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Berkeley e-Recycling

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Electronic waste, discarded electronics which often contain toxics such as lead

and mercury, is a fast growing source of environmental pollution. Computers are being

deposited by the ton in local landfills. Six thousand computers become obsolete in

California every day[1]. Eco-maps by the Silicon Valley Toxics Coalition illustrate the

alarming effects of e-waste in California including contamination of groundwater near

schools and local hospitals[2]. Of growing concern is the fact that the EPA has correlated

resulting pollutants with increased rates of cancer, and much of California is already in

the "danger zone" with a range of 171 to 1543 hazardous air pollutants per million . Safe

levels are up to 54 pollutants per million[3]. Businesses purchase two of every three

computers and therefore are a primary contributor to the e-waste problem. I will examine

the business e-waste characteristics in three geographical regions in the United States:

The San Jose-San Francisco Bay Area, Seattle (Washington), and Houston (Texas). By

examining the data in existing research and surveys, including the Code-Green "Business

E-Waste Study" and EnviroMetrics "E-Waste Data Archive", I will highlight similarities

and differences in the treatment of business e-waste. In addition, I will compare the

attitudes and opinions of e-waste decision makers are compared. Finally, I will evaluate

other influences on e-recycling including the nature of region's business climate and e-

recycling infrastructure such as the number of regional recyclers.

The rates of business e-waste disposal in the San Jose-San Francisco Bay Area,

Seattle, and Houston are similar in some ways but different in others. The overall rates of

business e-recycling are similar across the regions. Roughly 30% of businesses in the

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[1] http://ewaste911.org/ewaste.html
[2] http://svtc.org/resource/maps/index.html
[3] http://svtc.org/ecomaps/svtc_cep/

Bay Area do not e-recycle at all[4]. 17% have well-established programs with written

guidelines to recycle the company's electronics including computers and peripherals.

34% of businesses have no written policies regarding electronic waste but "regularly" e-

recycle computers and peripherals. 19% of businesses do not have written policies but e-

recycle "occasionally". It should be noted that the "Bay Area Business E-Waste" study

was conducted exclusively amongst small-midsize businesses. In Seattle, 59% of

businesses engage in e-recycling of "PCs, cell phones, printers/copiers, and/or other

electronic devices"[5]. 33% of Seattle businesses do not engage in systematic e-recycling.

8% were unsure of their company's policy with regards to electronic waste or "declined

to state". In Houston, the percentages are slightly lower. 55% of businesses e-recycle

"PCs, cell phones, printers/copiers, and/or other electronic devices", 34% did not engage

in systematic e-recycling, and 11% were unsure or "declined to state". The figures for

Seattle and Houston are from the EnviroMetrics "E-Waste Data Archive". This data set

was produced from a survey of businesses of all sizes in Seattle and Houston. Large

corporations are included in this data set while they are not included in the Code-Green

study of the Bay Area. While this complicates direct comparison, it appears that the

overall e-recycling rates are comparable, with the Bay Area having the highest rate and

Houston having the lowest of the three regions.

　　　　While overall rates are comparable across the three regions, the data reveals

differences in the details, specifically in the kinds of electronics recycled and the

organization's e-recycling decision-maker. Cell phone recycling is highest in the Bay

Area, with 34% of businesses surveyed stating that they "often" or "always" recycle cell

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[4] Code-Green "Bay Area Business E-Waste"; abstract – pg i
[5] EnviroMetrics "E-Waste Data Archive"

phones purchased for employee use. The rate is 29% in Seattle and 26% in Houston.

The reason for this difference may owe to the e-recycling infrastructure in the various

regions. This will be elaborated on in greater detail, later in the report. Seattle had the

highest rate of e-recycling of large devices including copiers, stand-alone printers and fax

machines. In Seattle, 28% of businesses recycle large equipment while the rate is 24%

for the Bay Area and 23% for Houston. The e-recycling decision-maker depends on the

region. In Silicon Valley, that person is likely to be the "Information Technology

Manager" who manages the company's network or the "Operations Manager". In

Seattle, the e-waste decision-makers include the "Management Information Systems

Manager", "IT Manager", "Chief Information Officer", and a host of specific titles

having to do with community relations and business practices. In Houston, the key

decision-maker tends to be the "Information Technology Manager". Seattle businesses,

when compared to those in the Bay Area and Houston, tend to place responsibility of e-

recycling higher up in the organization. For instance, the Chief Information Officer often

reports to the Chief Operating Officer (who reports to the President or CEO) or directly

to the President/CEO. In contrast, the usual e-waste decision-maker in the Bay Area and

Houston is the "IT Manager', a lower-level technology position.

　　　　The data reveals differences in attitudes and opinion across the regions. In Silicon

Valley, 60% of small-midsize businesses responded that "Managing our e-recycling

project takes more effort than it should"[6]. In Seattle, 54% of all businesses said they had

"adequate options for e-recycling". In Houston, 41% of all businesses responded in

similar fashion. The question posed to Bay Area companies is not identical to the one

posed to Seattle and Houston companies. The former were asked to gauge the difficulty

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[6] Code-Green "Bay Area Business E-Waste"; extract – pg ii

of their e-recycling project which factors in availability of e-recyclers but also considers the other difficulties associated with e-recycling including coordinating with multiple e-recyclers and dealing with associated paperwork. There appears to be room for improvement in terms of zeroing in on business e-waste needs since the satisfaction level is below 55% in all three regions. According to the Code-Green "Bay Area Business E-Waste Study", only 35% of Bay Area businesses were clear about the e-recycling reuse and recycling options available to them. The EnviroMetrics E-Waste Data Archive reveals that 78% of Seattle businesses understand "well" or "very well" the issue of e-waste. In Houston, the figure is 69%. The data sets do not provide an apples-to-apples comparison. The EnviroMetrics figures reveal that Seattle and Houston businesses understand what e-waste is and possibly the importance of addressing it. The Code-Green survey asks about the familiarity that the Bay Area decision-maker has with the options available to him or her, which include recycling, reuse options such as donation, and reselling. The resulting percentage is some subset of the percentage of businesses in the Bay Area which understand the issue of e-waste. When Bay Area decision-makers are asked "How important is recouping costs as a criteria when selecting an e-waste vendor? (from 1-5; 5 being the most important)", the average response is 2.4. This score is lower than a host of other criteria including environmental concerns, brand preservation, and convenience. The opinions of Seattle and Houston e-waste decision-makers differ. When asked to rank the significance of cost recovery in their e-waste strategy from 1 to 10, Seattle decision-makers rank cost recovery a 3.6, while Houston decision-makers rank it a 5.3.

Beyond attitudes and opinions, there are also differences between the regions in terms of actual e-waste practices. One area involves the number of vendors a company works with. E-waste vendors include recyclers, charities that accept electronics, and resellers who refurbish and sell the used equipment. In Silicon Valley, 65% of businesses work with multiple vendors. In Seattle and Houston, the percentages are far lower- 39% and 26% respectively. This may owe to the fact that Silicon Valley businesses recycle more kinds of equipment, such as cell phones, than their business counterparts in Houston and Seattle. Doing so often entails working with separate vendors to recycle or remarket each specific device. Another area where practices differ is the criteria used to select e-waste vendors. In the Bay Area, the top three criteria in determining an e-waste strategy are:

1. Convenience / Comprehensiveness: Ease of implementation and approaches that involve the least time/hassle
2. Environmental Concerns: Such as impact on local community
3. Business Concerns: Cost recovery

Convenience is the top criteria, by a large margin, to e-waste decision-makers in the Bay Area. Since convenience trumps environmental concerns, it may suggest that environmentalism is a second-tier priority to Bay Area decision-makers. Alternatively, it may mean that e-recyclers equally address environmental concerns and that the chief differentiator between them is the convenience they offer. In Seattle and Houston, the top reasons to initiate an e-waste program (amongst businesses that have a formal, written e-waste policy) were "Environmental Reasons" and "Corporate Responsibility". The

emphasis on "Corporate Responsibility" may come as a result of the EnviroMetrics study's inclusion of larger corporations. Such companies often have a broader commitment to the community, given the greater risks such as brand liability from not engaging in responsible corporate practices.

The differences amongst the regions may owe to the unique characteristics of the region's e-recycling infrastructure. By infrastructure, I refer to the non-profit/private electronics recyclers, state or municipal sponsored drop-off points, and city or state-wide regulations that facilitate the collection and disposal of e-waste. In the Bay Area, there are 65 different e-recycling vendors, listed by CompuMentor's TechSoup database[7]. Vendors include private firms such as Hackett Electronics in San Jose which resells used electronic equipment, non-profits such as "Excess Access" in San Francisco which matches available inventory with non-profit needs, and schools such as Oakland Technology Exchange. Alameda County's StopWaste.org site maintains a database of recyclers of specific kinds of electronics. A search for cell-phone recyclers reveals 37 vendors in the Bay Area[8]. The relatively large number of cell-phone recyclers may explain the high rate of cell-phone recycling by Bay Area businesses. According to the TechSoup database, there are 12 e-recycling vendors in the Seattle area. However, nine of the twelve are "Microsoft Authorized Refurbishers" which means they have a contract with Microsoft to install the Microsoft Windows operating system on donated PC's. Therefore, despite a lower number of e-recyclers in Seattle, there is a high percentage of

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[7]

http://www.techsoup.org/resources/index.cfm?action=resource.view_summary&resourcelist_id=145&order=title&style=recycle&stateid=0&set=products

[8]

http://stopwaste.org/home/index.asp?page=36&actionview=Go2&actionstep=2&Go2DropDown=ele&Mat=CLT

professional operations. Seattle's overall e-recycling rate was below that of the Bay Area, but not significantly so. Perhaps with the expansion of its e-recycling infrastructure, Seattle may see its business e-recycling rate increase. According to the same TechSoup database, there are seven e-recyclers in Houston, which may explain its lower rate of e-recycling. Conspicuously absent from the Houston list are commercial recyclers. Another factor which may account for differences in e-waste rates is state-wide regulation. In California, former Governor Gray Davis signed the E-Waste Collection and Recycling Act, which subsidizes the collection and demanufacturing of CRT (cathode ray tube) computer monitors. Each CRT contains several pounds of lead, an environmental pollutant. E-recyclers are compensated per pound for CRT monitors recycled. While this law may have boosted Bay Area e-recycling, Seattle may also benefit from pending legislation that would be the strictest e-waste regulations of any state in the nation. The Washington state legislature is considering a bill, based on the European WEEE (Waste Electrical and Electronic Equipment) regulations, that puts the burden of electronics recycling on manufacturers. Such a law might simplify and subsidize the cost of business e-recycling.

There are subtle differences in the e-waste recycling landscape between the regions. The Bay Area has the highest rate of e-recycling, but also boasts the most developed e-waste infrastructure with a wide variety of e-recyclers- small and large, non-profit and commercial. Bay Area businesses have the luxury of choice when it came to finding an e-recycling partner that suits their needs. In addition, they benefit from a California law that financially subsidizes the recycling of CRT computer monitors. Seattle has a slightly lower e-recycling rate. This could change with an expansion of e-

recycling vendors and a new statewide law that forces electronics manufacturers to cover the costs of recycling their used equipment. As Texas is home to major computer makers such as Gateway and Dell, it is unlikely that the state would pass a similar law to Washington's. However, Houston could also benefit from a broader variety of e-recyclers that could cater to the needs of the heterogeneous business community.

As the fastest growing source of toxics[9], e-waste is a significant environmental challenge. According to a report by the Silicon Valley Toxics Coalition, "About 25-30% of the groundwater beneath and around Phoenix has been contaminated resulting in a 15 mile long toxic plume - 70% of this by the high tech electronics industry". Given this dire predicament, along with greater recognition of the e-waste problem, Bay Area businesses are moving towards responsible practices regarding electronics disposal and reuse. By the data, Houston and Seattle have comparable rates of business e-recycling, suggesting that awareness of the e-waste crisis reaches beyond Silicon Valley. As regulations increase and the e-waste disposal landscape matures, business e-recycling rates may continue to rise nationwide.

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[9] http://ewaste911.org/ewaste.html

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