosk Centre for Dialogue, works with policy-makers and practitioners to accelerate the transition to renewable, restorative, resilient cities through meaningful engagement, critical research, capacity building and policy innovation.