Good Guys Electronics Take-back Pilot Project

Testing the take-back of televisions for recycling at Good Guys retail stores in Washington State

Project Report

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Northwest Product Stewardship Council &
US Environmental Protection Agency

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Executive Summary

Project Snapshot

Q: ***Is it feasible for large (big box) retailers to collect used electronics, including televisions, at their stores for recycling?***

A: ***Yes – In-store take-back at retail locations is feasible and, with the incorporation of lessons learned through this pilot, can be established on an on-going basis under current conditions.***

Background

Electronic waste is a rapidly growing problem. Western Washington households will generate more than one million obsolete electronics in 2005, more than half of which is comprised of used television sets. Disposal is challenging because these products contain toxic materials such as lead, mercury, and cadmium that, if improperly handled, can damage human health and the environment.

Without a state or nationally legislated financing system, such as those recently adopted in California and Maine, government agencies, electronics manufacturers, retailers and recyclers are faced with the question of how to finance and facilitate the convenient collection and recycling of used electronics on a local level.

To address the issue, in August 2004, government agencies of the Northwest Product Stewardship Council (NWPSC) worked with electronics retailer Good Guys to administer an in-store television collection and recycling pilot project. The pilot project invited customers to bring their old television sets to four Good Guys stores in Western Washington for recycling.

The program was designed using a product stewardship model where electronics manufacturers, retailers, consumers and local governments contributed to the funding and implementation of the pilot program. Funding for the project included a grant from the Environmental Protection Agency (EPA), contributions from Good Guys, electronics manufacturers JVC, Philips, Pioneer, Samsung, Sharp and Sony, consumers and the participating NWPSC government partners.

Pilot Project At-A-Glance

Why

To determine if it is logistically feasible and financially sustainable to take back electronic products, such as televisions, at big box retail stores. In addition, the pilot project sought to determine if this type of program provided the public with convenient locations where they could bring their used electronics for recycling. The use of coupons good toward 10 percent off the purchase of a new TV from participating manufacturer brands was also tested to see if sales could be increased at the stores.

Who

- Good Guys, one of the largest specialty retailers of high-end home entertainment electronics in the nation.
- Electronics manufacturers JVC, Philips, Pioneer, Samsung, Sharp and Sony.
- Recyclers Philips Services Corporation and Total Reclaim, Inc.
- The Northwest Product Stewardship Council (NWPSC) government agencies including King County, Snohomish County, City of Seattle, City of Tacoma and the Environmental Protection Agency.

How

Good Guys collected used televisions for a fee at four of their retail stores over a four week period. Customers paid $10 to recycle standard televisions and $25 for console televisions. The used televisions were brought into the store where they were packaged and stored until scheduled pick up by the recycler. They were then transported to a local facility where they were disassembled into key recyclable components including glass, metals, and plastics. The materials were then shipped to final domestic processing facilities. The total pilot program costs were $222,968. The costs to collect, transport and recycle the electronics comprised 24% of the budget and averaged $0.25 a pound for a total of $53,458. A significant portion of the budget, 30%, was spent on program planning including the recruitment of retailers and manufacturers.

When

Four weeks from July 8 to August 7, 2004.

Where

Good Guys retail stores located in Bellevue, Lynnwood, Puyallup and Tukwila in Washington State.

Want more information?

Visit www.productstewardship.net.

Planning and Execution

With funding from the EPA secured, the first step was to recruit manufacturer and retail partners to participate in the pilot program. Primary recruiting methods included conference calls, solicitation letters, and face-to-face discussions. Following several meetings, Good Guys signed on to run a television recycling pilot program at four local stores. Subsequent recruiting efforts aimed at Good Guys' key television vendors resulted in financial commitments from six manufacturers – JVC, Philips, Pioneer, Samsung, Sharp and Sony. Each manufacturer contributed $5,000 to offset recycling costs.

After soliciting bids from local electronics recyclers, Good Guys partnered with Philips Services Corporation (PSC) to handle equipment pick-up, transport, recycling and tracking. PSC delivered collected equipment to Total Reclaim, Inc., located in Seattle, where the parts were segregated for recycling by domestic processors.

Good Guys and the government partners developed a logistics plan for the collection, storage and transportation of the e-waste to the disassembly facility. The general approach was to have the customer bring their television into the store where the sales staff would take the TVs from customers and direct the customer to the register to pay the recycling fee. The customer would receive a discount coupon good toward the purchase of a new television made by participating manufacturers. They were also asked to fill out a short survey about the program. TVs were stored on-site for scheduled pick-up by PSC trucks and were transported to Total Reclaim for disassembly and recycling.

Each store had varied levels of success with this system depending upon the storage capacity, volume of TVs received, and staff resources. As the program progressed, alternative logistical methods for storing, packaging and transporting the TVs had to be employed at two of the stores due to the large volumes of TVs coming in and storage space constraints.

Results

Recycling

The Good Guys pilot project collected more than 4,000 televisions, double the projected number. Total weight of all televisions was 197,000 pounds, or 98.5 tons.

Recycled materials totaled 166,000 pounds, including:

- 26,000 pounds of plastics
- 7,000 pounds of copper wire
- 11,000 pounds of circuit boards
- 15,000 pounds of other metals
- 107,000 pounds of CRT glass (including 10,000 pounds of lead from the CRT glass)

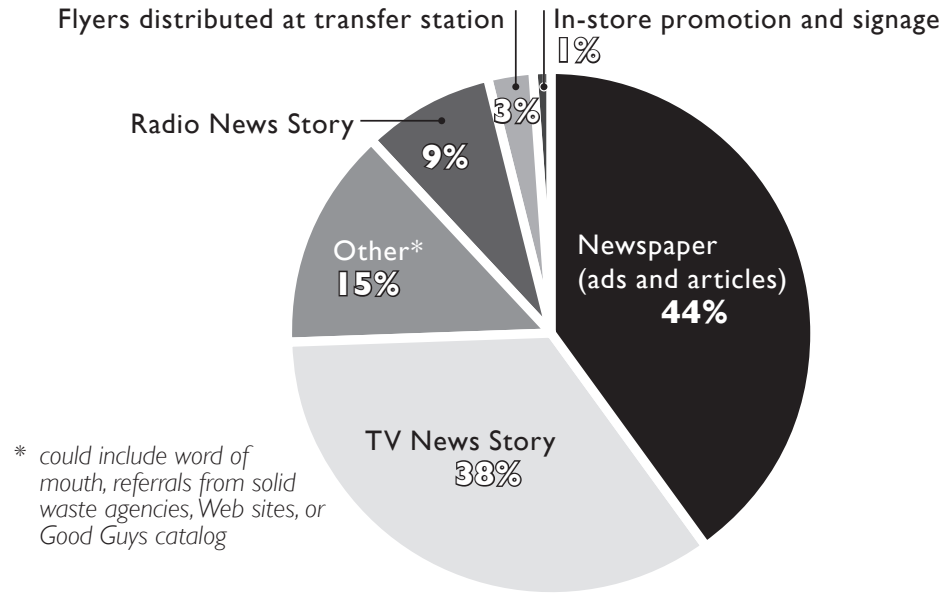
Promotion

Good Guys ran an advertising campaign that included newspaper ads and a notice on the cover of the Good Guys catalog, which was delivered to all their Western

Washington customers, at a cost of $74,246. In addition to paid advertising, the program received significant local media coverage (earned media). Coverage included at least two radio stories, seven television news stories, ten newspaper articles, and stories in several magazines and online journals. The value of the earned media is estimated to be $138,000.

Figure 1
HOW CUSTOMERS HEARD ABOUT THE PROGRAM

source: on-site customer survey



Customer Feedback

Customers were asked to fill out a survey when they paid the recycling fee at participating Good Guys stores. The 1,043 returned surveys indicated a high level of satisfaction with the program:

- 99 percent reported that store staff was helpful and knowledgeable.
- 99 percent reported that the service was easy to use.
- 96 percent thought the price was reasonable.
- 99 percent reported that they were likely to use the service again if offered.

Other significant findings:

- 43 percent of the customers had not been to a Good Guys store before.
- Approximately three-quarters of customers reported that they participated to "help the environment."
- Many customers reported that they participated because the program was convenient (39 percent) and because of the low cost (24 percent).
- 9 percent of customers reported that they participated in the program because of the discount coupon.

- About 5 percent of the customers reported making a purchase while in the store.
- 5 percent reported using the discount coupon that was offered.

Costs & Funding

The cost to recruit retailers and manufacturers to participate in the pilot project and to plan and implement the Good Guys pilot project was $222,968. The costs to transport the televisions from the retailer to the recycling facility and to recycle the equipment averaged $0.25 per pound.

Almost a third of the budget , $66,748, was spent on the recruitment of retailers and manufacturers to participate in the program. These are costs that would not be required for the set up of a take-back program at a retail store. Therefore it is likely that the costs for implementing an ongoing electronics take-back program at a retail store would be less than those reported in this pilot project. Costs could be reduced further by controlling the volumes of equipment coming in by limiting paid advertising, adjusting recycling fees and providing the program as a standard part of customer service.

Table 1
SUMMARY OF PROJECT COSTS

ACTIVITY	COST	%
Planning and setup	$66,748	30%
Collection	$4,239	2%
Transportation	$15,920	7%
Recycling	$33,299	15%
Paid Advertising	$74,247	33%
Evaluation	$28,515	13%
Total Pilot Project Costs	**$222,968**	**100%**

The program was financed by a grant from the EPA, recycling fees charged to the customer, contributions from manufacturers, Good Guys and the government partners.

Table 2
PROJECT FINANCING

EPA Grant	$41,000
NWPSC Government Partners	$38,088
Manufacturers *(JVC, Philips, Pioneer, Samsung, Sharp and Sony)*	$30,000
Recycling Fees	$49,090
Good Guys	$64,790
Total Funding	**$222,968**

What We Learned

The pilot project's primary question — "Can a retail take-back program work?" — was affirmatively answered, and the program partners took away several other key lessons.

Take-back of televisions at electronics retail stores is logistically feasible. The project demonstrated that electronic equipment, such as televisions, can be taken back at a retail store if the program is designed to accommodate the available storage space and staffing resources. Key elements to consider when designing the program include methods for packaging and storing the materials, the frequency of collection or shipment of the equipment, and ways to control the volume of materials that come into the store. It is essential to have a contingency plan in case unexpectedly large volumes of equipment are brought in.

Managing volume is critical. For a program to be sustainable, organizers must control the volume of equipment to the maximum extent possible. Three elements — limiting publicity, charging recycling fees and offering the program on an ongoing basis — are essential to managing volume. Offering the public "free" recycling programs under the current e-waste recycling infrastructure can result in unmanageable volumes of equipment and therefore a program that is not sustainable.

Under the current infrastructure, retail take-back programs can be financed using end-of-life recycling fees. It is feasible to cover the costs of collection and recycling of used electronics by charging customers a recycling fee when they bring the product in for recycling (end-of-life fees). This type of interim program, however, will only appeal to those willing or able to pay the end-of-life fee. Alternative financing systems, such as front-end financing, should be developed.

The program brought positive media coverage for Good Guys. The estimated earned media value was $138,000, reaching more than 4,216,894 consumers in the Western Washington area.

The project was popular with both new and existing customers. The pilot project demonstrated that customers responded favorably to the program, bringing in double the projected volumes of TVs. Ninety-nine percent of customer survey respondents said they would use the recycling program again if offered. Almost half of program participants had never visited a Good Guys store before and awareness of Good Guys increased by four percent from February through August in the Washington market.

The program produced environmental benefits. More than 4,000 televisions were recycled. This kept 10,000 pounds of lead, 197,000 pounds of CRT glass, 26,000 pounds of plastics and 22,000 pounds of metals out of area landfills. By recycling and

reusing these materials, mining and drilling for new materials can be avoided, thus reducing environmental degradation.

The program can be designed to encourage sales. Incentives, such as discount coupons, that encourage the customer to buy a new product and recycle an old one may be helpful in boosting sales at store locations. This program was successful in driving first-time customers into retail stores, which can lead to future purchases.

Clear communication between management and staff is critical. Store staff should receive detailed program objectives, clear expectations, and ample time for training and information distribution. Staff should be educated about the recycling process so they can explain it to customers, and managers should communicate any contingency plans to staff in case the program hits a snag.

Implications of Front-End Financing Systems on Retail Take-back Programs

A number of front-end financing systems are either currently in place, are being established or are anticipated in the relatively near future in the United States. The two front-end financing models currently gaining attention are the Advance Recycling Fee and the Manufacturer Responsibility model, also known as the Cost-Internalization model. Effective front-end financing can foster the sustainability of in-store take-back programs in four ways. Front-end financing systems will:

Reimburse the retailer for the costs of collecting the used electronics at the retail store. A front-end financing system that includes a "collection incentive payment" will cover retailer collection costs. A collection incentive payment is a set amount paid to the retailer (the "collector") from the funds collected via either an Advance Recovery Fee paid at the time of product purchase or via a manufacturer Cost-Internalization system. Front-end financing eliminates the need to charge customers end-of-life fees and removes the financial risk from the retailer.

Provide opportunities for many entities to become collectors of electronics. The availability of reimbursement funds provides an incentive for multiple organizations to become collectors of electronics. Customers will have numerous, conveniently located sites where they can bring their e-waste for recycling. As the number of collection sites increases and more services become available, there is less of a chance that large volumes of material will inundate an individual collection site.

Eliminate the "pent-up demand" that can result in a collector receiving a flood of materials. As more collectors provide ongoing programs, people will clean

out their basements and attics, effectively reducing the stockpile of old, obsolete electronic products. After that point, the volumes of products will remain more consistent and will flow more evenly into the collection locations.

Attain process efficiencies that result in additional cost-effective collection services. Front-end financing systems eliminate the need for staff to collect fees when the product is brought in for recycling. Such a system also provides incentives for more transport and processing services to develop and will make it easier for collectors, such as retailers, to access these services. Recyclers/processors will have to comply with environmentally sound management standards (in order to qualify as a registered recycler and receive payments) so the retailer does not have to conduct its own due diligence to ensure that the recycler/processor is complying with all laws and requirements. This also helps reduce the retailer's liability.

Recommendations

Financing

In areas that have no front-end financing system in place, providing financing for sustainable, ongoing retail take-back programs will be an issue. The following are recommendations for conducting take-back programs in areas where there is no front-end financing infrastructure:

- Charge customers an end-of-life fee that is high enough to cover the program costs and helps to control the volume of equipment that comes in to the store.
- Seek financial support from manufacturers to cover some of the recycling costs.
- Cover some program expenses by incorporating them into product price or cost of doing business.

Managing Volume

In order for the program to be sustainable, it is essential to manage the volume of materials coming into the store. Recommendations for controlling volume include:

- Determine the volumes of material that staff can reasonably handle without affecting normal business operations.
- Base the frequency of pick up by the recycler on the rate of incoming equipment and the available storage space and adjust the frequency as needed.
- Provide the recycling service on an ongoing basis, not as a special offer or event.
- Charge adequate end-of-life fees to manage the volume.
- Limit advertising.
- Consider offering a one-for-one take-back, i.e. when a customer buys a new TV, the retailer takes back the old TV to be recycled.

Recommendations for Good Guys

Good Guys' 71 stores are located throughout California, Nevada, Oregon and Washington. There are 60 stores in California, two stores in Nevada, three stores in Oregon and six stores in Washington. Of the 71 stores, 61 exist in California and Snohomish County, Washington where televisions are banned from disposal. The NWPSC recommends the following next steps for Good Guys:

Establish an ongoing end-of-life fee program in six stores in Washington. Building on the knowledge and relationships gained in the pilot, Good Guys could offer an ongoing end-of-life fee based program at their Washington stores that is financially and logistically viable. NWPSC offers these recommendations:

- Offer the recycling service to customers during regular store hours.
- Consider charging approximately $20 for standard televisions and $30 for big screen and consoles or an adequate amount to cover the collection, transportation and processing.
- Consider providing one-for-one take-back at no charge. In other words, allow one television to be recycled at no charge for customers buying a new television.
- Join the Snohomish County and King County Take it Back Networks (www.metrokc.gov/dnrp/takeitback) and be listed as a member in the brochure and on the web sites. This program can provide a modest amount of targeted publicity in lieu of spending advertising funds to publicize the program.
- Establish an on-going contractual relationship with one or more of the manufacturers involved in the pilot to help cover the costs of collecting TV's commensurate with their volume of sales through Good Guys.

Consider establishing an end-of-life fee program similar to the Washington program in Oregon and Nevada Good Guys stores. Based upon the knowledge and experience gained from the take-back pilot program in Washington, Good Guys could implement similar programs at the three stores in Oregon and two in Nevada.

Establish take-back pilot projects in a limited number of Good Guys stores in California to determine the feasibility of becoming an e-waste collector under a front-end financed system. Good Guys stores are in the unique situation of being one of the only television retailers to have conducted an electronics take-back program at retail stores. California is now accepting applications for collectors of electronics via their new statewide e-waste recycling system. Several Good Guys stores could apply to become a collector and receive reimbursement at the rate of $0.20/pound for the materials collected. These pilot stores could be used to test the assumptions about how a front-end financed electronics recycling system would work for a retailer providing collection services to customers.

Consider establishing an end-of-life fee program at CompUSA stores. Good Guys is a subsidiary of CompUSA, which has about 250 stores nationwide. CompUSA can benefit from the lessons learned during the Good Guys pilot project and programs offered by other retailers, in addition to providing customers with an added service. As more local and state governments ban televisions and computers from disposal, consumers will welcome an easy solution for their old products when they buy new ones. Customers will begin to expect this service as more retailers offer these e-waste recycling programs.

NWPSC recommends that CompUSA establish its own voluntary in-store take-back program with the following features:

- Provide on-going in-store take-back as a standard business practice.
- Use end-of-life fees to cover costs of program and control volume.
- Partner with product manufacturers to reduce the cost of recycling products. Offer recognition in exchange for recycling funds.
- Adjust end-of-life fees to cover costs remaining after any manufacturer contributions and to control volume in areas where there are limited recycling services.
- Consider establishing an ongoing one-for-one take-back system where customers purchasing a new product can recycle a similar product for no charge.
- Require environmentally sound recycling standards from all recyclers and processors participating in the program.
- Conduct pilots with stores in states that have front-end financing mechanisms, currently California and Maine to understand how those systems affect in-store take-back dynamics.
- Work with local and state government partners to design and establish pilots and programs.

Chapter 1

Background

Problem Statement

THE E-WASTE PROBLEM

Electronic waste (e-waste), including computers, TVs and cell phones, is a rapidly growing problem. With advances in technology and lower prices, consumers replace electronic products as often as every two years. In Washington State, households in Whatcom, Skagit, Snohomish, King, Pierce and Thurston Counties will generate more than one million obsolete electronics in 2005. Of that, industry experts expect 56 percent of the waste stream, or 733,000 units, to be television sets.[1]

Experts predict that the upcoming transition from analog broadcast signals to digital signals in 2006 may increase the demand for high definition televisions (HDTV) and therefore increase the number of analog televisions that need to be recycled. Industry experts also note that the prices of HDTVs are starting to come down as manufacturing processes become more efficient, making the purchase of new HDTVs even more attractive.

Disposing of electronic products is problematic because they contain toxic materials such as lead, mercury, cadmium and brominated flame retardants. In many cases cell phones, monitors, and TVs that contain cathode ray tubes (CRTs) contain enough lead to classify as hazardous waste. Flat panel displays, such as those in laptop computers, contain mercury in the backlighting which is also a toxic material.

Many of the materials in electronic products such as glass, metal and plastic can be recovered and used again in other applications. The proper recycling of e-waste can save resources and can keep the toxic materials out of our landfills. Environmentally sound recycling, rather than disposal, is the solution that most governments favor.

In Washington State, the waste management priorities are reuse, recycling and then disposal. To encourage reuse and recycling and to prevent hazardous materials from entering the solid waste stream, many local governments have banned certain electronic products, including TVs, from their solid waste disposal facilities. However, many agencies are not equipped to handle collection and recycling of these materials at their transfer stations or household hazardous waste facilities because of the expense to collect, store, transport and/or process e-waste.

1 *Cascadia Consulting Group, Inc. and Sound Resolutions for Seattle Public Utilities, 2003, E-Waste Generation in Northwest Washington.*

The local electronics recycling infrastructure is steadily developing. Large corporations have several options for recycling their used computers and televisions. Electronics recyclers prefer to work with large businesses because they tend to turn over their equipment more frequently and generate large volumes at one time. Many large businesses have purchasing contracts with computer manufacturers that require the manufacturer to take back the equipment for reuse or recycling via an asset management program. Businesses sometimes lease their computers and other electronic equipment so that they don't have to deal with the final disposition of the equipment. These leasing agreements ensure that the used equipment will be replaced and managed while it still has a resale value and before it becomes obsolete.

However, many of the services are still not convenient for residents and small businesses. Small businesses and residents with one or two outdated computers or other electronic devices do not have as many options. They usually have to transport the TV or computer to a collection location and then pay a fee for the recycling service.

The organizations that collect the used electronic equipment for a fee may take the materials to a domestic facility where the recyclable components are disassembled and sent for final processing. Companies that disassemble and recycle the materials domestically usually charge a fee for their services because of the costly labor required to tear down the equipment into its recyclable components. This is especially true of television sets which are often large, old and are constructed of various materials such as press board with wood veneer, wood grained plastics and other non-recyclable materials. Recycling rates for televisions has been documented at $15 for smaller TVs to more than $100 for console televisions.

In other cases, a broker purchases the electronics and exports the materials overseas for disassembly and/or processing. If the broker is paying the collector for the equipment, the broker may be exporting the materials to a country where the labor is less expensive and the products can be disassembled at a lower cost.

Under current U.S. law, it is not illegal for brokers to send electronic equipment overseas for recycling, however, it is an area for concern. Recent reports claim that some overseas recycling practices are dangerous and may cause harm to human health and the environment.[2]

The United States exports an estimated 50- to 80-percent of its electronic waste to countries like India, China and Pakistan. In these countries, workers, many of whom are children, disassemble computers by hand to reach the copper, aluminum and steel that can be sold and reused. Many wear little or no protective clothing and have minimal environmental protections. In addition to the risk to human health caused by handling toxic materials, improper disposal of these materials has led to environmental contamination.

In summary, electronics equipment is a growing waste stream that contains toxic materials that need proper handling. Many electronic products, including computer monitors and TVs, are designated as hazardous wastes and should be recycled. The

2 *February 24, 2003, issue of the Washington Post, "China Serves as Dump Site for Computers" and the Basel Action Network*

current recycling options for residents and small businesses are expensive, inconvenient and the fate of the materials sent for recycling is often in question.

Goal Statement

The goal of the pilot project was to test the feasibility of collecting used electronics in a retail setting and to determine whether this arrangement can provide the public with a network of convenient ongoing drop-off locations. The pilot project would use a product stewardship model where government, electronics retailers, electronics manufacturers and consumers would share in the cost of the program to provide a solution to the e-waste problem.

Project Objectives

The following objectives were established for the pilot project.

- The program will provide the public with convenient, ongoing locations for dropping off its used electronic equipment using private sector services.
- The program will provide recycling services for some or all of the following electronic equipment: televisions, computer monitors, central processing units, laptop computers, cellular phones and computer peripherals.
- Large electronics retailers will take back electronic products from the public at their retail stores for at least six months.
- Manufacturers will contribute resources to offset the costs of collection, transportation and recycling.
- The program will test different logistics including:
    - » collection at retail stores,
    - » storage of materials at the retail store and/or distribution center,
    - » methods for packaging the materials for transport,
    - » methods for transporting the materials to the recycling facility including pickups by recyclers on a geographic basis (milk runs) and reverse logistics whereby the materials would be shipped to the recycler in a delivery truck that would otherwise be heading back to the distribution center empty.
- The electronic products will be recycled domestically in an environmentally sound manner.
- The program may test different promotional tools such as one-for-one take-back and coupon offerings in a retail setting if retail partners are interested in pursuing these types of activities.
- The program will serve as a model for the national electronics recycling infrastructure that is being developed via the National Electronics Product Stewardship

Initiative (NEPSI) dialogues. The results and experience gained from this program can be used to help develop the national electronic recycling infrastructure.
- The program will demonstrate how to expand the EPA Plug-In to eCycling program to include ongoing retailer take-back of electronic products and will model how to roll out the program on a regional basis.

Project Partners

Government agencies: The following members of the Northwest Product Stewardship Council (NWPSC) participated in the project:
- City of Seattle
- City of Tacoma
- King County
- Snohomish County
- EPA Region 10.

These government agencies helped coordinate the project, provided assistance to the retailer, publicized the project in their local communities, and evaluated the project. In addition, Pierce County provided promotional support.

Retailer: Good Guys, a national retailer of consumer electronics, collected televisions at their Washington stores in Lynnwood, Puyallup, Bellevue and Tukwila for a period of one month during the summer of 2004.

Manufacturers: JVC, Philips, Pioneer, Samsung, Sharp and Sony contributed funds to offset the costs of recycling the televisions.

Recyclers: Philip Services Corporation collected the electronics from the four stores and worked with Total Reclaim, Inc. to disassemble and transport the equipment to final domestic processors.

Chapter 2

Pilot Project Description

Project Implementation

In 1999, a group of local governments in the Pacific Northwest created the Northwest Product Stewardship Council (NWPSC) to work with businesses and nonprofit groups to integrate product stewardship principles into the policy and economic structures of the Pacific Northwest.

In the spring of 2003, the NWPSC drafted a joint grant proposal and applied for funds from the U.S. Environmental Protection Agency (EPA) to coordinate and evaluate a pilot project(s) in the Pacific Northwest that modeled the product stewardship principles. The EPA awarded funding to the project as part of its Plug-In to eCycling campaign in late August 2003. The EPA also awarded funding to two additional electronics recycling pilot projects, one in Minnesota and one in the EPA Region I states.

The goals of the Plug-In to eCycling campaign are to:

- Facilitate partnerships with communities, electronics manufacturers, and retailers to promote shared responsibility for safe electronics recycling.
- Establish pilot projects to test innovative approaches to safe electronics recycling.

The Plug into eCycling campaign had already signed on a large number of electronics manufacturers and retailers as "Plug-In Partners," that were committed to collecting, reusing, and/or recycling old electronics. The objective of coordinating the pilot projects with the Plug-In to eCycling program was to help recruit the Plug-In Partners to participate in the various pilot projects either by contributing funding to help offset the costs of recycling the products or to participate in the actual take-back of electronics.

National Manufacturer and Retailer Participation

Recruitment of the manufacturers and retailers began in June 2003. On behalf of the pilot projects, EPA staff with the Plug-In to eCycling program arranged several conference calls with the Plug-In Partners. The staff asked the Partners to participate in one or more of the pilot projects as part of their commitment to the Plug-In to eCycling program.

The EPA hosted the first conference call with both the electronics manufacturers and retailers on June 26, 2003 to explain the scope of the three pilot projects and to provide them the opportunity to ask questions. The EPA hosted another conference

call with retailers on June 30, 2003. Additional conference calls were held on July 15, 2003 for all parties interested in the pilot projects (including recyclers and non profit groups) and on October 7, 2003 for Wal-Mart, Target and Boise Office Solutions.

On October 20, 2003 the EPA sent a letter from EPA Headquarters to the Plug-In to eCycling partners, as well as major retailers and manufacturers who were not partners, officially asking for their participation in the pilot projects. The letter asked the businesses to indicate their interest by November 14, 2003.

In addition to the letter, the pilot project leads (representatives from Minnesota, Snohomish County, WA and the Product Stewardship Institute) contacted the manufacturers' representatives that they knew personally to discuss participation. The pilot leads also followed up with the Plug-In Partners who had not participated in any of the previous conference calls. The deadline of November 14 passed with no commitments to participate in the Pacific Northwest pilot project.

Local Retailer Participation

With the failed attempts to recruit retailers and manufacturers to participate in the Pacific Northwest pilot project, the pilot project leads from King County, Snohomish County and Portland Metro decided to contact the "big box" electronics retailers in Washington and Oregon directly. A consultant to the pilot project, PRR, compiled a list of electronics retail stores based upon the following criteria:

- the retailer has several stores in the Pacific Northwest area;
- the retailer was headquartered in or had a major presence in this region and/or;
- the retailer had the ability to operate programs on a regional level vs. nationally.

The list included Fred Meyer stores, Fry's Electronics, Gateway, Good Guys, Magnolia AV, Sears, and Video Only. PRR sent out an initial letter on January 22, 2004, introducing the pilot project and followed up with several phone calls to all of the retailers on the list (Appendix A).

As a result, Good Guys, based in Alameda, California, indicated that they would be interested in collecting televisions at several of their Washington stores for a limited period of time. The project leads hosted several meetings with the Advertising Manager at Good Guys to discuss the project details. The team drafted a Memorandum of Understanding (MOU) that outlined the responsibilities of the retailer and government partners. The MOU also contained a section outlining the data that Good Guys and the government partners were required to collect for the pilot project (Appendix B). Representatives from King County (the official grant recipient), Good Guys and EPA Region 10 signed the MOU.

Manufacturer Participation

In April 2004, Good Guys and the EPA sent a letter to Good Guys' key television vendors asking them to participate in the pilot project. Manufacturers had a deadline of May 5, 2004 to voice their interest in participating. The Good Guys Advertising Manager then contacted the vendors via phone to explain the program in more detail.

Six television manufacturers — JVC, Philips, Pioneer, Samsung, Sharp and Sony — committed to participating in the project. The manufacturers made arrangements to contribute $5,000 each to the project to offset the recycling/processing costs.

In turn, Good Guys committed to advertising the companies as program co-sponsors in the following media and promotional materials:

- A minimum of two Sunday inserts in local newspapers
- Two pages of run-of-paper (ROP) newspaper advertising, or equivalent
- Press releases and media opportunities
- Grass roots communications to governmental agencies
- All in-store signage
- A "Thank you" coupon from Good Guys to customers that brought in a TV to be recycled. The coupon was good for 10% off the purchase of a new TV from the participating manufacturer brands.

In addition, Good Guys committed to sharing all program data with these manufacturers, including the number, sizes and weight of TVs collected, partners' contributions, government contributions, overall program operational impact including staffing, costs, and the impact on business.

Store Locations, Materials Accepted and Timeframe

Good Guys accepted televisions for recycling at four store locations: Lynnwood (Snohomish County), Puyallup (Pierce County), Bellevue and Tukwila (King County).

Good Guys store in Bellevue, Washington

The program ran from July 8 through August 7, 2004. Good Guys charged a $10 fee for standard television sets and $25 for console TVs and asked the customer to bring the TV into the store where the recycling fee was charged. Good Guys also asked the customer to fill out a customer survey form about the pilot project. Staff then took the TVs into the back area near the loading dock and stored them either in the store or in a trailer for pick up by the recycler.

Discount Coupons

Good Guys decided to offer consumers that brought in a TV for recycling a coupon good for a 10 percent discount off the purchase price of participating manufacturer televisions. Customers received the coupons when they paid for the recycling service. Coupons were redeemable through August 21, 2004 in order to give people time to come back and use their coupon at a later date. Good Guys tracked the recovery of the coupons to determine if the pilot project resulted in a sales lift.

Customer Survey

A customer survey was conducted at all of the Good Guys stores. The survey (Appendix F) asked the customer how they heard about the program, whether they had been to the store before, why they participated in the program and whether they were satisfied with it. As an incentive to fill out the survey form, customers that filled out the survey were entered into a drawing to receive a $50 Good Guys gift certificate.

Recycling Logistics

Recycler Selection

Good Guys solicited bids from several local electronics disassembly/recycling vendors. Good Guys asked the vendors to bid on an estimate of 500 TVs per store for a total of 2,000 TVs during the duration of the pilot project. NWPSC based these estimates on the volumes generated by the Take-it-Back Networks[3] in Snohomish and King counties, Washington and on data from a one month long collection program held at Circuit City in the Minneapolis/St. Paul area in 1999.

Good Guys asked the bidders to provide costs for picking up, transporting and recycling the TVs in addition to tracking by brand and size of television. Bidders were also required to comply with Guidelines for Materials Management developed by the EPA for Plug into eCycling program partners (Appendix C).

Good Guys established an agreement with the vendor Philips Services Corporation (PSC). PSC agreed to package and transport the equipment from the four Good Guys stores and deliver it to Total Reclaim, Inc for disassembly and final processing. PSC was to provide kits for spill clean up to each store. Each kit would contain a labeled five-gallon bucket that would be used to contain the glass in the event that a television was broken. The bucket was to be placed with the TVs and the glass would be recycled with the TVs. PSC was also responsible for tracking the number and brands of TVs that were recycled through the program.

Collection, Packaging and Transportation

Customers bringing their televisions to the Good Guys stores either carried the television into the store, or if the TV was too heavy, the Good Guys staff used a hand truck to move the TVs from the customer's car into the store. Staff directed customers to the cashier area to pay the fee and receive the discount coupon. About halfway through the program, one store directed customers through the store to the video desk in order to insure that the customer would gain more exposure to the store.

Good Guys staff brought the TVs to the back of the store where they were stored in any available space, including hallways in some cases. Good Guys staff marked each television with a pink sticker to indicate that the TV was part of the pilot program.

3 *The Take it Back Network is a group of local electronics repair and resale shops, recyclers and nonprofit groups that take back electronic equipment for recycling on an on-going basis www.metrokc.gov/dnrp/takeitback*

Stacks of TVs collected through the pilot program.

This was important because there were some TV returns that were not part of the pilot project that were also stored in that area.

Under the original program design, PSC would collect the televisions from each Good Guys store two times per week. Because PSC does not operate on weekends, there were no scheduled pickups on Saturdays and Sundays. Each store was to receive three three-cubic yard boxes (Gaylord boxes) in which to store the televisions. A Gaylord box generally holds six to eight TVs.

The PSC driver, under the original plan, was to count the TVs at each store, record the size and brand of each television, repackage the TVs onto pallets, shrink-wrap them and load them into the truck. The truck would hold up to four pallets at a time. Based upon the original estimates of the number of TVs that would come in to the stores, it was expected that the driver would have enough capacity to pick up TVs from two stores on the same day.

In the event that a Good Guys store received more than three gaylord boxes of equipment and needed additional pickups, they were instructed to call PSC. Additional pickups would result in an additional charge.

Shortly after PSC delivered the Gaylord boxes to one of the stores, it was evident that the boxes would not work for the pilot program. They were too large to fit in some stores and did not have enough capacity to hold all of the TVs that were brought in on a daily basis.

On the first day of the actual collection event on Thursday, July 8, people were waiting at the doors with equipment before the stores had opened. As a result of the large volumes and the fact that the Gaylord boxes did not work well, the TVs were simply stacked in the back of the store near the loading docks and in the hallways where space would allow.

LYNNWOOD STORE

At the Lynnwood store, which received the largest number of TVs, an emergency pickup was required on the first day and PSC sent a truck out on Friday, July 9th. That evening it was evident that the store would run out of space for incoming TVs during the weekend. Since PSC did not work weekends and could not pick up the additional TVs, Total Reclaim volunteered to place a 28-foot trailer on-site for the weekend. Good Guys staff could then place the TVs directly into the trailer instead of having to stack them in the halls while waiting for the scheduled pickups by PSC's smaller truck.

Total Reclaim placed the trailer at the loading dock. Because Good Guys' merchandise shipments are delivered to the loading dock on Tuesday mornings, Total Reclaim returned to the store and removed the nearly full trailer on Monday night to

TVs were stored in trailers at the locations where large volumes were collected.

make room for the Good Guys delivery truck. Total Reclaim returned with an empty trailer on Tuesday afternoon after the delivery truck had left.

Originally PSC was to provide a truck and driver who would count and package all the TVs, load them onto the truck and deliver them to Total Reclaim. Since Total Reclaim's trailers were placed into use on the first weekend of the program, this became an unanticipated element in the logistics of the program and caused some confusion. As a result, the TVs were not initially counted and TV brands were not recorded.

The security system at the Lynnwood store is set up so that only the security company can open the back door to the loading bay area. Therefore Good Guys staff had to stand at the back doors during the entire time the TVs were loaded onto the trailer. The TVs were "loose loaded" into the trailers meaning they were stacked individually rather than shrink wrapped on pallets or secured into gaylord boxes. At least seven trailers out of 24 were loaded in this manner.

Since the TVs that were loaded into the trailers did not get counted, PSC set up a different system to count the TVs. After the program had already started the company made arrangements with Total Reclaim to count the TVs as they were unloaded from the trailers.

This system became very labor intensive for several reasons. The loose loads of TVs shifted during transport and made it difficult for Total Reclaim staff to open the trailer doors and unload the contents. Once the trailer doors were safely opened, staff had to unload the TVs by hand from the trailer, count them and then palletize or place the TVs in gaylord boxes to be moved into the facility with a pallet jack. This system required two people working a total of 4.5 hours to unload one truck.

As the volumes of TVs remained steady at the Lynnwood store, PSC decided to switch from the 28-foot trailers to 42-foot trailers so they wouldn't have to be replaced as frequently. PSC rented the trailers from a shipping company which freed up Total Reclaim's 28-foot trailers.

Total Reclaim became concerned about the amount of staff time and cost that would be incurred to unload the larger trailers and count the TVs. Total Reclaim was already receiving large volumes of equipment from summer recycling collection events and both space and labor were limited. In addition, a truck door became damaged by the loose loaded equipment and they were concerned that the shifting equipment might cause damage or injury to their employees.

To address these concerns PSC arranged for the final 42-foot trailer to be delivered to their

PRODUCT STEWARDSHIP

Product stewardship is an environmental management strategy that means whoever designs, produces, sells, or uses a product takes responsibility for minimizing the product's environmental impact throughout all stages of the products' life cycle. The greatest responsibility lies with whoever has the most ability to affect the lifecycle environmental impacts of the product.

Kent facility. They hired labor-ready employees to remove the loose loaded TVs from the trailer, count them, palletize, shrink wrap and reload them into trailers for delivery to Total Reclaim. The shipments were staggered so that Total Reclaim could manage the volumes. PSC hired a total of four labor-ready staff for approximately three days of work.

TUKWILA

The Tukwila stores also received larger volumes of material than was anticipated and after two and a half weeks of scheduled pickups by the smaller truck, Total Reclaim placed a 28-foot trailer on-site to handle the larger volumes. The Tukwila store had three loading bays which allowed Total Reclaim to drop the empty trailer at one of the bays. Total Reclaim picked up the trailer when it was full and replaced it at the same time with an empty trailer. There was no need to move the trailer to make space for deliveries.

BELLEVUE AND PUYALLUP

The Bellevue and Puyallup stores continued to use the original system of storing equipment in the stores while waiting for regular pick up by the PSC truck. PSC hired an additional person to help count, palletize, and load the truck because the volume of TVs was too large for one person to handle.

Disassembly and Processing

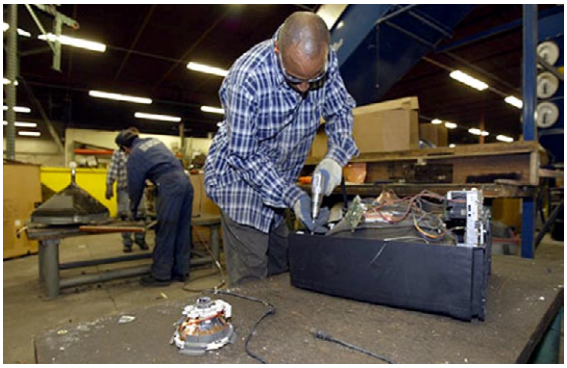
While reuse is higher on the solid waste management hierarchy than recycling, Good Guys and the Government Partners agreed that the local reuse market for televisions is very weak and can result in export to unmonitored facilities. They decided therefore that the complication and expense necessary for testing and identifying TVs appropriate for reuse was not warranted in this pilot.

The various components from the television were processed as follows.

TV Cases: First, Total Reclaim employees remove the backs of the TVs by hand. The black TV cases on newer TVs are made of a fairly standard type of high impact polystyrene. Many of the cases are stamped with a symbol indicating the specific type of plastic. When the plastic can be identified, Total Reclaim sends these polystyrene cases to PC Plastics in Portland, Oregon. The plastics are ground, pelletized and sold to Panasonic in Vancouver, Washington to be made back into TV cases.

Plastics without the stamped recycling codes are baled with the white plastics and are exported for reprocessing because there are no domestic markets available for mixed plastic recycling. Since plastic does not designate as a hazardous material there are fewer concerns about exporting this type of material.

Console and projection TVs are made of many different types of materials including wood, fiberboard, and wood-grained plastics. None of this material is recyclable and is removed by hand and disposed as garbage.



Total Reclaim disassembles TVs in preparation for recycling.

Cathode Ray Tubes: The cathode ray tubes are removed from the TV cases. The metal band that encircles the glass tube is ground off, the yoke is taken off the funnel and any remaining plastics, metal or rubber is cleaned off the tube. The tubes are then gravity dropped from a conveyor belt to break the glass and remove the steel mask that is embedded in the tube. The glass was sent to Envirocycle for recycling back into CRTs.

Metals: The yoke, also called the "deflection coil" or "deflection yoke," is positioned at the end of the electron gun's emitter around the funnel end of the CRT. The yoke is an electronically controlled device that generates a strong magnetic field and is comprised of copper, steel and plastic. The yokes are separated from the rest of the metals and are run through the shredder in one large batch to isolate the copper from the other metals.

The remaining metal components include the housing supports, metal trays, circuit boards and wires. These are run through the shredder in one batch and are mechanically separated into ferrous and nonferrous metals and low grade circuit boards.

Staff Training

Good Guys store managers, a representative from the government partners and two representatives from PSC conducted training sessions at each of the four stores and all sales staff was required to attend the training. The store manager explained the program and Good Guys's interest in providing the service to their customers. The government representative then provided background information and details about the environmental concerns regarding improper disposal of televisions. The PSC representatives outlined the procedures for packaging the TVs, the pickup schedule and what to do in case of breakage. Copies of the training materials are included in Appendix D.

Publicity and Advertising

Paid advertising by Good Guys

On July 8, the program start date, Good Guys ran full page, four-color ads in the following newspapers: the Seattle Times, Seattle P-I, Everett Herald and the Tacoma News Tribune.

On July 18 and July 25, Good Guys ran preprinted inserts in the Seattle Times, Seattle P-I, Everett Herald and the Tacoma News Tribune. At a midpoint in the

Good Guys Newspaper Ad

campaign Good Guys placed a quarter page advertisement in the Saturday edition of the Seattle Times. Good Guys also placed a front cover announcement on their July catalog that was mailed to 90,000 customers in the region. A complete list of paid advertisements is shown in Table 3 on page 24.

Good Guys and the government partners set up a web page under the URL www.Recyclemytv.com. The URL linked to a web page inside the Good Guys web site (www.goodguys.com) where the public was provided with specific information about the recycling program and the discount coupons.

Table 3
GOOD GUYS PAID ADVERTISING

Run of Paper Ads (ROP – placed on back outside of the first section of the paper)

DATE	NEWSPAPER	SPECS	CIRCULATION	COST
7/8/04	Seattle Times & Seattle P-I	Full page, 4-color	388,332	$17,935.45
	Tacoma News Tribune	Full page, 4-color	55,100	$4,610.00
	Everett Herald	Full page, 4-color	128,710	$0.00
7/31/04	Seattle Times & Seattle P-I	Quarter page, 4-color	388,332	$6,351.74
		TOTALS		
		ROP media total		$28,897.19
		ROP creative/production		$4,000.00
		ROP total		**$32,897.19**

Preprints (preprinted inserts placed into the paper)

DATE	NEWSPAPER	SIZE	CIRCULATION	COST
7/18/04	Seattle Times & Seattle P-I	4 BS	415,000	$13,658.48
	Tacoma News Tribune		50,857	$1,869.51
	Everett Herald		25,600	$1,146.88
7/25/04	Seattle Times & Seattle P-I	8 OT	415,000	$13,658.48
	Tacoma News Tribune		50,857	$1,869.51
	Everett Herald		25,600	$1,146.88
		TOTALS		
		PP total		$33,349.74
		Insert creative/production		$3,000.00
		Inserts total		**$36,349.74**

July Catalog

DATE	SIZE	CIRCULATION	COST
July	Front cover notice with ⅛ page description inside	90,000	$5,000.00*

**Note that this only includes the cost of producing the front cover announcement. The actual cost/value of the catalog is not included.*

GRAND TOTAL	
All paid advertising	**$74,246.93**

Discount Coupons

Customers that recycled their TV at Good Guys during the pilot project received a discount coupon in return. The coupon was good for 10 percent off the purchase of a new TV from one of the participating manufacturers — Samsung, Sony, Sharp, Pioneer, JVC and Philips. The coupon was good from July 8 through August 21,

Good Guys Discount Coupon

2004 at the four Seattle area Good Guys stores. Customers could not combine the coupon with any other offer, including financing, and had to present the coupon at time of purchase.

Publicity by Government Partners

The government partners in King, Snohomish, Pierce Counties, the City of Seattle and City of Tacoma publicized the Good Guys pilot project via a number of tools including press releases, a media event, web sites and flyers. See Appendix E for copies of the materials.

PRESS EVENTS AND RELEASES

On July 7, 2004, the project team held a press event at the Bellevue Good Guys store. Washington State Representative Mike Cooper and the EPA Regional Administrator, John Iani, attended the event.

Representative Cooper sponsored HB 2488, a bill that passed in the 2004 Washington legislative session requiring the Department of Ecology to conduct research and develop recommendations for implementing and financing an electronic product collection, recycling and reuse program in Washington. Several television stations interviewed both Rep. Cooper and Mr. Iani.

King County, Snohomish County, Pierce County, the City of Seattle, the City of Tacoma and the Environmental Protection Agency issued a joint press release on July 7, 2004. Snohomish County also sent a press release to local weekly newspapers and local radio stations on July 7.

The City of Tacoma included two "media briefs" in its weekly news advisory, one at the program kick-off and one at the close of the program that highlighted the program results.

FLYERS

King County distributed flyers about the Good Guys program to customers at its eight transfer stations. The City of Seattle distributed flyers at its two transfer stations and two permanent hazardous waste collection sites and at three Seattle neighborhood two-day summer festival events.

The City of Tacoma distributed flyers at the Tacoma Landfill. Snohomish County handed out flyers at its three solid waste and recycling transfer stations. The City of Lynnwood's recycling coordinator also had flyers for distribution.

WEB SITE

King County ran an announcement on the King County Home page (www.metrokc.gov) throughout the duration of the program. The City of Seattle posted the event on the Seattle Public Utilities main services page (www.seattle.gov/util/services/). The City of Tacoma ran an announcement on its city home page (www.cityoftacoma.org) and solid waste utility home page (www.cityoftacoma.org/solidwaste). Snohomish County ran an announcement of the program on its Electronics Recycling webpage (www.co.snohomish.wa.us/publicwk/solidwaste/programs/takeitback/).

All sites linked to the Good Guys site (www.recyclemyTV.com, no longer active) where the program was explained in more detail. EPA ran an announcement on the Region 10 home page and on the national Plug-In to eCycling webpage.

RADIO

Snohomish County purchased four radio spots per day for 10 days prior to the program launch on KSER 90.7, as well as two radio spots per day for 20 days during the pilot program. KSER conducted two 10 minute interviews with Snohomish County staff pertaining to the program on subsequent Monday mornings.

OTHER

Television announcements were placed on TV Tacoma, the municipal cable TV station, Channel 12 and CityPost, an electronic community bulletin board that operates on Channels 77/85. The City of Tacoma also ran articles in its employee newsletter, "Take 5."

Snohomish County, King County and City of Seattle's recycling information phone line staff provided referrals to the program in response to phone inquiries about electronics recycling.

Snohomish County promoted the program in the "Snohomish County's Employee Newsletter" and listed it on its employee electronic bulletin board which reaches 2,700 Snohomish County employees. King County also promoted the program on its employee electronic bulletin board with a readership of 14,500 employees.

Market Conditions During the Pilot Project

E-waste bans at disposal facilities

The responsibility for the administration of solid waste handling systems in Washington is divided among the state, counties, inter-jurisdictional health departments, and cities. The State Department of Ecology sets the minimum functional standards for the handling of solid waste in Washington. Cities and counties are required to adopt these standards via their local jurisdictional health departments. The

cities and counties enforce these standards at their solid waste handling facilities and can set standards and policies that are even more stringent.

The cities and counties in this pilot project area have differing policies regarding the acceptance of electronic waste at their facilities. Table 4 provides an overview of the solid waste facilities and the waste acceptance rules.

Table 4
SOLID WASTE FACILITIES AND E-WASTE DISPOSAL POLICY

JURISDICTION	POPULATION	FACILITIES	ELECTRONIC WASTE DISPOSAL POLICY
City of Seattle (in King County)	563,300	2 transfer stations	Prohibits disposal of computer monitors and TVs from both residential and commercial customers.
City of Tacoma (in Pierce County)	193,200	Landfill/transfer station	Prohibits disposal of computer monitors and TVs from businesses, schools and non-profit organizations..
King County	1,737,000	8 transfer stations, 2 rural drop boxes	Prohibits disposal of computer monitors from commercial customers.[4]
Snohomish County	637,500	3 transfer stations and 5 rural drop boxes	Prohibits disposal of computers, computer monitors, televisions, and other electronics that contain CRTs (cathode ray tubes), and separated computer circuit boards from all customers. Accepts computers and TVs for recycling at the transfer stations for a fee.
Pierce County	700,800	6 transfer stations	Accepts electronics for disposal.

The agencies that restrict the disposal of electronic waste at their transfer stations generally provide their customers with some level of public education about e-waste and their recycling options.

Level of public education about e-waste in participating communities

Each of the participating local governments has conducted various public education campaigns dealing with electronics waste and recycling. All of the cities and counties provide information on their web sites about proper methods of handling e-waste and list places where the public can bring their e-waste for recycling.

King County, the City of Seattle and Snohomish County operate a program called the Take it Back Network which is a group of local electronics repair and resale shops, recyclers and nonprofit groups that recycle or reuse electronic equipment. Participating computer and electronics stores distribute brochures about the program as do government agencies around the counties. The government agencies also maintain Take it Back Network web sites featuring information about network members and their recycling services.

The City of Seattle distributed the Take it Back brochures at their summer neighborhood festival events, "Use it Again, Seattle!" events, community service centers,

4 *King County plans to ban computers, computer monitors, televisions and cell phones from disposal at the transfer stations in mid-2005.*

Household Hazardous Waste sheds and transfer stations. The city mailed brochures to customers who call the Customer Service line for information about recycling e-waste.

In King County, the Solid Waste Division and the majority of the suburban cities offer recycling collection events where they accept computers and TVs for a fee and provide educational materials about electronics recycling.

Snohomish County stopped accepting computers, computer monitors, televisions and other electronics that contain CRTs (cathode ray tubes), and separated computer circuit boards as garbage on November 1, 2002. Leading up to this prohibition and since, the County has implemented an extensive public information campaign regarding the need to recycle electronics. The campaign has included radio spots, display ads, classified ads, yellow page ads, messages in the footer of phone book pages, bus cards, direct mailings to commercial generators, outreach to businesses that handle electronics, transfer stations handouts and signage, and extensive use of press releases. Promotional costs in 2003, a ramp up year, totaled about $45,000.

The City of Tacoma and Pierce County sponsored an electronics recycling event in 2002 that generated more than 8,000 electronic items and helped raise awareness of electronics recycling in general. Since the one-time event, Tacoma continues electronics recycling promotion with periodic articles in its EnviroTalk newsletter and up-to-date information on the web.

In general, communities that have policies restricting electronic equipment from disposal, such as Snohomish County, have conducted a significant amount of public education about their e-waste bans. There is a high level of awareness about the disposal bans and citizens are actively looking for alternatives.

Curbside programs with e-waste collection (Bellevue and Kirkland, WA)
During the week of June 28, 2004 the City of Bellevue launched a new single stream recycling program for residential customers. In this new system residents in single family homes can recycle, at no extra charge to the customer, small appliances including TVs up to 21" in size by placing them next to the large blue recycling containers on their regular garbage pick up day.

Rabanco, who is the City of Bellevue's waste management contractor, along with the city, delivered three to four pieces of collateral material explaining the new program to each resident. This new recycling opportunity for e-waste may have had some impact on the amount of small televisions coming in to the Bellevue Good Guys store.

The City of Kirkland, which borders the City of Bellevue, also has curbside collection of electronics which includes single family residential curbside collection of small TVs (21" screen or smaller). The city introduced the program in December 2003. The existence of this program may also have reduced the number of small TVs that might otherwise have been brought into the Bellevue store.

Other e-waste collection programs

On July 18, 2004, Office Depot launched a pilot project at all Office Depot stores in the United States. The Office Depot program accepted computers, peripherals, desktop copiers, and cell phones as well as televisions that measured less than 27" in size. Office Depot charged no fees to recycle the equipment through this program.

The Office Depot stores in Tukwila and Puyallup are located close to the Good Guys stores. Although there was minimal advertising about the opportunity at Office Depot stores to recycle televisions, this program may have had some impact on the Good Guys program, especially since the recycling was free to the consumer. The government partners distributed flyers to the four Office Depot stores in the vicinity of the Good Guys locations. The flyers provided information about the Good Guys TV recycling pilot project. Office Depot staff gave these flyers to customers that brought large TVs in for recycling. In turn, the Good Guys stores referred people that brought in computers to the nearby Office Depot locations.

Since the Office Depot program only overlapped during the final week of the Good Guys program and since Office Depot only accepted small TVs in a component of the program that was not well advertised, the effect on the number of TVs collected at Good Guys stores was marginal.

Competing events around the stores

The weekend of July 23–25, 2004 Bellevue held its sixth annual Arts Fair. The Arts Fair extended to 106th Ave between NE 8th and NE 4th Streets. 106th Ave was closed to vehicle traffic from Friday afternoon through Sunday afternoon. This is significant as the Bellevue Good Guys Store is located on 106th Ave at NE 6th Street and access to the store was hindered. This may have had an impact on the number of people able to bring a TV in for recycling during the Arts Fair weekend. The Bellevue store brought in 683 televisions over the duration of the project which was considerably fewer than the number that came in to the Lynnwood or Tukwila stores.

Chapter 3

Pilot Project Results

Quantity of Televisions Collected and Recycled

The Good Guys pilot project collected a total of 4,042 televisions. Customers brought in 3,464 standard televisions and 578 console models for recycling. The total actual weight of all televisions was 197,000 pounds or 98 tons, as weighed by Total Reclaim. Table 5 displays these totals in detail.

Table 5
NUMBER OF TELEVISIONS COLLECTED BY STORE

STORE	STANDARD	CONSOLE	TOTAL	ESTIMATED WEIGHT, IN POUNDS[5]
Lynnwood	1,673	239	1,912	93,000
Tukwila	855	126	981	48,000
Puyallup	356	110	466	23,000
Bellevue	580	103	683	33,000
Totals	3,464	578	4,042	197,000

The Lynnwood store collected 1,912 televisions which was far greater than the number collected at any of the other three stores. This is likely the result of the strong media coverage in the Lynnwood area, particularly in the Everett Herald, as well as the television disposal ban in effect in Snohomish County.[6]

The Bellevue store brought in fewer TVs than was expected which may have been a result of the Bellevue and Kirkland offering a curbside collection program for smaller TVs in addition to the interference from the Bellevue Arts Fair during one week of the program.

Total Reclaim reported the weight of the total number of TVs collected to be 197,000 pounds. Total Reclaim recorded the size and brand for most of the televi-

5 *The weight collected at each store was estimated by calculating an overall average weight per television of 49 pounds (197,000 pounds as reported by the processor/Total Reclaim divided by 4,042 televisions) and applying that average to the known number of televisions collected at each store.*

6 *The Lynnwood Store is in Snohomish County. The Bellevue and Tukwila stores are in King County, and the Puyallup store is in Pierce County.*

sions collected through the program. A small percentage of the televisions (approximately 16 percent) from the Lynnwood store did not get recorded due to the initial difficulties during the first weekend of the program. Due to the large volumes of TVs that came into the store, the TVs had to be placed directly into trailers instead of getting recorded and picked up by the PSC staff.

Total Reclaim identified more than 125 brands of televisions. The top three brands collected, RCA, Zenith and Sony, accounted for nearly 40 percent of all televisions collected. The television brands of the participating manufacturers — JVC, Philips, Pioneer, Samsung, Sharp and Sony — comprised approximately 20 percent of all televisions collected. Table 6 presents the relative fraction and estimated number of televisions collected for each of the top 40 brands represented.

Table 6
NUMBER OF TELEVISIONS COLLECTED: TOP 40 BRANDS[7]

Participating manufacturers are in **bold**.

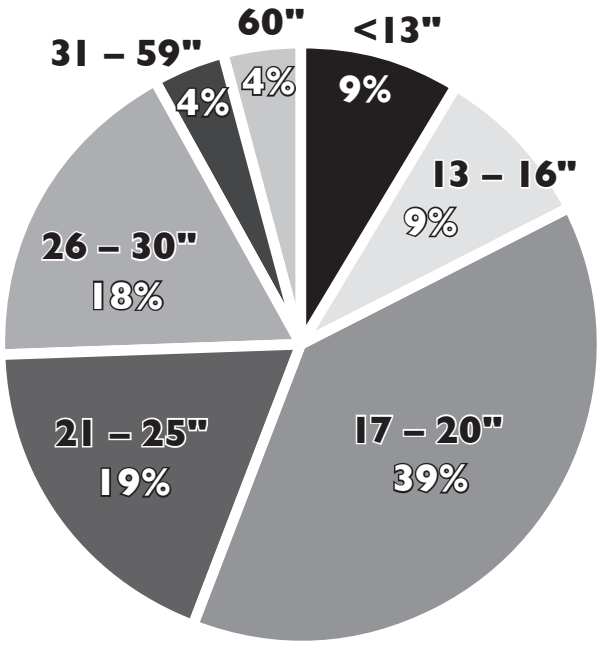
BRAND	FRACTION OF TVS COLLECTED	ESTIM. NUMBER COLLECTED	CUMULATIVE PERCENT
RCA	16.0%	648	16%
Zenith	10.7%	432	27%
Sony	10.3%	416	37%
Magnavox	5.7%	229	43%
Panasonic	5.3%	214	48%
Mitsubishi	4.8%	193	53%
JVC	3.4%	138	56%
Sears	3.4%	137	60%
Toshiba	3.3%	135	63%
Emerson	3.2%	130	66%
Sharp	3.0%	123	69%
G.E.	2.9%	117	72%
JC Penney	2.2%	87	74%
Hitachi	2.2%	87	76%
Sylvania	2.1%	85	78%
Quasar	2.0%	82	80%
Samsung	1.6%	66	82%
Sanyo	1.6%	66	84%
Philips	1.4%	55	85%
GoldStar	0.9%	35	86%
NEC	0.6%	24	86%
Fisher	0.5%	21	87%
Teknika	0.5%	21	88%
MGA	0.4%	18	88%
Symphonic	0.4%	14	88%
Trinitron	0.4%	14	89%
Philco	0.3%	12	89%
LXI	0.3%	12	89%
Curtis Mathis	0.3%	12	90%
Montgomery Ward	0.3%	12	90%
Daewoo	0.2%	10	90%
Motorola	0.2%	10	90%
Samsonite	0.2%	10	91%
Sampo	0.2%	8	91%
Portland	0.2%	7	91%
Proscan	0.2%	7	91%
Quazar	0.2%	7	91%
Pioneer	0.1%	6	91%
Funai	0.1%	6	92%
Radio Shack	0.1%	6	92%
Unknown brand	3.7%	149	95%
All other brands	4.6%	185	100%
Total Collected		**4,042**	

7 The number of televisions collected by brand was estimated by sorting a portion (3,395 out of 4,042) of all televisions collected. Estimates were made by applying the brand sort data from the 3,395 TVs sorted to all TVs known to be collected (4,042). Accordingly, the estimates by brand are rounded figures; therefore, summing the individual brand estimates above may not add to the known total of 4,042.

Slightly more than half, or 57 percent, of all televisions collected had screens measuring 20" (diagonally) or less. More than a quarter of televisions collected measured between 25" and 27". Approximately 10 percent of televisions collected were 28" or more, including 4 percent that were over 60". Figure 2 presents more detail.

Figure 2

SIZE DISTRIBUTION OF TELEVISIONS COLLECTED



As described in Disassembly and Processing section of Chaper 2, Total Reclaim disassembled and processed the televisions collected through the pilot. Although Total Reclaim was not able to track the exact weights of the individual commodities produced, they were able to provide estimates of the average composition of televisions collected in the pilot.[8] Applying this composition to the weight of all televisions collected (197,000 pounds) yields the estimates in the following table. As the table on page 34 shows, an estimated 166,000 pounds of material were recycled.

8 *Total Reclaim provided detailed data for two standard and two console televisions. Average composition of the two standard televisions was (by weight): CRT, 67%; plastics, 20%; wire, 5%; circuit boards, 6%; and other metals, 2%. Average composition of the two console televisions was (also by weight): CRT, 34%; plastics, 2%; wire, 2%; circuit boards, 5%; metals, 16%; and wood, 41%. These compositions were combined by considering each composition in proportion to the number of standard or console televisions collected, to determine an overall estimate of the average composition of televisions collected in the pilot, by weight: CRT, 54%; plastics, 13%; wire, 4%; circuit boards, 6%; metals, 8%; and wood, 16% (totals do not add to 100% due to rounding). These figures are only estimates and should be used with caution.*

Table 7
ESTIMATED WEIGHT OF MATERIALS RECYCLED

MATERIAL	ESTIM. OVERALL COMPOSITION	ESTIM. OVERALL WEIGHT, IN LBS	DISPOSITION
CRT glass[9]	54%	107,000	Recycled
Lead within CRT glass	5%	10,000	Recycled
Plastics	13%	26,000	Recycled
Wire	4%	7,000	Recycled
Circuit boards	6%	11,000	Recycled
Metals[10]	8%	15,000	Recycled
	Sub-total, recycled	**166,000**	
Wood	16%	31,000	Disposed
	Total	**197,000**	

As described in the problem statement, one of the concerns regarding electronic waste is the lead contained within CRTs. Given the estimate of CRT glass above, it is possible to estimate the total quantity of lead contained in the crts collected through this pilot.

Table 8
ESTIMATED WEIGHT AND LEAD CONTENT OF CRT PARTS

PART	ESTIM. WEIGHT	ESTIM. LEAD CONTENT[11]
Face	70%	0–3%
Funnel	24%	24%
Neck	5%	30%
Frit*	1%	70%

**The frit joins the face to the funnel.*

Applying these composition and lead percentages to the estimated 107,000 pounds of CRT glass collected yields an estimate of 10,000 pounds of lead recycled through this pilot.

The "wood" component comes primarily from console and projection TVs which are made of many different types of materials including treated wood, fiberboard and wood-grained plastics. None of this material is recyclable and is removed by hand and disposed as garbage.

Publicity and Advertising Results

In addition to the paid advertising that Good Guys ran (see Table 3 for a complete list of advertisements) the promotional efforts led by the government partners generated a significant amount of media coverage in newspapers, television, and radio.

Information about the Good Guys electronics recycling program was featured on at least two radio stations, resulted in seven television news stories, was featured in

9 *The figures for crt glass include the weight of the lead embedded in the glass.*

10 *Not including copper wire or heavy or precious metals contained in circuit boards or CRT glass.*

11 *Townsend and Vann, University of Florida, 2002. Research Update: Leaching of Hazardous Chemicals from Discarded Electronics. Presentation to the National Electronic Equipment Management and Compliance Assistance Workshop.*

SPORTS, PAGE C1

Herald

TV recycling program viewed as cheap, simple

By Lukas Velush
Herald Writer

Folks in Snohomish County are apparently more than ready to recycle their old televisions.

The managers of Good Guys electronics store in Lynnwood were expecting to see about 500 old TVs lugged in through their doors during a month-long TV recycling test program that started last week.

Instead, they saw 500 TVs in one week, and the flow hasn't slowed since there was a line out the door on the first day the recycling program began, said Dave Marriott, Good Guys' store manager.

"I'm surprised at the turnout," Marriott said. "We've been getting about 90 TVs a day. I thought it would slow down, but it really hasn't."

The Lynnwood store has easily outpaced three other Puget Sound area Good Guys stores participating in the study, said Sego Jackson, a planner in Snohomish County's solid waste department.

At $10 for regular TVs and $25 for larger ones, Good Guys is charging considerably less than the county for recycling the sets. It's also handing out coupons for 10 percent off the purchase of new equipment.

"If you have convenient, easy-to-use services, then people will like it," Jackson said.

TVs need to be recycled because they are filled with such hazardous materials as lead, cadmium and mercury that don't belong in landfills, say environmental officials.

The study is the nation's first monthlong TV recycling program offered by a large TV retailer. It ends Aug. 7. TV recycling
Old televisions can be dropped off until Aug. 7 at Good Guys electronics store in Lynnwood.
Recycling is $10 or $25 for big-screen televisions.
Good Guys is located at 19800 44th Ave. W. and can be reached at 425-640-5514.

Nationally, 112 million pounds of electronics waste was
ends up in landfills each year, said Bill
sor.

The Seattle Times

Freddy Garcia beats M's; team ends road trip 0-9

Here & Now

Information to help you survive and thrive

E-CYCLING PILOT

KING5.com
Coverage You Can Count On

What to do with your old TV

By GARY CHITTIM
Friday, July 23, 2004
Run time – 2 min 12 sec

LYNNWOOD, Wash. – Every day Americans take hundreds of old, used television sets to the landfill and that's a problem.

TV's are full of toxins that threaten the environment.

But there's still time to take advantage of a local program that guarantees your old set will be properly recycled.
Workers at the Lynnwood Good Guys store are busier than usual. They've got hundreds of worthless television sets to move.

At a giant warehouse in south Seattle, the old TV's are taken apart and recycled.

They say they got a little more than they bargained for when they signed up for a program.

"We were expecting a few TV's to trickle in every day. We didn't expect the amount of people coming in we've so far," said Dave Marriott, Good Guys store manager.

They got hundreds more than they expected and people still have a week left to drop off their sets at the
Guys. So where to they go from there?

They go to a giant warehouse in south Seattle where they are stacking up. Each one of these sets will
apart and shredded down to their most basic elements in a process that looks something like an asse
Indy pit crews.

The sets are dismantled, the materials separated and sent up a conveyor belt to the powerful jaws
robot. Cameras inside the sealed machinery show how the toxic elements are crushed into fine bit
dropped into separate bins.

"The plastic is going to a plastics recycler, the glass is going to a glass recycler, which will then
another TV," said Yvonne Pascal, Total Reclaim.

And none of it ends up in a landfill. The Federal EPA likes the sound of that.

"Because a lot of folks don't realize there are heavy metals in all TV sets and eventually wi
landfills those heavy metals will find their way into the groundwater," said John Iani, EPA

And with an estimated one million tons of home electronics dropped in landfills each yea
use a break.

The EPA is sponsoring the program with Good Guys and King, Pierce and Snohomis
$10 and $25 to recycle an old TV set. The program ends July 31, but if you miss it,
give you advice on how to recycle your set.

http://www.king5.com/localnews/environment/stories/NW_072304ENBrecycletvKC

MONDAY'S Herald

TV treasures plucked from the trash heap

Golden-era TVs are cast aside for recycling, but some of them have a few good years left.

By Victor Balta

Remote controls? Flat screens? Plasma? TiVo?

Those weren't even glimmers in people's black-and-white-watching eyes when the earliest television sets landed in their living rooms in the late 1940s and 1950s.

Touting their "Phonorama" acoustics and "twice-as-bright" picture tubes, the first TVs really were the best thing since sliced bread, which was popularized by Wonder Bread about a decade earlier.

Alas, about 50 years later these magical picture boxes that once put sparkles in many eyes only raise eyebrows when they're added to a heap of junk to be recycled.

During a monthlong promotion offering a $10 discount on the cost of recycling a TV, four "Good Guys" electronics stores in the Puget Sound region pulled in 4,042 sets, far exceeding the goal of 2,000.

The Lynnwood store, the only one in Snohomish County that participated, attracted the most TVs with 1,912. Stores in Tukwila, Bellevue and Puyallup also participated in the campaign that ran from July 8 to Aug. 7.

The older ones that are in good enough condition are put aside and sometimes used by TV and movie production companies when they need period props.

Even past their useful years, they maintain their value.

The oldest of the lot was a 1955 Philco Model 4310. It is a "luxurious full door 21-inch console" with a "crotch mahogany pattern" and lockplate hardware in an antique English finish, according to an original sales brochure found on www.tvhistory.tv.

"I think that one would have cost at least $400, which was a lot back then," Lincoln Torgerson of Miller TV in Everett said, referring to the 1955 Philco. "People saved their money forever to get them."

That set likely doesn't work.

"Looking at the cords, I didn't even want to plug it in," said Pete Keller, manager of Total Reclaim in Seattle, the

"TV treasures..." front page feature on Monday, August 16, 2004

Samples of Good Guys Media Coverage

ten newspaper articles, and in several magazines and online journals. NWPSC estimates the total value of the earned media was $138,000 (Appendix E).

During the first week of the program Good Guys received coverage by KOMO-TV (an ABC affiliate) as well as a front page article in the Everett Herald, articles in the Seattle Times, Seattle P-I and a mention in the King County Journal. There was also exposure on local radio stations in the greater Seattle area. Midway through the program, there was additional coverage by KING-TV (an NBC affiliate) which also aired on its sister stations KONG-TV and Northwest Cable News. Furthermore, the Everett Herald ran a follow up story on the program's success to date.

Each customer that brought in a TV to be recycled received a survey card. More than 4,000 TVs were recycled during the project. However, because people could bring in more than one TV this does not represent 4,000 unique transactions. Good Guys collected 1,043 survey cards. NWPSC used the information on these cards to determine the impact of the paid and earned media.

According to survey results, newspaper advertising and articles had the greatest impact on the consumers as 44 percent of the respondents indicated they heard about the program via a "newspaper ad". The survey card's design did not differentiate between newspaper ad and article, therefore it is likely that some of the people who indicated they heard about the program via an "ad" may indeed have been influenced by an article.

Thirty-eight percent (38%) of the respondents indicated they heard about the program through television. Since Good Guys did not run any TV advertising to support the program, all these responses are attributed to the earned media. Nine percent (9%) of the respondents heard about the program via radio, and again, since Good Guys did not run any mainstream radio advertising to support the program, all these responses are attributed to the earned media.

Flyers from city or county transfer stations accounted for 3 percent of the awareness. The in-store promotion in the form of a 22" x 28" sign was responsible for just 1 percent of awareness. Of note, 15 percent of the respondents said they heard about the program via "other". It is likely that the "other" category includes word of mouth, referrals from solid waste agencies, websites and the Good Guys catalog cover wrap.

In summation, the newspaper ads and stories coupled with the TV coverage were the two main drivers of the program. They generated more than 75 percent of the awareness for the campaign. The other mediums (radio, flyers, websites, word of mouth) were all contributing factors, but to a much smaller degree. Copies of the articles, ads and materials are found in Appendix E.

Coupon Redemption Rates and Customer Traffic

Outlined below is the total number of TVs recycled, and the number of TV coupons redeemed at each store location during the six week period the coupon was valid.

Comparing the data on television sales for this period of time with the number of TVs brought in for recycling, the trends shows that the greater the number of televisions brought in for recycling, the fewer the television sales. One hypothesis is that as

the volume of traffic increased, the sales associates were more distracted from the process of selling and, rather, focused on assisting customers with their recyclable TVs.

Table 9
TELEVISIONS RECYCLED AND COUPONS REDEEMED

LOCATION	TVS RECYCLED	COUPONS REDEEMED	YIELD
Lynnwood	1912	26	1.35%
Tukwila	981	20	2.04%
Bellevue	683	19	2.78%
Puyallup	466	15	3.21%
Totals	**4,042**	**80**	**1.98%**

While the coupon redemption rates may appear low, it's important to remember that buying a TV is a considered purchase. If a person coming into the stores to recycle wasn't already in the market for a television, chances are he/she wouldn't be swayed into buying one with a coupon. That said, when that person is in the market at a later date, he/she may be more apt to include Good Guys in their consideration of retailers.

Distance Traveled to Good Guys Stores

The customer survey included a request for participants' zip codes. The zip code data was used to estimate the distances the customer traveled to recycle their TV. As depicted in the following table, analysis of the data indicates that most customers (69 percent) came from within 10 miles of each store.

Table 10
DISTANCE TRAVELED TO GOOD GUYS PILOT LOCATIONS & CORRESPONDING NUMBER OF TVS RECYCLED[12]

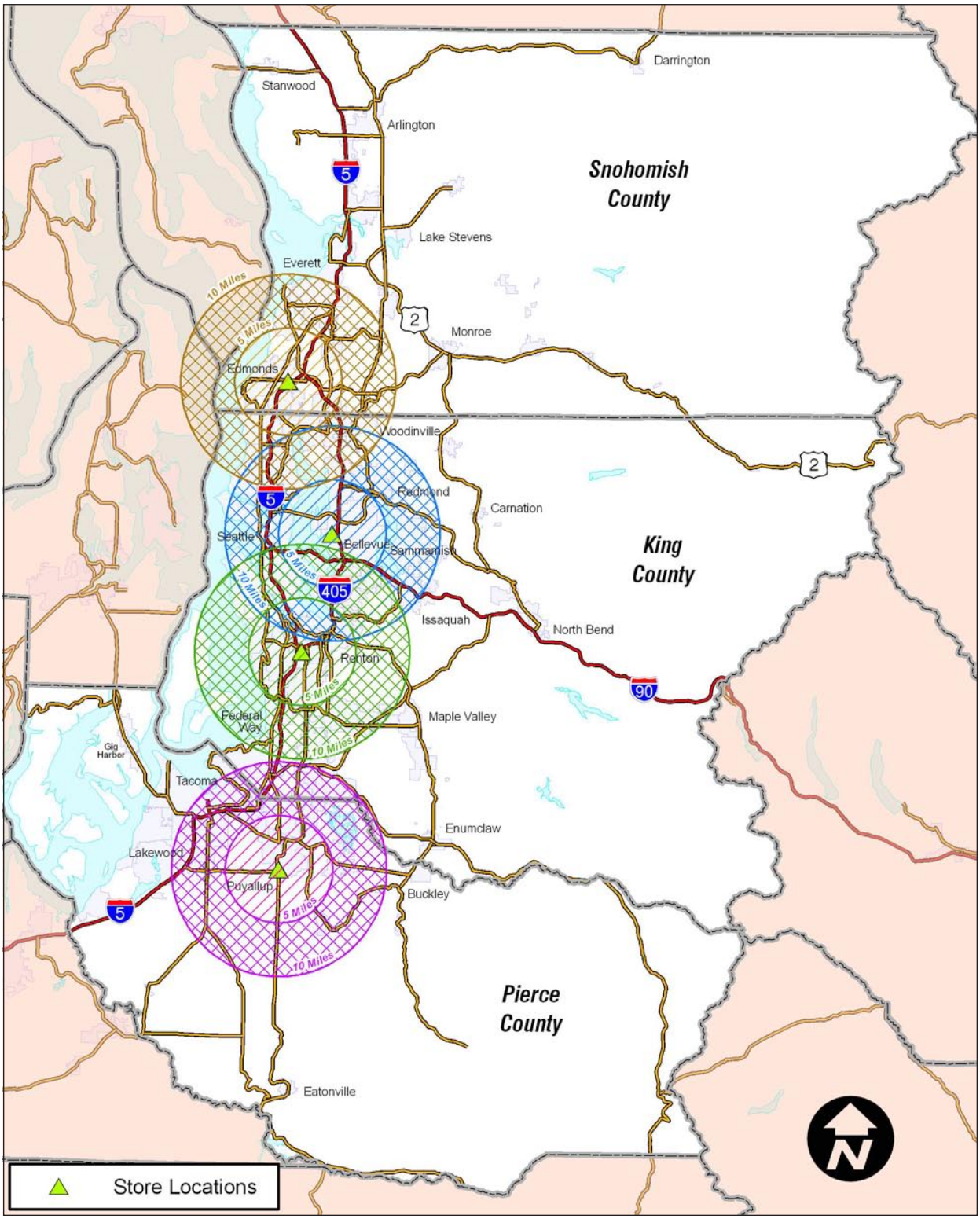
DISTANCE, IN MILES	LYNNWOOD	TUKWILA	PUYALLUP	BELLEVUE	ESTIMATED FRACTION OF CUSTOMERS[13]	CORRESP. QTY OF TVS RECYCLED[14]
0–5	40%	24%	31%	24%	32%	1,309
5–10	34%	44%	24%	47%	37%	1,509
10–15	10%	23%	24%	12%	15%	616
15+	16%	9%	22%	18%	15%	608
Total	**100%**	**100%**	**100%**	**100%**	**100%**	**4,042**

12 Because zip codes are areas that can span distances of several miles, zip codes were judged to be 0–5, 5–10, 10–15, or 15+ miles from each store based on the distance between the geographic center (or centroid) of each zip code's area and each store. Percentages may not add to 100% due to rounding.

Use caution drawing conclusions from individual store data, as individual store results are based on a limited number of surveys (particularly at Bellevue, where only 34 surveys were returned).

13 These percentages are based on the number of surveys received from each distance class for each store, weighted by the number of televisions received at each store.

14 The estimated number of televisions collected was calculated by multiplying the fraction of surveys received from each distance class for each store by the total number of televisions collected at that store.



Locations and areas within five and ten miles of Good Guys stores participating in pilot project.

As the data indicates, more customers came from between five and 10 miles (37 percent) than from the other distance ranges analyzed.

Store-specific findings include the following:

- A higher proportion of Puyallup customers came from more than 10 miles away. One possible explanation for this finding is that the Puyallup location was well-positioned to serve a more rural population who had fewer alternatives for e-waste recycling and are accustomed to driving significant distances to reach services. The Puyallup store also has more land area and fewer geographic barriers, such as Lake Washington or Puget Sound, in the 10–15 and 15+ distance classes than the other stores.
- Both the Bellevue and Tukwila stores garnered a number of visitors from five to 10 miles, perhaps indicating that these stores were conveniently located to residents of nearby or adjacent cities. In particular, the Tukwila store attracted a large number or residents from Renton, Kent, and south Seattle. The Bellevue store attracted residents from Redmond, Kenmore, Woodinville and Sammamish. Zip codes with higher levels of participation often followed significant transportation corridors, such as I-5, I-90, 405 and major state routes.
- The Lynnwood store had a higher proportion of customers coming from less than five miles away. The relatively high population density near the store and strong local media coverage in this area likely contributed to strong turnout in the neighborhoods near the store.

In general, analysis of the zip code data indicates that customers were willing to travel several miles to reach the Good Guys pilot. In particular, the findings indicate that more than a third of the respondents (37 percent) were willing to travel five to 10 miles to recycle their TV, 15 percent were willing to drive 10–15 miles, and 15 percent were willing to travel more than 15 miles.

Perceptions of the Good Guys Pilot Program

NWPSC surveyed customers and Good Guys store managers about their impressions of the pilot project.

Customer Survey Results

When customers recycled their televisions, Good Guys staff asked them to complete a short survey and either leave it at the store or return it via mail. NWPSC received and analyzed 1,043 completed surveys. Consistent with store manager perceptions, the customers reported being very satisfied with the program. In particular,

- 99 percent reported that store staff were helpful and knowledgeable;
- 99 percent reported that the service was easy to use;
- 96 percent thought the price was reasonable; and
- 99 percent reported that they were likely to use the service again if offered.

Other key findings from the customer survey include the following:

- **A large portion (43 percent) of the customers had not been to a Good Guys store before.** The Lynnwood store had the highest fraction of new customers: more than half (53 percent) of customers were new. The high level of publicity in the Lynnwood area and Snohomish County's ban on disposal of televisions may have contributed to the high turnout of new customers at the Lynnwood store.
- **Relatively few customers made a purchase while recycling their televisions.** About five percent of the customers reported making a purchase while in the store. Similarly, five percent reported using the store discount coupon.
- **Customers reported that they participated to help the environment.** Approximately three-quarters of customers reported that they participated to "help the environment." In addition, a sizeable portion of customers reported that they participated because the program was convenient (39 percent) and because of the low cost (24 percent). Only nine percent of customers reported that they participated in the program because of the discount coupon.
- **Newspaper and television were the most often cited sources of information about the program.** Approximately half (48 percent) of the customers reported that they heard about the program from the newspaper, while more than a third (37 percent) reported hearing about the program on television. Customers at the Lynnwood store were particularly likely to cite newspaper as their source, likely due to the great coverage in that region by the Everett Herald.

Please see Appendix F for more detailed survey results, including information particular to each store.

Consumer Awareness of Good Guys

Awareness of Good Guys increased in the Seattle market from February through August 2004, as indicated in Good Guys' bi-annual Attitudes and Awareness study.[15] In total, awareness of Good Guys increased by four percent during the six-month period. Although research isn't conclusive, it's likely that the recycling program contributed to this increase.

Store Manager Interviews

Overall, the managers were enthusiastic about the program both for doing something for the environment and for bringing people into the stores. It was an "awesome program," "a terrific concept and a terrific offer to the public" which filled a need, "getting junk out of houses but keeping it out of landfills and off streets."

15 *Good Guys bi-annual Attitudes and Awareness Study delivers a quantitative measurement of consumer perceptions of Good Guys and their competition. The study is conducted in an online format each February and August.*

Most felt it was a positive experience for the customers who were happy to recycle their televisions and it attracted people who had never been to a Good Guys store. The challenge for the managers lay in meeting the demand and having staff to move the product. The Lynnwood store, which collected the largest number of TVs, reported receiving 118 televisions the first day and 60–70 each day thereafter. The manager felt that if the volume continued at that rate they would need one full time person just to handle the TVs.

CUSTOMER TRANSACTIONS

The managers described the customer transaction process as follows:

- Customers carried or used a hand truck to bring the TVs into the store. Often, most of the time in two stores, customers requested help and staff went to their cars to assist with the hand truck. The store with most volume had 10–15 people in line when the doors opened on several days.
- Customers went to the cashier desk to pay the fee and receive the coupon. About half way through the program, one store had them go to the video desk for more exposure to the store.
- Managers reported that the transaction time varied between three to 20 minutes for the whole process. The managers reporting the longer transaction times said that the process took longer than they expected. The store receiving the most volume estimated that the transaction took three to eight minutes. However, at that particular store, people sometimes dropped off their TV and $10 and left because they didn't want to wait in line.
- The process could be improved by making it clear that there is a fee for recycling. According to one manager, the process for moving the product from the car into the building needs some improvement. He said it was a problem for the commissioned workforce who was not dressed for that type of work. Another manager had his staff dress down after the first week.

STORING AND SHIPPING

- Generally, staff moved the TVs to a store hallway, then to the back room/warehouse or a trailer at the back of the store.
- At the two stores where TVs didn't go to a trailer, packaging the materials for shipment was estimated at three hours a day or longer.
- Problems in handling TVs and moving them were generally due to the weight, the awkward shapes and the dirty conditions of the TVs. Some of the TVs smelled bad or were covered in dust and spiders.
- The four Good Guys managers said that the Gaylord boxes didn't work; they were too small. All stores stopped using them after the first day or week of the program.
- Due to the volume, there was not enough storage space at two of the stores. Loading the TVs directly into a trailer worked best for those two stores. However, one of the stores still didn't have enough storage space even with the trailer.

- For all but one store, the pick-ups weren't frequent enough. All the managers agreed additional pick-ups weren't handled satisfactorily. Problems mentioned included: the recycler was closed on the weekends, which was their busiest time, truck was too small, and at two stores they had to keep moving the used TVs in order to replenish their stock. That happened when the pick-up was late and the retailer's supply truck needed to be unloaded into the same area.
- One store needed to refinish their entry area floor and repaint a hallway due to damage.
- The managers suggested the process could be improved by more frequent pick-ups, more staff and using a trailer or other metal container so the used TVs didn't have to be stored in the store.

STAFF PARTICIPATION

Staff at three of the stores were excited and pleased to participate in the program, especially at first. As the weeks went by, staff still cared about the program but were less enthusiastic. One manager said, "If asked at this point, staff would say never do this again." At the store with most volume, the manager was proud of his staff for their continued attentiveness. The volume was larger than expected, and on weekends it never stopped. Managers felt the training was adequate though one manager wanted to include more information on handling the TVs.

One manager remarked that the spill clean up kits never arrived and noted that they could have used them. The kit was intended to include a labeled five-gallon bucket. In the event that a television was broken, the glass residue was to be swept up into the bucket and placed with the rest of the TVs so it could be recycled. The manager also suggested including rubber gloves in the cleanup kit.

Managers at three stores thought the program could be improved with additional staff, an external person doing the work, or extra pay. One manager commented that the staff is motivated by the prospect of earning money and could use an incentive like a contest or $1 per TV brought in for recycling. One store awarded an "Employee of the Month" award to the person who processed the most recycling invoices (200).

CUSTOMER SATISFACTION

According to the managers, the majority of customers loved the program. Most recognized the need and importance of ensuring that electronics are properly recycled. Customers were pleased to participate and thought the discount coupon was a nice incentive, but not that important. One person from Oregon wanted to mail her TV to the Lynnwood store for recycling. Two managers thought that many people were glad to simply get rid of their old TVs.

The managers estimated one to three percent of the customers across the stores were dissatisfied; one percent refused to pay. These customers were unhappy about paying any fee or being charged the $25 instead of $10. The managers surmised this

was because customers hadn't received information or heard that the service was free. One or two customers expected they should be paid to bring in a television. A few complained on the customer comment card about being charged $25 vs. $10; one manager mailed them a refund. One manager felt that overall, customers were not appreciative of the effort and cost to Good Guys.

For the managers, the customer turnout was the highlight of the program and they remarked on the number of people coming in that had never been to a Good Guys store before. "Question is how it sticks," one commented. The number of purchases customers made was small, including those made with the discount coupon. Three managers estimated that customers made about 10–15 purchases per store (this includes all products, not just TVs). The manager from the store collecting the fewest TVs thought there were about 30 sales made. One manager commented, "The TV they brought in wasn't the TV they were using so they weren't looking to purchase a replacement."

The managers' suggestions for improving sales include: issuing a gift card for a certain dollar amount good across the spectrum of the store for future use, discounts available with financing, or free recycling with a purchase in addition to the coupon. At one store, staff gave customers who brought in a TV for recycling a discretionary discount for the cost of recycling in addition to the discount coupon when they made a purchase.

PUBLICITY

All the managers agreed the publicity was excellent, maybe even too much; "It made the promotion." Three stores found the TV news stories worked best; there was "a jump at each media hit." One said as soon as it was on the news, there were phone call inquiries for up to an hour. The fourth manager found print media drove the most traffic to his store. Newspaper stories and ads, transfer station referrals and websites contributed at the other stores as well. The managers noted that more clear information about the fee, particularly in the news stories, could have helped to set people's expectations correctly. One manager mentioned that incorrect information in some news stories caused dissatisfaction among customers since no charge was mentioned.

POST PROGRAM DETAILS

Generally, customers did not continue to bring TVs to the stores after the program ended. The stores still get calls and people are referred to the Take it Back Network which lists a number of recycling locations. If people do bring in a TV, staff give them a Take it Back Network brochure and send them to the nearest recycling facility. While the Office Depot pilot project was still running, customers were referred there.

If the store managers were to design this program, all agreed that they would do it again but would like it to be at a more manageable level or to have additional staff. Two managers would like it to be located in the parking lot with a trailer. The store manager with the least volume thought it should last longer.

Chapter 4

Project Costs

Table 11 outlines the total costs for the pilot project and breaks costs down into several categories: planning and setup, collection, transportation, recycling, paid advertising and evaluation.

Table 11
SUMMARY OF PILOT PROJECT COSTS

ACTIVITY	DESCRIPTION	COST	%
Planning and setup	Pilot project planning, coordination with EPA Plug Into eCycling program, recruitment of retailers and manufacturers, recycler selection, coordination with retailer and manufacturers, volume estimates, training materials development, staff training, and development of promotional materials.	$66,748	30%
Collection	Customer assistance with bringing large TVs into the store, collection of fee, distributing coupon and survey, placing TVs into trailers (Lynnwood and Tukwila), returning surveys to government partners.	$4,239	2%
Transportation	Set up of trailers (Lynnwood and Tukwila), set up and pickup of trailers. Packaging TVs and loading them onto the truck (Bellevue and Puyallup)	$15,920	7%
Recycling	Unloading the TVs from the trucks and trailers, disassembling the TVs into plastic, metal, and glass components, packaging and shipping to final processors.	$33,299	15%
Advertising	Paid print ads and catalog development and placement.	$74,247	33%
Evaluation	Tracking and collection of data, drafting the final report.	$28,515	13%
	Total Pilot Project Costs	**$222,968**	**100%**

Program Planning and Set Up Costs

Planning and set up costs include the time government partners spent coordinating with the EPA Plug Into eCycling program to recruit the participation of national manufacturers and retailers. It also includes the time spent soliciting local electronics retailer participation, development of the Memorandum of Understanding and program promotion. Good Guys planning costs include coordination with operations staff, communications with electronics manufacturers to secure contributions, and coordination of the paid advertising.

Set up costs include the selection of the recycler, developing a report estimating the volume of TVs likely to be turned in for recycling, logistical coordination, development of training materials, and conducting the training session. Grant funds and in-kind contributions from the government partners covered the majority of the planning and set up costs as shown in Table 12.

Table 12
PLANNING AND SET UP COSTS

JURISDICTION	DESCRIPTION	HOURS	TOTAL VALUE
King County	Planning, recruitment and coordination with EPA Plug Into eCycling Program (consultant time billed directly to KC in 2003)	31	$1,718
King County	Project management, planning, customer survey, training, program promotion (staff time including benefits)	165	$8,804
Snohomish County	Project set-up, recruitment, management, customer survey, training, program promotion (staff time including benefits)	108	$8,580
Snohomish County	Printing, advertising (radio), mailing, surveys	48	$3,820
City of Seattle	Program promotion	8	$330
City of Tacoma	Promotional materials development	—	$500
EPA Grant	Program coordination, partner recruitment, recycler selection, training, setup (consultant time billed to grant)	—	$25,000
EPA	Program planning and promotion (staff time including benefits)	40	$18,200
Good Guys	Program planning, coordination with operations, manufacturer communications, advertising coordination (staff time not including benefits)	125	$14,375
Good Guys	Staff time to attend training	180	$1,800
	Total Planning Costs	**705**	**$66,748**

Collection, Transportation and Recycling Costs

Collection costs include Good Guys staff time to help customers carry their larger TVs into the store, process the fees, and hand out the discount coupons and survey forms and staff time to package the televisions for transport.

At the Lynnwood and Tukwila stores staff spent time loading TVs into a trailer. At the Puyallup and Bellevue stores, Good Guys staff stacked the TVs in the back area of the store while PSC staff packaged and loaded the TVs into the PSC truck.

Good Guys estimates that staff spent a total of 471 hours on the collection of TVs across all stores. An estimate of labor hours per store is outlined in Table 13.

Table 13
ESTIMATED LABOR HOURS AND COST DEVOTED TO PROGRAM[16]

STORE	HOURS	ESTIMATED COST
Lynnwood	227	$2,043
Tukwila	117	$1,053
Puyallup	51	$459
Bellevue	76	$684
Totals	**471**	**$4,239**

PSC transported the TVs from Good Guys stores to Total Reclaim for processing. The rates for these services are shown in Table 14. The cost of storage containers and packaging materials are included in the transportation fees.

The set up fees include the delivery of trailers to Lynnwood and Tukwila stores which received larger volumes of TVs than PSC's regular truck could accommodate. Refer to Collection, Packaging, and Transportation in Chapter 2 for further details on the collection and transportation logistics.

Table 14
TRANSPORTATION AND RECYCLING FEES

SERVICE PROVIDED	FEE	TOTAL COST	AVE. COST PER LB
Recycling		$33,299	$0.17
Television, <26"	$7		
Television, 26 – 40"	$10		
Television, >40"	$25		
Transportation		$13,820	$0.07
Per gaylord box or 32 TVs	$100[17]		
Set-up		$2,100	$0.01
Per trailer delivered	$150		
Total Cost		**$49,219**	**$0.25**

The costs for recycling ($33,299) and the total weight collected (197,000 pounds) translate into a per-pound cost of $0.17 per pound. When transportation and set-up are included, the total cost averages $0.25 per pound.

Costs per Store

In total, PSC invoiced Good Guys $13,820 for transportation, $2,100 for set-up of the trailers and $33,299 for recycling, for a total transportation and recycling cost

16 *Labor hours were estimated by Good Guys using an average store staff hourly rate of $9/hr.*
17 *Partial gaylords or units of 32 TVs were billed at the full, $100 rate.*

of $49,219. Labor costs to collect the materials varied by store depending upon the amount of materials brought in. Total costs for collection, transportation, recycling and Good Guys labor costs, not including overhead or management costs, was $53,458. Table 15 displays the costs per store.

Table 15
TOTAL COSTS EXPERIENCED BY GOOD GUYS BY STORE

STORE	COLLECTION	TRAILER SET-UP	TRANSPORT	RECYCLING	TOTAL
Lynnwood	$2,043	$1,200	$5,000	$15,186	$23,429
Tukwila	$1,053	$900	$4,300	$8,887	$15,140
Puyallup	$459	$0	$2,000	$3,967	$6,426
Bellevue	$684	$0	$2,520	$5,259	$8,463
Totals	**$4,239**	**$2,100**	**$13,820**	**$33,299**	**$53,458**

Project Financing

The project was financed by grant funds from the Environmental Protection Agency, contributions from Good Guys and six television manufacturers, recycling fees charged to consumers, and contributions and in-kind services from King County, City of Seattle, Snohomish County and the City of Tacoma.

Manufacturer Contributions

In total, Good Guys asked the 10 television manufacturers from which Good Guys sources their products to participate in the program. Six of the companies agreed to contribute $5,000 to the pilot project for a total of $30,000. The six companies were:

1) JVC Americas Corp
2) Philips Consumer Electronics of North America
3) Pioneer
4) Samsung
5) Sharp Electronics Corp
6) Sony

Customer Fees

Good Guys charged customers a recycling fee of $10 for each standard television and $25 for console TVs. Table 16 summarizes the recycling fees collected at each Good Guys store.

Table 16
RECYCLING FEES RECEIVED

STORE	STANDARD TV UNITS	$10 FEE	CONSOLE UNITS	$25 FEE	TOTALS UNITS	FEES
Lynnwood	1,673	$16,730	239	$5,975	1,912	$22,705
Tukwila	855	$8,550	126	$3,150	981	$11,700
Puyallup	356	$3,560	110	$2,750	466	$6,310
Bellevue	580	$5,800	103	$2,575	683	$8,375
Totals	**3,464**	**$34,640**	**578**	**$14,450**	**4,042**	**$49,090**

Government Partner Contributions

The government partners provided in-kind services related to program planning, coordination, program promotion and final evaluation of the pilot project. Government partners also paid for the customer survey that was conducted at all four stores. Table 17 itemizes the government partner contributions.

Table 17
GOVERNMENT CONTRIBUTIONS

JURISDICTION	DESCRIPTION	HOURS	VALUE
King County	Recruitment and coordination (consultant time billed directly to KC in 2003)	31	$1,718
King County	Proiect management, customer survey, training, program promotion (county staff time including benefits)	165	$8,804
King County	Media evaluation (consultant time billed directly to KC)	32	$2,054
King County	Evaluation and report writing (County staff — estimated)	151	$8,641
Snohomish County	Printing, advertising (radio), mailing, surveys	48	$3,820
Snohomish County	Project set-up, recruitment, management, customer survey, training, program promotion	108	$8,580
City of Seattle	Program promotion	8	$330
City of Tacoma	Handout		$500
EPA Region 10	Program planning	18	$819
EPA Region 10	Promotion	22	$1,001
EPA Region 10	Evaluation	40	$1,820
EPA Grant	Program coordination, partner recruitment, recycler selection, training, setup (consultant time)		$25,000
EPA Grant	Evaluation (Cascadia consultant time to compile recycling data and costs from PSC and TRI)		$8,000
EPA Grant	Report editing and formatting (PRR consultant time)		$8,000
	Total Contributions		**$79,088**

Good Guys Costs and Revenues

Program revenue from recycling fees and manufacturer contributions totaled $79,090. Good Guys program expenses, including recycling, transportation, set-up, staffing and advertising totaled $143,880. The net cost to Good Guys, therefore, is an estimated $64,790.

Table 18
GOOD GUYS EXPENDITURES

REVENUE		EXPENSES	
Customer Fees	$49,090	Planning and Set up	$14,375
Manufacturer Contributions	$30,000	Training	$1,800
		Recycling	$33,299
		Transportation	$13,820
		Set-up (trailer delivery)	$2,100
		Collection (staffing)	$4,239
		Advertising	$74,247
Subtotal: Revenue	**$79,090**	**Subtotal: Expenses**	**$143,880**
			Revenue less expenses ($64,790)

Chapter 5

Lessons Learned

The pilot project uncovered some valuable lessons for retailers embarking on an in-store electronics take-back program for their customers. It demonstrated that in-store take-back of televisions is logistically feasible and provided information on what adjustments are needed to establish an on-going and sustainable program. Outlined below are some of the significant findings of this study.

Take-back of televisions at an electronics retail store is logistically feasible.

- The program netted 4,042 televisions and tested several methods for collecting and packaging the TVs for shipment. While the logistics had to be adjusted several times through out the pilot project, the information gained from this pilot can be used to develop a sustainable system.

- Determine how much space each store can realistically allocate for storage of TVs for a specified period of time. Bids from recyclers should be based on this volume and frequency. Determine the most economical combination of storage volume and frequency of pickup.

- Select recyclers through a written procurement process. Include requirements for environmentally sound recycling practices, with an emphasis on domestic private sector processing and recycling.

- Keep the logistics flexible. Have each local store determine the at-store handling of the materials that best suits that store and the community it serves. Some stores may want customers to bring the equipment into the store. For others it may be better to escort the customer to a storage trailer at a loading dock outside the store. Shrink wrapped pallets worked better than gaylord boxes for storing large TVs. Trailers worked better at several stores where there was space to store a trailer at the loading dock.

- Rather than having the sales staff handling the TVs and taking away from their time on the sales floor, have warehouse staff at the stores handle the collection and packaging of TVs or designate this responsibility to other non-commissioned staff.

- Have a contingency plan in case unusually large volumes of equipment are collected. Some options are:
  1. An on-call system where additional pickups would be made by the recycler.
  2. The retailer may be able to haul the additional materials to the recycler.
  3. Additional storage options such as a trailer could be made available until pickups can be made.

Managing the volume of material is critical to a sustainable program.

- The volume of TVs coming in to the stores dictates the impact of the recycling program on regular store operations. The more material that comes in, the more space and time it takes to handle.

- Determine the volume of TVs that can be realistically stored at each location during a set period of time. Figure out how frequently that material needs to be transported to the recycler and design the program around those variables.

- There are three elements that can be used to manage volume:
  1. **Publicity**. Keep the program publicity to a moderate level. The program might first focus on customers that are buying new TVs, offering one for one take-back as part of the customer service. Make it known to other customers that the recycling options exist, then, if the volume is manageable, increase the publicity gradually.
  2. **Recycling fee**. Charge a fee to cover the costs of collection, transportation and recycling. At first some customers may not be interested in paying a fee to recycle, but as disposal options are phased out, more customers will be interested in using the service.
  3. **Program duration**. Make the program an ongoing service rather than a two or three week "event." An ongoing program won't create a sense of urgency and will spread out the number of customers over a longer period of time.

The program could be financed using end-of-life fees prior to the adoption of an alternative financing system.

- Until alternative financing mechanisms are made available for covering the costs of collection and recycling of used electronics (See Chapter 7: Implications of Future Front End Financing Systems on Retail Take-back Programs.) it is feasible to finance a retail take-back program with end-of-life fees. Even though these interim programs will only appeal to a portion of the public willing to pay the fee,

they are a viable interim measure. A front-end financing system has the advantage of including the cost of recycling in the price of the product allowing whoever is in possession of the product at the end-of-life to recycle it at no cost.

- The program could be sustained with a low end-of-life fee, supplemented by contributions from manufacturers to cover recycling costs. The cost to plan and operate the Good Guys pilot program was $143,880. If paid advertising was eliminated to manage the volume of TVs coming into the stores, the total program costs would be reduced to $69,633. Subtracting the manufacturer contributions of $30,000 would leave Good Guys with costs of $39,633 that would need to be covered by end-of-life fees. A fee in the range of $9.80 per television would cover this amount. Retailers could adjust this fee so that the customer with a console TV pays a higher price than the customer with a standard television.

- The program could be sustained without manufacturer contributions with a higher, but still reasonable, end-of-life fee. If manufacturer contributions were not available, Good Guys expenses (with no paid advertising) would again be $69,633. The fee needed to cover this amount would be $17.28 per television. Snohomish County currently charges transfer station customers $20 to recycle standard TVs and $27 for console TVs. They receive a considerable volume of TVs at this rate so it is feasible that some portion of the population would tolerate an even higher fee, if necessary.

- Use government programs to publicize the collection programs. Joining government run education programs such as the Take it Back Network can minimize advertising and promotional costs.. The Network would publicize Good Guys recycling services via a web site and brochures distributed at more than 100 sites in King and Snohomish Counties.

- Continue to solicit contributions from manufacturers to help pay for the costs of recycling and provide manufacturers with regular positive publicity. It may also be possible to arrange for manufacturers to cover the costs of recycling their own brand of TVs. An additional recycling fee could be charged for manufacturers' brands that are not participating in the recycling program.

The program was popular with customers and resulted in good public relations for Good Guys.

- Good Guys received significant earned media coverage from the program including features on at least two radio stations, stories in seven television news stories, in 10 newspaper articles, and several magazines and online journals. The total estimated value of the earned media was $138,000.

- Forty-six percent of the people that came to recycle their TVs had never visited a Good Guys store before.

- Awareness of Good Guys increased by four percent from February through August 2004, as measured by Good Guys Attitudes and Awareness Study. This may be attributed, in part, to the pilot project.

- The manufacturer partners received positive publicity and recognition for their contribution.

- The program was very popular with customers. Ninety-nine percent said they would use the recycling program again if it was offered.

- The Lynnwood Good Guys store and each individual staff member received a letter of recognition from the Snohomish County Executive congratulating Good Guys on their environmental ethic.

The program produced environmental benefits.

- The program netted 4,042 televisions (197,000 pounds) resulting in the recycling of 10,000 pounds of lead from 107,000 pounds of CRT glass, 26,000 pounds of plastics and 22,000 pounds of metals. This material was properly recycled and can be reused in the manufacture of other products, conserving our natural resources.

- The project provided the public with information about e-waste, the toxic components contained in electronic products and the reasons it should be properly recycled.

The program can be designed to encourage sales.

- Design the program so that customers walk through the store to complete the transaction (i.e. to deliver the electronic product for recycling or to pay the fee). Transactions that occur at the front of the store or outside of the store don't encourage people to browse.

- The sales staff need incentives they can work with that will both encourage the customer to buy a new product and recycle an old one. For example, if the customer buys a new TV, they get a coupon that allows them to recycle their old TV for free — as opposed to paying to have their old TV recycled. This feature be-

comes a part of the customer service much like hauling away and recycling an old appliance for free is a selling feature when a customer buys a new refrigerator.

- Offer a gift card or discount coupon to customers who bring in a TV for recycling that can be used across the whole spectrum of products offered by the store. Restricting coupon use to purchases of large, expensive items reduces the likelihood of use.

Clear communication between management and staff is critical.

- Allow plenty of lead time to inform and train managers and staff. Early involvement of managers results in buy-in to the program and smoother operation.
- Be clear about the expectations of the sales staff. Design program so that it doesn't affect the sales staff's ability to sell product.
- Be clear about which budget will pay for the program. Design the program so that there is some incentive for sales staff to "sell" the recycling feature.
- Provide training for staff that explains how materials should be handled and what to do if the program is not running smoothly.
- It is especially important to provide information about why recycling is necessary (e.g., environmental, economic development, political reasons) so they can answer questions from customers who may not know the many benefits of recycling a TV.

A team based approach to setting up the pilot project worked.

- The partnership between local government, retailers and electronics manufacturers was an ideal way for the partners to get on-the-ground experience setting up a collection program in a retail setting.
- The pilot project clarified the challenges and opportunities for collecting electronics in a retail setting.
- The pilot project design included input from experts in all areas: the retailers, government, recyclers and consultant partners.

- The retailer benefited from the additional recognition via earned media that was initiated by the local governments.

- The local governments were able to offer their expertise about environmentally sound management of TVs and proper recycling and handling techniques at the staff training.

- The retail sales staff was able to share this information with their customers.

Chapter 6

Recommendations for Implementing a Sustainable Retail Take-back Program

An interim approach prior to legislated financing programs

The goal of this pilot project was to test the feasibility of collecting used electronics in a retail setting and to determine whether this arrangement can provide the public with a network of convenient ongoing drop off locations. In other words, is it really possible to make recycling electronics as easy for the consumer as it is to purchase electronics? This pilot project and those conducted by Office Depot and Staples have shown that it is: in-store take-back of electronics is logistically viable as well as popular with customers.

The question is how can retailers voluntarily provide ongoing take-back programs in a way that is financially and operationally sustainable, until either a state-by-state or nationally legislated financing system is established.

The Interim Recycling Infrastructure

During the past several years, many organizations have made efforts to develop a national electronics recycling infrastructure based on the principles of product stewardship and use of front-end financing mechanisms such as Advanced Recycling Fees or Manufacturer Responsibility (cost-internalization).

The National Electronics Product Stewardship Initiative (NEPSI)[18] resulted in three years of dialogue between electronics manufacturers, retailers, local governments, non profit organizations and recyclers. NEPSI developed a resolution in early 2004 that stated the group supported development of a front-end financing system. Largely as a result of disagreement between manufacturers about the details of the front-end financing system, however, a final agreement between the NEPSI participants has not been reached. Meanwhile, the U.S. Department of Commerce and Government Accounting Office are developing reports for Congress about e-waste, and some initial efforts toward federal legislation have been undertaken.

Lacking timely and successful efforts at the national level, many state governments are now drafting their own legislation to address electronics reuse and recycling issues. Manufacturers and other parties are also resigning themselves to state by state imple-

18 http://eerc.ra.utk.edu/clean/nepsi/

mentation. At this time, in Washington and most other states, a legislated system for financing the collection and recycling of electronics does not yet exist, nor have manufacturers voluntarily provided adequate financing for widespread electronics collection and processing. California and Maine recently passed legislation that establishes "front-end" financing mechanisms to cover all or partial costs of collection and recycling using Advance Recycling Fees (CA) or manufacturer responsibility approaches (ME).

Until there is a national or state financing system for electronics recycling, manufacturers, retailers, recyclers and local governments are providing "interim solutions" to the e-waste problem through a variety of programs using a variety of financing techniques. "Interim" refers to the current period leading up to implementation of a comprehensive front-end financed electronics recycling infrastructure. This is consistent with the "Interim System" document created through the NEPSI process.

What does this mean for socially and environmentally conscious retailers that want to assist in providing solutions? Like others currently providing collection service such as some charities and some local governments, the retailer must be careful to design a program that can be sustained financially and logistically.

Under the conditions outlined above and until there is an adequate financing mechanism, it is important that an ongoing take-back program be designed such that the retailer is providing its "fair share" of a collection and recycling infrastructure, but does not become burdened with too much incoming material as a result of being the lowest cost or only service option in the area. This is particularly an issue in areas where local governments have banned electronics from disposal.

This next section addresses financing issues given these current conditions and makes recommendations for financing a sustainable electronics recycling program interim to long-term financing systems being established. The subsequent section discusses ways to manage the volume of materials coming in to the stores.

Interim Program Financing

A key element in establishing an ongoing and sustainable electronics recycling program is the financing mechanism. In areas where there is no government mandated front-end financing systems and unless electronics manufacturers voluntarily provide financing to help offset the costs of recycling, the retailer will need to charge an end-of-life fee to cover the cost of providing the service.

INTERIM FINANCING OPTIONS

- *Charge customers an end-of-life fee at the point of recycling that is high enough to cover program costs and help control volume.*
- *Seek financial support from manufacturers to reduce recycling costs.*
- *Cover some program expenses by incorporating them into product price or cost of doing business.*

As with other services and product sales, this fee should be set at a level that adequately pays for the service. The retailer may wish to establish agreements with all the manufacturers of brands sold at the retail store to help fund the recycling portion of the program.

The end-of-life fee can be adjusted up or down as desired to meet other goals or to reflect manufacturers' contributions to the program, keeping in mind the need to keep volumes coming in at a sustainable level. Alternately, the retailer can determine what level of service it can offer customers at its own expense, as a cost of doing business, and work that cost into the product pricing. For example, when a new television is purchased, the retailer could provide recycling for the customer's old TV at no cost and could consider it a customer service.

Managing Volume

The retailer will need to determine the approximate volume of recycled products it can handle on an ongoing basis and ensure that the design of the program will create that result. The ideal quantity of material will vary from retailer to retailer based on many factors including store size and customer base, frequency of pick up by contracted recycler or transporter, and capability of the retailer to backhaul recyclables to the recycler using their own vehicles.

Retailers can use fees to manage the volume of materials coming into a program and adjust them as needed to attain the desired results. They can also be discounted or eliminated for short periods for special promotions or to increase foot traffic during slow sales periods. Manufacturers can also provide funding in order to eliminate fees for short periods. Whenever such promotions happen, the retailer will need to prepare for the potential volume increase during the promotional period.

There are additional ways to use fees to moderate use of the program yet provide incentives for consumers to use the program and generate sales for the retailer. For instance, customers paying a fee to use the recycling service can receive a coupon of equivalent or lesser value to the recycling fee, which can be used for making purchases in the store (i.e. $10 off purchase of $50 or more). Another variation is that the coupon could be good for a percentage (i.e. 10 percent) off other purchases made at the store on the day the recycling service was purchased.

An alternative to using fees to control volumes is to offer the recycling service only to those customers that are making a purchase at the store. This may be restricted to the purchase of a similar type product or a purchase of some established value. For instance, when a customer purchases a new television, the retailer offers the customer an opportunity to recycle their old television at no charge. Or the retailer could issue a coupon good for recycling their old television at no charge within a given period of time (e.g., three months). This is referred to as one-for-one take-back. Alternatively, if a

MANAGING VOLUME

- *Determine the volumes of material that staff can reasonably handle without affecting normal business operations.*
- *Provide the recycling service on an ongoing basis, not as a special offer or event.*
- *Consider offering a one-for-one take-back, i.e. when a customer buys a new TV, the retailer takes back the old TV to be recycled.*
- *Charge adequate end-of-life fees to manage the volume.*
- *Limit advertising.*

customer purchases merchandise beyond an established value (e.g., $100 or more), the retailer could provide a similar coupon or service option.

Another method to manage the volume of materials is to limit the promotion and advertising of the program. Retailers could even choose not to spend any advertising dollars on the program and could rely on government education programs to promote the program to the intended audience.

Chapter 7

Implications of Future Front-end Financing Systems on Retail Take-back Programs

A number of front-end financing systems are currently in place, are being established or are anticipated in the near future in the United States. The two front end financing models currently gaining attention are the Advance Recycling Fee and the Manufacturer Responsibility Model (also known as the Cost-Internalization Model). Many examples of each model can be found in Canada, Europe and Asia.

Advance Recycling Fee

An Advance Recycling Fee (ARF) system requires consumers and businesses to pay a fee at the point of sale on specific electronics products such as televisions, computer monitors and computers. The accumulated fee covers all the costs necessary to support the collection and recycling of discarded electronic products. The accumulated funds might be overseen by a governmental entity or by an appointed board. Examples of ARF systems developing in the United States include:

- California passed legislation establishing an Advance Recycling Fee system managed by the state. Starting January 1, 2005 retailers must collect fees from their customers who purchase televisions, computer monitors, laptop computers, and any other product containing a cathode ray tube. The fees range from $6 to $10 depending on the size of the screen. "Qualified electronics collectors" will receive reimbursement in the amount of 20-cents per pound and "qualified recyclers" will receive 28-cents per pound for environmentally sound processing of the equipment. (See www.erecycle.org/.)

- Industry experts anticipate legislation in numerous states including Minnesota and Oregon where legisla-

THE ELECTRONIC MANUFACTURERS COALITION FOR RESPONSIBLE RECYCLING

Hitachi America
IBM Corp.
JVC America
Mitsubishi Digital Electronics America
Panasonic (Matsushita Electric)
Philips Consumer Electronics North America
Samsung Electronics America
Sanyo Fisher Co.
Sharp Electronics
Sony Electronics
Thomson (RCA)

tors have proposed an advance recycling fee system. (See www.moea.state.mn.us/stewardship/forums/process-summary.pdf.)

- The Electronic Manufacturers Coalition for Responsible Recycling, a group of 11 television and computer manufacturers, is backing a financial arrangement based on an advanced recycling fee. Retailers would collect the fee when consumers purchase equipment. The fee would cover the costs of collection, transport and processing of covered products. A private not-for-profit third party organization (TPO) would manage the funds and contract for services.

Manufacturer Responsibility/Cost-internalization

In contrast to the ARF, the cost-internalization model does not require a visible fee be applied to products at the point of sale. Manufacturers are required to arrange for take-back of their brand of product and to finance the collection and recycling of that product. This cost is then added into the price of the product as a cost of doing business.

- In April 2004, Maine passed legislation that follows the producer responsibility model such that manufacturers are responsible for the recycling of their own brand products (cost-internalization). Municipalities must bear the costs of collection and transportation to a consolidator. Manufacturers are responsible for the costs of handling, transportation from the consolidator to the recycler, and the processing of their brand television and computer monitor products. By March 1, 2005 manufacturers must provide a plan for compliance to the State Department of Environmental Protection.

- Hewlett-Packard and Office Depot implemented a nationwide recycling program for computer equipment and small televisions in August and September 2004. This effort was significant because it provided customers with in-store take-back at Office Depot retail stores and was financed jointly by a retailer and manufacturer.

Front-end Financing and Sustainable In-store Take-back Programs

Implementation of any effective front-end financing scenario (ARF or Cost Internalization) should bolster the sustainability of in-store take-back of obsolete products in at least four ways.

1. **Costs incurred by the retailer for providing the service should be reimbursed.**
   Costs should be covered by the front-end financing system in the form of a "collection incentive payment." This payment is a set amount, for example in California, the payment to the qualified collector is 20-cents per pound of materials collected. This amount would be paid to the retailer to offset the on-site collection costs. If the retailer's costs come in lower than this amount, they keep the difference. If the program costs more than that amount, they pay the difference. Transport, disassembly and processing/recycling costs would also be covered by "the system" in a payment to the recycler. This eliminates the need to charge customers end-of-life fees and removes financial risk from the retailer. The collection incentive payment is most often associated with an ARF system, but can and should be incorporated into a cost-internalization system.

2. **Provides opportunities for many entities to become collectors of electronics.**
   The availability of funds to reimburse the collectors for their costs provides incentives for many organizations including retailers, charities and government entities to become qualified collectors. This will result in numerous, conveniently located collection sites for citizens and customers to recycle their electronics. This will prevent the "scarcity of service" dynamics that can result from one-day collection events and temporary pilot programs. The volume of materials will be spread out among numerous collectors and reduce the amount of equipment coming in to any one collector.

3. **Eliminates the "pent up demand" that can result in a collector receiving a flood of materials.**
   As more collectors provide ongoing programs, more people will clean out their basements and attics reducing the stockpile of old, obsolete electronic products. After that point, the volumes of products will remain more consistent and will flow evenly.

4. **Process efficiencies can be attained resulting in more cost effective collection services.**

   - A front-end financing system eliminates the need for staff to collect fees when customers bring the product in for recycling. The retailer can simplify in-store procedures because there is no money handling involved during the transaction.

   - The front-end financing will provide incentives for the development of more transport and processing services. Retailers and other collectors will have more transport and processing services to choose from.

   - Recyclers/processors will have to comply with environmentally sound management standards required by "the system" so the retailer does not have to conduct

its own due diligence to ensure that the recycler/processor is complying with all laws and requirements. Consequently, the retailer's efforts and liability are reduced.

- Retailers can still offer incentives and other promotional programs linked to the recycling of used electronics.

Front-end financing will address the key issues currently faced by retailers regarding the sustainability of providing in store take-back opportunities. Retailers that implement product take-back systems in their stores until the establishment of these front-end financed systems can easily transition to the new systems and will greatly benefit from them.

Chapter 8

Recommendations for Good Guys

Good Guys' 71 stores are located throughout California, Nevada, Oregon and Washington. There are 60 stores in California, two stores in Nevada, three stores in Oregon and six stores in Washington. Of the 71 stores, 61 exist in California and Snohomish County, Washington where televisions are banned from disposal. The NWPSC recommends the following next steps for Good Guys:

Establish an ongoing end-of-life fee program in six stores in Washington.

Building on the knowledge and relationships gained in the pilot, Good Guys could offer an ongoing end-of-life fee based program at their Washington stores that is financially and logistically viable. NWPSC offers these recommendations:

- Offer the recycling service to customers during regular store hours.
- Consider charging approximately $20 for standard televisions and $30 for big screen and consoles or an adequate amount to cover the collection, transportation, processing and any advertising costs.
- Consider providing one-for-one take-back at no charge. In other words, allow one television to be recycled at no charge for customers buying a new television.
- Join the Snohomish County and King County Take it Back Networks (www.metrokc.gov/dnrp/takeitback) and be listed as a member in the brochure and on the web sites. This program can provide a modest amount of targeted publicity in lieu of spending advertising funds to publicize the program.
- Establish an on-going contractual relationship with one or more of the manufacturers involved in the pilot to help cover the costs of collecting TV's commensurate with their volume of sales through Good Guys.
- NWPSC will partner with Good Guys to establish an ongong program in Washington if desired.

Consider establishing an end-of-life fee program similar to the Washington program in Oregon and Nevada Good Guys stores.

Based upon the knowledge and experience gained from the take-back pilot program in Washington, Good Guys could implement similar programs at the three stores in Oregon and two in Nevada.

Establish take-back pilot projects in a limited number of Good Guys stores in California to determine the feasibility of becoming an e-waste collector under a front-end financed system.

Good Guys stores are in the unique situation of being one of the only television retailers to have conducted an electronics take-back program at retail stores. California is now accepting applications for collectors of electronics via their new statewide e-waste recycling system. Several Good Guys stores could apply to become a collector and receive reimbursement at the rate of $0.20/pound for the materials collected. These pilot stores could be used to test the assumptions about how a front-end financed electronics recycling system would work for a retailer providing collection services to customers.

Consider establishing an end-of-life fee program at CompUSA stores.

Good Guys is a subsidiary of CompUSA, which has about 250 stores nationwide. CompUSA can benefit from the lessons learned during the Good Guys pilot project and programs offered by other retailers, in addition to providing customers with an added service. As more local and state governments ban televisions and computers from disposal, consumers will welcome an easy solution for their old products when they buy new ones. Customers will begin to expect this service as more retailers offer these e-waste recycling programs.

NWPSC recommends that CompUSA establish its own voluntary in-store take-back program with the following features:

- Provide on-going in-store take-back as a standard business practice.
- Use end-of-life fees to cover costs of program and control volume.
- Partner with product manufacturers to reduce the cost of recycling products. Offer recognition in exchange for recycling funds.
- Adjust end-of-life fees to cover costs remaining after any manufacturer contributions and to control volume in areas where there are limited recycling services.

- Consider establishing an ongoing one-for-one take-back system where customers purchasing a new product can recycle a similar product for no charge.
- Require environmentally sound recycling standards from all recyclers and processors participating in the program.
- Conduct pilots with stores in states that have front-end financing mechanisms, currently California and Maine, to understand how those systems affect in-store take-back dynamics.
- Work with local and state government partners to design and establish pilots and programs.
- NWPSC will partner with CompUSA to demonstrate the program in Washington and Oregon prior to a national roll out if desired.

Appendices

A Retailer Recruitment Letter

B Memorandum of Understanding

C EPA Materials Handling Guidelines

D Retailer Training Documents

E Advertising, Media Coverage and Promotional Materials

F Customer Survey Results