



# Ryerson City Building Institute

## CBI POLICY PAPER

### It's Cool to be Smart:

### How Ontario's Growth Plan can Reduce Greenhouse Gas Emissions

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Introduced in the past decade, the Greenbelt and Growth Plan represent a pair of Ontario's marquee policies on smart growth and lands protection. These policies will preserve agricultural land and natural capital<sup>1</sup> and lead to a variety of economic benefits for the future. They also establish rules for "Smart Growth" without reducing housing supply for a growing region.<sup>2</sup> However, one overlooked aspect is their potential to help the province meet its climate goals.

#### FIRST COAL, NOW TRANSPORTATION

Ontario is working to emit 80 per cent fewer greenhouse gas emissions by 2050 than in 1990. But as it cuts emissions, the province will continue to grow. It is expected that between 1990 and 2050 Ontario will double in population. This means that in 2050 our per person carbon budget will be only 10 per cent of what it was in 1990 (see figure 1).

1. Green Analytics (2016). Ontario's Good Fortune, Appreciating the Greenbelt's Natural Capital. Available at: [http://www.greenbelt.ca/ontarios\\_good\\_fortune\\_greenbelt\\_natural\\_capital](http://www.greenbelt.ca/ontarios_good_fortune_greenbelt_natural_capital)

2. Neptis Foundation (2016). No shortage of land for homes in the Greater Toronto and Hamilton Area. Available at: <http://www.neptis.org/publications/no-shortage-land-homes-greater-toronto-and-hamilton-area>

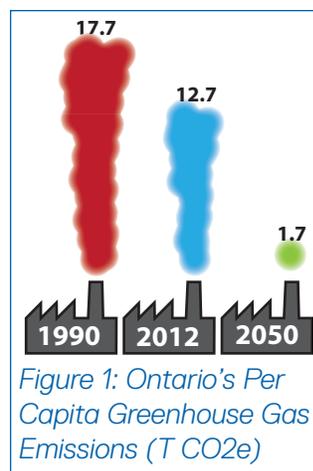


Figure 1: Ontario's Per Capita Greenhouse Gas Emissions (T CO<sub>2</sub>e)

Fortunately, Ontario has taken some big steps to reducing its emissions since 1990. Most importantly, the Government's coal phase out has all but eliminated emissions from our electricity sector.<sup>3</sup> Meanwhile Ontario has limited emissions from industry, buildings, agriculture and waste, all despite the province's growing population.

The sector that stands out is transportation, where emissions continue to climb (see figure 2). Rising transportation emissions are part of why Ontario's 2006 Growth Plan for the Greater Golden Horseshoe and the Proposed Growth Plan for the Greater Golden Horseshoe, 2016 are so important.

Not only does the Growth Plan protect valuable agriculture and natural capital, it will help ensure

3. Province of Ontario (2015). Ontario Permanently Bans Coal-Fired Electricity Generation. Available at: <https://news.ontario.ca/ene/en/2015/11/ontario-permanently-bans-coal-fired-electricity-generation.html>

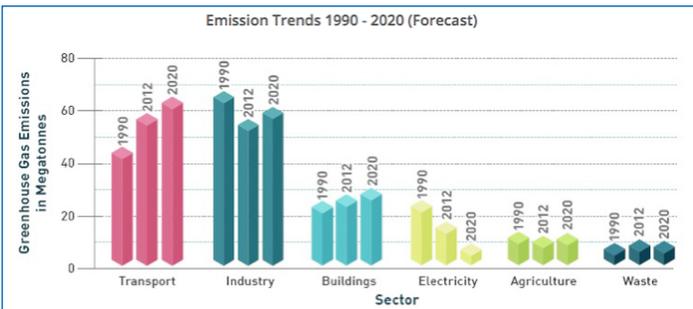


Figure 2: Ontario's Annual Greenhouse Gas Emissions

Emissions in every sector other than transportation have decreased or held steady since 1990. Reversing these climbing transportation emissions trend will be a key component of meeting Ontario's climate commitments.

Chart via: <https://www.ontario.ca/page/climate-change-action-plan>

we can reduce transportation emissions by putting new residents closer to jobs, transit, and day-to-day services. Here is a quick primer on some of the key changes called for in the Proposed Growth Plan:

- **Adding more people to existing neighbourhoods** by increasing the infill/intensification development share from 40 per cent to 60 per cent in all upper-tier and single-tier municipalities.
- **Prioritizing development around transit stations and corridors** through mandated density targets and effective land use planning.
- **Building higher density, more complete new neighbourhoods** by increasing the density target for greenfield development from 50 to 80 residents and jobs per hectare.

## HOUSEHOLD EMISSIONS IN THE GREATER GOLDEN HORSESHOE

To help understand the impact of development patterns and development location, the Ryerson City Building Institute partnered with Boston Consulting to carry out a greenhouse gas analysis comparing different forms of development across the Greater Golden Horseshoe. This work focused on household emissions attributable to energy use at home and the use of transit and automobiles.

On this basis, the average Greater Golden

Horseshoe resident is currently accountable for about three tonnes of greenhouse gas emissions per year.

However, location and development patterns have a significant impact on individual emissions. For example, the average resident living in a high-density downtown (or uptown) area emits about half of what an average resident in a low-density single-detached neighbourhood does (see figure 3).

While living in high-density areas comes with clear GHG reduction benefits, Ontario's climate plan certainly does not (and should not) require everyone to pack their bags and move to a small downtown condo. However, this analysis illustrates that we can make meaningful reductions to greenhouse gas emissions by carefully considering where and how we add new housing units in the coming 20-30 years.

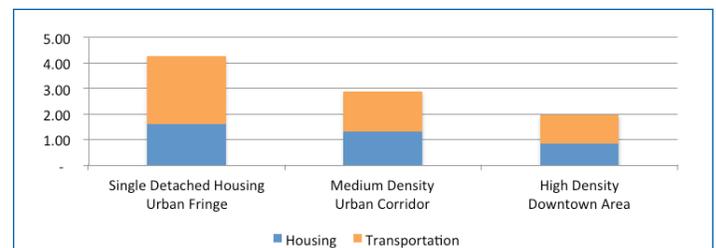


Figure 3: Neighbourhood Per Capita GHG Emissions (T CO2e)

Residents who live in higher density urban areas tend to emit fewer emissions than those living on the edge of urban areas in more car dependent neighbourhoods. The primary difference is a big reduction in transportation emissions, but high-density dwellings also tend to consume less energy.

## ACTION 1: MORE INTENSIFICATION, FEWER GREENHOUSE GAS EMISSIONS

Increasing the intensification target in the Growth Plan—that is building “in and up” rather than out—comes with a host of benefits and is arguably the plan's most important climate change action.

Increasing the 40 per cent intensification target to 60 per cent means that over the life of the Growth Plan we can expect about 650,000 more people

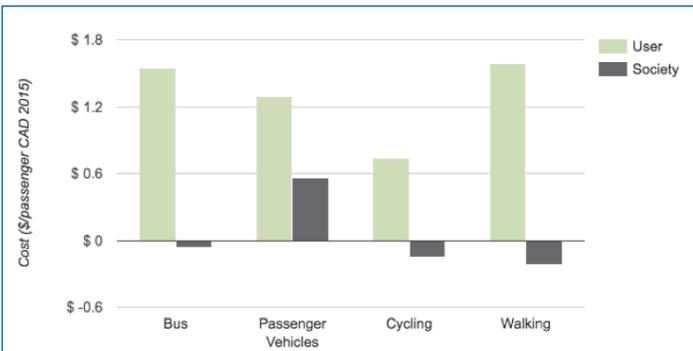


Figure 4: Costs by mode of a typical 10 km commute in Vancouver.

Modelling the costs associated with a 10 km travel distance along a transit route in Vancouver shows that commuting by car comes with costs to society, while a commute by any other mode creates net savings for society due to health, environment and social benefits.

Via: <http://movingforward.discoursemedia.org/cost-of-commute-calculator-data/>

to live in established urban areas instead of new greenfield subdivisions. This will result in many more people—more than Hamilton’s current population—living closer to established employment zones, transit routes, and daily services. From a climate change perspective, increasing our intensification rate results in four key benefits:

**Making it easier to take transit, bike or walk:**

Increased intensification moves new residents closer to, or even into, urban cores and other established employment centers instead of locating them on the edges of cities and suburbs. This shift in where we build new housing significantly cuts down on the average distance that new residents need to travel to access employment and daily services. And it increases the likelihood they will walk, bike, or ride transit to work. Getting people out of their cars and commuting by other modes produces major cost savings for society,

**Shortened commuting distances:** Even if new residents do not change modes as result of moving closer to downtown areas, cutting down on commute distances can make a big difference towards greenhouse gas emissions. For example, cutting 10km off of an round-trip automobile commute equates to reducing GHG emissions by

about 0.5 to 0.7 tonnes per year—a big chunk out of the average of 3 tonnes per year we all emit. There are a number of online emissions calculators you can use if you want to understand the GHG implications of your commute.<sup>4</sup>

**More energy efficient dwellings:** Intensification also shifts new residents from lower-density subdivisions featuring single-detached houses into higher-density neighbourhoods. This means new residents are more likely to live in multi-family buildings including townhouses, duplexes, and apartment buildings which are typically more energy-efficient than single-detached houses.<sup>5</sup>

**Benefits for existing residents:** Since intensification increases the density of existing neighbourhoods it will also bring current residents closer to new services and employment opportunities that will develop along with new growth. This means existing residents will be able to enjoy shorter travel distances and lower automobile dependence.

**ACTION 2: PUTTING MORE PEOPLE CLOSE TO TRANSIT**

The Proposed Changes to the Growth Plan calls for setting density targets at all major transit station areas. These targets will help optimise our transit investments by making it easier for people to live, work, and play closer to rapid transit stations.

Type of Transit	Minimum Density (people & jobs / hectare)
Subway	200
Light Rail Transit Bus Rapid Transit	160
Regional Express Rail & GO Transit	150

Table 1: Proposed Major Transit Station Area Densities<sup>6</sup>

4. E.g. Carbon Zero's Emission Calculator available at: <http://www.carbonzero.ca/calculate>

5. Ewing, R. and Rong, F. 2008. "The Impact of Urban Form on U.S. Residential Energy Use." Housing Policy Debate. 19:1-20.

6. Province of Ontario (2016). Proposed Growth Plan for the Greater Golden Horseshoe. Section 2.2.4.5.

Living close to transit, in more walkable, complete communities comes with real benefits to families and individuals. A two-car family can, for example, save over \$10,000 a year on transportation costs (fuel, insurance, registration, car payments, maintenance) if they are able to downsize to one car.

In addition to the direct benefits to households, allocating more homes and jobs near transit and growth centres reduces commute distances. This means we won't need to build as many new expensive highway infrastructure projects, which will result in saving billions in capital and operating costs.

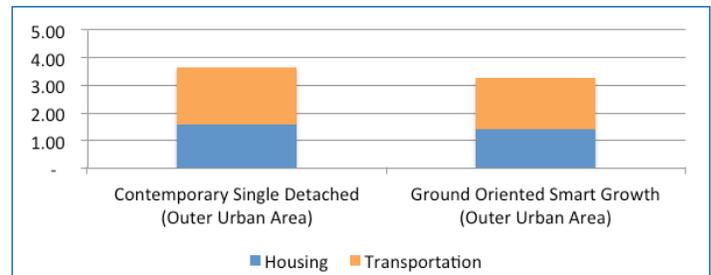
Finally, the climate change arithmetic on putting more people close to transit is relatively simple: More people close to transit equals less people driving, which equals fewer greenhouse gas emissions.

Increasing density around our transit lines will also benefit individuals living in those areas. More density means they will have access to more shops, more services, more jobs, and therefore more opportunities to leave the car at home, whether commuting to work or just travelling for day-to-day chores and entertainment.

### **ACTION 3: MORE COMPLETE NEW NEIGHBOURHOODS**

Although the Growth Plan calls for putting more people into existing neighbourhoods and closer to rapid transit stations, there will remain both a need and a demand for new greenfield subdivisions. Even with a 60 per cent intensification target, there will still be about 1.3 million new residents moving to new neighbourhoods in greenfield areas over the next 25 years. Although these neighbourhoods will be on the periphery of our existing cities and suburbs, we can still plan them to be more liveable and less polluting.

By increasing the density of these new neighbourhoods we can ensure that residents who move to these areas have a wide range of housing options to pick from—not just single-detached homes. This means that these residents will have the option to move into more affordable and energy efficient dwellings.



*Figure 5: Per Capita GHG Emissions (T CO<sub>2</sub>e) of lower density subdivisions versus new smart growth neighbourhoods*

*Residents in single-detached neighbourhoods on the fringes of our urban areas emit more greenhouse gasses than do residents in new ground-oriented smart growth neighbourhoods in similar areas.*

Higher density also promotes more commercial development directly in neighbourhoods, meaning that these new residents will be more likely to access employment opportunities and daily services right in their neighbourhood.

Our research with Boston Consulting supports this. We found that “ground-oriented smart growth” neighbourhoods in outer urban areas (e.g. Markham) which include a mix of low-rise housing options and commercial development resulted in 10 per cent fewer greenhouse gas emissions per resident than did contemporary single-detached neighbourhoods with lower densities, more uniform housing types, and less commercial development.

### **CONCLUSIONS**

By following through with the Proposed Growth Plan, there is a huge opportunity to ensure that new residents can help contribute to our climate change goals. By increasing the intensification target from 40 per cent to 60 per cent we will move 650,000 new residents from the edges of our cities and suburbs into existing neighbourhoods, closer to established jobs, shopping areas, and daily services—making them more likely to have opportunities to walk, bike, or take transit. Meanwhile another 1.3 million new residents coming to the Greater Golden Horseshoe will benefit from rules that increase the density of greenfield areas, putting them in new neighbourhoods with a variety

of energy efficient housing options, and shops and jobs close to home.

Getting our land-use planning right also comes with major advantages for society beyond just climate change. By building more dense new communities and making better use of existing urban areas, we can ensure that there is land supply to continue building new family-oriented housing well into the future, while also protecting valuable agriculture areas and natural capital.

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