

UNITED STATES DISTRICT COURT  
FOR THE SOUTHERN DISTRICT OF NEW YORK

CONSUMER ELECTRONICS ASSOCIATION, :  
INFORMATION TECHNOLOGY INDUSTRY COUNCIL, :  
AND ITAC SYSTEMS, INC., :

Plaintiffs, :

v. :

CITY OF NEW YORK, MICHAEL R. BLOOMBERG, : 09 CV 6583

in his official capacity as Mayor of the City of New York, : Judge Pauley

NEW YORK CITY DEPARTMENT OF SANITATION, :

JOHN J. DOHERTY, in his official capacity :

as the Commissioner of the Department of Sanitation, :

and ROBERT LANGE, in his official capacity :

as the Director of Waste Prevention, Reuse and Recycling :

of the Department of Sanitation, :

Defendants. :

DECLARATION OF MOHAN RAO, PH.D.

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1. I am an economist and Managing Director at LECG, an international economics research and consulting firm, and an Adjunct Professor in the Department of Industrial Engineering and Management Sciences at the School of Engineering and Applied Science at Northwestern University. I have prepared this Declaration to

memorialize my testimony regarding the significant economic costs of the inefficiencies of New York City's electronic waste program (hereinafter, the "New York City E-Waste Program") and its effect on interstate commerce. I have a Bachelor of Science in Engineering from the University of Michigan, a pre-doctoral fellowship from Harvard University, and a Ph.D. from the University of Colorado. I was a recipient of the Cooley Award from the University of Michigan College of Engineering and the David Cattell Fellowship from UCLA. I was previously a professor at UCLA and a Teaching Fellow at Harvard University. I am a member of the American Economic Association, the IEEE, and the Licensing Executives Society. I also am the Chair of the Valuation and Taxation Committee of the Licensing Executives Society. I teach financial economics at Northwestern University. My curriculum vitae is attached at [Tab 1](#). LECG bills \$575 per hour for my work on this matter. I also have been assisted by my team at LECG.

2. I have been retained by Beveridge & Diamond, P.C., counsel for Plaintiffs Consumer Electronics Association ("CEA") and the Information Technology Industry Council ("ITI"), to evaluate the economic efficiency of certain electronic waste collection and recycling laws and rules established by the City of New York and the New York City Department of Sanitation. In addition, I have been asked to evaluate the likely impact of these laws and rules on electronic product manufacturers.

3. I understand that this litigation relates to the New York City E-Waste Program recently established by the City of New York under certain New York City laws and rules, including:

- Local Law 13
- Local Law 21
- New York City Department of Sanitation Notice of Adoption of Final Rules Governing Electronic Equipment Collection, Recycling, and Reuse and,

- Electronic Waste Management Plan Submission Forms — Instructions, and Sections P-1 through P-5.

4. I understand that, as a general matter, the New York City E-Waste Program applies to any entity involved in the manufacture, assembly, branding, licensing or sale (“manufacturers”) of certain electronic goods sold at any time in New York City or sold outside of New York City and brought into New York City by consumers.<sup>1</sup> The Program essentially requires manufacturers to collect certain electronic waste from any resident in New York City, including collecting electronic devices weighing more than fifteen pounds directly from residences. For devices weighing less than fifteen pounds, the manufacturers have other options to direct collection, including establishing drop-off locations or a mail-back program.<sup>2</sup>

5. The New York City E-Waste Program is to be phased-in over two years.<sup>3</sup> By 2011, manufacturers will be required to retrieve any covered electronic waste that is of the type the manufacturer sells or sold, regardless of the original manufacturer of the device. Under the New York City Rules, manufacturers will be required to collect these items at the request of a New York City resident. By 2012, each manufacturer must retrieve electronic waste equal to 25 percent of the volume by weight it sells in New York City and, by 2018, each manufacturer is required to collect electronic waste equal to 65 percent of the annual volume by weight sold.<sup>4</sup>

6. Manufacturers are required to collect electronic waste from New York City residents, and are not allowed to charge any fees for the electronic waste collection except from for-profit businesses with over fifty employees.<sup>5</sup>

7. I have been asked to evaluate the economic efficiency of the New York City

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<sup>1</sup>Local Law 13, §16-421(g); New York City Rules, §17-01.

<sup>2</sup>New York City Rules, §17-03(h)(2)(i).

<sup>3</sup>Local Law 13, §16-422.

<sup>4</sup>Local Law 21, §16-424.

<sup>5</sup>Local Law 13, §16-423.

E-Waste Program and the competitive impact this Program may have on various manufacturers. Economists recognize that there are more efficient and less inefficient ways to achieve policy objectives. Efficient approaches achieve those objectives in the most cost-effective manner and minimize market distortions. Below, I apply economic theory and the results of similar electronic waste laws and regulations elsewhere to evaluate whether the New York City E-Waste Program is consistent with economic efficiency.

8. In addition, a new regulation or policy may place some manufacturers at a competitive disadvantage relative to others. Economists recognize that regulatory outcomes are most effective when this differential impact is minimized and when competitors are primarily rewarded for superior competitive performance, not regulatory gain. I also evaluate the likely impact of the Rules on manufacturers that have an extensive physical presence in New York City relative to those that do not.

9. The list of materials which I relied upon in forming the opinions set forth in this Declaration is attached at [Tab 2](#).

10. Based on my analysis discussed below, I conclude that:

- The Rules of the New York City E-Waste Program are likely to provide a competitive advantage to manufacturers with a local presence and disfavor those from out of state. Additionally, the Program — as structured — would put a strain on small manufacturers because compliance costs to establish direct collection systems or drop off locations are high relative to their sales revenue.
- The Program is economically inefficient and significantly more expensive compared to alternative and established approaches to the collection and recycling of electronic waste. At an estimated cost of \$3.62 per pound for direct collection of covered electronic waste weighing more than 15 pounds, New York City's Program is about 10 times the cost of programs in California and Maine.

- New York City appears to not have performed an adequate cost-benefit analysis of the Program. The Program — as structured — is likely to provide relatively few local benefits. Since New York City has no in-city disposal locations, many of the environmental benefits from a recycling Program are not likely to be realized in New York City. Because the Program will likely shift the economic burden to consumers who live outside the jurisdiction of New York City, it is difficult to conclude that local benefits are commensurate with the costs imposed on other jurisdictions.

## **I. The Rules Will Have Differential Impact on Manufacturers and Provide a Competitive Advantage to Some Manufacturers**

**11.** Under the New York City E-Waste Program, certain electronic goods manufacturers gain a significant competitive advantage in complying with the Program. For example, retailers who sell private label products will likely have a distinct cost advantage in complying with the Program as they already have an existing infrastructure of retail outlets and delivery/service vehicles. These retail manufacturers are also advantaged in complying with point of sale aspects of the Program since they can more easily distribute notifications regarding recycling at their local retail outlets for the electronic products that they manufacture and sell.

**12.** Moreover, private label retailers also have existing delivery, installation, and pick-up services. The retailer generally delivers and installs a new electronic device, such as a television, and removes the old unit from the residence. Such manufacturers would not have to establish or contract with a third party for the collection services mandated under the New York City Rules. In addition, manufacturers with a local presence in New York City also would have a competitive advantage in estab-

lishing local drop-off locations. Such a significant difference in the cost of collecting electronic products favors manufacturers with a physical presence in New York City and disfavors those from out of state. Furthermore, the New York City Rules will place a burden on manufacturers who have no presence in New York City at all. Simply by having a product enter the City — even if it was sold elsewhere — manufacturers who reside and do business solely outside the jurisdiction of New York City would be responsible for developing an infrastructure to collect and recycle that item.

**13.** As a result of the differential impact of the E-Waste Program on different manufacturers, the Program requirements will disturb the competitive balance that currently exists among these manufacturers in the New York City area and artificially create a competitive imbalance favoring certain manufacturers. This result would cut against one of the basic principles of a competitive market economy — that firms gain market share against their competitors through superior competitive performance and not through regulatory windfall.

**14.** Additionally, the Program would put a strain on small manufacturers because compliance costs are high relative to their sales revenue. For example, ITAC Systems is a manufacturer of “high-quality standard and custom trackballs and other input devices” that employs only seven people at its facility in Garland, Texas.<sup>6</sup> ITAC Systems has annual sales of approximately \$1.5 million and ships between 10,000 and 12,000 units.<sup>7</sup> ITAC Systems does not have any physical presence in New York City and estimates that only a very small percentage of its devices are sold there (less than one percent).<sup>8</sup> Because ITAC Systems is a small firm, and its revenue relative to its fixed costs is lower than large firms with greater economies of scale, it would bear a disproportionate burden of compliance with Program Rules compared with large manufacturers. Such small firms will likely not have the revenue needed to establish

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<sup>6</sup>Declaration Of John Ernsberger, page 2-3.

<sup>7</sup>Declaration Of John Ernsberger, page 3.

<sup>8</sup>Declaration Of John Ernsberger, page 3-4.

direct collection systems or drop off locations because of the large cost. It is my understanding that even compliance with the \$1,500 filing fee is burdensome to ITAC Systems.<sup>9</sup>

15. Standard economic theory teaches us that market outcomes are most beneficial to consumers when there are many competitive rivals in an industry and economic profits are earned by those firms that are the most efficient and most responsive to consumer demands. However, the New York City Rules for collecting and recycling electronic waste threaten to give certain manufacturers an artificial cost advantage over their competitors.<sup>10</sup>

16. While regulations often do have a differential impact on competitors within an industry, regulatory outcomes are most effective when this differential impact is minimized and when competitors are primarily rewarded for superior competitive performance, not regulatory gain. The significant regulatory burden of the New York City Rules (particularly the direct collection requirements), along with the widely differential impact on certain groups of competitors, creates a risk that the competitive playing field that currently exists among electronics manufacturers in the New York City area will be altered.

## II. The New York City E-Waste Program is Economically Inefficient

17. Economists recognize that a choice or alternative is economically efficient when it has the lowest opportunity cost of the available choices that can be employed to produce a similar level of output.<sup>11</sup> When a choice is available between different

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<sup>9</sup>Declaration Of John Ernsberger, page 6.

<sup>10</sup>Two seminal papers describing this are George Stigler, "The Theory of Economic Regulation" *The Bell Journal of Economics and Management Science* Vol. 2, No. 1, Spring 1971, pages 3-21 and Sam Peltzman, "Toward a More General Theory of Regulation" *Journal of Law and Economics* Vol. 19, 1976, pages 211-240.

<sup>11</sup>Michael L. Katz and Harvey S. Rosen, *Microeconomics*, 3<sup>rd</sup> ed. (Boston: Irwin McGraw-Hill,

collection and recycling programs that achieve similar outcomes, it is economically most efficient to choose the program with the lowest cost. New York City's E-Waste Program is substandard compared to other programs.

**18.** In order to facilitate collection and recycling of electronic waste, different programs have been developed around the U.S., including permanent collection facilities (often co-located with municipal hazardous waste collection programs), drop-off special events (one- or multiple-day events held at temporary sites), retail or manufacturer collection programs, curbside recycling, and nonprofit or thrift retail collections.<sup>12</sup> New York City's E-Waste Program is estimated to be a significantly more expensive approach to collecting and recycling electronic waste, in part because it does not employ these established approaches.

**19.** Based on an analysis of data provided by the U.S. Environmental Protection Agency, I estimate New York City's annual electronic waste to total approximately 42,146 tons. Of this amount, approximately 60 percent, or 25,287 tons, originates from residences.<sup>13</sup> Dan Butturini — an expert in solid waste management and

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1998), page 272.

<sup>12</sup>Hilary Nixon, et al., "Understanding Preferences for Recycling Electronic Waste in California: The Influence of Environmental Attitudes and Beliefs on Willingness to Pay," *Environment and Behavior* 41, no. 1 (January 2009), page 102.

<sup>13</sup>This estimate is based on data from the U.S. Environmental Protection Agency and New York City. The calculation is as follows:

- The ratio of New York City population to the U.S. population is approximately 2.8 percent (= 8,310,212 ÷ 301,290,332). Sources: New York City, Department of City Planning and U.S. Census Bureau, *Annual Estimates of the Resident Population for the United States, Regions, States, and Puerto Rico: April 1, 2000 to July 1, 2008* (NST-EST2008-01), respectively.
- Total annual U.S. municipal solid waste is approximately 254,180,000 tons. Therefore, scaling for New York City's population (of 2.8 percent), expected amount of New York City municipal solid waste is approximately 7,010,811 tons. Source: U.S. Environmental Protection Agency, *Municipal Solid Waste in the United States: 2007 Facts and Figures*, EPA530-R-08-010, November 2008, p. 35.
- However, New York City's actual municipal solid waste is 3,559,000 tons. Source: New York City, *Mayor's Management Report: February 2007*, p. 90.
- To account for this lower per capita solid waste, I adjust New York City's share of the national municipal solid waste to 1.4 percent (= 2.8 percent ×  $\frac{3,559,000}{7,010,811}$  = 1.4 percent).

logistics — has calculated that of the total residential electronic waste, 23,968 tons are covered electronic waste weighing more than 15 pounds under the New York City E-Waste Program. He estimates the cost for the direct collection of this electronic waste to be about \$173 million, or approximately \$3.62 per pound.<sup>14</sup>

**20.** This cost is significantly higher than the cost of electronic waste collection and recycling programs in other jurisdictions. For example, in California, electronics consumers are charged a fee on retail purchases of electronics. The State of California uses the money collected from these fees to compensate authorized electronic waste collectors and recyclers. Since 2004, the cost of the program has declined, from \$0.48 per pound in 2007 to around \$0.39 per pound.<sup>15</sup> Similarly, data from the first two years of the electronics recycling program in Maine indicate that the average cost of the program was approximately \$0.33 per pound.<sup>16</sup>

**21.** The New York City E-Waste Program is significantly more costly and less efficient because it duplicates the collection infrastructure. In New York City, an

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- Total electronic waste in the U.S. is approximately 3,010,000 tons. Source: U.S. Environmental Protection Agency, *Municipal Solid Waste in the United States: 2007 Facts and Figures*, EPA530-R-08-010, November 2008, p. 71.
  - Therefore, New York City's estimated share of this electronic waste is approximately 42,146 tons (= 3,010,000 × 1.4 percent). Note that this figure includes all electronic waste, including covered and non-covered items.
  - Of the 42,146 tons, 40 percent is estimated to be produced by commercial entities, resulting in approximately 25,287 tons of residential electronic waste. Source: U.S. Environmental Protection Agency, *Municipal Solid Waste in the United States: 2007 Facts and Figures*, EPA530-R-08-010, November 2008, p. 11.

<sup>14</sup>Declaration of Dan Butturini. If covered electronic waste above and below 15 pounds is considered, Butturini estimates the total cost of the New York City E-Waste Program to exceed \$200 million annually.

<sup>15</sup>Hilary Nixon and Jean-Daniel M. Saphores, "Financing Electronic Waste Recycling: Californian Households' Willingness to Pay Advanced Recycling Fees," *Journal of Environmental Management* 84 (2007), page 548.

<sup>16</sup>The costs related to the California and Maine programs cover all costs associated with the programs, from collection through transportation, consolidation, and recycling. The Maine and California costs are lower because they employ drop-off centers where the consumer takes the electronic waste to a centralized location. A portion of the lower cost results from the consumer sharing the collection burden by spending his or her time to bring the electronic waste to a collection facility.

infrastructure already exists to collect large items of waste from the curb, including discarded freezers, air conditioners, and other large appliances.<sup>17</sup> The Department of Sanitation regularly visits each block to pick up appliances and other large waste placed at the curbside. Direct collection of electronic waste by manufacturers requires developing a new infrastructure to collect the electronic waste — an infrastructure that requires manufacturers to go beyond curbside pickup. This infrastructure includes trucks and crews to physically collect the electronic waste, as well as logistics personnel, facilities, and equipment to manage the collection efforts. The establishment of an entirely new (and duplicative) infrastructure will be both costly and inefficient.

**22.** At present, the extant literature concerning electronic waste recycling does not cover New York City, and the best-available, rigorous studies cover California, which provides only a partial proxy for New York City. However, these studies show that alternative collection and recycling programs could achieve the same goal at a lower cost. A study of California residents by Professor Saphores and his colleagues at the University of California and the California Institute of Technology found that “[d]rop-off facilities are typically less expensive to operate than curbside collection programs, and they are faster to implement than take-back programs or other programs involving manufacturers.”<sup>18</sup> In fact, the same study concludes that in cases where public funds are limited, the most cost-effective method of electronic waste collection is via recycling centers.<sup>19</sup> Professor Saphores and his colleagues suggest that an alternative to recycling centers would be to “contract with existing retail establishments [as opposed to manufacturers] so they agree to collect e-waste.”<sup>20</sup>

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<sup>17</sup>Declaration of Professor Eric Williams, Ph.D.

<sup>18</sup>Jean-Daniel M. Saphores, et al., “Household Willingness to Recycle Electronic Waste: An Application to California,” *Environment and Behavior* 38 (2006), page 185.

<sup>19</sup>Jean-Daniel M. Saphores, et al., “Household Willingness to Recycle Electronic Waste: An Application to California,” *Environment and Behavior* 38 (2006), page 186.

<sup>20</sup>Jean-Daniel M. Saphores, et al., “Household Willingness to Recycle Electronic Waste: An Ap-

**23.** In addition to being more expensive, the New York City E-Waste Program is unlikely to be the preferred program by which to dispose of electronic waste in the eyes of residents. In a recent study by Professor Nixon and her colleagues at San Jose State University and the University of California, respondents from California were asked to rank five different collection and recycling program alternatives: (1) Pay As You Throw,<sup>21</sup> (2) Drop-Off Recycling Centers, (3) Curbside Recycling, (4) Drop-Off at Retail Locations, and (5) Deposit-Refund Program at Retail Locations.<sup>22</sup> Consumers were asked to weigh the different choices for the best combination between convenience and cost. While California differs from New York City in terms of density and culture, the study found that nearly two-thirds of respondents selected Drop-Off at Recycling Centers as their first or second choice. Pay As You Throw was the least popular choice and was ranked last by nearly one-third of the sample. Direct collection was not included in the study. In fact, no prominent academic study discusses direct collection by manufacturers (although several discuss curbside pickup using existing municipal infrastructure). However, its closest analog, curbside collection, ranked behind drop-off programs.<sup>23</sup>

**24.** The economic burden of the New York City E-Waste Program is not confined to New York City. Rather, the Program will also impact jurisdictions outside New York City and New York State. Since most manufacturers produce and sell to distributors and retailers outside of New York City, the increased cost of compliance will result in higher prices nationwide. In other words, the New York City E-Waste

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plication to California,” *Environment and Behavior* 38 (2006), page 205.

<sup>21</sup>Pay As You Throw programs are those in which households return the electronic waste to the manufacturer for a set fee that is paid by the consumer.

<sup>22</sup>Nixon, et al., “Preferences for Recycling Electronic Waste,” *Understanding Preferences for Recycling Electronic Waste in California: The Influence of Environmental Beliefs on Willingness to Pay* 41:1 (2009) page 103.

<sup>23</sup>Nixon, et al., “Preferences for Recycling Electronic Waste,” *Understanding Preferences for Recycling Electronic Waste in California: The Influence of Environmental Beliefs on Willingness to Pay* 41:1 (2009) page 119.

Program will shift the economic burden to consumers who live outside the jurisdiction of New York City. Moreover, New York City is home to few companies that qualify as manufacturers under the E-Waste Law. The cost of the Program, therefore, falls largely on manufacturers located outside of New York City.

### **III. New York City Appears Not to Have Performed an Adequate Cost-Benefit Analysis**

**25.** In order to ascertain the economic impact of the E-Waste Program, New York City needs to perform an economic cost-benefit analysis. Without such an economic analysis, it is not possible to fully determine whether the benefits of the Program are in line with its costs. In its City Environmental Quality Review (CEQR) of the New York City E-Waste Law, dated March 11, 2008, the Council of the City of New York found that “the proposed action would not have a significant adverse impact on the environment.”<sup>24</sup> The CEQR involves a review of the environmental impacts of the E-Waste Law and does not provide for an adequate analysis to understand the economic impact of the Law. The City Council’s finding of “No Significant Effect” is based on an environmental assessment that there would be no effect on land use; no displacement of residential populations, businesses, or employees; no effect on natural resources; no significant increase of truck traffic; and no adverse effects on open space, shadows, historic resources, neighborhood character, infrastructure, energy, transit, noise, air quality, and public health. The CEQR, however, does not provide a systematic economic cost-benefit analysis.

**26.** Similarly, the Department of Sanitation, in its memorandum regarding the CEQR Type II Determination, dated May 7, 2009, concluded that the Rules “hav[e] no significant adverse impact on the environment.”<sup>25</sup> As with the City Council’s re-

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<sup>24</sup>CEQR No. 08CCO006Y, page 1.

<sup>25</sup>Department of Sanitation Memorandum regarding the CEQR Type II Determination, page 5.

view, the Department of Sanitation's review is primarily an environmental document and is insufficient to determine the full economic impact of the E-Waste Program Rules.<sup>26</sup>

**27.** The findings of both the City Council and the Department of Sanitation are conclusory and unsupported from an economic perspective. Since neither performs an economic cost-benefit analysis of the New York City E-Waste Law or the E-Waste Program Rules, there exists little economic evidence to provide an understanding of whether the E-Waste Program is economically efficient or beneficial to New York City residents. An economic cost-benefit analysis allows policy-makers to better understand the net economic impact of regulations, laws, and rules as they relate to the welfare of the population affected by the regulation.<sup>27</sup> In the present context, an economic cost-benefit analysis would allow policy makers to engage in a full accounting of the electronic waste regulations and determine whether, on net, the regulations are socially beneficial.<sup>28</sup> Specifically, an economic cost-benefit analysis allows policy makers to compare the E-Waste Program to potential alternatives to determine whether it is economically efficient and whether the Program provides value in terms of the cost it imposes.

**28.** In its CEQR analysis, the City Council concluded that there are costs to the recycling Law but it provided no analysis that the benefits from recycling outweigh these costs. Further, the City Council concluded that the action would "have no negative impacts."<sup>29</sup> In doing so, the City Council ignores the fact that the recycling Law will increase traffic congestion, leading to increased emissions from both additional trucks on the road as well as cars that will be on the road for a

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<sup>26</sup>Department of Sanitation Memorandum regarding the CEQR Type II Determination, page 5.

<sup>27</sup>Anthony W. Boardman, et al. *Cost Benefit Analysis: Concepts and Practice*. New York: Prentice Hall, 1996.

<sup>28</sup>Harvey S. Rosen, *Public Finance 7<sup>th</sup> ed.*. Boston: McGraw-Gill Irwin, 2005. p. 240.

<sup>29</sup>CEQR No. 08CCO006Y, p. 2.

longer period of time.<sup>30</sup> In addition, as residents spend longer time waiting in traffic, the cost of the Program due to time cost increases.<sup>31</sup> By performing a cost-benefit analysis, the City Council would have a better, fuller understanding of the economic costs of the E-Waste Program on New York City residents.

**29.** The Department of Sanitation’s memorandum regarding the CEQR Type II Determination provides even fewer details than the City Council regarding the net costs of the E-Waste Program Rules. This lack of analysis is particularly problematic because the Rules require direct pick-up from residences, which contributes to the greater cost of the New York City Program over other electronic waste recycling programs in other jurisdictions. Specifically, the Department of Sanitation states that “nothing in the rulemaking would increase impacts to the environment with respect to the various impact categories that were already considered by the City Council in passing LL13/2008.”<sup>32</sup> Since the Law simply provides for convenient collection, while the Department’s Rules specify direct collection, the absence of a cost-benefit analysis underscores the lack of understanding of the true economic costs of this collection method to New York City residents.

**30.** In addition to failing to consider all of the costs, New York City does not quantify the level of benefits from the Program. Without a cost-benefit analysis, it is unclear whether the Program is an economically efficient method by which to “establish an electronics recycling and reuse program that is convenient and minimizes cost to consumers of electronic equipment and to the City.”<sup>33</sup> An economic cost-benefit analysis would quantify the benefits to New York City residents rather than simply assuming that they exist. In fact, the local benefits are likely quite small. New York City has no in-city disposal locations, so the environmental benefits — if any — from

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<sup>30</sup>Declaration of Professor Eric Williams, Ph.D.

<sup>31</sup>Robert T. Deacon and Jon Sonstelie, “Rationing by Waiting and the Value of Time: Results from a Natural Experiment,” *Journal of Political Economy* 93 (August 1985), pp. 627-647.

<sup>32</sup>Department of Sanitation Memorandum regarding the CEQR Type II Determination, page 5.

<sup>33</sup>CEQR No. 08CCO006Y, Attachment A, page 1.

a recycling Program are likely to be realized outside of New York City.<sup>34</sup> As discussed earlier, the New York City E-Waste Program will shift part of its economic burden to consumers who live outside the jurisdiction of New York City. Without an economic cost-benefit analysis, it is not possible to determine whether the benefits of the NYC E-Waste Program are commensurate with the high cost of the Program.

I declare under penalty of perjury that the foregoing is true and correct, and if called upon to do so, I could and would testify thereto.

Executed this 4<sup>th</sup> Day of August 2009 in Chicago, Illinois.

A handwritten signature in black ink that reads "Mohan Rao". The signature is written in a cursive style with a horizontal line underneath it.

Mohan Rao, Ph.D.

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<sup>34</sup>New York City Department of Sanitation, *Comprehensive Solid Waste Management Plan*, September 2006, page ES-1.