3 Solid Waste

Public concern over the generation and disposal of solid waste was galvanized during the mid-1980s by the Mobro garbage-barge episode in New York. The wandering barge appeared nightly on the news for months, searching for a place for its load and became the icon of the trash debate in the United States. Controversies about solid waste have surfaced in Canada as well, with the most notable recent example being the opposition to the proposed use of the Adams mine as a landfill site for Toronto's garbage.[20]

The average Canadian has become increasingly aware and concerned about their waste generation in the last decade, partly due to widespread campaigns such as "reduce, reuse, and recycle." Not surprisingly, there has been a corresponding improvement in reducing the amount of waste going to landfills and increasing the amount diverted to recycling and reuse purposes.

Waste disposal in Canada

Most of Canada's solid waste, 67%, is buried in landfill sites while only 3% is incinerated (Christenson 1996). The heavy reliance on landfills has perpetuated the fear that North America is running out of space for landfills but this popular belief is unfounded. A single square of land, about 71 km (44 miles) on each side and about 37 m (120 feet) deep, could accommodate all the waste generated in the United States for 1,000 years (Wiseman 1990). Canada, with its smaller population, would require less than one-tenth of this area.[21]

The impression that there is a lack of landfill space may be the result of many current landfills nearing their capacity. However, most landfills are designed to have a short life-span and are scheduled to close within a few years of opening. It is not the scarcity of land that inhibits the construction of new landfills and incinerators but rather the high price of land close to urban areas combined with political pressure. When a site is chosen for waste disposal, communities worry about odour, dust, litter, and scavenging animals that have been associated with landfills in the past. Fortunately, new sanitary technology now being used greatly reduces these problems.

Trends in disposal

Though Canada clearly does not lack space for landfills, a reduction in waste disposal is generally viewed as a positive environmental indicator. The Canadian Council of Ministers of the Environment (CCME) tracked solid waste disposal from 1988 to 1994 and estimates there was a 23% reduction per capita in the disposal of solid wastes over that six-year period (CCME 1998). In 1994, Statistics Canada started its biennial *Waste Management Industry Survey* that monitors both public and private providers of waste-management services. The survey's inception marked Canada's first real effort in measuring its solid waste in a comprehensive way. The 1998 survey showed that Canada disposed of 20.8 million tones of non-hazardous waste materials in landfills or incinerators, down from 21.5 million tones in 1994. This translates into 0.69 tonnes disposed for each Canadian, a decrease from 0.73 tonnes per capita in 1994. The provinces that showed the biggest decreases were Nova Scotia and Newfoundland, which disposed of 29% and 20% less, respectively, per capita from 1994 to 1998 (table 3.1).

These per-capita reductions in disposed waste are encouraging because they occurred during a period of tremendous economic growth in Canada. Generation of solid waste is generally thought to increase as a country's wealth increases. The first and most obvious reason for this is rising income, which leads to rising consumption: as Canadians become more prosperous, they purchase and discard more cars, clothes, and newspapers, among other things. Second, the increase in single-person households and the number of women in the workplace may also increase the amount of solid waste generated because both increase the consumption of small packaged items. These effects, however, were clearly outweighed by an increased attention to waste reduction due to a general concern about environmental quality in Canada.

The composition of municipal waste in Canada is (by weight) 28% paper and cardboard, 34% food and garden refuse, 11% plastics, 7% glass, 8% metals, and 13% textiles and other (OECD 1999: 166).[22] A report by the Ontario Ministry of the Environment and a comprehen-

sive study in the United States both show that discarded packaging accounts for about one-third of waste (Environment Canada 1991c: [25]7; Franklin Associates 1992).

Because so much solid waste is the result of discarded packaging, the Canadian Council of Ministers of the Environment (CCME) founded the National Packaging Protocol (NaPP) with the aim of reducing the amount of packaging sent for disposal to 50% of the 1988 level by the year 2000. This goal was achieved in 1996, four years ahead of schedule.

One of the ways in which communities could further reduce garbage disposal is to implement user-fees for waste collection. Communities in the United States that charge "pay-as-you-throw" rates for garbage collection in conjunction with recycling programs have routinely reported between 25% and 45% reduction in tonnage going to disposal facilities (Skumatz 1993).

Trends in recycling

In the 1970s, many local governments in Canada and the United States opened community depots for recycling and started curbside recycling programs. For example, municipal governments, grocery stores, newspaper publishers, and the plastics, packaging, and soft-drink industries jointly funded the Ontario's Blue Box program, through which recyclable refuse from households are collected on a designated day. Since the advent of these recycling programs, recycling rates have continued to climb and some municipalities have expanded collection to include cardboard and rigid plastic containers.

In 1998, Canada generated 29.6 million tonnes of non-hazardous solid waste, 8.8 million tonnes of which was either recycled or reused. This is up from 5.98 million tonnes recycled in 1996. The waste generation in 1998 was 0.98 tonnes per capita, of which 0.69 tonnes were disposed and 0.29 tonnes were recycled (Statistics Canada 1998) (table 3.2). Roughly 33% of recycled material is paper products; metals make up an additional 21% and material from construction and demolition another 18% (figure 3.1).

On a provincial level, British Columbia had the highest rate of recycling: 32% of all waste generated was recycled. Quebec and Nova Scotia tied for second with 30%. British Columbia also had the highest recycling rate of waste solely from residential sources at 41%, followed closely by Nova Scotia at 39% (See table 3.2).

Although an increase in recycling rates is often considered a positive indicator, it is not always economically feasible or environmentally desirable to recycle waste. In some cases, manufacturing products from recycled materials requires more resources and energy and causes more pollution than does manufacturing the same products from primary raw materials.[23]

In other cases, changing the material a product is made from to a seemingly more environmentally friendly one involves unseen trade-offs. For instance, McDonald's decision to discontinue the use of polystyrene hamburger packaging has had several unfortunate consequences. The polystyrene shell used 30% less energy to produce than the paperboard alternative and resulted in 46% less air pollution and 42% less water pollution (Scarlett 1991). McDonald's decision to switch from polystyrene to paperboard also unfortunately caused the closure of the National Polystyrene Recycling Company, which had been newly formed by Dow Chemical and seven other plastic manufacturers to recycle polystyrene from 450 McDonald's restaurants (Bast *et al*. 1994).

Conclusion

Indicators for the disposal of solid waste in Canada have shown an improving trend in the last decade. Not only is the aggregate amount of waste going to landfills down from 1994, but per-capita disposal rates have also continued to drop. Recycling initiatives are partly responsible for these trends as well as regulatory and market forces that encourage producers to use less material in packaging.

Table 3.1: Disposal of waste by province and territory

	Waste disposed (tonnes)			% change	Waste disposed per capita (tonnes)			% change
	1994	1996	1998	1994–98	1994	1996	1998	1994–98
Newfoundland	486,523	372,324	366,280	–24%	0.84	0.67	0.67	–20%
Prince Edward Is.	x	x	x	—	x	x	x	—
Nova Scotia	713,941	553,638	502,577	–29.6%	0.76	0.59	0.54	–28.9%
New Brunswick	576,102	505,957	468,571	–18.6%	0.76	0.67	0.62	–18.4%
Quebec	5,189,400	5,491,000	5,537,465	6.0%	0.71	0.75	0.75	5.6%
Ontario	7,350,586	6,913,786	6,988,157	–4.9%	0.67	0.62	0.61	–8.9%
Manitoba	951,142	947,884	964,726	–1.4%	0.84	0.84	0.85	1.1%
Saskatchewan	925.121	900,210	848,408	–8.2%	0.91	0.88	0.83	–8.7%
Alberta	2,329,327	2,435,884	2,527,817	–8.0%	0.86	0.88	0.87	1.1%
British Columbia	2,791,478	2,413,528	2,458,484	–11.9%	0.76	0.62	0.61	–19.7%
Yukon & NWT	x	x	x	—	x	x	x	—
Canada	21,464,714	20,673,903	20,840,883	–2.9%	0.73	0.69	0.69	–5.4%

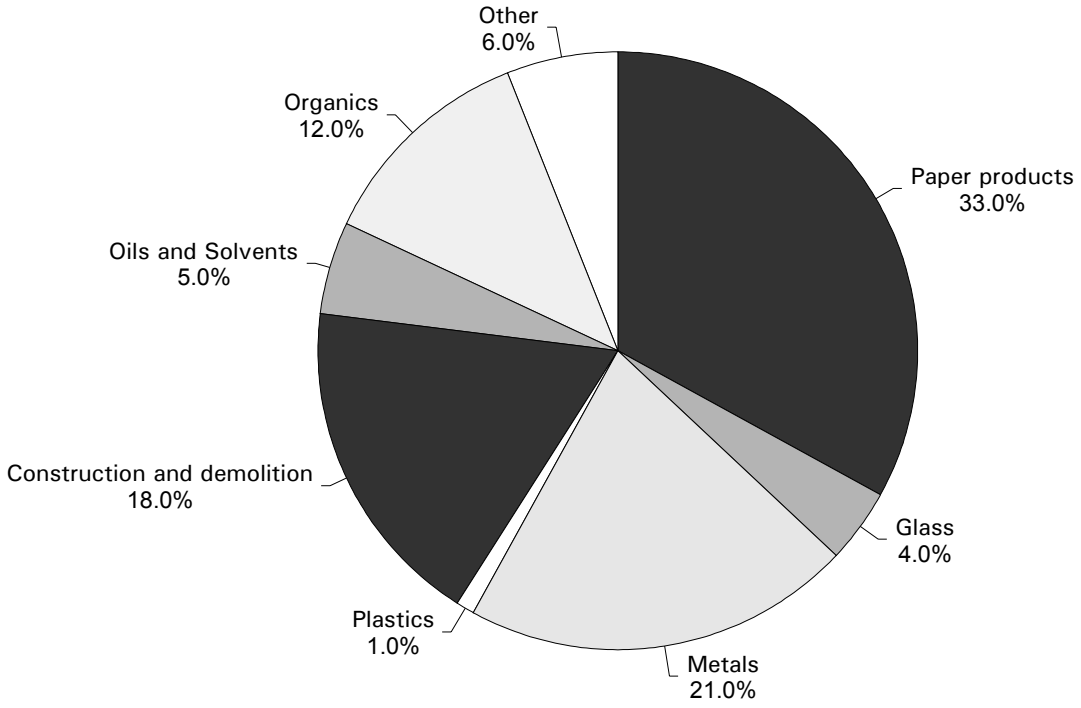
Source: Statistics Canada 1998b: 7. Note 1: Waste refers to total amount of waste disposed in public and private waste disposal facilities. These numbers do not include waste disposed of in hazardous waste disposal facilities or waste managed by the waste generator on site. Note 2: Quebec figures are derived from the results of complementary surveys conducted by the province. Note: 3. Northwest Territories includes Nunavut.

Table 3.2: Disposal, diversion and generation per capita by province and territory, all sources

	Disposal per capita (tonnes)	Recycling per capita (tonnes)	Generation per capita (tonnes)	Rate of recycling per capita (per cent)
Newfoundland	0.67	x	x	x
Prince Edward Island	x	x	x	x
Nova Scotia	0.54	0.23	0.77	30
New Brunswick	0.62	0.19	0.81	23
Quebec	0.75	0.36	1.21	30
Ontario	0.61	0.24	0.85	28
Manitoba	0.85	0.29	1.14	26
Saskatchewan	0.83	0.27	1.1	25
Alberta	0.87	0.18	1.05	17
British Columbia	0.61	0.29	0.9	32
Yukon and NWT	x	—	1.15	—
Canada	0.69	0.29	0.98	30

Source: Statistics Canada 1998b. Note 1: Waste refers to total amount of waste disposed in public and private waste disposal facilities. These numbers do not include waste disposed of in hazardous waste disposal facilities or waste managed by the waste generator on site. Note 2: Quebec figures are derived from the results of complementary surveys conducted by the province. Note 3: NWT includes Nunavut.

Figure 3.1: Materials recycled or reused, by type



Source: Statistics Canada 1998b