



# Town of Oakville Ecological Footprints Results by Neighbourhood

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*Summary results*

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## **Introduction**

The Town of Oakville is committed to reporting the ecological footprint as part of a larger effort to track and measure progress towards environmental sustainability and quality of life objectives (2009). Oakville reports the ecological footprint in the State of the Environment Report and as part of the Open Data Oakville initiative. This report updates the previous ecological footprint calculated in 2010. In addition to reporting an ecological footprint for the Town, the report updates the neighbourhood ecological footprint estimates also previously completed in 2010.

The ecological footprint is a sustainability accounting tool that measures the environmental impact of human consumption. Oakville's ecological footprint accounts for household consumption of goods and services, food, transportation, housing and government services and expresses the findings in terms of the land area needed to support that level of consumption. The results offer community leaders, policy makers and city planners' useful information to help develop sustainability strategies targeting the household sector. The findings can be used to raise awareness and educate citizens about the sustainability impacts of lifestyle choices and inspire and promote dialogue to encourage household behaviour change. The finer resolution neighbourhood-level analyses provide policy makers and planners with information to develop and target programs and policies to reduce environmental impact, including, for example, improving urban form, increasing population density, and active transportation.

## **Oakville Ecological Footprint**

The Oakville average ecological footprint is 9.1 global hectares per person. In terms of total area, Oakville's ecological footprint occupies over 1.7 million global hectares.<sup>1</sup> This is over 120 times the town's total land area (13,850 hectares), or almost two and half times the size of the Greater

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<sup>1</sup> The ecological footprint expresses results in global hectares. A global hectare is a standardized unit to account for the fact that different land types and different land categories have different productivity or biocapacity potentials.

Toronto Area (712,500 hectares). Figure 1 depicts Oakville's ecological footprint in relation to Town boundaries.

Figure 1: Oakville ecological footprint



The Oakville ecological footprint is able to exceed the political boundaries of the city as it is a measure of total household consumption of residents. The indicator accounts for the consumption of materials and energy of a given population regardless of where the extraction, production, and manufacturing occur. In fact, the majority of Oakville's ecological footprint falls outside its borders. Because of trade the impacts associated with resource extraction, food production, manufacturing and distribution, for example, do not necessarily occur within Oakville, Ontario or Canada.

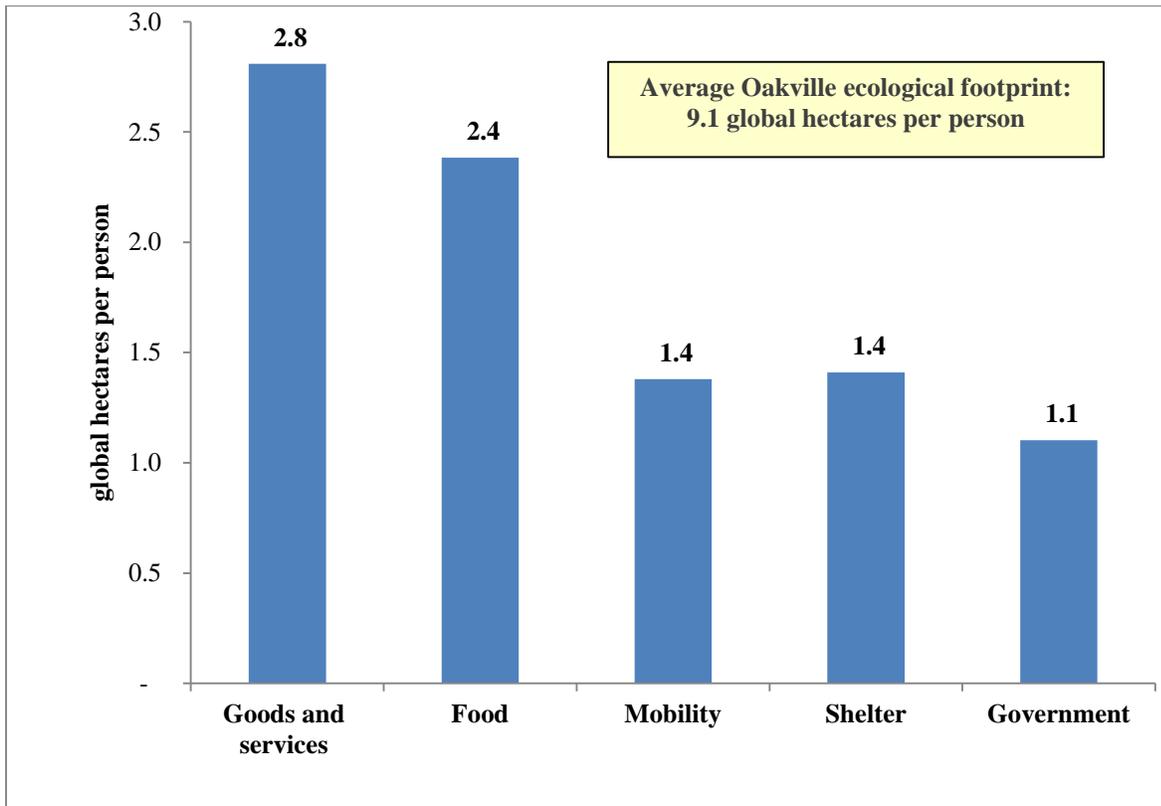
### **Global Sustainability Perspective**

Similar to other Canadian cities, Oakville's ecological footprint remains substantially higher than the global sustainability threshold of 1.7 hectares per capita (Living Planet Report, 2014). The global sustainability threshold is determined by taking the total amount of bioproductive space in the world and dividing it by the total population. Assuming an equal distribution of bioproductive space among the global population, Oakville residents, on average, are using over five times more than their 1.7 hectare share of the global bioproductive space.

### **Ecological footprint by consumption category**

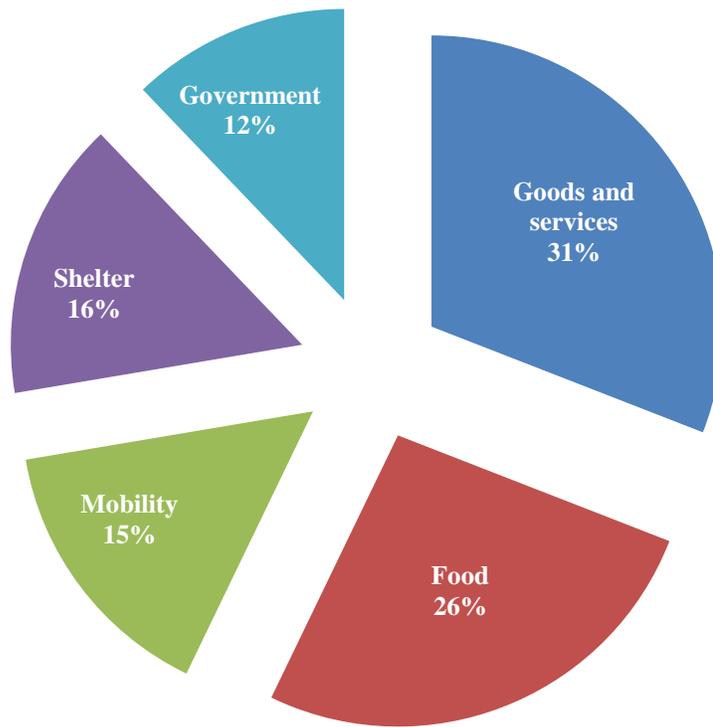
The Oakville ecological footprint can be broken down by consumption category (Figures 2, 3). Consumption categories include goods and services, food, shelter, personal transportation, and government services. The consumption of goods and services makes up 31% of the total ecological footprint. The goods and services category accounts for all the stuff we buy and the services we use other than those directly related to food, housing and transportation. The food category makes up 26% of the ecological footprint and includes direct food consumption as well as the embodied impacts associated with the production and distribution of food.

**Figure 2: Ecological footprint by consumption category**



Shelter, which includes household energy consumption as well as the materials and energy used to maintain the shelter, makes up 16% of the total ecological footprint. Personal transportation accounts for 15% of the ecological footprint. Government services makes up 12% of the total ecological footprint. Government services would include such things as roads, schools, health care, garbage collection, and snow removal. For a description of consumption categories and ecological footprint calculation approach, see Appendix A.

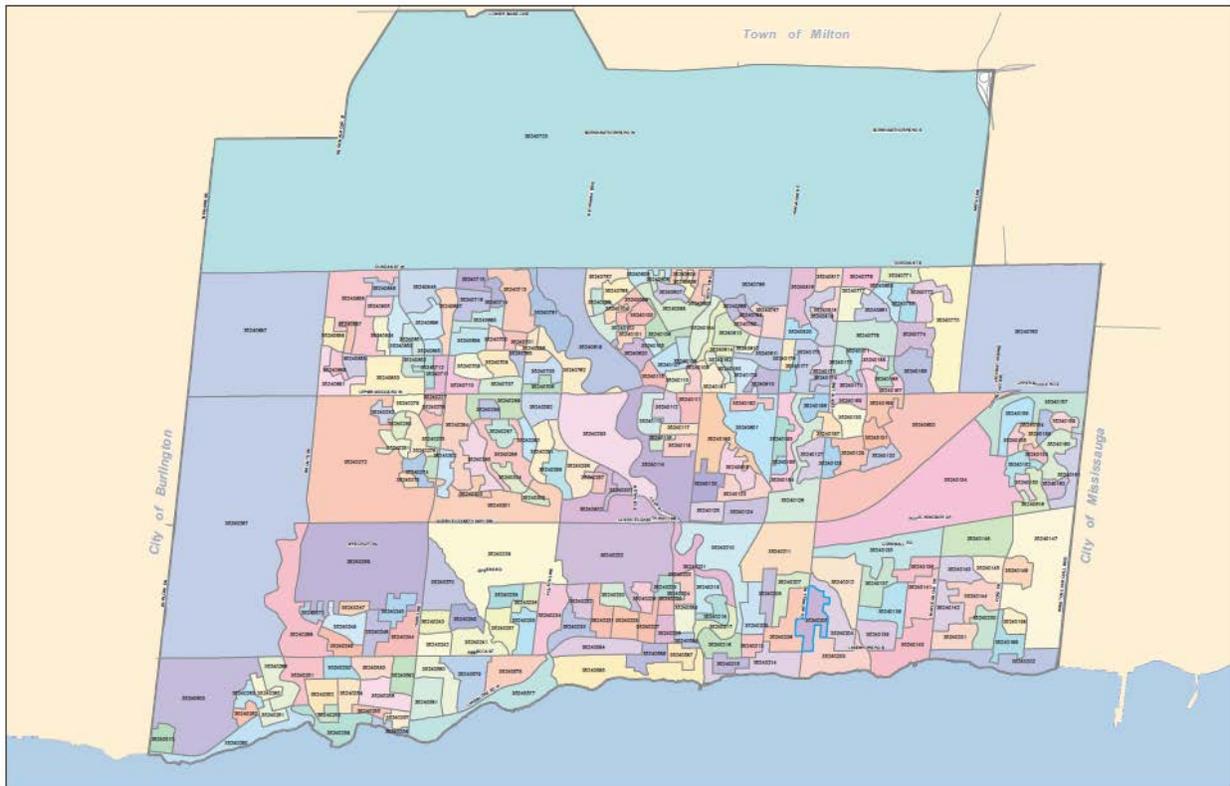
**Figure 3: Ecological footprint by category (percentage)**



### **Neighbourhood Ecological Footprint Estimates**

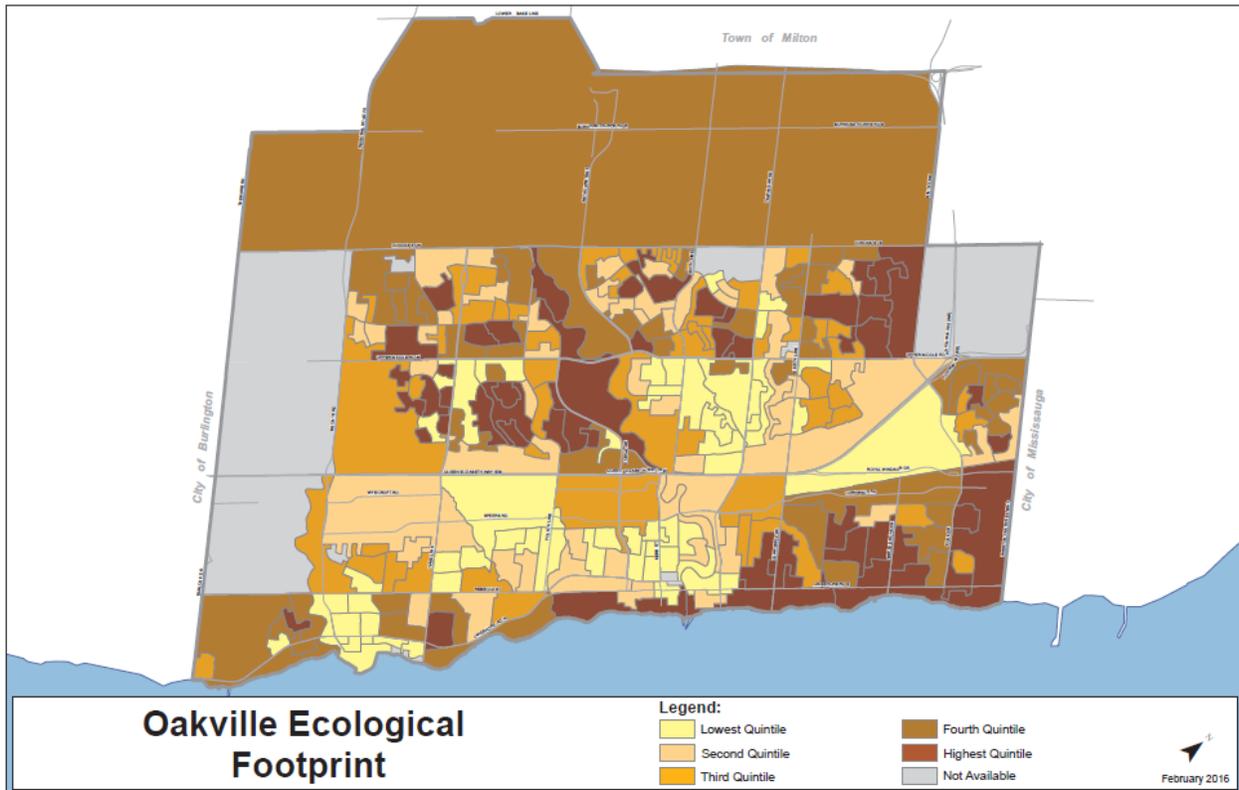
This report presents ecological footprint estimates for 274 neighbourhoods (Figure 4). Our report assumes that neighbourhoods correspond to dissemination areas (DA). A dissemination area (DA) is a Statistics Canada designation and is defined as a small, relatively stable geographic unit composed of one or more neighbouring dissemination blocks with a population of 400 to 700 persons. It is the smallest standard geographic area for which all Canadian census data are disseminated. Dissemination areas are a subset of census tracts, which are defined by a committee of local specialists (for example, planners, health and social workers, and educators) in conjunction with Statistics Canada (Statistics Canada 2007). Oakville has 283 dissemination areas. Due to data suppression or incomplete data we did not estimate a footprint value for 9 dissemination areas.

Figure 4: Oakville dissemination area (DA) map



Ecological footprint results by neighbourhood range from 5.7 global hectares per person to 15.0 global hectares per person. The range in average neighbourhood ecological footprint per person can be attributed to a number of factors including differences in household income leading to greater purchasing capacity, household energy use, commuting distance, mode of travel (e.g. walking/biking or taking public transit to work), household size and number of people per household. Figure 5 presents a map of neighbourhood results by quintile. See Appendix B for a list of neighbourhood ecological footprint results. Geographically, high ecological footprint neighbourhoods tend to be located along the Town's lake shore, old Oakville, and near the Oakville golf course. Low footprint neighbourhoods tend to be clustered in the urban core and around industrial and commercial zones. The spatial presentation of results reveals patterns of high and low ecological footprint neighbourhoods within Oakville.

**Figure 5: Neighbourhood ecological footprint results**



## Conclusion

Reporting Oakville's ecological footprint offers an easy to understand assessment of where the Town stands in relation to overall sustainability objectives. The ecological footprint, in combination with a set of complementary indicators, provides a comprehensive framework for setting targets and measuring progress towards sustainability goals. This report updates the pioneering neighbourhood level ecological footprint analysis completed for Oakville in 2010. While the calculation approach is similar, small adjustments to the goods and services component and the transportation component were made based on feedback and review of the original approach. Similar to our 2010 analysis, results demonstrate variability in household energy and material consumption within a community. The fine scale results provide community leaders, policy makers and planners with useful information to prioritize program delivery, allocate limited resources and support policy development to reduce environmental impact.

## References

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## **Appendix A – Calculation Approach**

The ecological footprint tool makes it possible to estimate the area of land needed to support the consumption demands of Oakville residents. While the ecological footprint is an indicator of sustainable consumption, important factors other than consumption habits influence the ecological footprint. These include population size, technology, and gains or losses in eco-efficiency. For background about the Oakville ecological footprint please refer to the 2010 Oakville Ecological Footprint report or ‘Measuring environmental impact at the neighbourhood level’ by Wilson, Tyedmers, and Grant in the *Journal of Environmental Planning and Management*. For general information about the ecological footprint please visit the Global Footprint Network website ([footprintnetwork.org](http://footprintnetwork.org)). The Global Footprint Network maintains the national ecological footprint accounts and is the global authority on the ecological footprint.

The 2015 Oakville ecological footprint update follows the bottom-up/top-down calculation approach used to estimate the 2010 footprint values. The approach is described in Wilson, Tyedmers and Grant (2013) and updates the sub-national footprint calculation strategy presented in Wilson and Grant (2009). The sub-national footprint calculation strategy estimates ecological footprint categories based on proxies for the major consumption categories of the ecological footprint: food, shelter, mobility, goods, services, and government. The energy footprint associated with electricity use and home heating is calculated directly. For detailed calculations of the 2015 results, please refer to the Oakville neighbourhood calculation spreadsheets (available upon request).

### **Consumption categories**

#### **Goods and services**

The goods and services component of the footprint refers to the embodied footprint associated with our consumption of ‘stuff’. Ecological footprint estimates attributed to goods and services are derived based on a comparison of ‘available income’ between neighbourhoods. ‘Available income’ is after-tax income minus shelter expenses which includes expenses such as mortgage payment or rent and the costs of electricity, heat, water, other municipal services, property taxes

and condominium fees. After tax household income and shelter expenses are reported at a neighbourhood level in the National Household Survey.

In addition, we subtract expenses on food, gasoline and other fuels, airplane travel and non-consumption expenditures such as personal insurance payments, pension contributions, gifts of money, support payments and charitable contributions which are reported in the Survey of Household Spending. While the Survey of Household Spending does not report at a neighbourhood level, spending data are reported at a provincial level by income quintile. We adjust neighbourhoods based on the respective income quintile they fall in. 'Available income' is assumed to be a strong indicator of expenditures on goods and services.

### **Shelter – energy**

The shelter energy footprint refers to the direct energy demands associated with electricity consumption and home heating. Electricity and natural gas consumption data were converted to greenhouse gas (GHG) emissions using Ontario conversion factors. Greenhouse gas emissions were converted to global hectares using the footprint intensity of carbon conversion factor from the Global Footprint Network calculation standard (2009). Electricity and natural gas consumption data were provided at a neighbourhood level by the Town of Oakville and come directly from the respective utilities.

### **Shelter – non energy**

The non-energy component of the shelter footprint refers to the construction, maintenance, and other material inputs to support shelter. Neighbourhood level shelter – non energy footprint estimates were estimated based on household residential floor area data provided by the Town of Oakville.

### **Transportation**

GHG emissions for Oakville were derived from provincial data on fleet size, annual kilometers traveled per vehicle, and average fuel consumption of the vehicle fleet reported by Transportation Canada (2014). Greenhouse gas emissions are converted to global hectares using

the Global Footprint Network standard conversion factor (GFN 2009). Neighbourhood level ecological footprint estimates associated with private transportation were estimated by adjusting the Oakville value according to differences in commuting patterns (distance and mode) by neighbourhood.

### **Food**

The Oakville food footprint is updated based on differences in food expenditures for Ontario in food inflation adjusted dollars. We estimated neighbourhood food footprints based on an analysis of food footprints by household income decile by Mackenzie and colleagues (2008). The food footprint is adjusted by corresponding scalar reflecting the income decile that the neighborhood falls in.

### **Government**

To adjust the government component of the ecological footprint we use expenditure on municipal and provincial government services as a proxy. Federal government expenditures would be consistent across the country. While government expenditures may vary by region within a province and a city, government services such as roads, schools, health care, garbage collection, and snow removal serve all citizens.