

Backyard Composting Undervalued

New Data Reveals Underestimated Diversion Rates and Collection Cost Savings

Backyard composting is undervalued; it is far more important than we thought.

Each year in North and West Vancouver, between 8,398 and 10,514 tonnes of single-family organic waste is generated but never placed curbside for municipal collection and disposal.

This rivals the curbside Yard Trimmings collection service in diversion tonnages (10,638 tonnes), but minus all the associated municipal costs (~\$2,100,000) and environmental implications of an industrialized collection and composting system.

Without backyard composting, North Shore municipalities would require an additional 1,500 truck trips to the transfer station, for which they would be charged \$874,227 in tipping fees each year.

Factoring backyard composting into the equation increases the single-family diversion rate from 59.5% to 67.2%, approaching our Regional target of 70%.

Over the past five years, backyard composting has saved the municipalities about \$3.5 million in tipping fees alone.

Study Context and Methods

The North Shore Recycling Program (NSRP) administers the residential curbside recycling program and provides waste reduction education in North and West Vancouver, BC, member

municipalities of Metro Vancouver.

This study was initiated to address municipal and regional data gaps in the calculation of organic waste diversion rates attributed to backyard composting.

Three studies were run concurrently to provide an accurate average annual per-household diversion rate through backyard composting and to evaluate compost bin alternatives:

1. **Study 1:** Organic Waste Diversion
2. **Study 2:** Suitability of the Mega Composter
3. **Study 3:** Suitability of the Green Cone Food Waste Digester

Twenty-five volunteer composting households were recruited to participate in this project.

After receiving personalized Compost Coaching in January 2010, volunteers weighed their composted household organic waste and yard trimmings for the remainder of the year (11 months).

Suitability of Alternative Composter and Digester

Neither the Mega Composter nor the Green Cone presents a viable alternative to the compost bin currently available to North Shore residents.

Capacity issues are better addressed by emphasizing the benefits of a multi-bin system.

The Green Cone could be considered as a component in an onsite organics management system that includes backyard composting, but only for qualified North Shore residents and only once a support program is in place.

Organic Waste Diversion Measurements

Twenty-five volunteer households diverted over seven tonnes of organic waste from curbside pickup in 2010.

The average study household kept 452 kg off the curb during the year.

We calibrated an earlier baseline estimate from households composting without any support or training to derive an estimate of 361 kg/hh/year.

	Measured (with training)	Calibrated Baseline (no training)
Total Organics	452 kg	361 kg

Weights kept of the curb per household per year due to backyard composting.

Unlike other studies in our region, our research measured the combined total of organic waste composted from both inside and outside the single-family home.

Results for the indoor component were on par with the "non-contact"

extrapolation in the Township of Langley's 2010 study.

Results for the outdoor component matched Seattle Public Utilities' calculated findings from the 1990s.

Our overall results are 20-30% higher than the National Backyard Composting Program (USA) findings from 1996.

Metro Vancouver bases their per-composter diversion on Seattle's yard trimmings estimates, which is a significant underestimate.

Curbside Collection Implications

Seventy-nine percent of participating households increased the amount of material they composted and reduced the amount of waste they put in the garbage.

Compared to the 2008 North Shore average, participants decreased what they placed at the curb by half a can of yard trimmings and a full can of garbage each week.

All composting households on the North Shore compost 8,398 to 10,514 tonnes that the municipalities never need to handle or pay to tip each year; this is equivalent to approximately 1,500 truck trips and is almost the same quantity (10,638 tonnes) as the current Yard Trimmings

collection service, which costs \$1,500,000 in fleet and salary-related collection costs each year.

Diversion Rate Implications

The North Shore does not currently include backyard composting in its municipal diversion rates calculation of 59.5% (2010).

When composting is factored in, the North Shore's diversion rate is 67.2%: our single-family diversion rate is higher than we've been reporting to municipal staff.

Metro Vancouver (MV) uses the number of bins distributed multiplied by 250 kg/bin to generate an estimate of organics generated and managed onsite (4,052 tonnes).

We find that the actual diversion due to composting households on the North Shore is 10,514 tonnes, 2.5 times greater than MV's estimate; the regional residential sector diversion rate may be higher than currently estimated.

Tipping Fees Avoided

Two-thirds of the total garbage and yard trimmings annual collection service costs are in the form of tipping fees.

At 2011 rates, each study household saves the municipality \$35.44 in tipping fees each year.

For the North Shore's population of composting households, this extrapolates

to \$874,227 each year in avoided tipping fee costs.

Tipping fee savings are cumulative so long as a composting household maintains its composting behaviour.

Over the last five years on the North Shore, we have invested approximately \$16,100 in bin subsidies and backyard composting has resulted in avoided tipping fees of approximately \$3,500,000.

Personalized Compost Coaching

With training, households compost almost 100 kg more each year than unsupported households.

Supported study participants increased their diversion of low-quality household papers from the garbage to the compost, kept more leaves for onsite use, used alternative recycling depots for non-curbside collected materials and altered buying habits to reduce waste at source.

Compared to its low cost of delivery, personalized Compost Coaching services provide immeasurable social and environmental value beyond the direct tipping fee savings and decreased curbside collection requirements.

Selected Recommendations

- Include backyard composting in the annual North Shore Single-Family diversion rate calculation, using a per-household rate

Sophia (left) holds one week's accumulation of the family's garbage while Melanie (middle) and Ariadne (right) hold their household compostables from the same week.



between 361 kg and 452 kg.

- On an annual or bi-annual basis, collect statistically-significant data on the number of households composting and usage of composting best practices.
 - Recognize annual costs avoided due to composting as a line item in budget summaries and planning documents to municipal staff.
 - Increase support for onsite composting, the lowest-cost municipal waste diversion tool in the suite of collection programs which has diversion and cost-saving results disproportionate to its minimal investment.
 - Allocate staff and resources to significantly increase the number of composting households, recognizing that the scale of diversion through onsite composting is on par with curbside Yard Trimmings collection and that the scale of incremental cost savings will be in the six-figure range annually.
 - Introduce Compost Coaching or similar personalized training and troubleshooting service as a core support component for all composter sales.
 - Completely integrate composter sale operations with community outreach functions.
- We respectfully suggest that Metro Vancouver consider the following recommendations:
- Request that municipalities submit number of households using compost bins derived from statistically significant surveys, instead of using total number of bins distributed.
 - Capitalize on the advantage of scale to conduct more economical statistically-significant surveys determining the number of households composting by municipality and for the overall Region.
 - Revise the 250 kg per bin factor upwards to between 361 kg and 452 kg per household.

We only made 2.5 kilograms of garbage in the last 2 months and almost 50 kgs of compost!

Melanie Solheim