STATE OF NEVADA

REPORT ON ELECTRONIC WASTE REUSE AND RECYCLING

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Report to the Nevada Legislature

Submitted by:

NEVADA DEPARTMENT OF CONSERVATION AND NATURAL RESOURCES
DIVISION OF ENVIRONMENTAL PROTECTION
BUREAU OF WASTE MANAGEMENT
SOLID WASTE BRANCH

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http://nevadarecycles.gov/study2010/index.html

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2011 Final Report

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Executive Summary

Assembly Bill (AB) 426, introduced during Nevada's 75th Legislative Session, proposed the creation of a State program to govern electronic waste (e-waste) recycling. During the session, AB426 was amended to require the Nevada Division of Environmental Protection (NDEP) to conduct an interim study of e-waste reuse and recycling programs in Nevada and surrounding states.

Voluntary systems and mandatory programs were examined nationwide. Mandatory programs are employed in 23 states. In the absence of national legislation, a patchwork of state legislation has developed[1]. These programs vary widely in their approach to e-waste reuse and recycling, e.g. in the types of electronic devices covered by their programs, the means by which their programs are funded, the level of oversight and reporting required, etc. Three state programs representing the range of approaches being implemented across the country are discussed in detail: California's Advance Recovery Fee (ARF), the only "consumer fee" program in the country; Oregon's Producer Responsibility (PR) program, which was adopted in 2009 and is one of the most complex state mandatory programs; and a simplified PR program recently adopted by Maryland.

The mandatory programs being run in California and Oregon were determined to be overly-complex and fiscally burdensome and were not recommended for legislative consideration. While Maryland's program is a simplified and less costly version of a PR program, the initial start-up of such a program would still have a significant fiscal impact on state and local agencies and would require fees to be assessed on electronics manufacturers. While such a program may be effective in urban areas, it would be difficult to implement in the rural parts of the state and may provide no additional coverage in those areas. Additionally, these programs are typically established in conjunction with a ban on the disposal of electronic waste into landfills. Such a ban would ensure that more e-waste goes to recyclers and could increase the number and availability of recyclers. However, it would also increase initial implementation costs, would require more enforcement capability, and would likely result in more e-waste being exported to developing countries for end-of-life management. Based on the experiences of other states, a landfill ban in Nevada would need to be implemented gradually over a few years and then perhaps only in the most urban counties to allow for the necessary additional recycling capacity to be developed and to avoid unintended impacts such as desert dumping.

Voluntary systems are currently operating in the remaining 27 states, including Nevada and a number of our neighboring states, i.e. Idaho, Arizona and Utah. Although several e-waste bills have been proposed over the years in those states, none have become law due, in part, to the funding required to develop, staff, and implement mandatory programs.

Under Nevada's existing voluntary system, the infrastructure is already in place to deal with most of Nevada's e-waste. There are currently 45 drop-off locations in the two major population

[1] A federal e-waste program has yet to be developed. However, in response to a GAO draft report, dated May, 2010, the U.S. EPA issued a letter, dated May 28, 2010, stating that they are working with other federal agencies to draft Federal e-waste reuse and recycling legislation[1]. Completion of this legislation is not anticipated in the near future.

centers of the state. The e-waste collection that occurs at these centers is augmented by the collection activities of several large non-profit organizations. E-waste collection services are often offered fee-of-charge, while others charge per unit or by the pound fees. For example, there is typically a charge to recycle TVs because, compared to computers, TVs are less valuable to recyclers. Between local collection facilities, special collection events, retail take-backs and trade-ins, mail-ins, and on-line trade-ins, about 95% of Nevada's population has access to some form of existing e-waste recycling services. The remaining 5% represents consumers in Nevada's most remote rural areas. All of the reuse/recycling services currently available in Nevada are listed on the NDEP website, NevadaRecycles.gov.

Recommendation

Because the vast majority of Nevadans currently have access to e-waste recycling, and significant initial costs to the state would be incurred to establish a mandatory program, efforts to increase e-waste recycling through the existing voluntary program are recommended. With existing resources, NDEP could continue to work with local retailers, manufacturers, recyclers and local governments to enhance public awareness of existing e-waste programs and to encourage the development of new programs.

If, after additional efforts to increase public awareness, the voluntary program is not achieving the desired results and funding becomes available, the legislature could consider establishing a simplified version of the PR program, similar to one being implemented in Maryland in conjunction with a ban on the disposal of e-waste.

1.0 Background

1.1 Nevada Assembly Bill 426

Assembly Bill (AB) 426, introduced during Nevada's 75th Legislative Session, proposed the creation of a State program to mandate the recycling of electronic waste (e-waste). The proposed program was to be modeled after Oregon's e-waste recycling program in which manufacturers of certain electronic devices are required to provide for their end-of-life (EOL) management through physical and/or financial responsibility.

Numerous recyclers, retailers, manufacturers and interest groups testified on this proposal -- some supporting and others opposing AB426. Collectively, their testimony affirmed that e-waste recycling is already occurring in Nevada, but that these services have not been adequately identified, documented, or promoted to the public. A common theme emerged throughout the hearings: E-waste reuse and recycling has merit on many levels, including protection of human health and the environment, and should be addressed because of its growing volume and prevalence, but deciding upon the best approach is a complex issue that required additional evaluation. As a result, the proposed bill was amended to require an interim study of e-waste reuse and recycling programs.

The NDEP was tasked with the study and specifically with: 1) conducting an inventory programs for the reuse and recycling of computers and other electronics in Nevada and in neighboring states; 2) evaluating those programs; and, 3) submitting a report to the Legislature recommending possible legislation. A study group, which included representatives from the electronics industry, recyclers and local government, was formed to identify existing reuse and recycling programs statewide, provide insight on how any proposed program would impact their business, advantages and disadvantages of other state programs and their effectiveness.

1.2 Definition of E-Waste

For the purposes of this report, e-waste is defined as EOL computers (including CPUs, laptops, Cathode Ray Tubes (CRT) and flat panel monitors) and TVs. The e-waste definition does not include mobile communication devices (cell phones, PDAs) because they may be readily recycled for no charge at their source through manufacturer take-back programs and pose no significant e-waste problem.

1.3 E-Waste Concerns and Hazards

Electronic devices are composed of a wide variety of hazardous constituents such as arsenic, lead, nickel, cadmium, and mercury. These constituents have been identified by the EPA as "priority toxins" because they are persistent in the environment and bio-accumulate. They are considered dangerous, even in small quantities, and are known to pose risks to human health and the environment if mismanaged[2]. Although no evidence of e-waste contaminated leachate has been found in Nevada to date, if landfilled, e-waste has the potential to release these hazardous constituents into the soil and groundwater.

[2] US GAO Report to Congressional Requesters, "Electronic Waste, Strengthening the Role of the Federal Government Encouraging Recycling and Reuse." November 2005, GAO-06-47.

While not a major concern in Nevada, our survey found that other states are experiencing dwindling landfill space as e-waste volume continues to grow. Diverting e-waste from landfills has several merits: conserving/protecting natural resources (air, water, and raw materials), allowing for recovery of reusable materials from e-waste, and extending a landfill's useful life-span in areas that have high-use, high-density landfills. In order to address these concerns and to comply with mandatory e-waste laws in other states, several major manufacturers have established programs to recover and recycle their products nation-wide.

1.4 Federal E-Waste Regulations

Nationally, e-waste stakeholders have been debating how to address EOL management for many years. These stakeholders include federal, state and local public agencies, manufacturers and retailers, environmental groups, recyclers, and non-profit organizations. Stakeholders and lawmakers have yet to agree on how to draft e-waste legislation that would establish a federal solution. The lack of a federal e-waste program and low e-waste recycling rates nationally prompted the U.S. Government Accountability Office (GAO) to study what the EPA is doing to promote e-waste reuse and recycling.

In a July 2010 report[3], GAO recommended that the EPA do two things to promote environmentally sound e-waste reuse and recycling. First, evaluate their partnership programs for effectiveness and look for ways to improve e-waste EOL management. Second, they recommended that EPA work with other federal agencies to come up an e-waste management proposal for congressional consideration. The EPA agreed with the recommendations and has begun reaching out to form partnerships with manufacturers, retailers and other e-waste recyclers to improve their take-back programs. EPA is also working with the State Department and other federal agencies to draft a legislative package addressing both commercial and household generated e-waste.

Currently the EPA regulates e-waste generated commercially under two (2) federal programs: the Resource Conservation & Recovery Act (RCRA)[4], or the Cathode-Ray Tube (CRT) Rule[5]. Household generated e-waste is not regulated at the federal level.

2.0 State of Nevada – Voluntary System

2.1 Overview

[3] US GAO Report to Chairman, Committee on Science and Technology, "Electronic Waste, Considerations for Promoting Environmentally Sound Reuse and Recycling." July 2010, GAO-10-626.

[4] US EPA, *Resource Conservation and Recovery Act* (RCRA), which was enacted by Congress in 1976. RCRA's primary goals are to protect human health and the environment from the potential hazards of waste disposal, to conserve energy and natural resources, to reduce the amount of waste generated, and to ensure that wastes are managed in an environmentally sound manner. RCRA regulates the management of solid waste (e.g., garbage), hazardous waste, and underground storage tanks holding petroleum products or certain chemicals.

[5] US EPA, *Cathode-Ray Tube (CRT) Rule*, July 2006. This rule streamlines management requirements for the recycling of used CRTs and glass removed from CRTs under the Resource Conservation and Recovery Act (RCRA).

Approximately 95% of Nevada's population currently has access to existing e-waste services through a combination of local drop-off facilities, special collection events, and mail-in take-back programs. Some e-waste reuse and recycling services are free-of-charge, while others charge per unit or by the pound fees. Televisions are more difficult to reuse or recycle than computers. Because recycling TVs less profitable than recycling computers, not all recyclers accept TVs, and many of those that do charge a fee.

2.2 Current Infrastructure

There is a wide array of options currently available in Nevada through which electronic wastes can be recycled:

- Three non-profit organizations (NPOs) accept computers and computer peripherals for reuse and resale. NPOs work with local communities across the state, including rural areas, to conduct special e-waste collection events on a periodic or annual basis.

- Most electronic retailers and manufacturers offer drop-off or mail-in e-waste recycling. These services are often free of charge.

- Several name brand TV manufacturers have established partnerships in Nevada with local waste handlers and recyclers to accept their brands free-of-charge. For a nominal fee, these same handlers and recyclers will take other TV brands as well.

Recycling information is available on the NDEP website, NevadaRecycles.gov. This website provides up-to-date information on the manufacturers, retailers, NPOs and other organizations providing recycling services statewide. It includes a current list of Nevada's e-waste handlers and collectors, the type of e-waste they accept, and their operating areas.

EPA's program, Plug-In to e-Cycling, enables manufacturers, retailers, and service providers to publicize their programs, and includes helpful links and other e-cycling information.

2.2.1 Drop-off Locations

As of May 2010, 45 residential e-waste collection points have been identified statewide, most of them situated in retail outlets. These drop-off locations are concentrated in the four most highly populated counties: Clark, Washoe, Douglas, and Carson City. They provide easy access to 91% of Nevadans. Another 4% can recycle their e-waste through regularly scheduled special collection events (monthly/quarterly/annually) or at special events in more remote communities. For a current list of Nevada's e-waste handlers and collectors, the type of e-waste they accept, and their operating areas, see Appendix A. Appendix B is an interactive map of e-waste collection facilities statewide.

2.2.2 Special Collection Events

Special collection events have been another powerful resource that has contributed to the success of Nevada's voluntary system. These types of events require some level of community support and participation which is often provided by local service groups These groups typically provide advertising and promotion, a staging location, and volunteers for various functions associated with the collection events. They also establish partnerships with the reuse/recycler that will be

taking the collected materials away for processing. Over the past several years, northern Nevada NPOs have been holding annual e-waste collection events in Carson City, Douglas, Elko Humboldt, and Washoe Counties for computer e-waste.

2.2.3 Manufacturer Take-back Programs

Mail- and trade-in programs, offered by many electronics manufacturers are also an important component of successful state voluntary systems because they enable e-waste recycling from anywhere in the country. Often free-of-charge, these take-back programs effectively divert participating manufacturers' name brands from the e-waste stream for reuse and recycling. Other brands may be accepted for a nominal fee.

For consumers who want to dispose of electronics that are still in working order, some manufacturers offer trade-ins for cash or credit toward a new purchase. Some manufacturers even offer on-line trade-ins. Straight buy-back programs are also offered by several of the major manufacturers where they pay cash for their used electronics depending on condition, age, or other factors.

Several manufacturers are partnering with retailers and recyclers to provide drop-off locations. In Washoe County, for example, the waste management and recycling franchisee has partnered with several TV manufacturers to provide free take-back for their products. A Sparks recycler has established a similar arrangement with a major TV manufacturer. Both of these local recyclers collect all other brands of e-waste for a per pound fee. For a complete list of take-back programs and services currently available in Nevada, see Appendix A. This list also includes links to each company's website where detailed information on the programs they provide can be found. This information is also available and is regularly updated on EPA's Plug-in to eCycling website.

The current economic climate and market volatility have caused a number of e-waste businesses to spring up and close down just as rapidly. The NDEP continues to work with manufacturers to obtain and share the latest information and developments in e-waste recycling with the public through various media outlets (nevadarecycles.gov, Nevada Recycling Hotline, etc.).

3.0 E-Waste Legislation in Other States

As of June 2010, 27 states manage their e-waste reuse and recycling under voluntary systems, while the remaining 23 have established mandatory programs. As in Nevada, these voluntary systems make use of local drop-off locations, special collection events, and by taking advantage of manufacturer take-backs to maximize reuse and recycling. Mandatory state programs vary widely, both in the types of electronic devices that are covered and the means by which their programs are funded. California was the first to enact legislation in 2003 establishing a mandatory system for the collection and recycling of certain e-wastes. Since then, 22 additional states have followed suit. State programs typically focus on video display devices because they pose the highest potential risk to the environment and human health.

Two types of mandatory programs have been adopted: Advanced Recovery Fee (ARF) programs, or Producer Responsibility (PR) programs. Under an ARF program, consumers pay a fee at the point of purchase to cover the collection and recycling of e-waste. This program is

labor intensive and very costly (See Section 3.1.1 for more detail). California is currently the only state that has adopted an ARF program. Under a PR program, the manufacturer either takes back, or reimburses recyclers for a portion of the cost of collecting and recycling their products, either directly or through a state administered fund. PR program reimbursement structures vary from state-to-state, with some based on tonnage and others on the number of units collected. The amount paid by manufacturers to the regulatory agency can be based either on a manufacturer's share of last year's market sales, on the percentage of e-waste collected bearing their brand, an annual fee, or a combination of these.

PR programs require manufacturers to register with a state, and, in most programs, pay an annual fee to be able to market their products in those states. While this might sound straightforward, PR programs have several drawbacks. Obtaining registration information and collecting fees from international companies has proven to be difficult and time-consuming. Most states are insufficiently staffed to enforce manufacturer registration. Even the term "manufacturer" has proven to be an obstacle to program funding as some claim they are "brand owners," not manufacturers, by definition, and refuse to pay the fee.

Programs based on return-share require additional tracking efforts by collectors and recyclers, as well as enforcement by public agencies. Using market-share to set a program's funding structure requires the purchase of a national market-share report each year from market research firms. These reports are estimated to cost up to $20,000 depending on the amount of data and level of detail requested in the report.

3.1 State Mandatory Programs

State mandatory programs were examined nationwide and three state programs representing the different approaches being implemented across the country are discussed in detail: California's ARF, the only "consumer fee" law in the country; Oregon's program, one of the more complex PR programs; and a simplified PR program that was adopted in Maryland.

3.1.1 California – ARF Program

California's e-waste program is limited to specific video display devices (4" and larger), and imposes a consumer paid fee ranging from $8-$25 per item purchased. The fee is collected at the retail level, 3% of which the retailer retains. The remainder is deposited into a state-administrated recycling fund. The fund reimburses state approved e-waste collectors and recycling companies and covers the salaries of state and local e-waste program staff. According to the current rate schedule, collectors are paid $0.16/lb by recyclers, and recyclers are paid $0.39/lb by the state. For additional information on California's e-waste program, please click here: CA Electronic Waste Recycling Act.

3.1.1.1 Evaluation

As a result of this program, additional e-waste is diverted from landfills, conserving landfill space and natural resources. However, because there is no federal ban on the export of e-waste for recycling, much of the e-waste collected under this program is shipped out of the country for recycling and may end up in locations with little or no environmental regulation. Businesses and jobs were created because the increased supply of regulated e-waste created the need for additional collection, resource recovery and reclamation operations, transportation, and other ancillary functions.

The program is funded by fees paid by the consumer for each electronic device purchased. State and local governments required considerable staffing and funding increases to develop, implement and enforce the ARF program. Although retailers receive some compensation (3% of the fees collected) to cover the cost they incur to collect, account for and transmit the funds collected to the State, that compensation is considered by the retailers to be insufficient to cover their costs. Manufacturers are not required to pay registration fees or provide take-back programs for their covered electronic devices in California's ARF program as they are under a typical PR program, they are, however, required to provide the California Integrated Waste Management Board with information annually demonstrating their efforts to: 1) reduce the levels of toxic substances in electronic devices they produce; 2) increase the use of recyclable materials in their products; and, 3) provide outreach programs to consumers (Public Resource Code Section 42465.2).

Based on discussions with California's ARF program staff, the following table summarizes the pros and cons of their mandatory program:

California	***Pros***	***Cons***
FISCAL IMPACTS		
Affected entities	**Manufacturers** *No fees assessed, but they are required to submit annual reports*	**Consumers** *Fees on the purchase of each electronic device fund the program*
	State *After initial program development, revenue collected from consumers covers associated program costs*	**State/Municipalities** *Must fund initial program development*
		Retailers *Costs to collect, account for and transmit fees are not completely covered*
Implementation		**State/Municipalities** *Expands government: additional staffing and budget line items required* *Amendments required to franchise agreements, operating permits, and contracts*
Compliance & Enforcement		**State/Municipalities** *Staff intensive & costly* *Fraud prevention enforcement required*
ENVIRONMENTAL IMPACTS		
Results	E-waste diverted from landfills and recycled into usable products	Because there is no federal export ban, e-waste collected can readily be exported out of country for recycling
	Landfill space conserved	
	Natural resources conserved measured in tons	
	Businesses and jobs created in e-waste	

California	***Pros***	***Cons***
	collection/handling/processing	
Anticipated #s Diverted	4.54 lbs per capita in '09[6]	
INFRASTRUCTURE IMPACTS		
		State/Municipalities *Staff intensive for initial program development, implementation, enforcement & compliance* *Lack of enforcement consistency between public regulatory agencies.*

Estimated Fiscal Impacts in California[7] (FY 2010/11)*

Allotment for Payments to Recyclers:	**$**	**80,386,000.00**
Appropriation (including allotment):	**$**	**84,687,000.00**
Total Expenditures:	**$**	**92,029,000.00**

** Of the total expenditures, 87% is allotted to reimburse collectors and recyclers, the remaining 13% funds State agency administrative and regulatory activities. The number of employees required to operate the ARF is difficult to estimate as there are multiple state and local agencies involved.*

California's program is not recommended for further consideration due to its inherent complexities and fiscal impacts.



3.1.2 Oregon - PR Program

Oregon's PR program is designed to establish and finance convenient collection and recycling programs in each county throughout the state. The program requires manufacturers of desktop computers, laptops, monitors, and TVs to either join a state sponsored take-back program or create a take-back program of their own. Regardless of their choice, all manufacturers pay an annual registration fee based on their market-share of units sold in the previous year. In addition, under the State take-back program, manufacturers pay a recycling fee to participate based on the return-share of their products. A manufacturer that chooses to create an independent plan will pay the state for any shortfall if their plan fails to meet their collection obligation (a pre-determined collection percentage goal). In 2009, the cost of the program to the state was $1.4 million[8]. The assessed fees cover the contractor managing the program, any required information technology for billing and tracking, compliance and enforcement activities, and any legal services required to deal with non-compliance issues. For additional information on Oregon's e-waste program, please click here: Oregon E-Cycles.

3.1.2.1 Evaluation

[6] The Electronic Takeback Coalition has been collecting data from states with mandatory e-waste recycling programs and has published a recent report of this data.
[7] Cost estimates for the CA program were received from the CA Department of Resources and Recovery.
[8] Per telephone conversation with Oregon's E-Cycles program staff.

As a result of this program, additional e-waste is diverted from landfills, conserving landfill space and natural resources. However, because there is no federal ban on the export of e-waste for recycling, much of the e-waste collected under this program is shipped out of the country for recycling and may end up in locations with little or no environmental regulation. Businesses and jobs were created because the increased supply of regulated e-waste created the need for additional collection, resource recovery and reclamation operations, transportation, and other ancillary functions.

Oregon's "dual plan" PR program requires additional government resources to track sales, verify compliance with collection goals, enforce registration requirements, establish data management systems and manage fees. After initial start-up, the annual registration fee was designed to cover the costs incurred by state and local government agencies. These same registration fees are used to reimburse local recyclers for a percentage of their collection and transportation costs. While there is no fee assessed directly on the consumer, the fees charged to manufacturers are typically passed through to the consumers. Under this program, retailers are required to provide public education and outreach

The follow table summarizes the pros and cons of Oregon's PR program.

Oregon	***Pros***	***Cons***
FISCAL IMPACTS		
Affected Entities	**State/Municipalities** *After initial program development, revenue collected from manufacturers covers associated program costs*	**State/Municipalities** *Must fund initial program development*
	Manufacturers Has flexibility, choice of joining State or independent program	**Manufacturers** *Required to fund the entire program*
		Retailers *Cost to assist in public education and outreach*
		Consumers *Program costs passed through to consumers*
Implementation		**State/Municipalities** *Expands government: additional staffing and budget line items required* *Amendments required to franchise agreements, operating permits, and contracts*
Compliance & Enforcement		**State/Municipalities** *Revenue to program lost due to legal challenges to "manufacturer" definition* *Staff intensive and costly for initial program development, implementation, enforcement & compliance* *Fraud prevention enforcement required*
ENVIRONMENTAL IMPACTS		

Oregon	***Pros***	***Cons***
Results	E-waste diverted from landfills and recycled into usable products	Because there is no federal export ban, e-waste collected can readily be exported out of country for recycling
	Landfill space conserved	
	Natural resources conserved measured in tons	
	Businesses and jobs created in e-waste collection/handling/processing	
Anticipated #s Diverted	4.96 lbs per capita in '09[9]	
INFRASTRUCTURE IMPACTS		
	Manufacturers *Incentivized to implement take-back programs to reduce their registration fees.*	**State/Municipalities** *Staff intensive and costly for program development, implementation, enforcement & compliance*
	Retailers *Involved in Public Education & outreach*	

Estimated Fiscal Impacts in Oregon **– STATE OPERATED PROGRAM**[10]

FTEs: 4 – 1 supervisor, 3 ES III	**$**	**243,356.00**
Direct Costs:	**$**	**228,660.00**
Indirect Costs:	**$**	**43,804.00**

Estimated Fiscal Impacts in Oregon **– CONTRACTOR OPERATED PROGRAM**[11]

FTEs: 1 ES III	**$**	**70.804.00**
Direct Costs: ***Contract(s), IT & Legal fees***	**$**	**1,400,000.00**
Indirect Costs:	**$**	**12,745.00**

Oregon's program is not recommended for further consideration due to its inherent complexities and fiscal impacts.



3.1.3 Maryland – Simplified PR Program

Maryland adopted one of the nation's simplest PR e-waste laws. Electronics manufacturers are required to pay an initial fee of $10,000, then a renewal fee annually thereafter. The annual renewal fee is $500 if they implement a take-back program, or $5,000 if they don't[12]. Counties and local municipalities are encouraged to establish e-waste collection and recycling programs in their jurisdictions. The state collects the registration fees and maintains a list of manufacturers that are registered and approved. The state in turn grants funds to the counties and municipalities

[9] The Electronic Takeback Coalition has been collecting data from states with mandatory e-waste recycling programs and has published a recent report of this data.
[10] Cost estimates for the State Operated option were from the Fiscal Note submitted with BDR 40-466 (AB426).
[11] Cost estimates for the Contractor Operated option were received from Oregon e-Cycles program staff.
[12] Cost estimates received from Maryland's eCycling program staff.

operating e-waste programs. For additional information on Maryland's e-waste program, please click here: e-Cycling in MD.

3.1.3.1 Evaluation

Although the Maryland program was recently implemented, so it's effectiveness has yet to be determined, it is anticipated that additional e-waste will be diverted from landfills, conserving landfill space and natural resources. However, because there is no federal ban on the export of e-waste for recycling, much of the e-waste collected under this program may be shipped out of the country for recycling and may end up in locations with little or no environmental regulation. Businesses and jobs are expected to be generated because the increased supply of regulated e-waste will create the need for additional collection, resource recovery and reclamation operations, transportation, and other ancillary functions.

Significant resources were needed to initially establish this PR program. However, after the initial startup, the manufacturer's annual registration fees should cover state and local government costs. These same fees will be used to reimburse local recyclers for a percentage of their collection and transportation costs. Although electronics consumers are not directly assessed a fee, the fees paid by manufacturers are typically passed on to the consumers.

Maryland	***Pros***	***Cons***
FISCAL IMPACTS		
Affected Entities	**State** *After initial program development, revenue collected from manufacturers covers associated program costs*	**State/Municipalities** *Must fund initial program development*
	Manufacturers *Registration fees lower due to simplified program*	**Manufacturers** *Required to fund the program*
		Retailers *Share responsibility for e-waste* *Required to assist in public education and outreach*
Implementation		**State/Municipalities** *Expands government: additional staffing and budget line items required* *Amendments required to franchise agreements, operating permits, and contracts*
Compliance & Enforcement		**State/Municipalities** *Staff intensive and costly for initial program development, implementation, enforcement & compliance* *Revenue to program lost due to legal challenges to "manufacturer" definition* *Fraud prevention enforcement required*
ENVIRONMENTAL IMPACTS		
Results	E-waste is being diverted from landfills and recycled into usable products	Because there is no federal export ban, e-waste collected can readily be

Maryland	***Pros***	***Cons***
		exported out of country for recycling
	Landfill space conserved	No enforceable collection goals, so diversion rate may not increase significantly
	Natural resources conserved measured in tons	
	Businesses and jobs created in e-waste collection/handling/processing	
Anticipated #s Diversion	New program – no data yet	
INFRASTRUCTURE IMPACTS		
	Manufacturers *Incentivized to implement take-back programs to lower registration fees.*	**State/Municipalities** *Staff intensive and costly for initial program development, implementation, enforcement & compliance*
	Retailers *Involved in public education & outreach*	

Maryland - Estimated Fiscal Impacts[13] *

FTEs: 1 ES III	**$ 70,804.00**
Direct Costs: ***Expenditures & Encumbrances***	**$ 708,230.00**
Indirect Costs:	**$ 63,306.00**

** The direct costs reflect funds for reimbursement of counties and municipalities in the form of grants for their e-waste programs. The financial components of the Indirect Costs is difficult to determine; however, assuming that Maryland adheres to standard government accounting practices, such costs are calculated as a percentage of direct costs.*

3.2 State Voluntary Systems

Like Nevada, our neighboring states, Arizona, Idaho, and Utah operate under voluntary e-waste systems. Although several e-waste bills have been proposed over the years, none have passed legislative review to become law in those states. The lack of legislation in these states is due, in part, to insufficient funding to develop, staff, and implement a mandatory e-waste management system.

3.3 State E-Waste Landfill Bans

Another e-waste management alternative that merits consideration is the imposition of a ban on e-waste disposal in landfills. As of June 2010, 13 states (CA, CT, IL, IN, ME, MN, NJ, NY, NC, OR, RI, SC and VT) have passed e-waste landfill disposal bans to maximize e-waste collection and recycling. When considering an e-waste ban, the following must be explored: Will the current commodities market and existing local collection infrastructure be able to handle the additional in-flow of materials, how will the ban be funded, and how and where will the e-waste diverted from the landfill be managed or recycled?

Adopting a landfill ban would increase the amount of e-waste reused and recycled. This increased supply could increase Nevada's current reuse and recycling infrastructure by attracting new recycling businesses. Because many of the recyclers are currently operating at or near

[13] Cost estimates received from Maryland's eCycling program staff.

maximum capacity in Nevada and it takes time to expand the existing infrastructure and develop new collection programs, a state ban typically requires a 3-5 year phase-in period to allow recycling companies and other key stakeholders adequate time to set up new services or expand existing services.

In states with mandatory PR e-waste programs, landfill bans are typically funded by the electronics manufacturers. Under a voluntary system, the cost of developing and implementing a ban is typically borne by the local government. As is often the case, if additional fees are imposed on residents as a result of a ban or if the ban makes it significantly more difficult to get rid of e-waste, illegal dumping activities increase placing additional burdens on state and local law and code enforcement agencies.

3.3.1 Evaluation

A landfill ban would help to divert tons of e-waste from landfills and would encourage reuse and recycling, reduce potential contamination of the environment and allow for reclamation of valuable components and reuse; it would also require new program to be developed and implemented with fiscal impacts to state and local agencies. Any proposed ban should consider where and how the e-waste being diverted from the landfill will be recycled. Because there is no federal ban on the export of e-waste for recycling, much of the e-waste diverted through such a ban may be collected then shipped out of the country for recycling and may end up being "recycled" in locations with little or no environmental regulation.

Because the majority of reuse and recycling collection services are located in Clark and Washoe Counties, limiting a ban to counties with populations over 100,000 may be appropriate. However, preliminary discussions with county officials indicate a landfill ban may not be in the best interest of all parties concerned.

Landfill Ban	***Pros***	***Cons***
FISCAL IMPACTS		
Affected Entities	**Manufacturers/Retailers** *No economic impacts for a landfill ban*	**State/Municipalities** *Staff intensive and costly for development, implementation, enforcement & compliance*
	Recyclers *Guaranteed increase in supply of e-waste for reuse and recycling*	**Residents** *Disposal rates and fees increase to cover cost of landfill ban*
Implementation		**State/Municipalities** *Amendments required to franchise agreements, operating permits, and contracts* *Expands government: additional staffing and budget line items required*
Compliance & Enforcement		**State/Municipalities** *Fraud prevention enforcement required*
ENVIRONMENTAL IMPACTS		
Results	Reduces or eliminates the risk of leachate contamination from e-waste	Illegal dumping activities increase
	Landfill space conserved	Because there is no federal export ban,

Landfill Ban	***Pros***	***Cons***
		diverted e-waste can readily be exported out of country for recycling
	Natural resources conserved measured in tons annually	
	Businesses and jobs created in e-waste collection/handling/processing	
Anticipated #s Diversion	UNKNOWN	
INFRASTRUCTURE IMPACTS		
	Potential new businesses and jobs related to collection, handling and processing	**State/Municipalities** *Public agencies on the hook for collection and handling whether recyclers have capacity or not*

Landfill Ban - Estimated Fiscal Impacts *

FTEs:	***Variable***
Direct Costs:	***Variable***
Indirect Costs:	***Variable***

** The fiscal impacts of a landfill ban would depend on the complexity of the adopted ban, i.e. the variety of materials that are banned, the area covered by the ban (statewide or by county), tracking requirements, level of compliance and enforcement, etc. There will be initial costs to agencies for program development and implementation, and later for compliance and enforcement. A landfill ban will require amendments to operating permits and, in some cases, modifications to franchise agreements.*

4.0 Recommendation

State e-waste programs were evaluated nationally to determine the most appropriate e-waste management options for Nevada. California, Oregon and other state programs were not recommended for further consideration due to inherent complexities and fiscal impacts. Although, EPA is currently working to develop national e-waste recycling program. It is unknown what the federal program would look like or when it would be adopted. We recommend that the voluntary program be continued and enhanced as described below.

Preferred Alternative

No Legislation – Continue Existing Voluntary System

No major gaps in the availability of recycling services were identified for the majority of Nevada residents. While recycling services are more limited in the rural part of the state, it is not clear that a mandatory program could be cost-effectively implemented or that a mandatory program would improve the recycling capability outside of the major urban areas. While a mandatory program could increase the recycling rate for e-waste, there would be a significant cost to state and local governments to develop and initially implement such a program and fees would be required to cover program implementation costs into the future.

Over the next few years, while the State's economy improves and as the federal program is being developed, efforts could be made to increase the e-waste recycling rate in Nevada through the existing voluntary program. Improvements could and should be made to enhance public

awareness of the risks associated with the disposal of electronic waste and the benefits and availability of reuse/recycling programs and environmentally-preferable purchasing practices. With existing resources, NDEP could:

- Continue to maintain the most current e-waste recycling information on NDEP's website, www.NevadaRecycles.gov .
- Continue to work with local retailers, manufacturers, recyclers and local government officials to identify and implement new outreach and education opportunities.
- Encourage electronic manufacturers to advertise and use other means to actively promote their e-waste take-back and mail-in programs statewide.
- Encourage e-waste companies and electronics manufacturers to continue to use a variety of media to advertise e-waste collection events.
- Continue to educate Nevadans about available e-waste services via NDEP's website, www.NevadaRecycles.gov and NDEP's toll-free Recycling Hotline: (800) 597-5865.
- Make a point of promoting e-waste recycling as a part of all recycling outreach meetings and events.
- Encourage municipalities to include e-waste reuse and recycling programs in their Solid Waste Management Plans.
- Continue to track e-waste recycling and reuse information that is reported to the Division.
- Promote environmentally-preferable purchasing (EPP) practices and provide links to websites that rate electronic devices based on their toxicity on the NDEP website.
- Encourage EPP practices and EOL e-waste reuse and recycling practices at State agencies.

Should EPA be unable to develop a federal program over the next few years and if the voluntary program, after increased public education and outreach, is not achieving the desired results, the legislature could consider establishing a simplified mandatory producer responsibility program, similar to the program adopted by Maryland, and adopting a ban on the disposal of e-waste in landfills when funding necessary to develop and implement such a program becomes available. This program would be less complex and costly than the one proposed during the 2009 legislative session, but could ensure that computer CPUs, laptops, monitors and TVs are recycled or reused.

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APPENDIX A

Tables of Available Services

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STATEWIDE E-WASTE DROP-OFF LOCATIONS			
NAME	**ITEMS TAKEN[1]**	**CONTACT PHONE**	**FACILITY LOCATION**
Virgin Valley Disposal Inc.	1-3, 5-6	702.346.5936	3200 Mesquite Heights Dr
Humboldt Co. Regional Landfill	1, 6	775.623.2985	50 W. Fifth St, Winnemucca
IVGID Waste Not Program	1 - 6	775.832.1284	Sweetwater Dr, Incline Village
Douglas Disposal Inc.	3 - 5	775.782.3925	Pinenut Rd, Gardnerville
Recycle America, WM Inc.	1 - 6	775.326.2381	E. Commercial Row, Reno
Blind Center of Nevada	1-3, 5-6	702.642.6000	N. Bruce St, Las Vegas
New2U Computers	1-3, 5-6	775.329.1126	155 Glendale Ave, Sparks
Computer Corps	1-3, 5-6	775.883.2323	US Hwy 50 E, Carson City
Clean Harbors Environmental	1 - 6	775.624.8060	1200 Marietta Way, Sparks
H2O Environmental	1 - 6	775.351.2237	3510 Barron Way, Reno
Best Buy	1 - 6	612.291.6127	Retail Outlets Statewide
Office Depot	1 - 6	775.887.9006	Retail Outlets Statewide
Staples	1-3, 5-6	775.267.0845	Retail Outlets Statewide
Apple Computers	1-3, 5-6		Retail Outlets Statewide
Sims Recycling Solutions	1-6	800.884.2275	725 Grey St, Sparks
EPC		702.458.0092	
A-American Storage	1 - 6	Retail Outlets Statewide	Retail Outlets Statewide
Goodwill/Dell	1 - 6	Retail Outlets Statewide	Retail Outlets Statewide
Redemtech	1-6	877.478.3261	Statewide

[1] 1-Computers, 2-Laptops, 3-CRTs, 4-TVs, 5-Flat Panel Monitors, 6-Peripherals

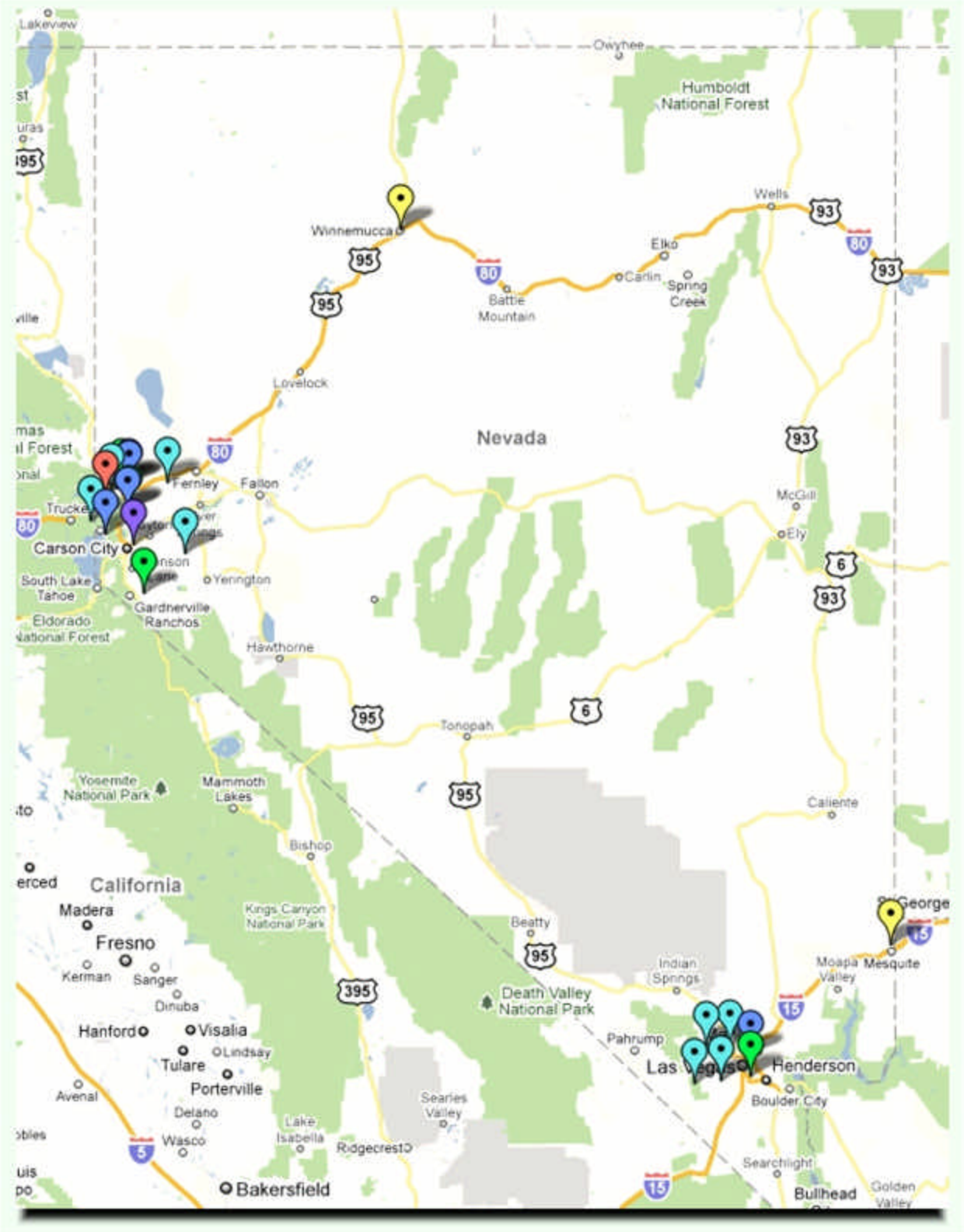
COMPUTER TAKE-BACK PROGRAMS	
COMPANIES	**WEBSITES**
Best Buy Dell Reconnect (a Dell & Goodwill partnership) FujitsuHP NEC Office Depot Sony Staples Toshiba	Best Buy Dell Reconnect (a Dell & Goodwill partnership) FujitsuHP NEC Office Depot Sony Staples Toshiba

TV TAKE-BACK PROGRAMS	
COMPANIES	**ADDITIONAL INFORMATION**
Best Buy	Accepts any brand of TV up to 32 inches for a $10 charge, and the company will give you a $10 Best Buy gift card to offset that cost. You can bring in up to two devices a day, per household, to any Best Buy store in the US.
LG Electronics	Teamed up with Waste Management to develop a network of electronics drop-off and recycling locations. Products covered by the LG Electronics Recycling Program for free recycling include LG, Zenith and GoldStar brands of TVs. LG and Waste Management offer a spreadsheet with details of available drop-off sites.
Panasonic, Sharp, and Toshiba.	Developed a recycling network of 280 locations to collect their branded TVs for free recycling.
Samsung	Offers more than 218 locations throughout the US where consumers can drop off their Samsung TVs at no cost (other brands are accepted for a fee).
Sony	Provides consumers 274 nationwide locations with free recycling services for all Sony branded TVs and fee-based recycling of other brands.

APPENDIX B

Map of Drop-off Services in Nevada

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Click the map to activate.

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APPENDIX C

Assembly Bill 426

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Appendix C

Assembly Bill No. 426–Assemblymen Pierce, Arberry, Atkinson, Hogan, Horne, Kihuen, Kirkpatrick, Koivisto, Leslie, McClain, Mortenson, Munford, Oceguera, Ohrenschall and Segerblom

Joint Sponsors: Senators Parks, Copening and Wiener

CHAPTER

AN ACT relating to recycling; requiring the Division of Environmental Protection of the State Department of Conservation and Natural Resources to conduct a study concerning programs for reusing and recycling computers and other electronics; and providing other matters properly relating thereto.

Legislative Counsel's Digest:

This bill requires the Division of Environmental Protection of the State Department of Conservation and Natural Resources to conduct a study concerning programs for reusing and recycling computers and other electronics. The study must include an inventory of any programs for donating or recycling computers and other electronics in this State and surrounding states and an evaluation of those programs. This bill also requires the Administrator of the Division to submit a report setting forth the results of the study and at least one recommendation for legislation to the Director of the Legislative Counsel Bureau for transmission to the 76th Session of the Nevada Legislature.

THE PEOPLE OF THE STATE OF NEVADA, REPRESENTED IN SENATE AND ASSEMBLY, DO ENACT AS FOLLOWS:

Sections 1-33. (Deleted by amendment.)

Sec. 34. 1. The Division of Environmental Protection of the State Department of Conservation and Natural Resources shall, within the limits of available money, conduct or cause to be conducted a study concerning programs for reusing and recycling computers and other electronics.

2. The study must include, without limitation:

(a) An inventory of any programs for donating or recycling computers and other electronics in this State and surrounding states; and

(b) An evaluation of those programs and their effectiveness, including, without limitation, an assessment of the environmental effect of those programs.

3. The Administrator of the Division shall submit a report setting forth the results of the study and at least one recommendation for legislation to carry out a program for reusing and recycling computers and other electronics in this State to the Director of the Legislative Counsel Bureau for transmission to the 76th Session of the Nevada Legislature.

Sec. 35. This act becomes effective on July 1, 2009.

— End —