

Changes in Diversion Rates Following Introduction of Bi-weekly Garbage collection in
Canadian Municipalities: Lessons for Metro Vancouver

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Research Question: Based on findings of diversion rate increases that are believed to be result of bi-weekly garbage collection implementation (once every two weeks as opposed to every week) in Canadian municipalities, should Metro Vancouver implement bi-weekly garbage collection?

Based on the research a number of Canadian municipalities, a change from weekly collection of waste to collection of waste every two weeks does not increase diversion rates on its own. Metro Vancouver municipalities therefore should not implement bi-weekly *waste* (non-recyclables and non-compostables) collection, unless it is accompanied by other waste management programs. This paper argues that in order to increase diversion rates in Metro Vancouver, environmentally friendly consumer-producer waste management programs and approaches should be implemented alongside bi-weekly collection. These programs and approaches consist of the following: co-mingled blue-box recycling, EPR (Extended Producer Responsibility), green-bin composting, and community education. In order to maximize diversion rates and reach the ultimate goal of efficient waste management, which for the purposes of this paper are increased diversion rates and waste reduction in a cost-effective manner, Greater Vancouver municipalities should implement bi-weekly collection alongside the above programs.

Introduction & Procedure

Key terms will be defined through the paper at a point at which their understanding is required. I worked alongside Dillon Consulting, which is an employee-owned consulting firm based in Richmond, British Columbia. I was asked by Dillon to contact several

municipalities in Canada that currently have *bi-weekly waste collection* (which is collection once every two weeks) for single-family households. *Curbside collection* is the collection of municipal residential household waste and recyclables from the street level. All municipalities in the study had *blue-box recycling* programs, and some had *green-bin* compost or “food waste” collection. In order to determine whether Metro Vancouver should implement bi-weekly waste collection I contacted 15 Canadian towns, municipalities, and provinces in an attempt to acquire their diversion rate statistics. The goal was to compare diversion rates of the locale when weekly collection was in place, to when bi-weekly collection was in place. What I expected to find was that bi-weekly collection increased diversion rates. The reason for this is that when a household is forced to throw away trash less frequently (50% less often, as a result of decreased pick-up frequency), they are expected to decrease their consumption of non-recyclable waste. It was therefore expected that the data would infer that bi-weekly waste collection implementation, on its own, increases diversion rates.

Unfortunately, this was not the case. Each locale that was contacted has implemented other large-scale programs in conjunction with bi-weekly collection. Green-bin compost and community education programs were implemented simultaneously in all cases.

It was predicted that decreased pick-up frequency would reduce collection costs in regards to both fuel consumption and salaries. Whilst attempting to produce diversion rate data from each locale, I attempted to find information regarding whether bi-weekly collection did indeed reduce said costs. Because most locales did not have information

regarding such cost-reductions as well as the fact that this was not the primary focus of the project there is no definitive answer to that question for this report.

As Biocycle World (2007) tells us, some are opposed to bi-weekly collection due to a fear of a reduction in the quality of services. This was not the case for any municipalities that gave data for the purpose of this project. Each implemented a sound pilot project before a larger-scale and more permanent program was introduced.

As Berglund (2006) says, a moral motive for incentivizing households to properly sort their waste is very important when introducing new schemes. This goes along in regards to the education and communication with communities as how best to implement waste management schemes such as the kind that is the focus of this paper – bi-weekly collection.

Results

Table 1 below indicates the changes in diversion rates following introduction of bi-weekly garbage collection systems.

The information, taken at face value, indicates that diversion rates did increase substantially in most municipalities. The following paragraphs, however, illustrate that a number of other factors may also contribute to these results.

Table 1: Changes in Diversion rates in Selected Canadian Municipalities following Introduction of Bi-weekly collection

| Locale | Diversion rate, Year of 2005-06 (bi-weekly collection not in place) | Diversion rate, Year of 2011 (bi-weekly collection in place) | Increase in Diversion rate as a percentage |
|--------------------------------|--|---|---|
| Qualicum Beach, BC | 26% | 62% | 36% |
| Nanaimo | 28% | 64% | 36% |
| New Market, ON | 37% | 65% | 28% |
| Olds County, AB | 0% | 37% | 37% |
| Dryden, ON | 35% | 63% | 28% |
| Town of Perth, ON | 34% | 62% | 28% |
| Region of Durham, ON | 32% | 64% | 32% |
| Moose Jaw, SK | 29% | 61% | 32% |
| District of Muskoka, ON | 25% | 59% | 34% |
| Markham, ON | 27% | 58% | 31% |

Note that: In the table above, figures were attained for 2011 as opposed to immediately after bi-weekly implementation (2007) so that there could be time for an adjustment to the new collection schemes to take place.

Discussion

Consistency and availability of data: Since some municipalities had compost collection and some did not, it was often difficult to compile consistent data. Some diversion rates were given with the weight of compost included, and others not. The intention was to separate the weights amongst garbage, recycling, and compost in order to exclude compost weight because Dillon requested that the diversion rates only include recycling and garbage (non-recyclables, non-compostables) weight. However, the data provided to me were often impossible to split into groups and when separate weights were requested

the information was not given except in the case of Markham, Ontario. For data given to me that was inseparable I used diversion rate data that included compost weights. This makes the data different for each place. For example, if City Y had 1kg of recyclables, 1kg of compost and 2kg of non-recyclable waste, the diversion rate given to me was 50% ($(1+1 / 1+1+2)$). When compost is excluded the diversion rate is 33%. Although Dillon requested that green-bin compost weight be excluded from diversion rate measurements, it is important to include it because instead of having food scraps go into non-recyclable trash bins they go into green-bins and after processing can be used to replenish soil, and be used as fertilizers.

Prince Edward Island was unable to provide me with data because they felt that the data prior to 'Waste Watch' and after it were not comparable. The representative from Oshawa did not wish to provide diversion rate data. The most comparable data to an area such as Metro Vancouver that I attempted to find were from Port Moody and Port Coquitlam. Neither of the two were able to provide data, although if this project were to go forward, a stronger attempt at obtaining data from them would be pursued as this data would be most relevant to Metro Vancouver. Even so, going along with the thesis of this paper, their data might not be valuable if a correlation between *just* bi-weekly collection and increased diversion rates is the goal. That is because Port Moody and Port Coquitlam, like the other locales contacted likely have green-bin compost programs in place.

There were some representatives who seemed to be less formal than others. Exact measurements and numbers seemed to be less important for those representatives that were more informal. It is possible that the data acquired for each locale may be informal data which might not accurately represent report on a consistent basis. Despite this caveat

I am confident, though, that the numbers are not too far off their exact measurements, if at all.

Site specificity, Dahlén et al. (2006 & 2009) tell us, is important when considering implementation of waste management schemes. For locales of study in this project it is vital to note that demographics vary. Some places have higher income per capita, others are more rural or urban, and others are more or less sparsely populated. Some may have a large proportion of apartments, others separate houses. Each factor can affect the connectivity a household has with its local waste collection program as well as the ability to decrease waste when needed. So, when considering these statistics it is important to keep in mind that each locale has different characteristics than those of Metro Vancouver. Despite the caveats, these statistics must be used for the purposes of this project because Metro Vancouver does not have an identical twin.

Outsourcing: Several of the locales contacted have outsourced their waste collection. For example, for the Town of Olds, the Mountainview Waste Management Commission is an outsourced firm for the town and the surrounding County. Olds, Sunder, Didsbury, Carstairs, and Cremona make up the county, with an estimated cumulative population of 32,181 as of 2011 (Reid, 2012). This area is an example of a rural community in which blue-box has been around for a short time when compared with Vancouver municipalities. There was no diversion rate as a result of no recycling in the mid-90s, and now the rate has surged to 37%. Collection is bi-weekly, but recycling began only after 2005.

Other Factors Contributing to Increased Diversion Rates:

Green-bin compost and Extended Producer Responsibility Programs (EPR)

The Newmarket representative with whom I spoke was adamant about green-bin compost programs. He believes that they are necessary to achieve higher diversion rates. To paraphrase, he said that bi-weekly collection implementation on its own would absolutely not increase diversion rates. He does not think households will reduce waste if forced to reduce waste collection to every two weeks instead of every week.

Even if community education programs were not in place, because green-bin compost weights were included in many of the diversion rate data, it is nearly impossible to infer bi-weekly collection caused an increase in diversion rates. This is because compost weights are included in diversion rate calculations. I attempted to attain separated data wherein individual weights of compost, waste, and recyclables were given. The majority of locales were not able to provide separated weights, so the diversion rates for this project include compost weights. If compost weights were not included, diversion rates for each locale would decrease quite dramatically. For the one locale that did provide separated weights (Qualicum Beach), this is what the data looked like:

Table 2 Waste Composition Qualicum Beach

| Waste type | Household average kg/year 2006 | Household average kg/year 2011 |
|-------------------|---------------------------------------|---------------------------------------|
| Garbage | 340 | 179 |
| Recyclables | 121 | 109 |
| Foodwaste/Compost | N/A | 105 |

One can infer that the introduction of compost collection after 2006 was a cause of reduction in garbage five years later. One would expect the compost and garbage in 2011 to sum to something close to what total garbage was in 2006. Instead, they sum in 2011 to 284 compared with 340 in 2005. The reason they are so much lower in 2011 than in 2006 (340) is, as stated and backed up by the representative to whom I spoke, is the EPR (extended producer responsibility) program.

Being able to comprehend and interpret these data is critical to understanding why bi-weekly collection on its own will likely not decrease diversion rates. Seeing how total compost + garbage has decreased as a result of a program is important for understanding how it helps to decrease total waste. Suffice it to say that if Metro Vancouver were to implement bi-weekly waste collection, it should likewise introduce an EPR program of sorts that reduces the waste households produce. It is also important to verify that the bi-weekly collection of which this project speaks is only referring to garbage. Recyclables and compost are collected weekly. The reason for this is that, as González-Torre and Adenso-Díaz (2004) and Van der Werf (2011) tell us, having compost build up over more than a week creates a “smelly” problem that households do not want to deal with. Similarly recycling should continue to be collected weekly because households should not have an incentive to reduce use of recyclable items.

Some of the representatives with whom I was in contact to attain the data were more helpful than others in providing more information than just the diversion rates. This was helpful in regards to understanding the programs used to ensure efficient integration

of bi-weekly collection (for example, the *EPR* Extended Producer Responsibility program in Qualicum Beach).

Some people opposed to waste reduction programs believe that an attempt to introduce such schemes could lead to waste management inefficiencies – De Jaeger et al. (2011) argue the contrary. De Jaeger et al. argue against those that believe municipal solid waste reduction would lead to inefficiencies saying that when municipalities voluntarily agree to reduce waste at the highest ambition level, waste management will be more efficient. Such communities would introduce *EPR* programs, educate their communities about how best to reduce their waste and how best to integrate their waste disposal practices so that they catalyze efficient management. The representative in Qualicum Beach with whom I spoke is confident that their *EPR* program is likely a large reason for their increased diversion rates.

Bi-weekly waste collection has not worked everywhere. Bi-weekly waste collection was implemented in parts of the United Kingdom in the 1990's. Weekly collection was reinstated in some areas later in the 2000s. The reason for this was the program was not well integrated with the communities and households were not properly informed regarding how and when to set out their waste for curbside pickup. This is a case not having a high ambition level, as De Jaeger et al. say. For bi-weekly collection to work, it needs to be implemented side-by-side programs that facilitate efficiency. Additionally, all parties involved should be fully dedicated to accomplishing productive waste management practices.

Tanskanen (2001) tells us that smaller bins result in higher recycling rates, so perhaps this is something Metro Vancouver should consider in addition to the green-bin

compost, community education, and producer responsibility programs. In parts of the UK bi-weekly collection of garbage and weekly collection of recyclables is combined with limits (one garbage can, for non-recyclables, of a defined volume) on the amount collected from the curbside.

Conclusion

As one can see from table 2, there is a correlation between bi-weekly collection and diversion rate ascension. However, as this paper argues, because a multitude of other factors were in place (as said: green-bin compost, mingled recycling, community education, and in the cases of Nanaimo and Qualicum Beach, producer responsibility programs) one cannot rightly state that bi-weekly collection implementation, single-handedly, is the causation of the ascension in diversion rates. Metro Vancouver should implement bi-weekly collection of waste, but not on its own, if higher diversion rates are the goal.

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