

# Endnotes

## Director's Note

1. See the Natural Resources Defense Council's *Wastewatch Summer 2001 Report: New York City's Failing Public Education Campaign for Recycling*, and the NYC Department of Sanitation's August 2001 response *New York City's Public Education Campaign For Recycling*, available from the Department upon [request](#).

2. The United Nations defines a megacity as an urban region with more than 10 million inhabitants, including those living in the city proper and close-lying suburbs. New York City and Los Angeles are the only megacities in the United States. Others include: Tokyo, Sao Paulo, Mexico City, Bombay, Calcutta, Dhaka, Delhi, Shanghai, Buenos Aires, Jakarta, Osaka, Beijing, Rio de Janeiro, Karachi, and Manila. Source: United Nations, *World Urbanization Prospects: the 1999 Revision*, at <http://www.un.org/esa/population/publications/wup1999/wup99.htm>.

3. Neil Brenner, "State Territorial Restructuring and the Production of Spatial Scale," *Political Geography*, Vol. 16, No. 4, May 1997, pp. 273–306.

## Introduction

1. Other City functions (mainly in construction, demolition, road building and fill operations) account for

another 1.4 million tons annually, 95 percent of which is reused in road building and other infrastructural applications. This tonnage is matched by a little over 11 million tons per year from the private sector, the majority of which also comes from construction, demolition, and fill sources.

2. Throughout this report, "residential" will refer to residential *and* institutional sources serviced in New York City by DSNY. The latter include City agencies, schools, and public hospitals, as well as many nonprofit institutions and State/Federal government offices. The residential to institutional breakdown is roughly 88 percent to 12 percent, respectively, for the total DSNY-managed waste stream.

3. Christopher Williams, "Earth Day Celebrates Recycling, But Waste Companies See Red," *Dow Jones Newswires*, August 22, 2002.

## Chapter 1: Recycling Economics

1. This is in contrast to the extensive planning of cities carried out in countries like the Netherlands, Denmark, and Sweden. See David Gordon, *Green Cities: Ecologically Sound Approaches to Urban Space*, Black Rose Books, Montreal, New York, 1990.

2. William K. Stevens, "When Trash Leaves the Curb: New Methods to Improve Recycling," *New York Times*, May 2, 1989, C1.

3. "Secondary materials" include municipal and commercial recyclables, as well as industrial scrap, which is frequently of even higher quality. In this report, "recycled materials" will refer to recyclables from residential and commercial MSW (including public institutions).

4. All prices discussed in this report are taken from *Recycling Manager, Official Board Markets*, or *Waste News*.

5. Recycling is mandatory for businesses under local law 87 of 1993. See DSNY's "Recycling: It's Not a Choice, It's the Law," available on the DSNY website: [http://www.nyc.gov/sanitation/html/bw\\_comm/index.html](http://www.nyc.gov/sanitation/html/bw_comm/index.html).

6. Environmental Protection Agency, *Municipal Solid Waste in the United States, Facts and Figures*, 2000, EPA530-R-02-001.

7. Adam Smith published the *Wealth of Nations* in 1776. In it he argued that as long as there is free and fair competition among producers, social preferences are most efficiently and accurately met through the "invisible hand" of the market.

8. Christopher Williams, "Earth Day Celebrates

Recycling, But Waste Companies See Red," *Dow Jones Newswires*, August 22, 2002.

9. U.S. Investment Research, April 28, 1999, p. 1.

10. Peter Anderson, et al., "The Impact of Waste Industry Consolidation on Recycling," *MSW Management*, June 2001.

11. California Integrated Waste Management Board, *Markets Status Report: Secondary Material Export Markets*, <http://www.ciwmb.ca.gov/Markets/StatusRpts/Exports.htm> (accessed February 25, 2004).

12. See the Environmental Protection Agency's *The United States Experience with Economic Incentives for Protecting the Environment*, (EPA240-R-01-001) and the Northeast Recycling Council's *Recycling Economic Information Study*, June 2000, conducted by R.W. Beck, for but two examples of this massive body of literature.

13. William J. Clinton, 2000, "America Recycles Day Presidential Message," November 15, 1999, White House Proclamation.

14. Environmental Protection Agency. *Characterization of Municipal Solid Waste in the United States: 1998 Update*, September 1999 (EPA530-R-99-021).

15. These figures come from a 1996 survey conducted by the Container Recycling Institute. See <http://container-recycling.org/publications/bevdesys/envirobenefits.html>.

16. Daniel S. Wagner, *Rigid Plastic Packaging Containers: State Regulations*, International Sanitary Supply Association, Lincolnwood, IL, 2001.

17. California Integrated Waste Management Board, "Legislative Mandates/Regulations," *Market Guides*, <<http://www.ciwmb.ca.gov/MktGuides>>.

18. Ibid.

19. Tom Kacandes, Empire State Development Environmental Management Incentives Group, Albany, New York, personal communication, July 19, 1999 to ISLR, as reported in *Wasting and Recycling in the United States 2000*, Washington, D.C.

20. Claudia H. Deutsch, "Plastic Recycling is a Work in Progress," *New York Times*, March 30, 2002.

21. American Forest and Paper Association, "Introduction to Recycling Policy," no date, [www.afandpa.org/content/contentgroups/recycling2/recycling.htm](http://www.afandpa.org/content/contentgroups/recycling2/recycling.htm) (accessed February 25, 2004).

22. Institute for Local Self Reliance, *Waste to Wealth*, no date, [www.ilsr.org/recycling/](http://www.ilsr.org/recycling/) accessed February 25, 2004.

## Chapter 2: Modern History of NYC Recycling

1. See Benjamin Miller, *Fat of the Land: Garbage in New York: the Last Two Hundred Years*, Four Walls Eight Windows, New York, 2000.

2. Frank Ackerman, *Why Do We Recycle? Markets, Values and Public Policy*, Island Press, Washington, D.C, 1997; and Ibid.

3. Office of Operations, Planning, and Control, City of New York Department of Sanitation, *New York City Recycling Strategy White Paper*, January 1988, p. ii.

4. City of New York Department of Sanitation, *Comprehensive Solid Waste Management Plan*, August 1992, p. 8-3.

5. Office of Operations, Planning, and Control, City of New York Department of Sanitation, *New York City Recycling Strategy White Paper*, January 1988, p. 1.

6. Ibid., p. 38.

7. Ibid., p. 2.

8. Ibid, p. 186.

9. Ibid., p. 16.

10. The law specified that a tonnage of 4,250 tpd of recycling was to be achieved by 1995. This tonnage requirement was based on a total, DSNY-managed, waste-stream estimate of roughly 17,000 tpd, far higher

than the 12,000 tpd actually generated in this stream. The discrepancy has since been found through internal DSNY audits to have arisen from less than optimal record-keeping during the pre-computerization days of the Department.

11. Local Law 19, Section 16-313, available on the NYCWasteLess website at the following URL: <<http://nycwasteless.org/gov/pdfs/LocalLaw19.pdf>>.

12. Ibid.

13. Office of Operations Planning, City of New York Department of Sanitation, *Preliminary Recycling Plan, Fiscal Year 1991*, p. 88.

14. Ibid., p. B-3.

15. City of New York Department of Sanitation, *Comprehensive Solid Waste Management Plan*, August 1992, p. 8-16.

16. Ibid., p. 8-3.

17. Office of Operations, Planning, and Control, City of New York Department of Sanitation. *New York City Recycling Strategy White Paper*, January 1988, p. 16.

18. Ibid., p. 27.

19. City of New York Department of Sanitation, *Comprehensive Solid Waste Management Plan*, August 1992, p. 8-10.

20. Ibid.

21. Office of Operations Planning, City of New York

Department of Sanitation, *Preliminary Recycling Plan, Fiscal Year 1991*, p. 53.

22. Michael Specter, "Hope, Off the Ash Heap; New York City Fought Over an Incinerator, But Real Focus of Waste Plan is Recycling," *New York Times*, August 29, 1992, Sec. 1, p. 1.

23. Office of Operations Planning, City of New York Department of Sanitation *Preliminary Recycling Plan, Fiscal Year 1991*, p. 6.

24. Ibid.

25. Ibid., p. 2.

26. Allan R. Gold, "As Trash is Recycled, Where Can It All Go?" *New York Times*, October 3, 1990, p. B4.

27. Staff, "Why the EPA is Happy With Glass Containers," *Business Week*, March 31, 1975, p. 66B.

28. Staff, "Recycler Benefits from Refuse Strike," *New York Times*, December 25, 1981, Sec. 2, p. 37.

29. Al Wyss, "Recycling Turns Trash into Cash as U.S. Garbage Crisis Heats Up," *Journal of Commerce*, May 5, 1987, p. 1A.

30. Office of Operations, Planning, and Control, City of New York Department of Sanitation, *New York City Recycling Strategy White Paper*, January 1988, p. 33.

31. Allan R. Gold, "As Trash is Recycled, Where Can It All Go?" *New York Times*, October 3, 1990, p. B4.

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32. Office of Operations Planning, City of New York Department of Sanitation, *Preliminary Recycling Plan, Fiscal Year 1991*, p. 57.
33. *Ibid.*, p. 7.
34. Allan R. Gold, "As Trash is Recycled, Where Can It All Go?" *New York Times*, October 3, 1990, p. B4.
35. Office of Operations Planning, City of New York Department of Sanitation, *Preliminary Recycling Plan, Fiscal Year 1991*, p. 54.
36. Internal memorandum from Michael Knoll to Tom Polk, June 25, 1992, re: "Feasibility of Processing Paper at Hamilton Avenue Plant."
37. Alan Breznick, "Private Recyclers Trash City Recovery Plant Plan," *Crain's New York Business*, May 24, 1993, p. 7.
38. *Ibid.*
39. *Ibid.*
40. *Ibid.*
41. Randy Kennedy, "Trash Plant: No Salvation," *New York Times*, May 15, 1994, Sec. 14, p. 8.
42. Mark D. Shantzis, Hi-Rise Recycling Systems (Editorial), "Recycling Creates More Problems Than It Was Meant to Solve," *New York Times*, March 2, 1994, p. A14.
43. *Ibid.*
44. Judy Temes, "Study Sees Garbage In, Jobs Out for NYC," *Crain's New York Business*, September 6–12, 1993, p. 21.
45. City of New York Department of Sanitation, *Comprehensive Solid Waste Management Plan*, August 1992, p. 15–5.
46. Allan R. Gold, "As Trash is Recycled, Where Can It All Go?" *New York Times*, October 3, 1990, p. B4.
47. Office of Operations Planning, City of New York Department of Sanitation, *Preliminary Recycling Plan, Fiscal Year 1991*, p. 7.
48. *Ibid.*, p. 9.
49. City of New York Department of Sanitation, *Comprehensive Solid Waste Management Plan*, August 1992, p. 19–29.
50. Alan Breznick, "City to Prompt Local Plants to Extract Cash from Trash," *Crain's New York Business*, April 12–18, 1993, p. 4.
51. Hugh O'Neill and Meghan Sheehan, *Exploring Economic Development Opportunities in Recycling*, Urban Research Center, New York University/Appleseed, 1993, p. 12.
52. Alan Breznick, "City to Prompt Local Plants to Extract Cash from Trash," *Crain's New York Business*, April 12–18, 1993, p. 4.
53. New York City Economic Development Corporation, *Bush Terminal, Brooklyn New York. Phase Two: Proposal for a Recycling Industrial Park*, 1992 (prepared by Buckhurst
- Fish & Jackmart in association with Hugh O'Neill, Appleseed, and Bob Pauls, Robert B. Pauls Consultants).
54. Judy Temes, "Study Sees Garbage In, Jobs Out for NYC," *Crain's New York Business*, September 6–12, 1993, p. 21.
55. *Ibid.*
56. *Ibid.*
57. Vertical integration refers to the consolidation of a number of functions of the production process under "one roof" (or within one company), such as recyclables processing and product manufacturing. Horizontal integration refers to the establishment of a network of business relationships (usually through contracts) among firms specializing in different stages of the production process.
58. Hugh O'Neill and Meghan Sheehan, *Exploring Economic Development Opportunities in Recycling*, Urban Research Center, New York University/Appleseed, 1993, p. 199.
59. *Ibid.*
60. *Ibid.*, p. 92.
61. *Ibid.*, p. 94.
62. *Ibid.*, p. 118.
63. *Ibid.*
64. *Ibid.*
65. *Ibid.*
66. *Ibid.*
67. *Ibid.*, p. 7.
68. *Ibid.*
69. *Ibid.*
70. *Ibid.*
71. Judy Temes, "In Brooklyn, Recycling Out of the Jobs Slump: Plastics Firm Tries Manufacturing Revival," *Crain's New York Business*, January 8, 1990.
72. Alan Breznick, "Recycling Firm May Be Wasted: City, State Shun Its Products," *Crain's New York Business*, June 22–29, 1992.
73. *Ibid.*
74. *Ibid.*
75. Miguel Almeida, "Just Sittin' on the (Plastic) Dock of the Bay," *New York Times*, June 4, 1995, Section 13, p. 12.
76. Hugh O'Neill and Meghan Sheehan, *Exploring Economic Development Opportunities in Recycling*, Urban Research Center, New York University/Appleseed, 1993, p. 70.
77. Thomas J. Lueck, "Ruling is Seen as a Threat To Preferences in Bidding," *New York Times*, Section 1, p. 25.
78. For an account of a decade of efforts to build such a mill, see Allen Hershkowitz, *Bronx Ecology*, Island Press, 2002, and Lis Harris, *Tilting at Mills*, Houghton Mifflin, 2003.

79. John Tierney, "The Big City: Paper Profits that Failed To Materialize," *New York Times*, August 1, 2000, p. B1.
80. Transcript of "Earthbeat," aired January 12, 2002 on Radio National ABC in Australia. EarthBeat host Alexandra de Blas interviews Allen Hershkowitz of NRDC.
81. Press Release, Office of the Mayor, "Mayor Giuliani and George Pataki Announce Corporate Recruitment of Recycled Paper Facility Pratt Industries to City," August 4, 1995.
82. Joel Siegel, "77G Donation Recycled," *Daily News*, February 15, 1997, p. 7.
83. For an example of such a "solution" to the City's recycling problems, see, for instance, the editorial "An Overlooked Recycling Solution: Plastic Lumber," *New York Times*, May 23, 1993, written by Gerard J. Gunzberger, a plastic lumber manufacturer in Florida.
84. These provisions stated that a vendor could only reject a delivered load on the spot if it were clearly a misdirected refuse truck. Vendors were to track costs for disposal of residue and residue rates, to be verified if necessary by periodic waste characterization studies. Per the contracts, these rates were not to rise above 15 percent.
85. Judy Temes, "Study Sees Garbage In, Jobs Out for NYC," *Crain's New York Business*, September 6–12, 1993, p. 21.
86. Organization of Waterfront Neighborhoods/Consumer Policy Institute/Consumers Union, *Taking Out the Trash: A New Direction for New York City's Waste*, May 31, 2000.
87. Judy Temes, "Study Sees Garbage In, Jobs Out for NYC," *Crain's New York Business*, September 6–12, 1993, p. 21.
88. Hugh O'Neill and Meghan Sheehan, *Exploring Economic Development Opportunities in Recycling*, Urban Research Center, New York University/Appleseed, 1993, p. 35.
89. Natural Resources Defense Council, et al., *Recycling Returns: Ten Reforms for Making New York City's Recycling Program More Cost-Effective*, April 2004, <http://www.nrdc.org/cities/recycling/depth.asp> (accessed April 26, 2004).
90. Ibid.
91. Samantha MacBride, "Market Development and Economic Scale—Where is 'the Loop?'" presented at the Solid Waste Association of North America's *Waste Reduction, Recycling and Composting and Collection and Transfer Symposia*, San Diego, CA, February 9–14, 2004, publication in proceedings forthcoming at [www.swana.org](http://www.swana.org); currently available upon request from [smacbride.nycrecycles@verizon.net](mailto:smacbride.nycrecycles@verizon.net)
92. Thomas J. Lueck, "Ruling is Seen as a Threat To Preferences in Bidding," *New York Times*, Section 1, p. 25.
93. California Integrated Waste Management Board. *Benefits of Regional Recycling Markets: An Alameda County Study*, September 2003, <http://www.ciwmb.ca.gov/Publications/Markets/41203022.pdf> (accessed April 26, 2004).
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95. Alan Breznick, "Private Recyclers Trash City Recovery Plant Plan," *Crain's New York Business*, May 24, 1993, p. 7.
96. Ibid.
97. Philip Lentz, "Rudy, Developers Split on Subsidies," *Crain's New York Business*, Nov. 27, 1995.
- See Press Room Article, "Unique Program for Collecting and Composting Restaurant and Produce Waste," Spring 1999, [www.sunsetscavenger.com/prcompostwaste.htm](http://www.sunsetscavenger.com/prcompostwaste.htm) (accessed May 16, 2004).
3. Calculated from data in Appendix D, "Estimates of Residential and Commercial Waste," in United States EPA, *Characterization of Municipal Waste in the United States: 1998 Update*, July 1999. Also see DSNY's *New York City Recycling—In Context*, for a full description of how much yard-waste composting adds to the official rates that cities report for diversion.
4. Staff, "Municipal Recycling Survey," *Waste News*, February 2004.
5. Jack Macy, "Food Residuals Put City on Track to Over 50 Percent Diversion," *BioCycle*, February 2002, p. 40–46.
6. Communication from Robert Besso, Norcal, May 29, 2003.
7. Jack Macy, "Food Residuals Put City on Track to Over 50 Percent Diversion," *BioCycle*, February 2002, p. 40–46.
8. Ibid.
9. Jack Macy, "San Francisco Takes Residential Organics Collection Full-Scale," *BioCycle*, February 2000, p. 51.
10. San Francisco Department of the Environment, "San Francisco

### Chapter 3: Lessons from Other U.S. Cities

1. San Francisco Recycling Program, "San Francisco's Resource Conservation Programs," April 1998.
2. The percentage of San Francisco's overall residential waste stream that comes from yard waste is not published, but is referred to qualitatively as "very little."

## Endnotes

- Residential and Apartment Recycling Report,” April 2001, internal report.
11. Janine DeFao, “Nearly Half of S.F. Trash Bypasses Landfill and is Recycled,” *San Francisco Chronicle*, December 11, 2001, p. A23.
12. Ibid.
13. Staff, “Municipal Recycling Survey,” *Waste News*, February 2004.
14. California Integrated Waste Management Board, *What is Diversion?*, no date, [www.ciwmb.ca.gov/Iglibrary/dsg/whatis.htm](http://www.ciwmb.ca.gov/Iglibrary/dsg/whatis.htm) (accessed May 8, 2004).
15. Staff, “Municipal Recycling Survey,” *Waste News*, February 2004.
16. Jack Macy, “San Francisco Takes Residential Organics Collection Full-Scale,” *BioCycle*, February 2000, p. 51.
17. San Francisco does not report total residential diversion tonnages. To estimate this figure, we divided San Francisco’s residential refuse tonnage of 270,547 (reported to the California Integrated Waste Management Board for 2000, at [www.ciwmb.ca.gov/Profiles](http://www.ciwmb.ca.gov/Profiles)) by its residential disposal rate, calculated as one minus its residential diversion rate as reported in *Waste News* (1 – 38 percent = 62 percent). This suggested a total residential waste tonnage (refuse + recyclables) of 436,366 (270,547 / 62), and a residential recycling tonnage of 165,819 (436,366 – 270,547).
18. Jack Macy, “Food Residuals Put City on Track to Over 50 Percent Diversion,” *BioCycle*, February 2002, p. 40–46.
19. Jack Macy, “San Francisco Takes Residential Organics Collection Full-scale,” *BioCycle*, February 2000, p. 51.
20. Jack Macy, “Food Residuals Put City on Track to Over 50 Percent Diversion,” *BioCycle*, February 2002, p. 40–46.
21. Ibid.
22. California Integrated Waste Management Board, “Jurisdiction Profile for City of San Francisco,” no date, at [www.ciwmb.ca.gov/Profiles](http://www.ciwmb.ca.gov/Profiles) (accessed May 4, 2004).
23. San Francisco Department of the Environment, “San Francisco’s Resource Conservation Programs,” April 1998. Out of publication. May be available upon request from the San Francisco Department of the Environment, [www.ci.sf.ca.us/sfenvironment](http://www.ci.sf.ca.us/sfenvironment) (accessed May 13, 2004).
24. Interview with Mark Stout, San Francisco Dept. of the Environment, August 27, 2002.
25. Ibid.
26. Ibid.
27. Ibid.
28. Ibid.
29. Though some households opt for a less expensive “minican,” others for a larger, more expensive refuse container, and some fixed-income residents enjoy lower fees, on average this represents the per household cost.
30. Ilene Lelchuk, “S.F. Report Rips Commercial Trash Monopoly,” *San Francisco Chronicle*, February 15, 2002, p. A23.
31. This figure is calculated by dividing the reported tonnage of paper, metal, plastic, and glass diversion for 2000, 60,000 tons, by the projected total residential waste tonnage of 436,366.
32. See, for example, the *New York Law Journal’s* article, “City Found Violating Recycling Law In Calculating Collected Tonnage,” January 23, 1997.
33. Cornell Waste Management Institute, “Roundtable Two: Reducing the NYC Waste Stream: The Potential Role for Composting,” April 3, 1998, <http://cwmi.css.cornell.edu/PDFS/NYComRT.pdf> (accessed May 23, 2004).
34. See DSNY’s *Composting in New York City: A Complete Program History*, August 2001.
35. This total is derived by dividing total disposed tons in 2000 (the most recent year for which audited data are available) by one minus the diversion rate in 2000.
- Both total disposed tons and the diversion rate are reported at by the California Integrated Waste Management Board in the “Jurisdiction Profile for City of Los Angeles,” no date, at [www.ciwmb.ca.gov/Profiles](http://www.ciwmb.ca.gov/Profiles) (accessed May 13, 2004).
36. Pete Fehrenbach, “L.A. Story: Green Doesn’t Come Easy,” *Waste News*, May 13, 2002.
37. Kerry Cavanaugh and Lisa Mascaro, “Recycling Catch Up: Several Plans to be Tested at Apartments,” *The Daily News of Los Angeles*, January 27, 2004.
38. California Integrated Waste Management Board. “Jurisdiction Profile for City of Los Angeles,” no date, at [www.ciwmb.ca.gov/Profiles](http://www.ciwmb.ca.gov/Profiles) (accessed March 4, 2004).
39. Staff, “Municipal Recycling Survey,” *Waste News*, February 2001.
40. Ibid.
41. Staff, “Municipal Recycling Survey,” *Waste News*, February 2003.
42. Staff, “Municipal Recycling Survey,” *Waste News*, February 2003 and February 2004. In February 2003, LA residential yard-waste recycling of 468,036 tons from housing of four or fewer units was reported. In February 2004, it reported only 6,495 tons of residential yard-waste recycling.
43. Trucks are mostly Amrep bodies with Peterbilt or Volvo chassis. See Daniel Oliver

## Processing and Marketing Recyclables in New York City

- Hackney, "Recycling Rocks in L.A.," *Waste Age*, May 2000, p. 62.
44. They may also set up free bulk collection, and can drop off large amounts of brush and up to four tires per year at their local district sanitation yard.
45. City of Los Angeles, Dept. of Public Works, Bureau of Sanitation, Solid Resources Collection Division, *Best Practices Report, 2000*.
46. Daniel Oliver Hackney, "Recycling Rocks in L.A.," *Waste Age*, May 2000, p. 60–63.
47. City of Los Angeles, Dept. of Public Works, Bureau of Sanitation, Solid Resources Collection Division, *Best Practices Report, 2000*.
48. Ibid.
49. While the Committee gathered data on NYC, it did not conduct a site visit here.
50. Daniel Oliver Hackney, "Recycling Rocks in L.A.," *Waste Age*, May 2000, p. 60–63.
51. Ibid.
52. Susanna Duff, "Boom Goes Waste," *Waste News*, Sept. 3, 2001.
53. Susan Carpenter, "First Person: Where Does it All Go?" *Los Angeles Times*, April 2, 2002, part 5, p. 2.
54. Daniel Oliver Hackney, "Recycling Rocks in L.A.," *Waste Age*, May 2000, p. 60–63.
55. Ibid.
56. Ibid.
57. Ibid.
58. Press Release, Department of Public Works, "Los Angeles Department of Public Works No Longer Collecting the Contents of Green and Blue Bins Containing Contamination," February 6, 2004, [www.lacity.org/SAN/index.htm](http://www.lacity.org/SAN/index.htm) (accessed March 15, 2004).
59. Email communication from Karen Coca, L.A. Bureau of Solid Resources, to Samantha MacBride, August 2, 2001.
60. Kerry Cavanaugh and Lisa Mascaro, "Recycling Catch Up: Several Plans to be Tested at Apartments," *The Daily News of Los Angeles*, January 27, 2004.
61. Email communication from Karen Coca, L.A. Bureau of Solid Resources, to Samantha MacBride, August 2, 2001.
62. City of Los Angeles, *AB 939 2000 Report*, sec.5.2, p. 4.
63. Massie Ritsch, "City Adds Fee for Haulers," *Los Angeles Times*, June 27, 2002.
64. Patrick McGreevy, "L.A. Moves to Bring Trash Recycling to Rental Units," *Los Angeles Times*, January 24, 2004.
65. Kerry Cavanaugh and Lisa Mascaro, "Recycling Catch Up: Several Plans to be Tested at Apartments," *The Daily News of Los Angeles*, January 27, 2004.
66. Ibid.
67. Ibid.
68. Deborah McGuffie, "Waste Not," *Fleet Owner*, October 2001, p. 46.
69. Telephone conversation with Javier Polanco of the Los Angeles Bureau of Sanitation, December 9, 2002.
70. Joe Truini, "Cities, Companies Lean Toward One Bin," *Waste News*, February 19, 2001.
71. City of Los Angeles, Dept. of Public Works, Bureau of Sanitation, Board of Public Works, *Solid Resources Infrastructure Strategy Facilities Plan*, November 2000.
72. Ibid.
73. Ibid.
74. Eric Malnic and Tom Gorman, "Agency to Buy Desert Dumps for L.A. Trash," *Los Angeles Times*, August 10, 2000, p. B5.
75. City of Los Angeles, Dept. of Public Works, Bureau of Sanitation, Board of Public Works, *Solid Resources Infrastructure Strategy Facilities Plan*, November 2000.
76. Ibid.
77. Ibid.
78. City of Los Angeles, Dept. of Public Works, Bureau of Sanitation, Solid Resources Collection Division, *Best Practices Report, 2000*, p. 16.
79. These costs were reported in the "Solid Resources Fact Sheet" on the Bureau's website: [www.ci.la.us/SAN/factsht.htm](http://www.ci.la.us/SAN/factsht.htm).
80. Daniel Oliver Hackney, "Recycling Rocks in L.A.," *Waste Age*, May 2000, p. 60–63.
81. Staff, "Municipal Recycling Survey," *Waste News*, February 2003.
82. In 1999 private haulers collected a total of 271,013 tons of recyclables from commercial, residential, and multifamily sources. According to the City "the majority... were collected from the commercial sector." See City of Los Angeles, *Year 2000 AB939 Report*, p. 2–5.
83. See Vivian S. Toy, "Judge Rules that New York is Missing Goals of the Recycling Law," *New York Times*, January 17, 1997, B2.
84. Ibid.
85. For a particularly egregious example of inconsistencies in comparison, see "The Paradigm Shift in NYC's Solid Waste Management," by Neil Seldman and Kelly Lease of the Institute for Local Self Reliance, <http://www.ilsr.org/recycling/NYC/NYCmain.html> (accessed May 12, 2004).
86. Daniel Oliver Hackney, "Recycling Rocks in L.A.,"

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- Waste Age*, May 2000, p. 60–63.
87. Telephone interview with Richard Wozniak, September 30, 2002.
88. City of Los Angeles, Dept. of Public Works, Bureau of Sanitation, Solid Resources Collection Division, *Best Practices Report, 2000*.
89. City of Los Angeles, Inter-Departmental Correspondence, Bureau of Sanitation Director Judith A. Wilson to Mayor Richard J. Riordan, June 4, 2001.
90. This figure was calculated from data in *Waste News's* 2002 Municipal Recycling Survey in which Chicago reported a total of 2,352,418 tons of recyclables collected and a diversion rate of 44.9 percent for the combined residential and commercial stream for the year ending June 2001.
91. Staff, "2003 Municipal Recycling Survey," *Waste News*, February, 2004.
92. Examples for apartment buildings include the use of energy-saving light bulbs, and reusing supplies.
93. Kathleen M. White, "Recycling in Chicago: A Mixed Bag," *Waste Age*, March 2, 2001.
94. Dave Newbart, "City recycling wastes away," *Chicago Sun-Times*, August 12, 2002.
95. Kathleen M. White, "Recycling in Chicago: A Mixed Bag," *Waste Age*, March 2, 2001.
96. Ibid.
97. Ibid.
98. These figures are derived from the percentages of persons stating that they "do not recycle at home at all" in a five-year series of telephone questionnaires administered by a market research firm contracting with the Department. According to this research, only 5 percent of residents do not recycle. While it is probable that nonparticipants were underselected in this survey, and that those who did respond may have been hesitant to admit not recycling at all, the fact that this instrument was randomly applied to over 6,000 residents over a five-year period suggests that it is safe to conservatively estimate nonparticipation at a 20-percent maximum.
99. Kathleen M. White, "Recycling in Chicago: A Mixed Bag," *Waste Age*, March 2, 2001.
100. Susanna Duff, "Boom Goes Waste," *Waste News*, Sept. 3, 2001.
101. David Biddle, "Growing Curbside Efficiencies," *Biocycle*, July 1998, no. 7. DSS reports that the cushioning effect of yard waste and garbage in the packer trucks cuts down on glass breakage. In addition, several years into the program, DSS reduced the compaction rate on its collection vehicles to help preserve the contents of the blue bags and prevent contamination. (Kathleen M. White, "Recycling in Chicago: A Mixed Bag," *Waste Age*, March 2, 2001).
102. Dave Newbart, "City recycling wastes away," *Chicago Sun-Times*, August 12, 2002.
103. Kathleen M. White, "Recycling in Chicago: A Mixed Bag," *Waste Age*, March 2, 2001.
104. <http://www.cityofchicago.org/Environment/BlueBag/FAQ.html> (accessed May 23, 2004).
105. Dave Newbart, "City recycling wastes away," *Chicago Sun-Times*, August 12, 2002.
106. David Biddle, "Growing Curbside Efficiencies," *Biocycle*, July 1998, no. 7.
107. According to the Chicago Department of Environment, the city's "market pricing is based on low grade commodities. The effort to minimize cross contamination of co-collected materials has more to do with keeping down the net cost of processing versus the recyclability of the primary sort material." David Biddle, "Growing Curbside Efficiencies," *Biocycle*, July 1998, no. 7.
108. Kathleen M. White. "Recycling in Chicago: A Mixed Bag," *Waste Age*, March 2, 2001.
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111. Jon Schmid, "Residents Question Sludge Use on Farm," *Chicago Sun-Times*, June 30, 1999.
112. Kathleen M. White, "Recycling in Chicago: A Mixed Bag," *Waste Age*, March 2, 2001.
113. Henry L. Henderson, "The City and the Environment," Chicago Department of Environment website, [www.cityofchicago.org/Environment/html/RiverCity.html](http://www.cityofchicago.org/Environment/html/RiverCity.html) (accessed May 23, 2004).
114. Ibid.
115. Ibid.
116. Jon Schmid, "Residents Question Sludge Use on Farm," *Chicago Sun-Times*, June 30, 1999.
117. This information was compiled from the following reports published by Seattle Public Utilities, Resource Planning Division, Forecasting and Evaluation Section: "Apartment Recycling Report, December 2003," "Curbside Recycling Report, December 2003," "Garbage Report, December 2003," and "Yard Waste Report, December 2003," available at [www.cityofseattle.net/util/solidwaste/reports.htm](http://www.cityofseattle.net/util/solidwaste/reports.htm) (accessed March 29, 2004).
118. Ibid.
119. Seattle Public Utilities, Resource Planning Division, Forecasting and Evaluation

Section. "Apartment Recycling Report, December 2003." In 2003, the Apartment Recycling Program reported an average of 27.3 pounds per unit per month.

120. Seattle Public Utilities, Resource Planning Division, Forecasting and Evaluation Section, "Curbside Recycling Report, December 2003". In 2003, the Curbside Recycling Program reported an average of 67.7 pounds per unit per month.

121. Seattle Public Utilities, "1998 Comprehensive Solid Waste Management Plan: Seattle's People and Their Waste," p. 15.

122. A. Pandora Touart, "Maximizing Multifamily Recycling," *Biocycle*, July 2000, p. 52.

123. Environmental Protection Agency, "Complex Recycling Issues: Strategies for Record-Setting Waste Reduction in Multi-Family Dwellings," October 1999, EPA-530-F-99-022.

124. A. Pandora Touart, "Maximizing Multifamily Recycling," *Biocycle*, July 2000, p. 52.

125. Ibid.

126. Telephone interview with SPU's Hans Van Dusen, December 6, 2002.

127. Ibid.

128. Ibid.

129. Institute for Local Self-Reliance/Environmental Protection Agency, *Cutting*

*the Waste Stream in Half: Community Record Setters Show How*, EPA-530-R-99-013, June 1999, p. 139.

130. Interview with SPU's Jennifer Bagby, July 9, 2002.

131. City of New York Department of Sanitation, *Comprehensive Solid Waste Management Plan*, August 1992.

132. King County Solid Waste Division, "2002 Annual Report," p. 4-19.

133. Jennifer Bagby, "City of Seattle: Past, Present and Future and the Role of Full Cost Accounting in Solid Waste Management," Seattle Public Utilities, March 1999, p. 12.

134. Information calculated from information in the City's contracts with Washington Waste Hauling and Recycling, and US Disposal II, respectively, available at [www.cityofseattle.net/util/solidwaste](http://www.cityofseattle.net/util/solidwaste).

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136. Seattle's contract with U.S. Disposal II, available at [www.ci.seattle.wa.us/util/solidwaste](http://www.ci.seattle.wa.us/util/solidwaste).

137. Ibid.

138. Jennifer Bagby, "City of Seattle: Past, Present and Future and the Role of Full Cost Accounting in Solid

Waste Management," Seattle Public Utilities, March 1999, p. 3.

139. Ibid.

140. Seattle Public Utilities, "1999 Solid Waste Annual Report," March 2000.

141. Citywide Recycling Advisory Board, "Rational Solid Waste Management in New York," February 2002, at [www.geography.hunter.cuny.edu/~mclarke/CRABFeb2002positions-a.htm](http://www.geography.hunter.cuny.edu/~mclarke/CRABFeb2002positions-a.htm) (accessed May 23, 2004).

142. Gersh Kuntzman, "American Beat: New Trash City," *Newsweek*, July 22, 2002.

## Appendix II: Beyond Case Studies: Comparative Studies of Recycling Rates

1. Jerry Powell, "What Have You Done for Me Lately," *Resource Recycling*, August 1997.

2. Telephone interview with Don Gibson, Recycling Coordinator, City of Tucson, July 12, 2002, conducted by Samantha MacBride.

3. City of Los Angeles, Dept. of Public Works, Bureau of Sanitation, Solid Resources Collection Division, *Best Practices Report*, 2000.

4. Staff, "Apples to Kumquats," *Waste News*, February 14, 2000.

5. These variables include: (1) demographics: population size, region, population density; (2) tonnage data: tons recycled/composted, the diversion rate (recycling plus composting); (3) cost data: recycling/composting cost per ton (total program costs), revenue per ton, and landfill tip fees; (4) funding sources: general fund, general waste-collection fees, material sales revenue, state grants, tipping fees/charges, other revenue sources, or special recycling collection fees; (5) important problems identified by recycling managers: financing/budget, securing participation, lack of markets, unfunded state mandate, obtaining information about best recycling practices, theft/scavenging of recyclables; (6) factors in annual budget discussions about continued funding for the recycling program: cost of recycling vs. disposal, recycling's political popularity, environmental benefits of recycling, state mandates/reduction goals, need to extend life of the landfill; (7) participation indicators: participation rate, whether program is mandatory or voluntary, curbside or drop-off only; (8) factors related to participation, diversion, costs: same day pickup, use of penalty, compost yard wastes, yard waste banned from SW landfill, recycling goal, free bins provided, block leaders for recycling, source separation requirement, speeches by city officials, variable-rate program (PAYT), recycling coordinator full time or half



## Endnotes

- time, tin and other materials recycled, multifamily generators, competitive bids required, materials sold to highest bidder, and technical assistance in marketing recyclables obtained from a state or regional organization.
6. David H. Folz, "Municipal Recycling: A Public Sector Environmental Success Story," *Public Administration Review*, July/August 1999, Vol. 59, No. 4.
7. *Ibid.*
8. *Ibid.*
9. *Ibid.*
10. *Ibid.*
11. *Ibid.*
12. NYC's recycling tonnage was approximately 665,000 tons per year pre-suspension. Doubling that, would save 665,000 x \$0.02, or \$13,000. To put this figure in perspective, DNSY's budget is roughly one billion dollars per year.
13. David H. Folz, "The Economics of Municipal Recycling: A Preliminary Analysis," *Public Administration Quarterly*, 1995, 19(3): 299–320.
14. *Ibid.*
15. *Ibid.*
16. *Ibid.*
17. David H. Folz, "Municipal Recycling: A Public Sector Environmental Success Story," *Public Administration Review*, July/August 1999,
- Vol. 59, No. 4.
18. Telephone interview with Don Gibson, Recycling Coordinator, City of Tucson, July 12, 2002, conducted by Samantha MacBride. Telephone interview with Mark Stout, San Francisco Dept. of the Environment, August 27, 2002.
19. David H. Folz, "Municipal Recycling: A Public Sector Environmental Success Story," *Public Administration Review*, July/August 1999, Vol. 59, No. 4.
20. *Ibid.*
21. *Ibid.*
22. Consumer Policy Institute/Consumers Union, *Taking out the Trash: A New Direction for New York City's Waste*, May 31, 2000, [www.consumersunion.org/other/trash/trash1.htm](http://www.consumersunion.org/other/trash/trash1.htm).
23. U.S. Conference of Mayors, *Multifamily Recycling: A National Study*, EPA-530-R-01-018, November 2002, p. 1.
24. See U.S. Environmental Protection Agency, *Complex Recycling Issues*, EPA document 530-F-99-022, October 1999; Ronald McQuaid and Angus R. Murdoch, "Recycling Policy in Areas of Low Income and Multi-Storey Housing," *Journal of Environmental Planning and Management*, December 1996 39(4), p. 545; Recycling Council of Ontario, Assessment of Multi-Unit Recycling in Ontario, August 2000; and Knowlton Foote and Scott Foster, "Moving On Up," *Waste Age*, May 2002.
25. U.S. Conference of Mayors, *Multifamily Recycling: A National Study*, EPA-530-R-01-018, November 2002, p. 1.
26. *Ibid.*, p.1.
27. *Ibid.*, p. 13.
28. *Ibid.*, p. 1.
29. *Ibid.*, p. 1.
30. *Ibid.*, p. 28.
31. *Ibid.*, p. 1.
32. *Ibid.*, p. 13.
33. *Ibid.*, p. 2.
34. *Ibid.*, p. 17.
35. *Ibid.*, p. 2.
36. *Ibid.*, p. 2.
37. *Ibid.*, p. 9.
38. *Ibid.*, p. 40.
39. *Ibid.*, p. 40.
40. *Ibid.*, p. 40.
41. *Ibid.*, p. 48.
42. *Ibid.*, p. 49.
43. *Ibid.*, p. 49.
44. *Ibid.*, p. 47.
45. *Ibid.*, p. 39.
46. *Ibid.*, p. 19.
47. Private collection includes contract, franchise, and subscription services.
48. U.S. Conference of Mayors, *Multifamily Recycling: A National Study*, EPA-530-R-01-018, November 2002, p. 19.
49. *Ibid.*, p. 35.
50. *Ibid.*, p. 9.
51. *Ibid.*, p. 30.
52. *Ibid.*, p. 45.
53. *Ibid.*, p. 45.
54. *Ibid.*, p. 45.
55. *Ibid.*, p. 30.
56. *Ibid.*, p. 13.
57. Institute for Local Self-Reliance/Environmental Protection Agency, *Cutting the Waste Stream in Half: Community Record Setters Show How*, EPA-530-R-99-013, June 1999, p. 2.
58. *Ibid.*, p. 7.
59. *Ibid.*, p. 7.
60. *Ibid.*, p. 7.
61. *Ibid.*, p. 116–117.
62. *Ibid.*, pp. 8–10.
63. *Ibid.*, pp. 8–10.
64. *Ibid.*, p. 33.
65. *Ibid.*, p. 9.
66. *Ibid.*, p. 9–10.
67. *Ibid.*, p. 9.
68. *Ibid.*, p. 8.

**Appendix III:  
Waste  
Prevention  
Policy and  
Planning:  
Clearing Up  
Confusion**

1. For examples of this line of argument, see the Waste Prevention Coalition's *Why Waste the Future*, May 2002, available at <http://www.wastesaver.com/WPCreport.pdf> (accessed April 19, 2004); and Neil Seldman's *Paradigm Shift in NYC's Waste Management* at <http://www.ilsr.org/recycling/NYC/NYCmain.html>.

2. See, for example, Waste Prevention Coalition testimony to the City Council Sanitation Committee, March 20, 2002, referenced at [www.geography.hunter.cuny.edu/~mclarke/resume.htm#Legislation&Testimony](http://www.geography.hunter.cuny.edu/~mclarke/resume.htm#Legislation&Testimony) (accessed April 21, 2004).

3. See, for example: Alison Blackman Dunham, "Bloomberg, Budding Environmentalist?" *Gotham Gazette*, November 2001, available at <http://www.gothamgazette.com/environment/no.v.01.shtml> accessed April 21, 2004. Blackman Dunham writes that "the cost of getting rid of the city's garbage can be reduced by handling as much as possible within city limits, rather than exporting it elsewhere... Waste prevention of this sort costs only \$27 per ton, while exporting it costs up to \$100 per ton." The Department's research projects no such per ton cost in any of its publications.

4. New York City Department of Sanitation, *Comprehensive Solid Waste Management Plan*, August 1992. Volume 4.1, p. 22.

5. *Ibid.*, p. 76.

6. *Ibid.*

7. *Ibid.*

8. *Ibid.*

9. *Ibid.*

10. The 10 waste prevention reports prepared by Science Applications International Corporation (SAIC) for the NYC Department of Sanitation/Bureau of Waste Prevention, Reuse & Recycling are at the following location on the DSNY website: <http://www.nyc.gov/html/dos/html/recywprpts.html#>.

11. SAIC/Tellus Institute for the New York City Department of Sanitation, *Measuring Waste Prevention in New York City*, Spring 2000, p. 116.

12. *Ibid.*, p. 116; Tables 2-4, p. 36; 2-6, p. 44; 2-10, p. 54; 2-11, p. 61; 2-13, p. 66.

13. *Ibid.*, p. 11.

14. Marjorie Clarke, "New York City After Fresh Kills: Latest Developments in the Planning Process (the Saga Continues)", presented and published in the *Proceedings of the Air and Waste Management Association's 94th Annual Meeting and Exhibition*, Orlando, FL, June 24-28, 2001, referenced at [www.geography.hunter.cuny.edu/~mclarke/resume.htm#MajorPapers&Pubs](http://www.geography.hunter.cuny.edu/~mclarke/resume.htm#MajorPapers&Pubs)

[edu/~mclarke/resume.htm#MajorPapers&Pubs](http://www.geography.hunter.cuny.edu/~mclarke/resume.htm#MajorPapers&Pubs) (accessed April 21, 2004).

15. Waste Prevention Coalition, *Why Waste the Future*, May 2002, available at <http://www.wastesaver.com/WPCreport.pdf> (accessed April 19, 2004).

16. Neil Seldman's *Paradigm Shift in NYC's Waste Management* at <http://www.ilsr.org/recycling/NYC/NYCmain.html> (accessed April 21, 2004).

17. New York City Waste Prevention Coalition, *Waste Prevention in New York City: The Bare Facts*, available at [www.geography.hunter.cuny.edu/~mclarke/wpcoalitionbrochure.htm](http://www.geography.hunter.cuny.edu/~mclarke/wpcoalitionbrochure.htm) (accessed April 21, 2004).

18. Waste Prevention Committee, Manhattan Citizens' Solid Waste Advisory Board, *Comments and Questions Regarding the 2000 NYC Solid Waste Management Plan and DEIS*, June 16, 2000, available upon request through [www.geography.hunter.cuny.edu/~mclarke/mcswab.htm](http://www.geography.hunter.cuny.edu/~mclarke/mcswab.htm).

19. SAIC/Tellus Institute, *Measuring Waste Prevention in New York City*, Spring 2000, Table 3-1, p. 116.

20. This is the sum of DSNY implementation costs for 2002 only, for four of the eleven programs that were still being funded that year. These costs were, for NY Waste Match, \$122,000, as reported on Table 2-4, p. 36; for NYC Stuff Exchange, \$332,931, as reported in Table

2-6, p. 42; NYC WasteLe\$\$, \$1,680,000, as reported in Table 2-10, p. 54, and Materials for the Arts, \$180,000, Table 2-13, p. 66; all in SAIC/Tellus Institute, *Measuring Waste Prevention in New York City*, Spring 2000.

21. Marjorie Clarke, "New York City After Fresh Kills: Latest Developments in the Planning Process (the Saga Continues)", presented and published in the *Proceedings of the Air and Waste Management Association's 94th Annual Meeting and Exhibition*, Orlando, FL, June 24-28, 2001, referenced at [www.geography.hunter.cuny.edu/~mclarke/resume.htm#MajorPapers&Pubs](http://www.geography.hunter.cuny.edu/~mclarke/resume.htm#MajorPapers&Pubs) (accessed April 21, 2004).

22. Statement of Marjorie J. Clarke, Ph.D., Lehmann College, "Statement to Sanitation Committee, New York City Council," February 7, 2002 at [www.geography.hunter.cuny.edu/~mclarke/testimony.htm](http://www.geography.hunter.cuny.edu/~mclarke/testimony.htm).

23. Waste Prevention Coalition testimony to the City Council Sanitation Committee, March 20, 2002, referenced at [www.geography.hunter.cuny.edu/~mclarke/resume.htm#Legislation&Testimony](http://www.geography.hunter.cuny.edu/~mclarke/resume.htm#Legislation&Testimony), (accessed April 21, 2004).

24. Citywide Recycling Advisory Board, "Rational Solid Waste Management in New York," February 2002, [www.geography.hunter.cuny.edu/~mclarke/CRABFeb2002positions-a.htm](http://www.geography.hunter.cuny.edu/~mclarke/CRABFeb2002positions-a.htm).

25. Alison Blackman Dunham, "Bloomberg,

Budding Environmentalist?”, *Gotham Gazette*, November 2001, available at [www.gothamgazette.com/environment/nov.01.shtml](http://www.gothamgazette.com/environment/nov.01.shtml), (accessed April 21, 2004).

26. Waste Prevention Coalition. *Why Waste the Future*, May 2002, available at <http://www.wastesaver.com/WPCreport.pdf> (accessed April 19, 2004).

27. *Ibid.*

28. *Ibid.*

29. Waste Prevention Committee, Manhattan Citizens’ Solid Waste Advisory Board, *Comments and Questions Regarding the 2000 NYC Solid Waste Management Plan and DEIS*, June 16, 2000, available upon request through [www.geography.hunter.cuny.edu/~mclarke/mcswab.htm](http://www.geography.hunter.cuny.edu/~mclarke/mcswab.htm).

30. In 2002, the Mayor and City Council funded a community-based waste-prevention outreach and education program—the Waste Prevention Community Coordinator Program. This program, overseen by BWPRR, was initially funded for \$6.3 million and was to run for three years. Due to the citywide fiscal crisis, program funding was scaled back to \$1 million and the program ran for only one year (Summer 2002 to early Fall 2003).

INFORM Inc. (INFORM) and the Council on the Environment of New York City (CENYC) were contracted to complete projects through this program. To complete

their portion of the work, INFORM subcontracted with eight local community organizations, chosen through a competitive proposal process. Collectively, these organizations held 16 educational events (such as lectures, workshops, and free classes) and 27 one- and two-day drop-off events for electronics, used clothing, books, home furnishings, building materials, and yard waste. INFORM estimates that through these events at least 381 tons of material were diverted from the City’s waste stream.

CENYC worked with existing and newly hired staff to conduct waste-prevention education and technical-assistance programs at different NYC Housing Authority locations and NYC Department of Education schools. Through nine programs, approximately 375 tons of materials were diverted from the waste stream.

31. Willard Mies, *Pulp & Paper 1999 North American Factbook*, 1999, p. 16. Calculations were based on “consumption” (production plus net imports), a measure of domestic use.

32. Daniel C. Walsh, “Urban Residential Refuse Composition and Generation Rates for the 20th Century,” *Environmental Science and Technology*, Volume 36, No. 22, 2002.

## Appendix IV: Public Education About Recycling

1. Natural Resources Defense Council, *New York City’s Failing Public Education Campaign for Recycling* at [www.nrdc.org/cities/recycling/nycsurvey/survey.asp](http://www.nrdc.org/cities/recycling/nycsurvey/survey.asp) (accessed April 29, 2004).

2. Citywide Recycling Advisory Board, *Rational Solid Waste Management in New York*, February 2002, [www.geography.hunter.cuny.edu/~mclarke/CRABFeb2002/positions-a.htm](http://www.geography.hunter.cuny.edu/~mclarke/CRABFeb2002/positions-a.htm) (accessed May 17, 2004).

3. The “Expanded Recycling Program” added mixed paper, as well as household metal, bulk metal, and beverage cartons to the list of materials designated for recycling.

4. Telephone interview with Gloria Chan, San Francisco Department of the Environment, March 12, 2003.

5. Lisa Skumatz and John Green, *Evaluating the Impacts of Recycling/Diversion Education Programs—Effective Methods and Optimizing Expenditures*, report for the State of Iowa Department of Natural Resources, May 2002. Available for purchase at [www.serainc.com](http://www.serainc.com) (accessed April 29, 2004).

6. *Ibid.*

7. *Ibid.*

8. Institute for Local Self-Reliance/Environmental Protection Agency, *Cutting the Waste Stream in Half: Community Record Setters Show How*, EPA-530-R-99-013, June 1999, p. 25.

9. *Ibid.*

10. Interview with Gloria Chan, Public Information Officer, San Francisco Dept. of the Environment, March 12, 2003.

11. Lisa Skumatz and John Green, *Evaluating the Impacts of Recycling/Diversion Education Programs—Effective Methods and Optimizing Expenditures*, report for the State of Iowa Department of Natural Resources, May 2002. Available for purchase at [www.serainc.com](http://www.serainc.com) (accessed April 29, 2004).

12. *Ibid.*

13. Institute for Local Self-Reliance/Environmental Protection Agency, *Cutting the Waste Stream in Half: Community Record Setters Show How*, EPA-530-R-99-013, June 1999, p. 26.