

January 13/2002

To: Mayor & Members of Council
District of North Vancouver

From: Corrie Kost
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North Vancouver, BC
V7R2R3

Re: Jan 14/2002, Council Agenda Item #11
Improvements to Yard Trimmings Collection Program ?

The report by the Manager of Waste Reduction contains a number of factual errors and omissions.

Tonnage / Cost

In the summary it states that 1,220 tonnes/yr are debagged at \$10.36/tonne. My math would put the costs at $1220 * 10.36 = \$12,639$ **not the stated \$47,000**. However, **even if we take the \$47,000 as correct, this amounts to only \$2.35 / single family residence** (there are about 20,000 in the District).

Now, the average residence likely uses some 40 plastic bags/yr at a cost (using the report's \$4.99 for 20) of \$9.98. I have purchased 70 large volume clear bags (with yellow pull-string) at Costco for a much lower price/bag. The cost of using paper bags would increase this (again using the report's numbers) to \$23.92. The increase cost to the taxpayer is thus AT LEAST $\$23.92 - \$9.98 = \$13.94$.

So - we spend \$13.94 to save the District \$2.35 - some deal!

Two-Sticker Program

It is a fact that there are times of the year when far more than two containers of yard trim are put out. Only 2 stickers are planned to be distributed to each home. To have to obtain more stickers is an unnecessary burden on both the taxpayer and the system required to distribute/print them. This all comes about because the pick-up crew can no longer identify what is garbage and what is yard trim (that was why we had clear plastic bags remember!).

Clearly this program is devised to reduce the amount of yard trim that we recycle ("*collection efficiency will increase and collection and processing costs will decrease due to less yard trimmings put out for collection each week*"). There is the justifiable perception that this "improved" yard trimming collection program is nothing more than an attempt to terminate this program.

Composting/Mulching

Many of the residents are unable or unwilling to compost their yard trimmings (survey said only 15% do). Social engineering, by making the collection program expensive and cumbersome, is the apparent tactic being used to force residents to do more composting and mulching. Although there is a belief

that mulching is good for the grass, there is also the alternate view that many of the toxins concentrated from the air by grass and leaves will, over time, build-up in the top layers of soil. According to some, the soil will eventually become contaminated with heavy metals. There is thus some question of the sustainability of a recycling program where these harmful components are not removed. There are benefits to a professionally run, centralized, recycling facility, which allows for the removal of these contaminants.

Plastic Waste

So, just how much space do all those plastic bags take? Well, a box of 70 takes 3.5"x12"x9" ie. 378 cubic-inches or 0.219 ft³ so for 20,000 homes at 40 bags/yr this yield ~2500 ft³ or ~70 m³ per year. The total weight? Well, each large bag weight about 0.1lbs. This is **40 tons/year**. No big deal considering we collect from the single family homes a total of more than **26,000 tons/year** ! Thus yard trim plastic bags account for **about 1 part in 650 of our total waste stream**. The **cost to eliminate this minor component? - about 1 part in 15** (~\$11 increase out of \$164.70 garbage fee for yr 2002)

Alternate Argument:

The argument is made that plastic bags add to the environmental load. In fact, the added burden is insignificant. **Each home generates about 2600 lbs (1180 kgs)** per year (total of 26,000 tons for 20,000 homes), while **40 plastic bags weigh about 4 lbs**. Thus yard trim plastic bags account for **about 1 part in 650 of our total waste stream**. The **cost to eliminate this minor component? - a whopping 1 part in 15** (\$13.94-\$2.35 = ~\$11 increase out of \$164.70 garbage fee for yr 2002)

Economic cost/benefit ratio - a very poor 40 to 1

(650 / 15 = 40, a good figure for cost/benefit would be 0.5 to 1)

Paper Bags and Rain.

I want to see the proponent of this program do the following simple test:

- 1) Fill the paper bag with wet grass and leaves.
- 2) Drag the bag 100 feet across the lawn.
- 3) Leave the contents outdoors during the rainy season for 4 weeks.
- 4) Drag the bag to the curb
- 5) Observe what happens when the collection crew lift the paper bag.
- 6) Report back results to council!

Plastic Bags vs. Paper Bags

This argument has been decided in the private world in favour of plastic. Go to any supermarket and what do they use.....There, you said it! An easy to read discussion of the issue of Paper Vs. Plastic, from Lawrence University, can be found at <http://www.angelfire.com/wi/PaperVsPlastic/> - it concludes- " *it is our unbiased opinion that plastic is indeed more beneficial to the environment, in*

that it is less harmful" [than paper]. I have attached the pdf to this report. It at least illustrates that the issue is not clear cut.

As for paper bags being self supporting. That would be a trivial factor - even if it were true - which it is not! Almost all residents already have the support structures to hold their plastic bags in place far better than self supporting paper bags. A little wind - and off go the paper bags!

And the survey said...

Having read the 2001 Yard Trimming Collection Survey (Dec/2001) I take note that 76% of our residents stated that the yard trimming collection service was very or somewhat important to them, that only 14% of district residents compost their yard trimmings - with 74% simply putting them out for curbside collection.

Yes, it is true that **81% responded positively** to removing plastic collection bags when *"respondent were read a concise rationale for eliminating clear plastic bags used for garden & yard waste..."* **BUT, in my opinion the stated rationale was biased** and missed essential cost and environmental factors. I urge council to read page 9 of that report which states the question put to the residents.

Liability/Risk:

The proposed "improvements" will significantly escalate the total costs of the yard trimming collection program to the homeowners. The phase out of the highly successful clear-bag program will therefore seriously jeopardize the future of the weekly yard trimming collection program. As costs, bureaucracy, and efforts by our residents escalate they **will eventually turn to simplify the process by eliminating the source of the yard trimmings**. This would result in the deforestation of our District. I believe our residents want to support a "green" district. Please help them do so.

Another risk factor involves compliance on the issue of the purity of contents placed into the yard trimmings receptacles. Clear bags were used to not only identify yard trimmings, they also allowed them to be readily inspected for contaminants such as rocks, foods, etc. This will no longer be the case for the paper bags (the contents of the rigid containers can be inspected as they are emptied). The use of **paper bags will thus increase the risks of contaminant entering the composting facilities**.

Business Plan:

The business plan is seriously flawed.

Sticking with the existing program will save:

- ◆ costs of awareness (read "indoctrination") program
- ◆ cost of booking of advertising space for awareness campaign
- ◆ design costs for adds for transit and North Shore News
- ◆ design and printing costs of yard trim container decals
- ◆ design and printing costs of the awareness literature delivered with decals
- ◆ costs of development of media releases
- ◆ costs of designating and maintaining locations where more decals can be picked up
- ◆ costs of revising the municipal and NSRP websites to reflect new program
- ◆ cost of developing a Q&A sheet for municipal staff

The proposed program will substantially increase the costs to the taxpayer with minimal and possibly negative environmental improvements.

Finally Some Good News.

The good news is that the survey report (not the one by our Waste Reduction Manager) contains the suggestion that the District residents be allowed to purchase and use a second Schaeffer cart - appropriately labelled for Yard Trimmings. THIS is environmentally friendly, and easier on the backs of both residents and collection crew. It can, in most cases, be far easier to use than bags - by simply wheeling it around our yards when collecting the yard waste. The only downside is the cost - about \$150 - roughly equal to a amortized lifetime supply of plastic bags (although considerably cheaper than paper bags). There may still be the occasional time when there is a need to supplement with plastic bags. The district may wish to subsidize the Schaeffer carts, as over the long run they are more user and environmental friendly.

An option that seems worth exploring is that when clear bags are used that "debagging" take place as they are collected (at curbside) with plastic bags put in a separate area on the service truck. About 50 bags makes 1 ton - for which the current debagging costs of \$10.36 could be used to pay the pick-up crew to do that job. I think a trial run should be done to see if the economics work.

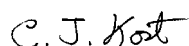
Offering the option of putting out yard trim in rigid containers may well see the number of plastic bags reduced to the point where the extra effort of debagging is not significant. A carrot works much better than a stick. Please don't impose a solution which has significant negative economic and environmental impacts.

The attached Table 1 gives a summary of the costs to "bag" 1 Ton of yard trim - using either paper or plastic.

Option:

There is only one - that council continue with the present, well tested, cost effective program allowing the **continued use of clear bags, tied bundles AND/OR a separate Schaeffer cart and other reusable rigid containers.**

Yours truly,



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Table 1

Cost of disposing of 1 Ton of Yard Waste

	Plastic Bags	Paper Bags
Capacity	40 lbs	40 lbs
# bags / ton	50	50
Cost of each bag	\$.20	\$.60 ^(*)
Total cost of bags	\$10	\$30
Debagging costs	\$10/ton	\$0/ton
Disposal Fee	\$50/ton	\$50/ton
Total Cost (capacity 40 lbs)	\$70 /ton	\$80/ton
Total Cost (capacity 20 lbs)	\$80 /ton	\$110 /ton

(*) - My research of paper bag prices in Ontario and the US indicates the cost/bag may well exceed \$.80 / bag

So the added costs going the paper bag route:

40 lbs/bag: \$10 / TON

20 lbs/bag: \$30 / TON

To put about \$30 - \$60 after-tax dollars into each ton of our garbage is a true waste!

Paper Vs. Plastic Bags?

By Rachel Decker and [Anders Graff](#)

For [Dr. Candice Bradley](#) Ecological Anthropology 36

[Lawrence University](#)



We've all been in the grocery store, at one time or another, and been asked, "Paper or plastic?" Do you remember which you chose? Moreover, why did you make that particular choice? And, was it an informed decision?

In our era of ecological and environmental awakening, the question of paper or plastic bags should be taken, and considered seriously. Everyone uses bags; Everybody has this choice. Why do we have a choice? It is a question of environmental impact, and it should be the responsibility of us all to make the most ecologically aware, and sound decision.

This homepage is an exploration of, and an attempt to answer, the question of which, indeed, is the better choice, paper or plastic bags?



Where it comes from: Paper.

Paper comes from trees, and the pulpwood tree industry is large. It begins with logging, where select trees are found, marked, and felled. After they're cut, roads are built into the forest on which the large machinery, used to load and transport the timber, can be moved. This process creates a tremendous scar in the forests natural habitat(s), for both plant and animal. It can take over a century for nature to recover from even a small logging operation. Addedly, if the small operation clears only 10 acres, many hundreds of acres surrounding are affected due to the extreme interplay/interdependency in nature.

Let it be added further that a large amount of heavy machinery is used, all having its own story on how it came to be, all needing its own upkeep, and all needing its own fossil fuel, to operate. On top of this, there is the human element. Logging is dangerous. Extreme fatigue, long term physical handicaps, and numerous accidents plague the less-than-wealthy loggers.

Logs are moved from the forest to a mill. Whence they reach a mill, there is a three year wait before they can be used, allowing proper drying. When the time comes, the logs are stripped of bark, and chipped into inch-wide squares. They are stored until needed, and then cooked with tremendous heat and pressure. After this, they are "digested" with a limestone and sulphurous acid for eight hours. The steam and moisture is vented into the outside atmosphere, and the original wood becomes pulp. For every ton of pulp made it takes over three tons of wood, initially.

The pulp is washed and bleached, both stages requiring thousands of gallons of clean water. After this, coloring is added to more water, and is then combined in a ratio of 1 part pulp to 400 parts water to finally make paper.

The pulp/water "brew" is dumped onto a web of bronze wires, the water showers through, leaving the pulp, which, in turn, is rolled into finished paper.

It must be noted that this is the paper making process. All cutting, printing, packaging, and shipping, requires additional time, labor, and energy, on top of the already exorbitant amounts of capital, electricity, chemicals, and fossil fuels used.



Where it comes from: Plastic.

Plastic comes from oil, and the oil industry is no small operation. In many places around the world, and in the U.S., sites exist where the geologic conditions are such that a gas and oil concentration has been trapped. Upon location of these traps, a hole is drilled and a pipe rammed into the oil deposit. The oil is pushed to the surface due to pressure in its chamber, and also from the weight of earth above. The oil drilling operation, itself, has become a rather small and sterile undertaking. An oil drilling/pumping rig is roughly the size of a house, and very little oil is spilled, anymore. Literally, you could 'mine' oil in your backyard.

At the drilling site, a storage drum is filled, and, when full, the content oil is loaded into trucks, but sometimes piped, to a refining facility. This is where plastic is made.

Plastic comes as a by-product of oil refining, and uses only 4% of the total world's oil production. It is a 'biogeochemical' manipulation of certain properties of oil, into polymers, that behave 'plastically.' Plastic polymers are manufactured into 5 main types, of which, plastic bags are made of the type known as Polyethylene. Raw Polyethylene comes from oil refineries as resin pellets, usually 3-5 mm diameter, by 2-3 mm tall. The raw material, as it is called, since it is plastic, can be manipulated into any shape, form, size, or color. It is water tight, and can be made UV resistant. Anything can be printed on it, and it can be reused.

Since plastic is so malleable, there are numerous processes used to turn plastic into finished goods. To make bags, a machine heats the Polyethylene to about 340 F and extrudes, or pulls out from it, a long, very thin, tube of cooling plastic. This tube has a hot bar dropped on it at intervals however long the desired bag is to be, melting a line. Each melt line becomes the bottom of one bag, and the top of another. The sections, then, are merely cut out, and a hole that is to be used as the bags' handle is stamped in each piece. Further finishing may be done such as, screen printing, however, for the majority of bags, it's off to the stores, etc., where they will be used.

With the exception of large, fuel burning, heavy machinery, used in the acquisition of oil, the entire plastic bag making process uses only electricity. The electricity used from start to resin/raw material is mostly nuclear. The power used in the bag manufacturing, for the most part, comes from coal fire power plants. One interesting note is that approximately 50% of the electricity generated from coal burning power plants is not from coal at all, it is, in fact, wrought from the burning of old tires, they being made of rubber, which is plastic.



Where it goes to: Paper.

When paper is thrown away, it can go to one of two places: The landfill or the recycling center. If it goes to the landfill, it will decay in time. If it is recycled, the paper will go through a lengthy process of disintegration and renewal.

When paper first reaches the recycling center, it must be returned to the state of pulp by using many different chemicals, such as sodium hydroxide, hydrogen peroxide, and sodium silicate. These chemicals will bleach and disperse the pulp fibers. The fibers are then run through cleaning and screening sequences which remove any contaminants. The pulp must then be washed with clean water to remove ink particles that were removed from the paper by the chemical process.

Flotation is a widely-used method of removing the ink. The pulp is submerged in water, and heated. The ink attaches to air bubbles, which must then be removed before they break and let the ink float back to the pulp. This is a tedious process, involving a watchful eye and careful timing.

Most recycling centers will treat the water they used, and remove any contaminants. Screens and mechanical cleaners are the most common, which may let chemicals slip through. Another clean-up treatment that these centers will use is called "sludge handling". Sludge is composed of water, inks, pigments and small particles of waste. The materials are separated and cleaned. By including this process, it reduces any waste that may have to be taken to the landfill. These materials can be used in bricks and fertilizers as well as other useful products.



Where it goes to: Plastic.

Like paper, when plastic has been used, it can go to one of two places: The landfill or the recycling center. In a landfill, plastics make up 7% of the waste by weight, and 18% by volume. Of the 44,100 million pounds of plastic products made each year, 26,700 million pounds ends up as municipal solid waste.

As landfill useage decreases each year, it is becoming more popular to incinerate our garbage. Today, with the requirement of emission controls on smoke stacks, burning garbage is 99.9% cleaner than in days of yore. About 10% of all garbage is burned, of this, plastic makes up, as previously stated, 18%.

One of plastics greatest assets is its recycleability. To recycle almost any kind of plastic is to mearely re-melt, and re-form. The re-melting will sterilize, allowing any recycled plastic to be used in even hospital grade products. And plastic can be re-formed into anything, many times over before it becomes brittle, whence it can be made into an ashtry or a mouse pad. If society were to implement a strict plastic recycling, an enormous percentage of plastic would efficiently be used, again.



Impact: Paper.

The recycling of paper is essential in cutting down on landfills: each day, enough paper is recycled to fill a

fifteen-mile long train of boxcars. When this statistic was taken in 1993, only 40 percent of paper used was being recycled. That left a lot that was thrown into landfills. By the year 2000, it is estimated that 78 percent of all paper used in the United States will be recycled, as well as 15 percent of all paper overseas.

Buying recycled paper is usually more expensive than buying virgin paper products, but the government, in an attempt to encourage recycling, presented purchasing mandates that can allow a 10 to 15 percent price premium so that it can compete with other cheaper paper products.

Another factor to consider is water pollution. The making of paper, whether virgin or recycled, uses many thousands of gallons of clean water that can soon become polluted in the papermaking process. Virgin paper creates 35 percent more water pollution than recycled paper. Recycled paper also creates 74 percent less air pollution than virgin paper. However, both types of paper can contribute to contaminating area waters. Scientific evidence shows that fish can experience adverse effects through chemicals that reside in sediment. It can more than three years for any level of toxicity to lower.



Impact: Plastic.

Plastic impacts in two ways: First, it hits the environment in its use of electricity when being manufactured. More than half of the power needed to make plastic bags is generated by nuclear fission. While controversial, it is argued that nuclear power puts no direct harm or detriment into the environment. The only drawback to nuclear power is the radioactive waste, which is, so far, being safely disposed of in deep underground caves. And, in deep sea trenches where the nuclear waste is subducted into earth's mantle and incinerated.

Pertaining to the rest of the electricity needed to make plastic bags, coal fire does pollute. But, plastic can be burned. In fact, the burning of plastic will yield from 10,000 to 20,000 btu per pound, of which 60% can be recovered. As stated above, plastic is burned to create electricity, hence, we could use plastic to make plastic, and reduce sulphur emissions from coal.

There is the question, though, of recovery of energy by burning plastic. This, too, causes controversy but only because of mental block. If 93% of all oil is burned straight away, why can't the 4% used as plastic have a second life as energy? The burning of plastics isn't without its drawbacks. Inks and additives to some plastics can create dioxins, and emit heavy metals when burned. Also, after being burned, the toxic ash still needs to be disposed of in toxic waste dumps. Another problem with the incineration of plastic is the argument that the energy produced by the process doesn't justify the misuse of a limited natural resource. The plastics already produced are better utilized by making new plastic materials by recycling.

The second way plastic impacts is through landfills. Plastic will never break down; It will never disappear. Biodegradable plastic is a misnomer because wood fiber has been mixed with the plastic so when buried, the wood dissolves leaving a million tiny pieces of plastic, instead of one bag. As stated, plastics make up 18% of waste by volume, and 7% by weight. If plastic were to be replaced in its uses by other materials, rubbish weight would increase by 150%, packaging would weigh 300% more, and energy consumed by the industry would increase by 100%. It has been found that the reduced weight of plastic has spillover benefits, elsewhere. Reduction of weight in aircraft saves an average of 10,000 gallons of fuel per plane, per annum, world over. In automobiles, it is directly responsible for doubling the fuel efficiency since the 1970's. Applied to plastic bags, they reduce weight in landfills; They take up less space. This being in light of the discovery that most landfills are air tight, not allowing decomposition, leaving readable newspapers and chicken bones with meat still on them.



Conclusion

The making of paper can waste many thousands of gallons of water, as can the recycling of paper. The human and mechanical efforts and costs are very high, not forgetting the physical cost to loggers and those who work around the numerous chemicals. Plastic is, by comparison, efficient and low energy to produce, and, easily and efficiently recycled. Plastic reduces, recycles marvelously, and in that, is reused. After contrasting the efforts behind the making of paper and plastic, it is our unbiased opinion that plastic is indeed more beneficial to the environment, in that it is less harmful. The next time you are asked the dreaded question, "Paper or plastic?", you can answer knowing that you are making the informed choice.



Sources

Arnold, Frank. "Life Cycle Doesn't Work." The Environmental Forum. Washington, D.C. Vol. 10. No. 5. Sept. 1993.

Banuri, Tariq, ed. Who Will Save the Forests? New Jersey: United Nations U., 1993.

Borchardt, John K. "Chemistry of Unit Operations in Paper Deinking Mills". Plastics, Rubber, and Paper Recycling. Radar, Charles P., ed. Washington, DC: American Chemical Society, 1995.

Convex Plastics. Web Site. New Zealand. 1996.

"Degradable Additives for Plastic Compost Bags." Biocycle. Vol. 36. No. 3. March, 1995.

Goff, Matthew. "Paper Vs. Plastic: The Great Supermarket Debate". Web Site (Linked). 1997.

Janda, Bruce W. "Advances in Paper Fiber Recycling: Meeting the Challenge". Plastics, Rubber, and Paper Recycling. Radar, Charles P., ed. Washington, DC: American Chemical Society, 1995.

Northern Paper Mills. Wood to Pulp to Paper. Milwaukee, WI: Wetzel Bros., (no date).

Scandia Plastics. (Interview). Sheboygan, WI. 1997.

Weaver, Rob. "Determining the Density of Plastic". Industrial and Environmental Chemistry Spring 1996. Indiana University of Pennsylvania.



Links

[Lawrence University Anthropology Homepage.](#)

[Lawrence University Geology Homepage.](#)

[Angelfire - Free Homepages.](#)

[Matthew Goff's Paper Vs. Plastic Page.](#)

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