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Measuring solid waste: Statistics Canada's surveys and results

Presentation given to the *Recycling Council of Alberta*

October 7, 2011

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Canada

Agenda

- StatCan environmental surveys
- The Waste Management Industry Surveys
- Disposal data
- Diversion: recycling and composting

Our environmental surveys

- Survey of Environmental Protection Expenditures
- Survey of Environmental Goods and Services
- Industrial Water Survey
- Agricultural Water Use Survey
- Survey of Source Water Treatment Plants
- Survey of Industrial Processes
- Households and the Environment Survey
- Waste Management Industry Surveys

The waste management surveys

- What we want to find out:
  - Financial information
  - Quantities of waste (hazardous and non-hazardous):
    - Disposal, diversion (recycling & composting), exports, imports
    - Per capita disposal rates tracked
  - What we use - two surveys:
    - Business sector : 1994, 1995, 1996, 1998, 2000, 2002, 2004, 2006, 2008
    - Government sector: 1993, 1994, 1996, 1998, 2000, 2002, 2004, 2006, 2008

Business Sector

- Sent to waste management firms, including those that:
  - collect solid waste and recyclables
  - operate solid non-hazardous and hazardous waste disposal facilities as well as recycling and composting facilities

- The survey universe is derived from Statistics Canada's Business Register

- The survey frame was developed using:
  - revenue and employment levels that vary according to the province/ territory of operation
  - 2008: Number of surveys returned = 411

Government Sector

- Sent to public bodies that have waste management programs, including:
  - local governments
  - waste management boards and commissions
  - provincial waste programs

- The survey frame is developed using the following criteria:
  - population… threshold varies according to province / territory
  - if a municipality has a waste disposal or material recycling facility within its borders
  - 2008: Number of surveys returned = 682

Survey Response Rates

- Based on the number of respondents:

	1998	2000	2002	2004	2006	2008
• Business sector:	75%	74%	75%	83%	83%	79%
• Government Sector:	90%	83%	91%	92%	88%	93%

- High response rates due to
  - the extensive collection/processing infrastructure that exists at Statistics Canada
  - mandatory nature of the surveys
  - Familiarity of survey content to many respondents

Waste disposal and diversion: a snapshot of the industry in 2008

Table 1-1

Disposal of waste — Province and territory

	Total waste disposal			Waste disposal per capita		
	2006	2008	Percentage change 2006 to 2008	2006	2008	Percentage change 2006 to 2008
	tonnes		percent	kilograms		percent
Canada	**25,925,964** r	**25,871,310**	**-0.2**	**796** r	**777**	**-2.4**
Newfoundland and Labrador	428,809 r	410,590	-4.2	840 r	811	-3.5
Prince Edward Island	x	x	x	x	x	x
Nova Scotia	359,105 r	354,231	-1.4	383 r	378	-1.2
New Brunswick	511,706 r	479,461	-6.3	686 r	642	-6.5
Quebec	6,317,393 r	6,158,152	-2.5	828 r	794	-4.0
Ontario	9,710,459 r	9,631,559	-0.8	767 r	745	-2.9
Manitoba	904,272 r	966,199	6.8	764 r	801	4.9
Saskatchewan	833,753	902,943	8.3	840	891	6.0
Alberta	3,819,872	4,029,435	5.5	1,117	1,122	0.5
British Columbia	2,917,080	2,811,568	-3.6	687	641	-6.7
Yukon, Northwest Territories and Nunavut	x	x	x	x	x	x

Note(s): Figures may not add up to totals due to rounding. Total amount of non-hazardous waste disposal in public and private waste disposal facilities includes waste that is exported out of the source province or out of the country for disposal. This does not include waste disposal in hazardous waste disposal facilities or waste managed by the waste generator on site.

Source(s): Statistics Canada, Environment Accounts and Statistics Division, CANSIM tables 051-0001 and 153-0041.

Waste disposal by source

- Residential waste disposal fell by 4% from 2006, while non-residential disposal rose by 2%.
- Alberta had the highest proportion of waste disposed from non-residential sources at 76%, followed by Saskatchewan at 68%.
- Newfoundland and Labrador had the lowest proportion at 47%.

Waste disposal by source *per capita*

- *Per capita*, there were 256 kilograms of residential waste and 520 kilograms of non-residential waste for each Canadian.
- Alberta: highest amount of non-residential waste *per capita* (855 kg).
- Saskatchewan ranked second with 605 kg.
- Newfoundland and Labrador: highest amount of residential waste *per capita* (429 kg).

Table 2
Diversion of waste by province and territory

	Total materials diverted			Diverted materials per capita			Diversion rate	
	2006	2008	Percentage change 2006 to 2008	2006	2008	Percentage change 2006 to 2008	2006	2008
	tonnes		percent	kilograms		percent		
Canada	**7,727,030** r	**8,473,257**	**9.7**	**237** r	**254**	**7.2**	**23.0** r	**24.7**
Newfoundland and Labrador	x	x	x	x	x	x	x	x
Prince Edward Island	x	x	x	x	x	x	x	x
Nova Scotia	275,983	289,950	5.1	294	310	5.2	43.5	45.0
New Brunswick	252,174	267,467	6.1	338	358	5.9	33.0	35.8
Quebec [1]	2,434,300 r	2,463,600	1.2	319 r	318	-0.4	27.8 r	28.6
Ontario	2,396,856	2,810,900	17.3	189	217	14.9	19.8	22.6
Manitoba	152,799	170,377	11.5	129	141	9.5	14.5	15.0
Saskatchewan	106,868	149,619	40.0	108	148	37.0	11.4	14.2
Alberta	652,637	728,536	11.6	191	203	6.3	14.6	15.3
British Columbia	1,366,191	1,505,112	10.2	322	343	6.6	31.9	34.9
Yukon, Northwest Territories and Nunavut	x	x	x	x	x	x	x	x

Waste diversion *per capita*

- The amount of waste diverted per Canadian to recycling or organic processing facilities rose from 237 kilograms to 254 kilograms per person.
- NB, BC, QC and NS diverted more from landfill than the national average.
- Saskatchewan and Manitoba diverted at least 100 kg per person less than the national average.

Materials diverted by source, province and territory

- Diversion increased by about 10% to almost 8.5 million tonnes in 2008.
- 49% of diverted materials came from non-residential sources (virtually the same in 2006).
- NB (77%), BC (77%), QC (58%) and MB (56%) had higher proportions of waste diverted from non-residential sources than the national average.

Diversion by material

- There was an increase in the diversion of most materials, regardless of source.
- The largest increase in diversion was for electronic materials.
- Plastic materials prepared for recycling had the second largest increase in diversion (40%).
- Paper fibres (newsprint, cardboard and mixed paper fibres) make up the largest proportion of all diverted materials, accounting for 41%.
- Organic materials (composting) rose 22% from 2006 to 2008 to 2.4 million tonnes .

Local government finance

- Operating revenues for governments from the provision of waste management services reached $1.8 billion in 2008.
- Current expenditures totalled $2.6 billion, compared to $2.1 billion in 2006.
- Full-time employment in the government sector of the waste management industry rose by approximately 5%.

Local government WM expenditures

Chart 1
Selected current local government expenditures [1] related to waste management, 2008

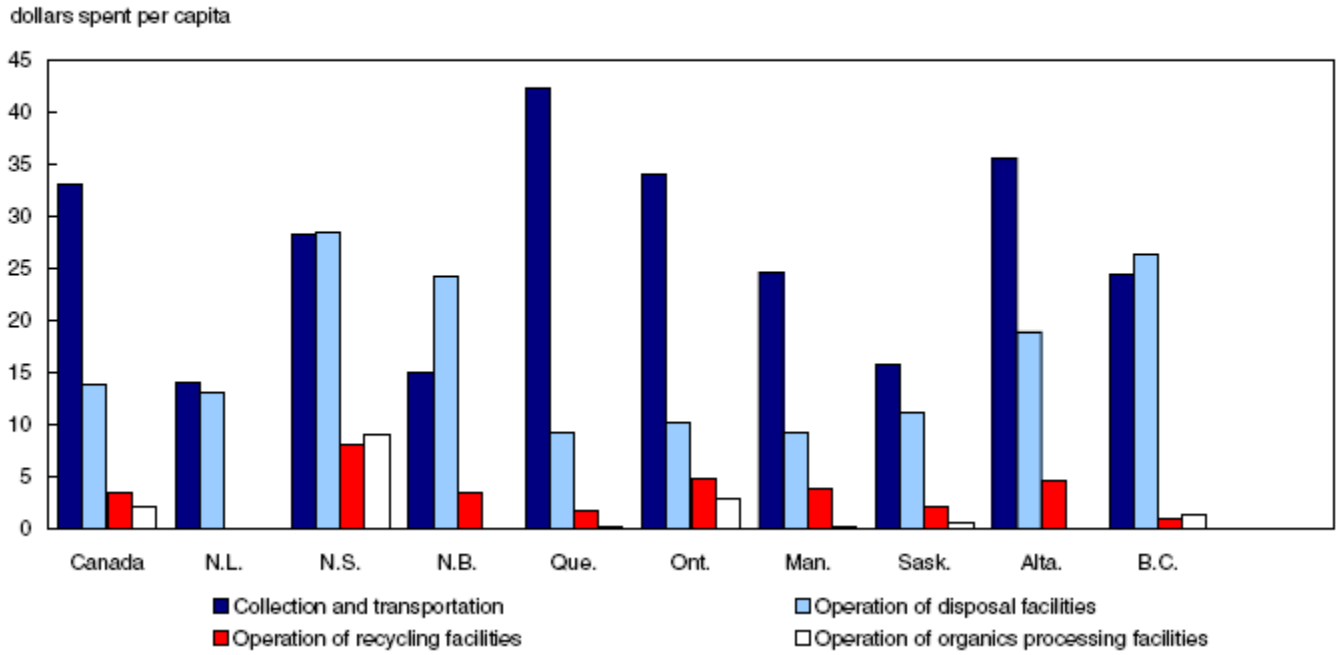
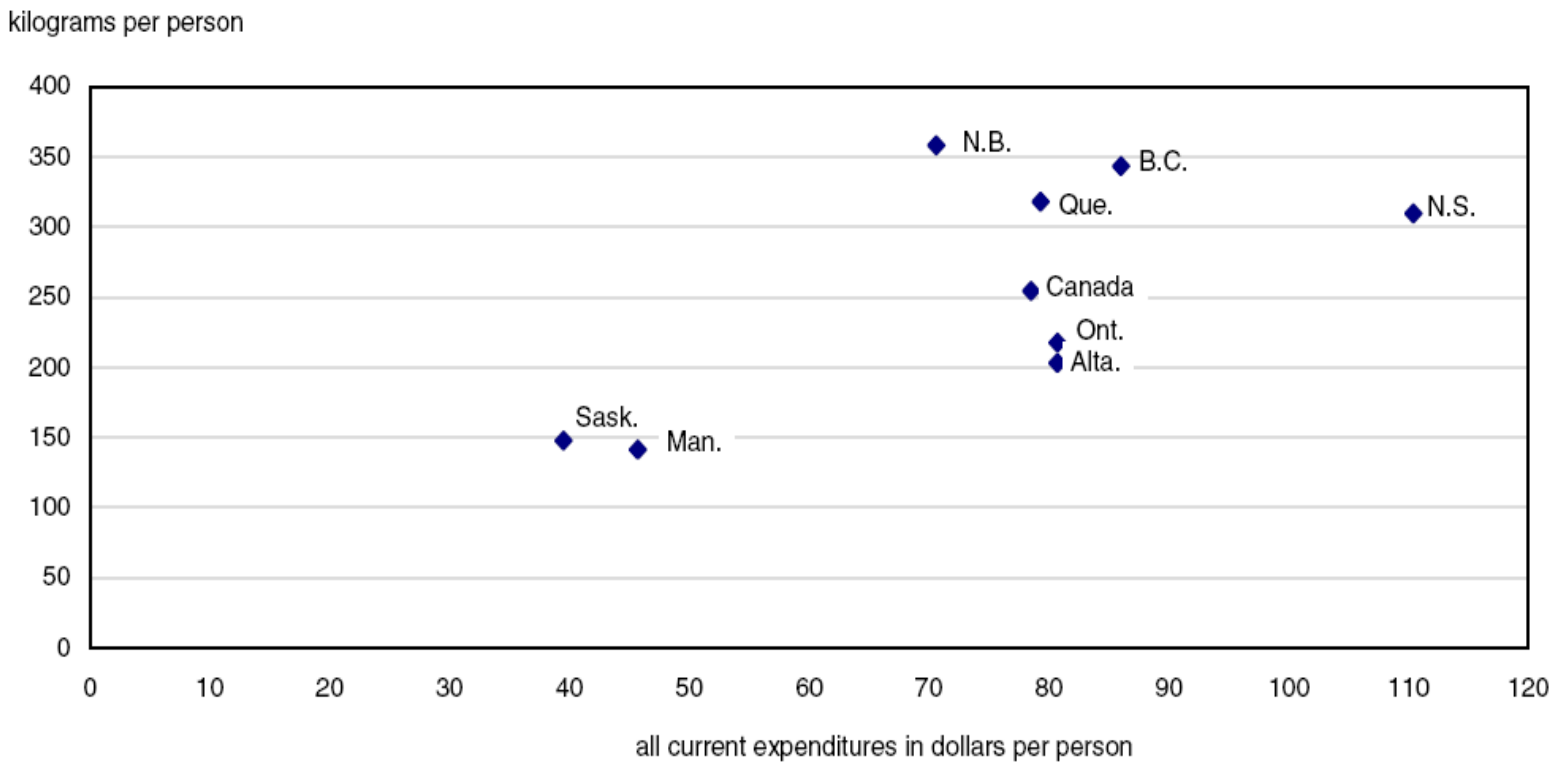


Chart 2

Waste diverted and local government current expenditures per capita, 2008



Note(s): Data for Newfoundland and Labrador, Prince Edward Island, Yukon, Northwest Territories and Nunavut are not included in order to meet the confidentiality requirements of the *Statistics Act*.

Source(s): Statistics Canada, Environment Accounts and Statistics Division, CANSIM tables 051-0001, 153-0043 and 153-0045.

Local governments: relation between expenditures and diversion

- An examination of per capita expenditures on waste management activities and the amount of waste diverted per capita indicates that those provinces that spent more money per capita were generally able to divert greater amounts of waste per person.

Waste management business sector

- Between 2006 and 2008, revenues of Canadian businesses providing waste management services climbed 13%. Full-time employment by these businesses increased nationally by about 13% during the same period.

Upcoming

- 2010 reference year waste surveys in the field (mailed out this Monday)

- The *Waste Management Industry Survey: Business and Government Sectors* report (for 2008 reference year) is available online at http://www.statcan.gc.ca/bsolc/olc-cel/olc-cel?catno=16F0023X&lang=eng

Thank you!

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Waste disposal

- Nationally, the amount of waste sent to private and public waste disposal facilities remained relatively stable between 2006 and 2008, totalling about 26 million tonnes in 2008.
- New Brunswick saw the greatest decline in waste disposal, with a drop of approximately 6% between 2006 and 2008.
- Saskatchewan had the highest increase, at approximately 8% over the same period.

Table 1-2
Disposal of waste — Source, province and territory

	Residential sources [1]		Non-residential sources [2]		All sources	
	2006	2008	2006	2008	2006	2008
	tonnes					
Canada	**8,893,494** r	**8,536,891**	**17,032,470** r	**17,334,419**	**25,925,964** r	**25,871,310**
Newfoundland and Labrador	227,618	216,992	201,192 r	193,598	428,809 r	410,590
Prince Edward Island	x	x	x	x	x	x
Nova Scotia	169,337	148,060	189,768 r	206,171	359,105 r	354,231
New Brunswick	263,580 r	233,703	248,125 r	245,758	511,706 r	479,461
Quebec	2,125,704 r	2,052,182	4,191,690 r	4,105,970	6,317,393 r	6,158,152
Ontario	3,411,642 r	3,231,399	6,298,818 r	6,400,160	9,710,459 r	9,631,559
Manitoba	425,304 r	400,297	478,968 r	565,902	904,272 r	966,199
Saskatchewan	296,062	289,760	537,691	613,182	833,753	902,943
Alberta	973,683	958,539	2,846,189	3,070,895	3,819,872	4,029,435
British Columbia	956,968	960,472	1,960,113	1,851,097	2,917,080	2,811,568
Yukon, Northwest Territories and Nunavut	x	x	x	x	x	x

1. Residential non-hazardous waste disposal includes solid waste produced by all residences and includes waste that is picked up by the municipality (either using its own staff or through contracting firms), and waste from residential sources that is self-hauled to depots, transfer stations and disposal facilities.
2. Non-residential non-hazardous solid waste are those wastes generated by all sources excluding the residential waste stream. These include: industrial materials, which are generated by manufacturing, and primary and secondary industries, and is managed off-site from the manufacturing operation; commercial materials, which are generated by commercial operations, such as, shopping centres, restaurants, offices, and others; and institutional materials which are generated by institutional facilities, such as, schools, hospitals, government facilities, seniors homes, universities, and others. These wastes also include construction, renovation and demolition non-hazardous waste, also referred to as DLC (demolition, land clearing and construction waste). These refer to wastes generated by construction, renovation and demolition activities. It generally includes materials, such as, wood, drywall, certain metals, cardboard, doors, windows, wiring, and others. It excludes materials from land clearing on areas not previously developed as well as materials that include asphalt, concrete, bricks and clean sand or gravel.

Note(s): Figures may not add up to totals due to rounding. Total amount of non-hazardous waste disposal in public and private waste disposal facilities includes waste that is exported out of the source province or out of the country for disposal. This does not include waste disposal in hazardous waste disposal facilities or waste managed by the waste generator on site.

Source(s): Statistics Canada, Environment Accounts and Statistics Division, CANSIM table 153-0041.

Table 3
Materials diverted by source, province and territory

	Residential sources [1]		Non-residential sources [2]		All sources	
	2006	2008	2006	2008	2006	2008
	tonnes					
Canada	**3,722,843** [r]	**4,360,505**	**4,004,187** [r]	**4,112,752**	**7,727,030** [r]	**8,473,257**
Newfoundland and Labrador	x	x	x	x	x	x
Prince Edward Island	x	x	x	x	x	x
Nova Scotia	138,869	149,961	137,114	139,989	275,983	289,950
New Brunswick	32,675	62,076	219,499	205,391	252,174	267,467
Quebec [3]	912,260 [r]	1,046,000	1,522,040 [r]	1,417,600	2,434,300 [r]	2,463,600
Ontario	1,511,467	1,878,899	885,389	932,001	2,396,856	2,810,900
Manitoba	70,239	74,168	82,560	96,209	152,799	170,377
Saskatchewan	38,578	78,381	68,290	71,238	106,868	149,619
Alberta	329,541	391,709	323,094	336,827	652,637	728,536
British Columbia	625,827	614,204	740,364	890,908	1,366,191	1,505,112
Yukon, Northwest Territories and Nunavut	x	x	x	x	x	x

1. Residential non-hazardous recyclable materials include solid non-hazardous materials produced in all residences and include non-hazardous materials that are picked up by the municipality (either using its own staff or through contracting firms) and non-hazardous materials from residential sources that are self-hauled to depots, transfer stations and disposal facilities.
2. Non-residential sources include solid non-hazardous recyclable material from the Industrial, Commercial, and Institutional (IC and I) sector as well as the Construction, Renovation and Demolition sector (CRD). Materials are those generated by all IC and I and CRD sources in a municipality, and are excluded from the residential waste stream.
3. Waste diversion data are derived from a survey administered by RECYC-QUÉBEC.

Note(s): Figures may not add up to totals due to rounding. This information covers only those companies and local waste management organizations that reported non-hazardous recyclable material preparation activities and refers only to that material entering the waste stream and does not cover any waste that may be managed on-site by a company or household. Additionally, these data do not include those materials transported by the generator directly to secondary processors, such as, pulp and paper mills while bypassing entirely any firm or local government involved in waste management activities.

Source(s): Statistics Canada, Environment Accounts and Statistics Division, CANSIM tables 153-0042 and 153-0043.

Table 4-2
Materials diverted by type, province and territory — 2008

	Newfoundland and Labrador	Prince Edward Island	Nova Scotia	New Brunswick	Quebec [1]	Ontario
	tonnes					
All materials	**x**	**x**	**289,950**	**267,467**	**2,463,600**	**2,810,900**
Newsprint	x	x	34,771	12,287	310,000	494,116
Cardboard and boxboard	x	x	27,271	15,111	456,000	419,690
Mixed paper	x	0	7,399	x	376,000	210,720
Glass	x	x	1,222	x	103,000	143,780
Ferrous metals	0	0	4,244	1,499	134,400	110,467
Copper and aluminum	x	x	581	x	19,200	17,363
Mixed metals	x	x	1,462	3,540	0	22,364
White goods	0	0	x	x	270,000	12,376
Electronics	0	0	x	x	7,000	4,419
Plastics	x	x	6,303	1,518	113,000	98,594
Tires	0	x	x	298	73,000	8,087
Construction, renovation and demolition	0	0	40,368	x	211,000	209,628
Organics	0	x	158,419	225,081	384,000	1,029,510
Other materials	x	x	2,400	954	7,000	29,786

	Manitoba	Saskatchewan	Alberta	British Columbia	Yukon, Northwest Territories and Nunavut	Canada
	tonnes					
All materials	**170,377**	**149,619**	**728,536**	**1,505,112**	**x**	**8,473,257**
Newsprint	45,638	18,796	84,239	124,979	x	**1,132,398**
Cardboard and boxboard	38,249	39,332	115,789	260,478	x	**1,400,907**
Mixed paper	10,263	8,158	86,941	x	x	**931,358**
Glass	7,361	x	x	x	x	**421,007**
Ferrous metals	x	x	20,685	34,193	x	**350,370**
Copper and aluminum	4,146	x	6,814	x	x	**58,950**
Mixed metals	4,052	1,143	20,266	73,471	x	**127,033**
White goods	x	2,743	x	12,192	x	**312,988**
Electronics	99	x	5,429	x	0	**24,367**
Plastics	9,247	4,863	26,342	64,864	x	**325,868**
Tires	1,499	x	3,392	x	667	**158,336**
Construction, renovation and demolition	2,331	x	54,056	198,480	0	**720,076**
Organics	x	12,190	231,544	343,586	x	**2,439,223**
Other materials	703	1,009	10,111	9,101	x	**70,375**

Expenditures per capita for local governments

- The local governments of Nova Scotia and British Columbia spent the most per capita on the operation of disposal facilities.
- The local governments of Nova Scotia spent the most per capita on the operation of recycling facilities.
- The local governments of Nova Scotia spent the most per capita on the operation of composting facilities.