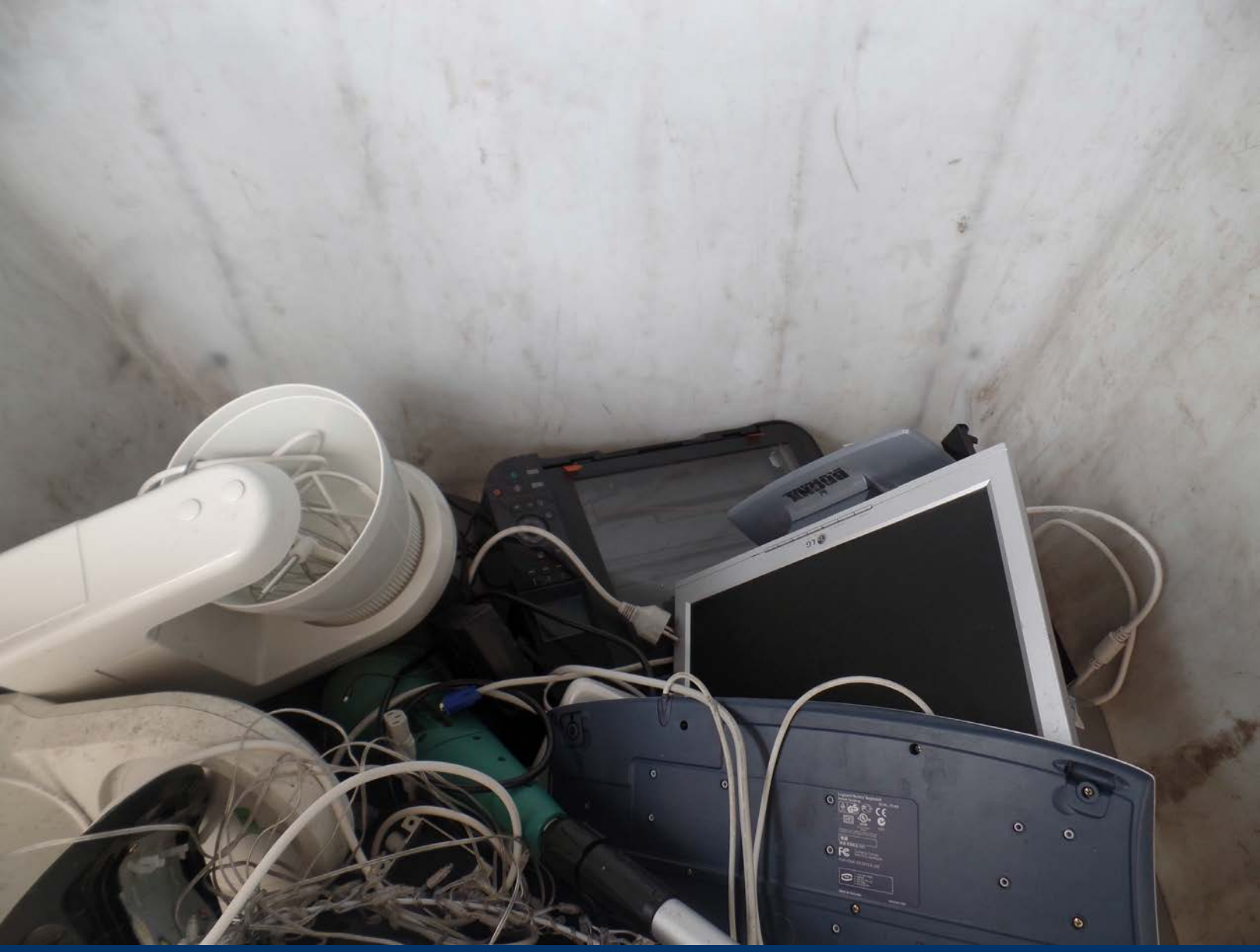

Estimating E-scrap in Illinois Counties for Improved Collection Strategies for the State

Master of Urban Planning Capstone Project
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EXECUTIVE SUMMARY

This Capstone examines the role and impacts of the Illinois Electronic Products Recycling and Reuse Act (IEPRR Act) and subsequent amendments on the successful and financially viable collection and recycling of electronic devices in the state of Illinois. First, it details the incomplete picture currently available through data on the weights and quantities of electronic devices collected in Illinois in compliance with the statute and Illinois Environmental Protection Agency reports. Then it examines the negative impacts that revisions to the Act have had on manufacturers, recyclers and municipalities in their efforts to collect and report real weights.

This capstone proposes a method for estimating how much and when certain electronic devices will emerge in the e-scrap stream by county in Illinois. The county level estimates of electronic devices owned in households are based on state level census data about ownership rates of computers and televisions and are paired with US Environmental Protection Agency and industry estimates of the lifespan of electronic devices to create estimated timelines for device emergence for end of life management.

This research forms the dual arguments that proportional collection throughout the state is essential to fulfill legislative requirements for diversion of e-scrap from landfill and that significantly increased collection rates are both possible and essential to supporting an economically viable private recycling market in Illinois. The county level data and methodology for anticipating waste volumes goes beyond the established benchmarks of service provision throughout the state designated as “well served” and “underserved” counties. The analysis reveals where there are large shortfalls in collection, how much valuable scrap is currently not arriving in e-scrap markets and which counties will continue to be low contributors to the e-scrap stream.

The report concludes with recommendations for future collection policies that integrate multiple systems employed in other states. Illinois must:

- Change the evaluation structure for collection goals to:
    - Use the weight of devices emerging in the e-scrap stream now, not new devices
    - Increasing collection goals to 7 pounds per resident to reflect the weight of older devices
- Revise fee structure in the law:
    - To allow for recycling fees assessed at the time of purchase for new devices
    - To clarify which fees municipal collectors may charge or assess for collection events
- Establish a quasi-government agency to help draft and enforce contracts between manufacturers and recyclers and to audit collection totals
- End current 2 for 1 incentives for rural collection that increase collection numbers on paper but decrease real weights of devices collected
- Modify the law to eliminate language that permits lead glass storage in landfill containers so that recyclers can fulfill e-Stewards and R2 certification standards
- Develop a merged collection strategy that has
    - Regionally proportional, year-round, convenience collection sites throughout the state
    - Separate year-round, population-based, convenience collection for the Chicago Metropolitan Area

Introduction to the Electronic Products Recycling Network in Illinois

The State of Illinois Electronic Products Recycling and Reuse Act (Public Act 095-0959, effective 9.17.2008)[1] identifies class of electronics designated Covered Electronic Devices (CED), makes disposing of CEDs in landfills illegal and requires sharing educational materials to consumers of electronics. Furthermore, it requires that state agencies provide lists of locations where electronic waste can be collected for reuse, refurbishing or recycling throughout the state. The law provides for an incremental increase schedule for improving the total weight of waste that is diverted from landfill into reuse or to collection by registered providers of end of life (EOL) management of all components of the CEDs.

Private companies provide recycling facilities and end of life management for the covered electronic devices. Electronic scrap moves into end-of-life management through manufacturer take-back programs, where the manufacturer agrees to take the items back and manage their disposal, or through a variety of collection centers throughout the state. The collection centers vary widely from thrift and re-use stores to community commissioned public collection events. E-scrap industry and community collection events were unexpectedly affected by the changes in certification and prohibition of fees that were modified in the July 2015 amendment.[2] It takes considerable education on the part of community planners, public health departments, county governments and the consumer to understand the different options and costs and associated with diverting electronics from landfill. Community planners are left unsure of how to help their citizens comply with the law.

E-scrap is recycled by private, for-profit companies in Illinois and the changing market value of the scrap and costs associated with shipping and collecting e-scrap can dramatically impact the recycler's ability to remain profitable. If recyclers are not able to profit from collection because shipping costs are prohibitively high, there are unreliable contracts and commitments to recyclers from collection sites or there is a negative balance between the value of materials reclaimed and the costs of disposing of toxic materials, these businesses may fail.[3] Though the laws and regulations that exist regarding consumer and manufacturer responsibility to find environmentally sound services for EOL of e-scrap seek to incentivize the growth of recycling capacity many of these laws have left recyclers, collectors, governments and consumers confused.

There are consistent problems with building the market and anticipating the value of material available from one year to the next. The initial IEPRR Act and subsequent amendments have produced a number of unanticipated challenges for everyone along the e-scrap stream. The current mix of manufacturer take-back programs with publicly funded local government collection sites and events demonstrate the enduring uncertainty about who is responsible for e-scrap collection infrastructure. All iterations of the IEPRR Act include language requiring increased manufacturer responsibility for take-back of electronics they sell and decreased costs for communities and other non-manufacturer collectors for providing collection services. Despite the relatively clear and consistent goal to make manufacturers responsible for the products they produce, two major factors affect the realistic options for achieving that goal.

Manufacturer take-back programs require everyone to participate in a circular economy

In the circular economy, manufacturers fold the future cost of recycling devices into the upfront price of the devices they sell. In this way, the consumer pays the future recycling cost when they purchase the device rather than paying when they recycle. Illinois state law prohibits charging a fee for recycling e-scrap so embedding the cost of future recycling in the purchase price is technical compliance with the law.[4]

The current system can be abused

There is concern that if all manufacturers do not apply commensurate fees for future recycling or fail to collect devices manufactured prior to the new circular economy model, manufacturers that don't participate or apply very low fees may gain a competitive edge over responsible manufacturers that charge reasonable fees and collect older devices.[5] There is still a need for community sponsored take-back events and non-manufacturer collection sites to collect e-scrap that manufacturers won't.

Current policy favors a shift to manufacturer take-back as primary collection strategy through incremental increases in collection goals for manufacturers. However, current incentives allow for multiple collection credits for a single device collected in underserved areas. Recyclers receive 2 for 1 credit for collecting in underserved rural counties. This incentive allows manufacturers to achieve their collection goals on paper by strategically collecting a smaller total volume of e-scrap each year from the most valuable locations.

The role of community planning agencies as educators and collectors in the stream is unclear

Most county governments provide lists of recyclers on government or affiliated webpages for their community members while others have no available information at all about locations where consumers can take e-scrap. Updating this information and

creating educational programming to ensure that the listed collection and recycling centers are appropriately certified falls to the discretion of municipalities and county governments. The lists of available services vary dramatically from one government website to the next and the lists do not always reconcile with the current ILEPA listings of certified recyclers. This creates hardships for consumers, governments, community planners and organizations that attempt to schedule collection events or expand collection and recycling options.

There is a domino effect from these loopholes and uncertainty

If the amount of scrap collected decreases, recyclers cannot process enough material to remain profitable. If the amount of collection required by manufacturers stagnates or decreases through double-credit incentives for collecting in underserved communities they have no need to provide more services to consumers than the minimum to meet quotas.[6] Consumers without a place to dispose of e-scrap may hoard devices awaiting a collection event. When there are community collection events, more scrap arrives than can be accepted. Consumers who are turned away must keep and continue to hoard their devices. Illegal dumping is the only available method for disposing of electronics in some areas. Municipal and private waste management services must police waste containers to avoid collecting and landfilling e-scrap. The costs are spread between everyone in the e-scrap stream and fewer participants see any benefit from the efforts to recycle.

Careful examination of all of the impacts of the IEPRR Act on providers and participants in the e-scrap stream is necessary to close loopholes and end the negative domino effect that undermines current recycling efforts. Policy that mandates manufacturers and communities to consistently and reliably work with recyclers to provide adequate scrap to maintain their businesses combined with reasonable estimates of the amount of material that will be available annually will help recyclers, communities and consumers understand their responsibilities, options and costs to the benefit of all.

What We Know about E-scrap Weights, Volumes and Quantities

The ILEPA has kept records on the amount of e-scrap reported as captured through manufacturer take back programs and collection sites.[7] The aggregated totals of electronics reported to ILEPA as collected through one of these two channels between 2011 and 2014 can be found in Table 1 (full collection data in Appendix A). There is no data for earlier collection periods available through ILEPA and the discrete categories of items collected has transitioned from an earlier list of all 17 CEDs broken down by weight and collection method to the aggregated list of 7 categories in Table 1. Tracking discrete objects in the collection chain and identifying which items are likely to emerge or are being successfully recaptured is made far more difficult due to the lower detail in contemporary reporting. However, understanding the weight of small, non-cellular phone devices has become less important to recyclers. Understanding the total amount and weight of Cathode Ray Tube and flat panel televisions and monitors has grown increasingly important due to their abundance in the e-scrap stream and rising costs associated with recycling these devices.

Table 1

Weight of Manufacturer and Collection Site Totals in Illinois for Years 2011 - 2014 (in pounds)

	Manufacturer Take Back 2011	Collection Site 2011	Manufacturer Take Back 2012	Collection Site 2012	Manufacturer Take Back 2013	Collection Site 2013	Manufacturer Take Back 2014	Collection Site 2014
Computers	*	*	4,201,669	8,345,999	2,832,319	4,899,948	2,492,425	4,689,524
Monitors	*	*	5,776,272	9,863,554	4,821,806	6,962,271	3,568,888	5,311,762
Printers / Scanners / Fax machines	*	*	4,042,810	11,244,346	3,341,120	5,270,663	3,874,023	5,383,382
Televisions	*	*	21,556,829	34,303,357	26,957,183	34,269,019	25,886,335	39,030,668
EED	*	*	1,578,585	2,615,453	1,914,873	2,373,129	2,455,861	9,506,236
Remaining CEDs (2014 report item)	32, 374,467	32,399,627	25,476,228	43,344,818	36,179,150	52,351,139	28,342,196	48,536,903
Annual Total	**32, 374,467**	**32,399,627**	**62,632,392**	**109,717,527**	**76,046,451**	**106,126,168**	**66,619,728**	**112,458,475**

assembly-report.pdf http://www.epa.state.il.us/land/electronic-waste-recycling/2014-legislative-report.pdf http://www.epa.illinois.gov/Assets/iepa/waste-management/electronics-

The July 2015 Amendment Left Recyclers, Municipalities and Citizens Uncertain

A 2015 amendment changed the Electronic Products Recycling and Reuse Act and created new requirements and benchmarks for the total amount of e-scrap that was to be diverted from landfill. It set new guidelines for manufacturer take back programs and redefined the financial requirements and restrictions placed on recyclers that collected e-scrap from municipalities. It further created new certification requirements for registration as a recycler in the state of Illinois.

> "PA 99-0013 (HB1455) signed into law July 10, 2015; effective July 10, 2015. Amends the Electronic Products Recycling and Reuse Act. Increases manufacturers' recycling goals from 50% to 80% for televisions and computer monitors; imposes penalties when those goals are not met (rather than when less than 70% of those goals are met); and prohibits recyclers and refurbishers from imposing a recycling fee on units of local government acting as collectors unless the recycler or the refurbisher also provides: 1) a financial incentive that is of greater value than the fee being charged; or 2) a premium service. Also recognizes the placement of CRT (cathode ray tube) glass into retrievable storage cells at a landfill; allows carry-forward credits to manufacturers; and requires recyclers and refurbishers to acquire certification from either R2 or E-Steward "[8]

In 2016, the two certification services, R2 and e-Stewards mounted a legal challenge to the amendment's provision that would allow recyclers to store lead glass in landfill containers. They contend that it is impossible to certify any recycler that would store lead glass in landfill containers because to do so is a violation of their certification standards. The recyclers in Illinois would not be able to both legally store lead glass, based on this statute, and also achieve requirements of certification.[9]

The total number of certified recyclers listed on the ILEPA information webpages has decreased significantly due to new certification requirements.

In 2015 the ILEPA listed 44 recyclers located in Illinois (Appendix B). In March 2016, there are a total of 40 recyclers listed as certified to recycle material from the state of Illinois and only 29 of those are located in the Illinois.[10]

ILEPA lists 324 e-scrap collection sites in the state of Illinois in 2016 but not all sites will accept all of the 17 CEDs requiring recycling.[11]

It falls to the consumer to contact collectors and recyclers to verify that their devices can be collected or recycled at individual facilities throughout the state.

Retail Chains with manufacturer take-back programs are a dominant portion of the list with 52 Best Buy and 41 Staples stores providing 28% of collection services for the state through manufacturer take-back services.

Goodwill thrift and resale stores appear 87 times on the list, totaling 27% of all collection locations in the state. Goodwill Industries partner with Dell Computers as a drop-off point for their manufacturer take-back program and accept working electronics for resale.

Goodwill Industries does not serve as a drop-off point for non-functioning e-scrap in need of recycling.[12]

As Statutory Diversion Rates Increased Registered Recyclers Decreased

As noted above, Best Buy, Staples and Goodwill Industries provide 55% of the options for collecting and recycling e-scrap in Illinois. Together, these three businesses have historically provided take-back services for a broad range of computer related e-scrap. Still, the services that can be offered by these companies and the other e-scrap collectors and recyclers remain limited because the cost of collecting, shipping, recycling or disposing of the materials in some devices is costly and the currently amended act makes unclear whether or not recyclers are required to process the lead glass they collect or if they may store it indefinitely.

Best Buy implemented a nationwide change to it's recycling policy in an effort to continue providing recycling services to customers despite rising costs associated with cathode ray tube (CRT) and flat screen monitors and televisions. As of February 1, 2016, Best Buy has added a fee of $25 to recycle televisions and monitors.[13] The imposition of the $25 fee was intended to allow Best Buy to continue taking these items in from the public but to end financial losses for doing so. However, they announced that they would have to stop collecting televisions or computer monitors, not purchased directly from Best Buy, at any of their stores in Illinois due to the PA 99-0013 (HB1455) amendment prohibiting recyclers from charging a fee to consumers for recycling services.

The July 2015 amendment led to the loss of 28% of locations in Illinois for consumers to safely dispose of the heaviest and most difficult to manage personal electronic devices that are in the scrap stream. All estimates show that older monitors containing leaded glass and cathode ray tubes, as well as contemporary flat-screen monitors will continue to surface in the stream in increasing numbers for several years (Appendix C).

The need for recycling facilities for these devices will not decrease though the capacity to manage them is already in decline and the mandate to process all of the materials within the year of collection is less clear in the 2015 amendment.

The Problem and the Need in Illinois Counties

It is clear that there is a substantial amount of e-scrap available for collection in Illinois but policy shifts have not created the type of mandate or conditions necessary to support a resilient recycling system in the state. ILEPA and state government recognize the low rates of participation in e-scrap recycling statewide and recent amendments to the law reflect an effort to increase consumer participation in recycling.[14] The majority of Illinois counties are consistently classified as 'underserved' for lack of collection and recycling services and a further lack of educational programing to help the public understand where they can take their e-scrap for recycling. Policy initiatives to improve the collection in underserved areas include a double credit for e-scrap collected in 85 of 102 counties in Illinois (Map 7). As discussed earlier, the impact has been a decrease in total amounts of e-scrap collected because manufacturers can meet their quotas by collecting strategically in areas that offer better credits.

Estimating the Amount of E-scrap Already in Need of EOL and Emerging in Future Years

According to the US Environmental Protection Agency, there were a total of 6,364,700 tons of Televisions (Table 2) and 4,424,700 tons of Monitors (Table 3) that were expected to move into end of life management or recycling in the United States during the years between 1999 and 2007. The combined 10,789,400 tons of televisions and monitors comprised 69% of the total weight of electronic devices in need of end of life management during those years. Desktop computer towers, portable computers, cellular phones and peripheral devices such as keyboards and mice made up the remaining 31% of the weight. Though total numbers of units for mice, keyboards and peripherals were consistently higher than the number of units of monitors, the difference in size and weight between these items play a much larger role when planning for material recapture, hauling, storage and recycling of these devices. Materials like leaded glass found in CRT monitors and televisions are rarely reused, so the value of recycling the material has been largely replaced with the cost of disposal. This both eliminates a private market for recycling heavy, lead glass monitors and creates new burdens for consumers and companies seeking safe locations for storage or disposal. Cellular phones have historically contained high value metals that offset costs of managing disposal of toxins. Their relative low weight and the abundance of recycling collection points through retailers and other services makes recapture of cellular phones less cumbersome and less challenging for recyclers in most contexts. Cellular phones are not addressed further in this report.

Table 2

Estimated Annual Television and Cell Phone Products Ready for EOL Management, By year

Year	Color CRT <19"		Color CRT > 19"		Flat Panel		Projection		Monochrom		Total TVs		Cell Phones	
	Units	Tons	Units	Tons	Units	tons	Units	tons	Units	tons	Units	tons	Units	tons
1999	6,100,000	125,000	7,500,000	7,500	0	0	400,000	44,300	2,600,000	54,200	16,500,000	497,700	18,800,000	5,000
2000	6,600,000	135,800	9,500,000	350,300	0	0	400,000	47,500	2,500,000	51,400	19,000,000	585,000	25,000,000	6,700
2001	7,200,000	148,300	10,100,000	10,100	0	0	500,000	55,100	2,000,000	42,500	19,800,000	615,100	37,900,000	8,900
2002	7,700,000	158,400	10,100,000	371,400	0	0	600,000	76,000	1,500,000	30,000	19,900,000	635,800	55,200,000	11,200
2003	9,000,000	183,600	10,600,000	10,600	0	0	800,000	98,800	3,100,000	65,000	23,500,000	734,100	75,800,000	14,500
2004	8,700,000	179,100	11,300,000	412,800	0	0	900,000	107,800	2,600,000	54,000	23,500,000	753,600	96,800,000	17,000
2005	8,800,000	180,300	12,000,000	12,000	0	0	900,000	112,300	2,300,000	48,400	24,000,000	786,000	116,500,000	18,600
2006	9,700,000	200,000	12,800,000	470,000	0	0	1,100,000	133,600	2,100,000	43,200	25,700,000	846,800	127,800,000	19,000
2007	10,300,000	212,800	13,400,000	13,400	0	0	1,300,000	165,800	1,800,000	38,100	26,900,000	910,600	140,300,000	19,200

Source: ERG Estimates based on modeling results

Source: Office of Solid Waste U.S. Environmental Protection Agency. (July, 2008). Electronics Waste Management in the United States Approach I. Retrieved from http://nepis.epa.gov/Exe/ZyPURL.cgi?Dockey=P1001FPK.txt

Table 3

Estimated Annual Personal Computer Products Ready for EOL Management, By year

Year	Desktops		Portables		Hard Copy Devices		Mice/Keyboards		CRT Monitors		Flat Panel Monitors		Total	
	Units	Tons	Units	Tons	Units	tons	Units	tons	Units	tons	Units	tons	Units	tons
1999	12,600,000	138,300	3,200,000	13,500	9,200,000	77,600	81,200,000	64,100	15,700,000	238,300	1,800,000	21,700	123,700,000	553,500
2000	15,400,000	174,300	3,900,000	16,000	10,900,000	92,800	66,700,000	70,900	18,900,000	314,800	1,800,000	22,700	117,700,000	690,400
2001	18,400,000	204,400	4,800,000	19,000	13,600,000	110,700	76,200,000	80,200	21,100,000	386,600	1,800,000	22,600	135,900,000	823,500
2002	21,900,000	244,800	5,800,000	22,000	16,200,000	134,700	80,500,000	83,100	23,900,000	480,700	1,800,000	21,700	150,100,000	987,000
2003	24,700,000	275,000	6,900,000	25,400	19,600,000	166,700	92,800,000	97,000	27,700,000	597,800	2,800,000	34,300	174,500,000	1,196,200
2004	26,600,000	293,600	7,800,000	28,200	21,300,000	181,700	103,200,000	96,300	27,800,000	627,800	3,700,000	45,300	190,400,000	1,272,900
2005	28,400,000	322,600	9,000,000	31,800	22,900,000	198,300	107,900,000	80,600	28,500,000	673,100	5,000,000	61,500	201,600,000	1,368,000
2006	28,300,000	311,600	10,200,000	35,200	24,000,000	199,100	96,800,000	68,800	23,800,000	550,300	6,300,000	77,100	189,400,000	1,242,100
2007	29,900,000	341,300	12,000,000	40,300	25,700,000	219,200	106,100,000	76,200	22,800,000	533,600	9,100,000	111,400	205,500,000	1,321,900

Source: ERG Estimates based on modeling results

Source: Office of Solid Waste U.S. Environmental Protection Agency. (July, 2008). Electronics Waste Management in the United States Approach I. Retrieved from http://nepis.epa.gov/Exe/ZyPURL.cgi?Dockey=P1001FPK.txt

Challenges to Estimating E-scrap Totals at State and County Scales

Conservative estimates of the weight and unit totals for some types of electronic devices currently in circulation and primed to enter e-scrap streams at state, county or municipal scales can be created by combining the national scale data about device ownership and with state and county level household data. Estimates of e-scrap emerging at state, county or municipal scales produced in this report are not absolute totals or weights for the e-scrap in the state. Absolute figures are unavailable for a number of reasons.

Firstly, the rapid emergence of new electronic device types, such as cellular phones, laptop computers or tablets, over the past 20 years has led to significant changes in the types of questions asked by the decennial US census, American Community Survey and the National Telecommunications and Information Administration surveys of populations. These surveys did not ask identical or comparable questions about electronic device ownership for all years. Survey questions and reporting have changed as devices obsolesce or emerge in consumer markets.

Secondly, it is infeasible to use manufacturer data to estimate quantities of all types of electronic devices owned by households or individuals at the state or county level in Illinois. Industry data about units manufactured that is considered sensitive or proprietary is suppressed and is not available through public reporting agencies. Tracing a unique device to a unique person or household cannot be gleaned from publicly available data on manufacturing (Appendix D).

Thirdly, publicly available data about personal device ownership gathered from the civilian population is reported at household levels but does not include institutional or non-civilian ownership of devices. While early census questionnaires about device ownership asked about household computer and television ownership, later surveys replaced questions about device ownership with questions about how individuals access the Internet. Questions about Internet access do not overtly include or exclude institutionally owned devices. It is not possible to narrow the data from these questions to a relevant understanding of device ownership at household or institutional levels as these questions do not ask survey participants to enumerate, or specify on which devices or at which locations they access the internet.

Despite these limitations, it is possible to develop useful conservative estimates of the amount of household computers, monitors and televisions that are likely to surface in e-scrap collection streams in a county or in the state in a given year based on ownership averages and trends.

Method for Estimating Annual E-scrap Unit Totals and Weights

Life Cycle Analysis and Life Expectancy

The life cycles of many contemporary devices are fairly predictable and there are many private consumer services and public agencies that produce comparable timelines for the movement of devices into EOL management. The complete 2009 EPA Estimates for the life expectancy of Electronic Devices predict, based on reported data of a large sample of items collected, what percentage of a device type will move into reuse or EOL streams over a range of years (Tables 2 and 3). Table 4 shows the average number of years between when a device type is purchased and when it moves into EOL management, including the average amount of time that a device remains in storage.

Adding the number of years before recycling to the estimate of total device ownership for a state or county
yields a conservative estimate of the amount and weight of electronic devices that will move into EOL management for a given year. By using the expanded estimates of life expectancy of devices, found in Appendix C, it is possible to achieve a more granular level of detail. The heaviest and most difficult items to safely recycle, televisions and monitors containing lead glass, continue to appear in the e-scrap stream for 14 or more years after they were purchased. Though these devices are sold less frequently, estimating e-scrap streams requires looking back to earlier ownership rates to identify when items will stop being used. Most televisions and monitors sold in 2005 will not emerge in the e-scrap stream until 2019. Life cycle analysis is essential to analyzing these trends.

Table 4

Life Expectancy of Devices Extrapolated from 2009 EPA Estimates

National Categories	Years before recycling
PC Desktop	12.0
PC Portable	5.5
Average of Desktop & Portable PC Life Span	**8.75**
PC monitor CRT - Flat	9.0
PC Peripherals	8.5
PC Keyboards	5.0
Average of Peripherals and Monitors	**7.5**
CRT TVs	14.3
Flat TV	9.0
Game/DVD/Blu-ray*	5.8

Source: Office of Solid Waste U.S. Environmental Protection Agency. (July, 2008). Electronics Waste Management in the United States Approach I. Retrieved from http://nepis.epa.gov/Exe/ZyPURL.cgi?Dockey=P1001FPK.txt

Method for Estimating Conservative E-scrap Totals at the National Scale

Between 1984 and 2013, the United States Department of Commerce and the U.S. Census Bureau (Table 5) captured computer ownership by household data. In 1997 36.6% of US households had a computer but by 2012 79% owned at least one computer. At a rate of 1 computer per 79% of households, a minimum 96.2 million desktop, laptop or tablet computers were owned in US households in 2012. By extension, an estimated 633 Million computers were owned in US households between 2000 and 2013 (Table 5).

Average life expectancy (LE) of all computers is 8.75 years (desktop computer LE is 12 years and laptop LE is 5.5 years, Table 4). The conservative

estimate is that 88.4 million computers owned in 2009 will enter the US e-scrap stream in 2016. With an average LE of 11.65 years for all televisions, the conservative estimate is that the 117.7 million televisions owned by US households in 2009 will enter the e-scrap stream in 2020.

While ownership data does not reflect continued ownership of a single device over many years, it also does not account for multiple devices owned in a single household, older devices stored and awaiting disposal or devices owned by businesses, institutions and the non-civilian population. This method produces useful information about when different devices may enter the e-scrap stream and for how long after certain devices obsolesce, facilities for safe disposal will be required.

Table 5

US Households with at Least One Computer / Television 1984 - 2011

Year	Total US Households	Total Households with Computer	Percentage of Households with Computer	Total Households with Television	Percentage of Households with Television
1984	87,073,000	7,139,986	8.2%		
1989	94,061,000	14,109,150	15.0%		
1992*	94,401,000	19,541,007	20.7%	91,191,366	96.6%
1993	98,736,000	22,610,544	22.9%	95,773,920	97.0%
1997	102,158,000	37,389,828	36.6%	99,501,892	97.4%
2000	105,247,000	53,675,970	51.0%	102,931,566	97.8%
2001	109,106,000	61,426,678	56.3%	107,142,092	98.2%
2003	113,126,000	69,911,868	61.8%	111,768,488	98.8%
2005*	113,343,000	76,053,153	67.1%	111,982,884	98.8%
2007	117,840,000	82,134,480	69.7%	116,543,760	98.9%
2009	119,296,000	88,398,336	74.1%	117,745,152	98.7%
2010	119,545,000	91,691,015	76.7%	117,751,825	98.5%
2011	119,250,000	90,153,000	75.6%	117,222,750	98.3%
2012	122,048,000	96,295,872	78.9%	119,973,184	98.3%

Household Computer Ownership Source: U.S. Census Bureau, Current Population Survey, October 1984, 1989, 1993, 1997, 2000, 2001, 2003, 2007, 2009, 2010, 2011, 2012.
Household Computer Ownership for 1992, 2005 and all television, dvd/vcr ownership data Source: Siebens, Julie (September 2013). Extended Measures of Well-Being: Living Conditions in the United States: 2011. Source: Retrieved from https://www.census.gov/prod/2013pubs/p70-136.pdf

Footnotes:

1 The householder refers to the person (or one of the persons) in whose name the housing unit is owned or rented (maintained) or, if there is no such person, any adult member, excluding roomers, boarders, or paid employees. If the house is owned or rented jointly by a married couple, the householder may be either the husband or the wife. The person designated as the householder is the ""reference person"" to whom the relationship of all other household members, if any, is recorded.

""2 In 2007 and 2009 the Current Population Survey did not ask about computer ownership. The estimates presented here for those years reflect adjustments made based on the ratio of computer ownership to Internet access in 2003 and 2010

Method for Generating E-scrap Estimates for Illinois at the State Level

Computer ownership data specific to Illinois households was collected for several of the same years that US computer ownership by household was surveyed. Illinoisans have owned computers at very comparable rates to the national average since reporting began. In 2001, roughly 53% of Illinois households reported owning at least one computer, slightly below the national average of

56.3% but by 2003, 61% of Illinois households owned computers compared to 61.8% ownership nationally. By 2013, 80% of Illinois households owned computers compared to approximately 79% of US households. In table 5 the Illinois data shows that at minimum 42.8 million computers were in Illinois households between 2000 and 2013. Where data specific to Illinois households was not available, national averages were used to estimate computer ownership for those years.

Table 6

Illinois Households with at Least One Computer 2000 - 2013

Year	% of Illinois Households with a Computer	% of US Households with a Computer	Estimated Number Illinois Households with a computer	Total number of Illinois households
2000	**	51.0%	2,341,807	4,591,779
2001	52.8%	56.3%	2,519,088	4,771,000
2002	**	No data	No Data	*
2003	61.0%	61.8%	2,970,090	4,869,000
2004	****61.0%	No data	2,920,070	4,787,000
2005	****61.0%	No data	2,961,550	4,855,000
2006	****61.0%	No data	2,988,390	4,899,000
2007	**	69.7%	3,459,211	4,963,000
2008	****69.7%	No data	3,418,785	4,905,000
2009	**	74.1%	3,580,512	4,832,000
2010		76.7%	3,759,834	***4,902,000
2011	**	75.6%	3,810,240	5,040,000
2012	**	78.9%	3,956,835	5,015,000
2013	80.0%		4,108,000	5,135,000

Source 2000 Total Households data:
https://www.census.gov/prod/2002pubs/c2kprof00-il.pdf
Source 2001 Total Households data and Percentage of Households with Computers:
https://www.census.gov/hhes/computer/files/2001/tab01B.pdf
Source Total Number of Households: US Census Current Population Survey 2013, 2012, 2011, 2010, 2009, 2008, 2007, 2006, 2005, 2004, 2003.
Source 2003 Computer Ownership by household:
https://www.census.gov/prod/2005pubs/p23-208.pdf
Source 2011 Computer Ownership by household:
https://www.census.gov/prod/2013pubs/p20-569.pdf
Source 2013 Computer Ownership by household: File, Thom and Camille Ryan, "Computer and Internet Use in the United States: 2013," American Community Survey Reports, ACS-28, U.S. Census Bureau, Washington, DC, 2014.

* For 2002, there is no National or State data about computer ownership.

** For years 2000, 2002, 2004, 2005, 2006, 2007, 2008, 2009, 2011, 2012 there is no available data for computer ownership by state. National percentages were used to determine number of households with computers in Illinois.

*** 2010 computer use data is by individual over the age of 3, not by household. The number of households was derived by dividing the total number of individuals who live in a household with a computer from Source: https://www.census.gov/prod/cen2010/briefs/c2010br-14.pdf by the average household size in Illinois for 2010 from Source: U.S. Census Bureau, Current Population Survey, October 2010 Table3B retrieved from http://www.census.gov/hhes/computer/publications/2010.html

**** Estimates for 2004, 2005, 2006, 2008, were derived by multiplying Total Number of Households by the % of ownership for the last reporting year.

Reconciling Different Methods of Measurement from Units to Weights

The IEPRR Act establishes collection quotas based on weight per capita so ILEPA requires that recyclers report the weight of e-scrap collected instead of unit totals. US Census and other surveys ask consumers about unit ownership and not weight of devices. In order to create policy relevant estimates of e-scrap, it is necessary to convert unit totals to weight using existing average device weight data. Table 6 shows the US Environmental Protection Agency average device weights from devices collected from 1999 through 2007.

Tablet computers were introduced in 2010 and sales have steadily grown with an estimated 45% of people in the US owning tablets in 2015, up from 3% in 2011.[15] During this same period, desktop or tablet computer ownership has remained constant though there is no public data that clearly delineates how many individuals own one laptop or one desktop computer or both. This complicates efforts to create reliable estimates of weights of e-scrap. The trend in device ownership suggests that lower weight laptops are more common now than in 2007 and that overall computer ownership has dropped since peaking in 2012.[16] When using US Census or survey data that groups desktop, laptop and tablet computers into a single category, it is necessary to revise average weights down to reflect the proportion of each device type in the category weight.

Table 7

Estimated Weight of Electronic Device Units in the Year Collected (in pounds)

	Desktops Pounds / Unit	Portables Pounds / Unit	Mice / Keyboards Pounds / Unit	CRT Monitors Pounds / Unit	Flat Panel Monitors Pounds / Unit	Color CRT <19" Pounds / Unit	Color CRT > 19" Pounds / Unit	Projection Pounds / Unit
1999	22	8	2	30	24	41	74	222
2000	23	8	2	33	25	41	74	238
2001	22	8	2	37	25	41	74	220
2002	22	8	2	40	24	41	74	253
2003	22	7	2	43	25	41	74	247
2004	22	7	2	45	24	41	73	240
2005	23	7	1	47	25	41	73	250
2006	22	7	1	46	24	41	73	243
2007	23	7	1	47	24	41	73	255

Source: Office of Solid Waste U.S. Environmental Protection Agency. (July, 2008). Electronics Waste Management in the United States Approach I. Retrieved from http://nepis.epa.gov/Exe/ZyPURL.cgi?Dockey=P1001FPK.txt

Average weight of devices was determined for a given year by dividing total number of units by total weight reported collected in the USEPA study.

Tablet computers have averaged 1 pound since their introduction in 2010.[17] According to industry data from 2006, the average weight of a desktop computer was 10 pounds and a laptop was 3.5 pounds.[18] These figures represent a significant drop in device weights that does not match the EPA estimates for device weights based on collection of those devices in a given year. Future estimates of device weights reflect proportional increases in laptop ownership and the emergence of tablet computers with average weights between Table 8 manufacturer estimates for new devices and Table 7 data about real collected totals.

Table 8

Average Weight of Electronic Device Units Sold in the US, 2008 - 2016 (in pounds)

	Desktops Pounds / Unit	Laptops Pounds / Unit	Tablets Pounds / Unit	CRT monitors Pounds / Unit	CRT Televisions Pounds / Unit	Flat Screen Televisions Monitors Pounds / Unit
2008	10	4		32	64	23
2009	10	4		32	64	23
2010	10	4	1	32	64	23
2011	10	4	1	32	64	23
2012	10	4	1	32	64	23
2013	10	4	1	32	64	23
2014	10	4	1	32	64	23
2015	10	4	1	32	64	23
2016	10	4	1	32	64	23

Source: Ewaste Guide. (2009). Weight. Retrieved from http://ewasteguide.info/weight

*Averages are based on 70% / 30% Desktop / Laptop computers 2008 - 2011 and 60% / 40% Desktop / Laptop Computers 2012 - 2016 of each device type in the combined waste weight.

Tablet computers were introduced to markets in 2010.

Source CRT Monitor and Televions Average Weights: Consumer Electronics Association. (2014). Analysis of CRT Televisions and Monitor Recycling in U.S. Households. Retrieved from http://www.electronicsrecycling.org/public/UserDocuments/Recycling%20Analysis%20CRT%20TVs%20and%20Mon%202014.pdf

Source Flat Panel Monitor Weight: E-cycle Wisconsin. (2016). Flat Panel Displays: Overviews and Challenges. Retrieved from

Analysis of E-scrap Totals and Reported Collection

Conservative estimates of how many computers were in Illinois in a given year, converted to average weights, plus the average life expectancy of the device type yields an estimate of the weight of devices available for EOL in that year. This figure can be compared to the weight of e-scrap reported to ILEPA as collected by Illinois Recyclers (Appendix A). First, it is necessary to subtract the life cycle estimate from the dates of collection and then convert unit totals to tons to compare reporting.

Using LE estimates (Table 4), computers collected in 2012 were reported as owned by an Illinois Household 8.75 years earlier in 2003. Desktop Computers in 2003 had an average weight of 22 pounds (Table 6). Laptop ownership had not increased significantly by 2003 so the weight of towers would have been the bulk of computer weight in 2003. Based on these figures, 2.97 million Illinois Households owned at least one computer (Table 5). So, an estimated 65.3 million pounds of computer e-scrap was likely to emerge for EOL management in the state in 2012.

Table 9 shows that the total weight of all computer related e-scrap reported as collected in 2012 was approximately 18 million tons, not including mice, keyboards, peripherals and external devices. Approximately 12.5 million pounds of computers were reported collected or returned to manufacturer take-back programs in Illinois in 2012 (Table 7). That is roughly 27% of the conservatively estimated total of computers in Illinois Households that were likely to need EOL that year.

This first comparison of the likely total amount of computer related e-scrap ready for EOL to the amount that is reported suggests that recycling rates are low in the state. The household ownership model used to create these estimates is only useful as a guidepost but it is worth noting that the estimates do not include devices currently being stored for lack of recycling resources, non-civilian owned devices or devices owned by institutions and businesses. It also does not account for failures in accounting or duplicative reporting to ILEPA that come from multiple unit credits for collection of devices in underserved areas.[19]

Table 9

Combined Weight of Manufacturer and Collection Site Totals in Illinois for Years 2011 - 2014 (in pounds)

	2011	2012	2013	2014	4 year total
Computers	*	12,547,668	7,732,267.12	7,181,949	27,461,885
Monitors	*	15,639,826	11,784,076.08	8,880,650.11	36,304,552
Printers / Scanners / Fax machines	*	15,287,156	8,611,782.80	9,257,405.30	33,156,344
Televisions	*	55,860,186	61,226,201.71	64,917,002.34	182,003,390
EED	*	4,194,037.60	4,288,001.91	11,962,097.10	20,444,137
remaining CEDs (2014 report item)	32,399,627	8,766,821.42	23,016,085.37	11,280,595.60	75,463,129
Annual Total	**32,399,627**	**112,295,695**	**116,658,415**	**113,479,700**	**374,833,437**

Sources:http://www.epa.state.il.us/land/electronic-waste-recycling/2012-general-assembly-report.pdf http://www.epa.state.il.us/land/electronic-waste-recycling/2013-general-assembly-report.pdf http://www.epa.state.il.us/land/electronic-waste-recycling/2014-legislative-report.pdf http://www.epa.illinois.gov/Assets/iepa/waste-management/electronics-recycling/2015-legislative-report.pdf

It is clear that there is a substantial amount of e-scrap available for collection in Illinois but policy shifts have not created the type of mandate or conditions necessary to support a resilient recycling system in the state. ILEPA and state government recognize the low rates of participation in e-scrap recycling statewide and recent amendments to the law reflect an effort to increase consumer participation in recycling.[20] The majority of Illinois counties are consistently classified as 'underserved' for lack of collection and recycling services and a further lack of educational programing to help the public understand where they can take their e-scrap for recycling. Policy initiatives to improve the collection in underserved areas include a double credit for e-scrap collected in 85 of 102 counties in Illinois. As discussed earlier, the impact of these credits has been a decrease in total amounts of e-scrap collected because manufacturers can meet their quotas by collecting strategically in areas that offer better credits.[21]

Method for Generating E-scrap Estimates for Illinois Counties

The methodology for generating conservative estimates of e-scrap at national and state scales can be applied to the county level once the number of households per county is identified and percentages of household ownership of devices is determined (Table 10). Estimates of ownership rates by county for a given year multiplied by average weight for devices gives annual estimates of weight of e-scrap generated by county. Adding the LE of different devices to a given year's annual weight total yields a prediction of the weight of certain devices expected to emerge in the e-scrap stream in future years.

Table 10

Illinois Households with a Computer or Television 1984 - 2011

Year	Total US Households	Total Illinois Households	Total Illinois Households with Computer	Percentage of IL Households with Computer	Total IL Households with Television	Percentage of IL Households with Television
1984	87,073,000	**	**	8.2%		
1989	94,061,000	**	**	15.0%		
1990		11,145,365				
1992*	94,401,000	**	**	20.7%		96.6%
1993	98,736,000	**	**	22.9%		97.0%
1997	102,158,000	**	**	36.6%		97.4%
2000	105,247,000	2,341,807	1,194,322	51.0%	2,290,288	97.8%
2001	109,106,000	2,519,088	1,418,247	56.3%	2,473,744	98.2%
2003	113,126,000	2,970,090	1,835,516	61.8%	2,934,449	98.8%
2005*	113,343,000	2,961,550	1,987,200	67.1%	2,926,011	98.8%
2007	117,840,000	3,459,211	2,411,070	69.7%	3,421,160	98.9%
2009	119,296,000	3,580,512	2,653,159	74.1%	3,533,965	98.7%
2010	119,545,000	3,759,834	2,883,793	76.7%	3,703,436	98.5%
2011	119,250,000	3,810,240	2,880,541	75.6%	3,745,466	98.3%
2012	122,048,000	3,956,835	3,121,943	78.9%	3,889,569	98.3%

Household totals and Household Computer Ownership Source: U.S. Census Bureau, Current Population Survey, October 1984, 1989, 1993, 1997, 2000, 2001, 2003, 2007, 2009, 2010, 2011, 2012.
Extended Measures of Well-Being: Living Conditions in the United States: 2011. Source: Retrieved from https://www.census.gov/prod/2013pubs/p70-136.pdf
Total number of Households 1990 US and Illinois source: US Census Bureau (2016). Census 1990. Retrieved from http://www.socialexplorer.com/tables/C1990/R11164959
*Household Computer Ownership for 1992, 2005 and all television ownership data Source: Siebens, Julie (September 2013).
** No data

Establishing Number of Households for all Illinois Counties

Total numbers of households and average household size data is available for 47 counties in Illinois through the American Community Survey (ACS) 2005 - 2012 and Decennial US Census data for 2000 and 2010. The remaining counties have total county population for the same years but not a count of households. By multiplying total county population by the state average percentage of the population living in households divided by state average household size provides county level estimates of the number of households in the remaining counties.

Estimating Missing Data for Total Numbers of Households

The US Census Bureau American Community Survey was created in 2005 leaving a gap in county level data from the 2000 Decennial Census to the 2005, 2007 or 2009 for counties in Illinois. In order to develop state-wide county level estimates for the same years for which there is reporting on percentages of device ownership, the missing data has been estimated using an even incremental change between the 2000 census data and the first year for which the ACS reported data (Appendix 5). The formula is the first ACS reporting year data minus the 2000 census data divided by the number of missing years. This increment is then added to each subsequent year, gradually stepping up or down based on population growth or decline. (Total household number estimates for all counties, Appendix E).

Identifying Estimated Number of Units of Computers and Televisions for all Illinois Counties

Multiply the number of households in a county by the percentage of computer ownership or television ownership by household in Illinois to create conservative estimates of the minimum number of televisions and computers in each county for a given year (Computers in Appendix F, televisions in Appendix G).

Converting Unit Totals to Weight for all Illinois Counties

Multiply the number of computers or televisions for a given year by their average weight for that year (Computers in Appendix H, televisions in Appendix I).

Estimating the Year that E-scrap will be in Need of Collection using Life Expectancy

Add the LE of each device type to the unit total or weight total for that county to estimate in which year that number of units or weight of e-scrap will emerge for end of life management.

Reconciling different Proportions of Device Types in the E-scrap Stream Through Time

Since the LE of televisions is different than the LE of computers and the LE of desktop computers is different than the LE of laptops and tablets, these totals are only a conservative estimate for each device group. Recycling collection and surveys of device ownership do not break the data apart to identify rates of ownership of specific weights or sub-categories of devices. For years where laptop ownership increased or was close to the same rate as desktop computer ownership, the average weight used in this report for each device type is 50% -50%. 2015 was the first year that desktop and laptop computer ownership were expected to be 50% - 50% so any estimates for earlier years err on the side of lower weight to maintain a very conservative estimate.

There is no clear mechanism to predict how the current backlog of scrap that has been under-collected statewide will impact numbers in the first few years after a new collection plan is implemented. In the near term the total weight of e-scrap collected may be much higher than these estimates due to a large amount of heavy CRT devices and older

desktop computers flooding the collection centers in the first few years. The purpose of erring on the side of lower weight for anticipated collection numbers is so that community planners and recyclers can have realistic numbers that account for 2 for 1-collection credits in underserved counties.

How Much E-scrap is in Illinois Counties

This report uses a household ownership model that allows for multi-year comparison of consistent national and state survey questions about numbers of households and household device ownership of the heaviest devices in the e-scrap stream: computers, televisions and monitors.

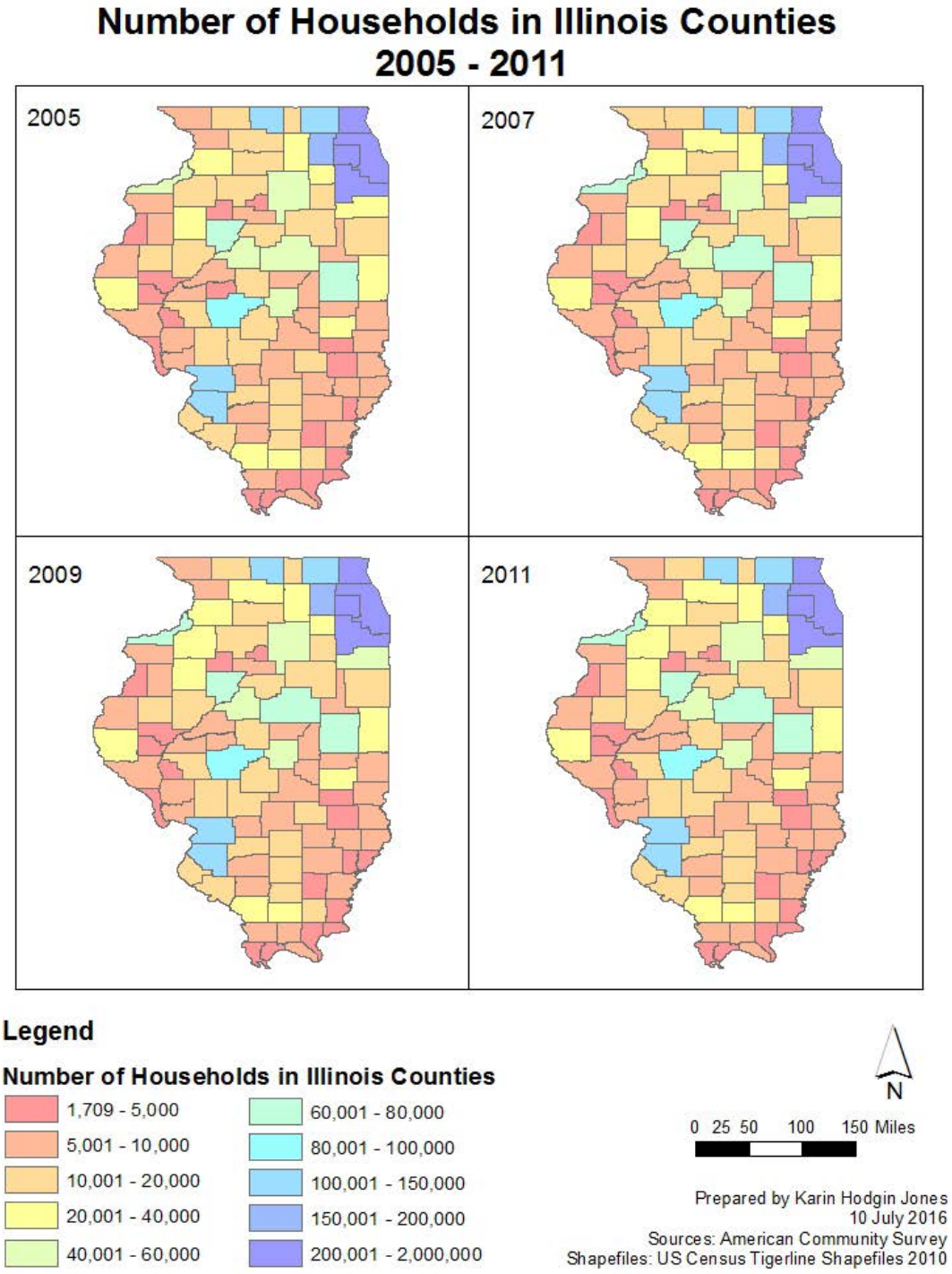
Though total device ownership has increased in the state (Table 6), this report reflects the downward trend in weight of new devices and lower average weights for combined categories (such as computers that often combine 1 pound tablets with 40 pound tower computers into a single collection class).

For the years 2005, 2007, 2009 and 2011, there is data about device ownership by household and total number of household data by county available for comparison. This report focuses on the six-year span to examine scrap likely to be collected between 2016 and 2022 based on the LE of devices (Table 4).

Distribution of Illinois Households

Northeast Illinois is the most populous region of the state. Twenty-three counties in Illinois represent approximately 84% of the total for the state. Four counties in the Chicago metro area have 200,000 or

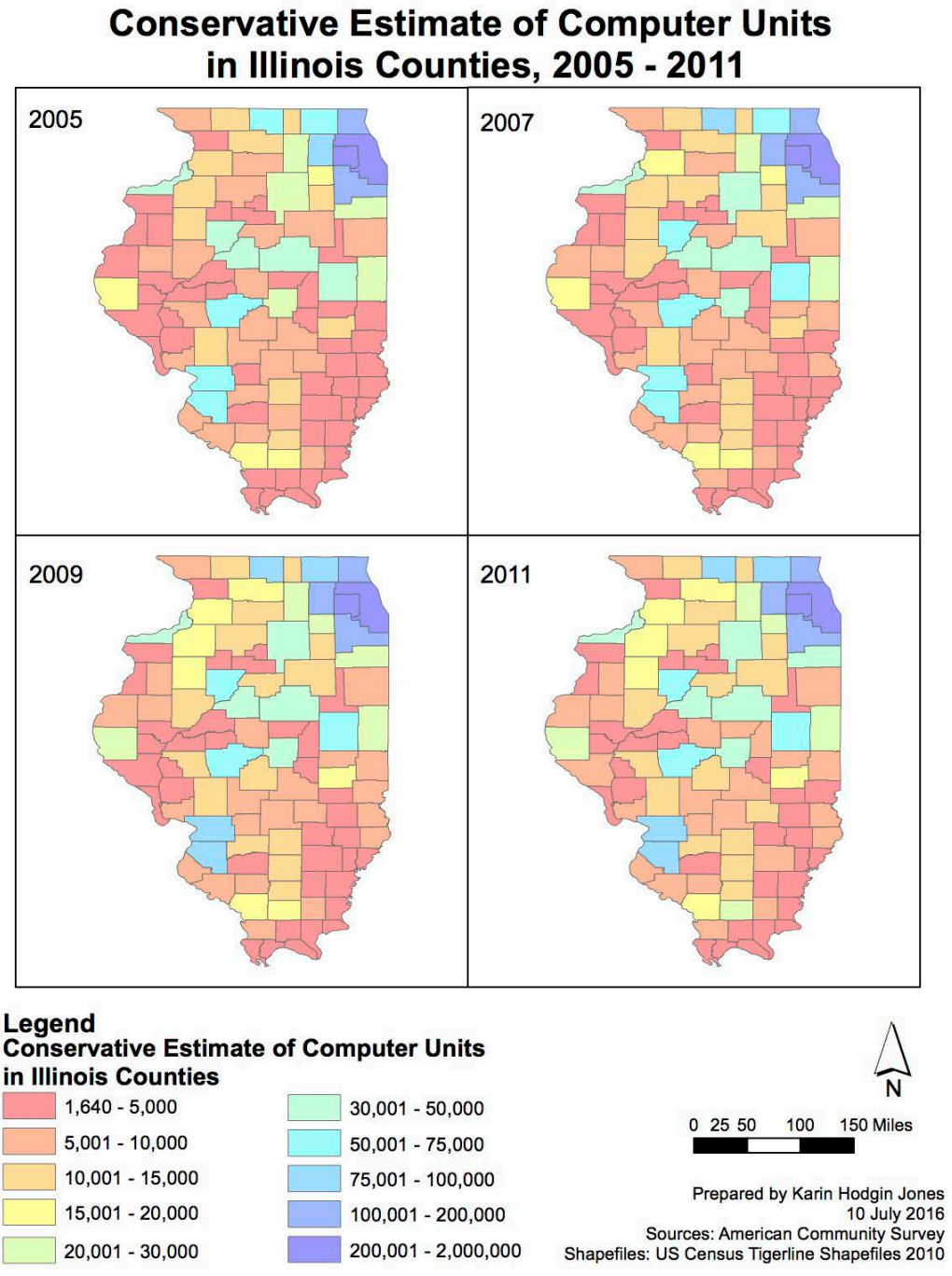
more households and comprise 57% of total Illinois households. Five counties have 100,000 – 200,000 households, 6 counties in the state have 50,000 – 100,000 households and eight counties have between 25,000 and 50,000 households. Seventy-nine counties have fewer than 25,000 households and 50 of those have fewer than 10,000 households. Using the household model to predict amount of e-scrap available by county, it is evident that the majority of electronics are in the NE region for the period from 2005 – 2011.



Map 1 Number of Households in Illinois Counties, 2005 - 2011

Computer Units in Illinois Households

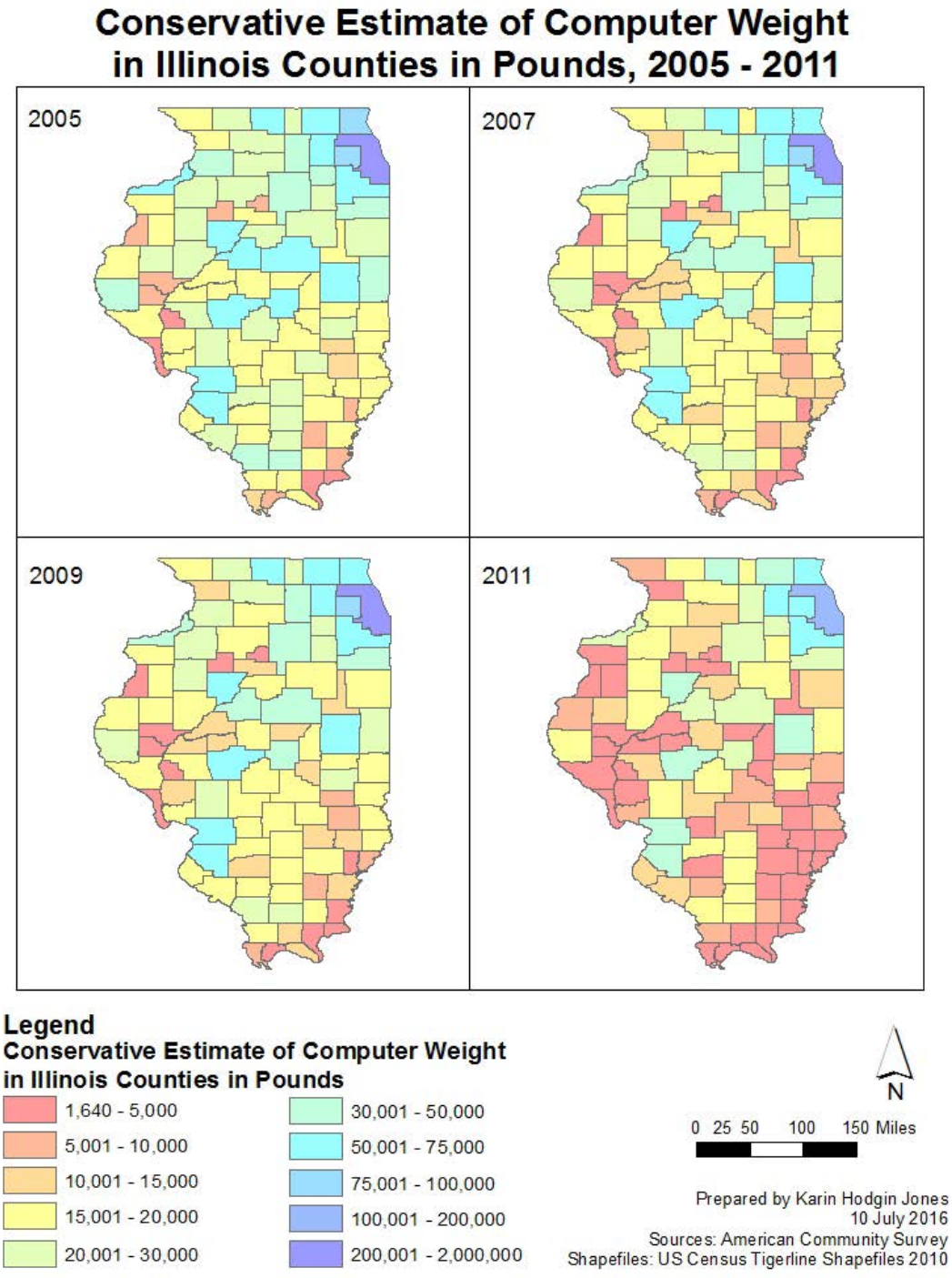
Total Units of computers in Illinois households have increased as average statewide ownership of devices increased from about 61% in 2005 to 77% in 2011. In 2005, 67 counties had less than 10,00 households with computers but by 2011, that number had dropped to 57 counties with 10,000 or fewer computers in households. For counties with more than 10,000



Map 2 Comparison of estimated Numbers of Computer Units in Illinois Households by County, 2005 -2011

Changes in County Weight Estimates Demonstrate Shifts in Weight of Devices

In 2005 and 2007, computers collected were high proportion desktop towers with a low proportion of laptops. The average weight for devices was an estimated 22 pounds for these years (Table 7). In 2009, proportional shifts in laptop ownership led to a revision to a 15-pound average for this class. By 2011, proportional ownership rates of desktop computers to laptops and the introduction of ultra-light tablets led to a further revision downward to a 7-pound average.

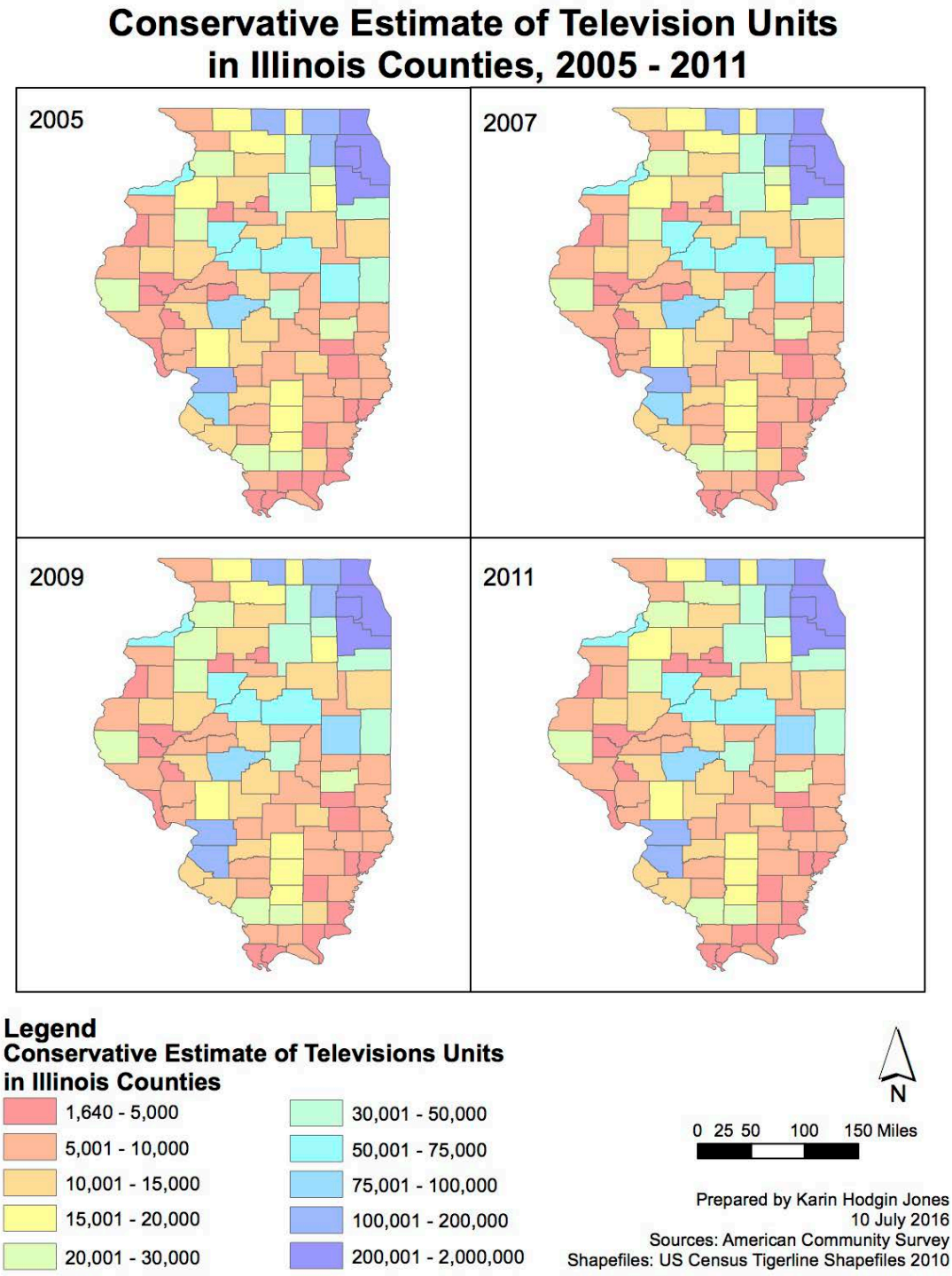


Map 3 Comparison of estimated Weight of Computers in Illinois Households by County, 2005 -2011

Television Units in Illinois Households

Total numbers of televisions owned by households have not changed substantially in this time period.

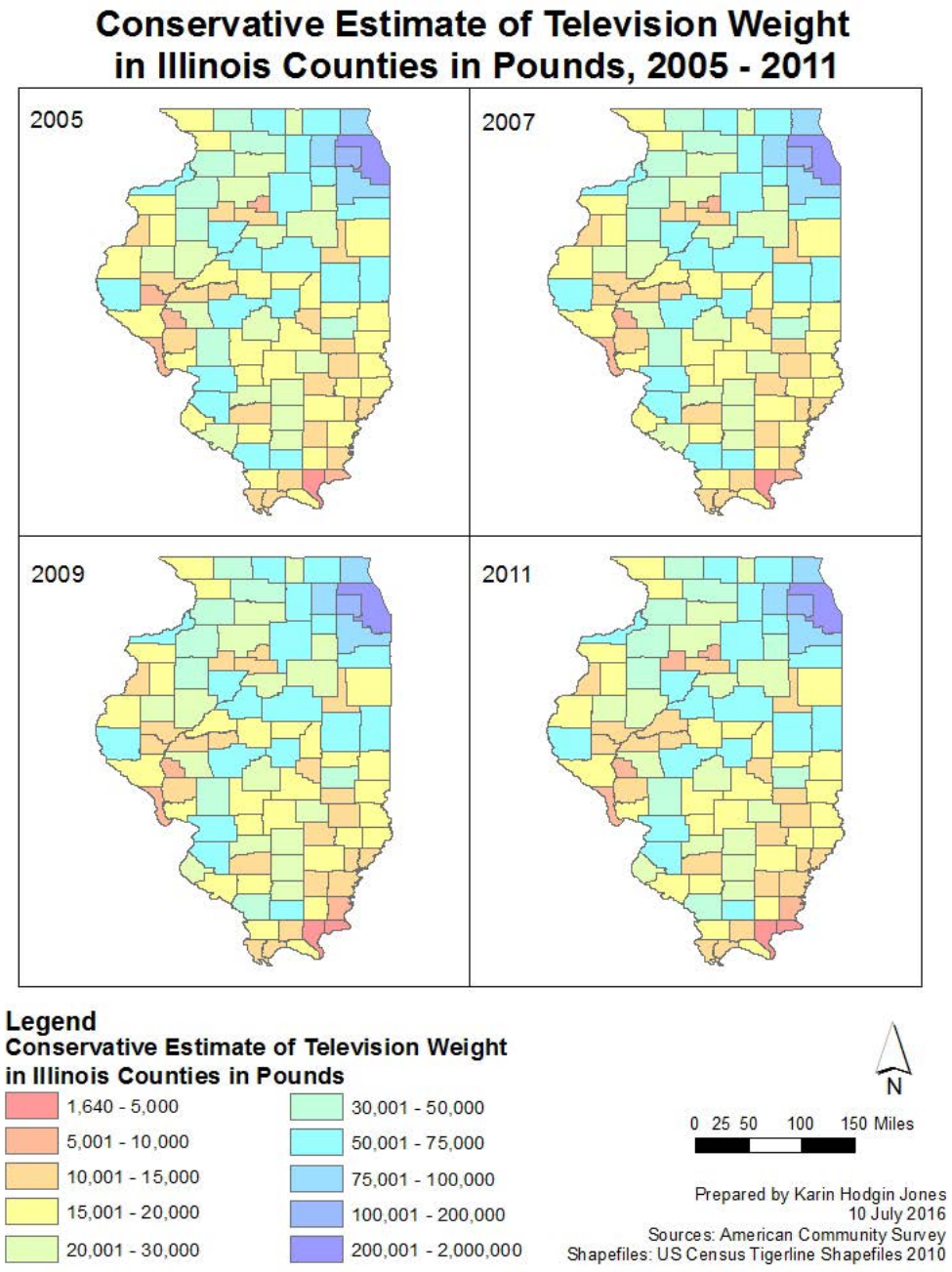
In 1992, Illinois household television ownership was 96.6% and in 2011 it was 98.3%. Between 2005 and 2011, the rate was consistently between 98% and 99%.



Map 4 Comparison of estimated Numbers of Television Units in Illinois Households by County, 2005 -2011

Changes in Device Weights are Less Significant with Televisions

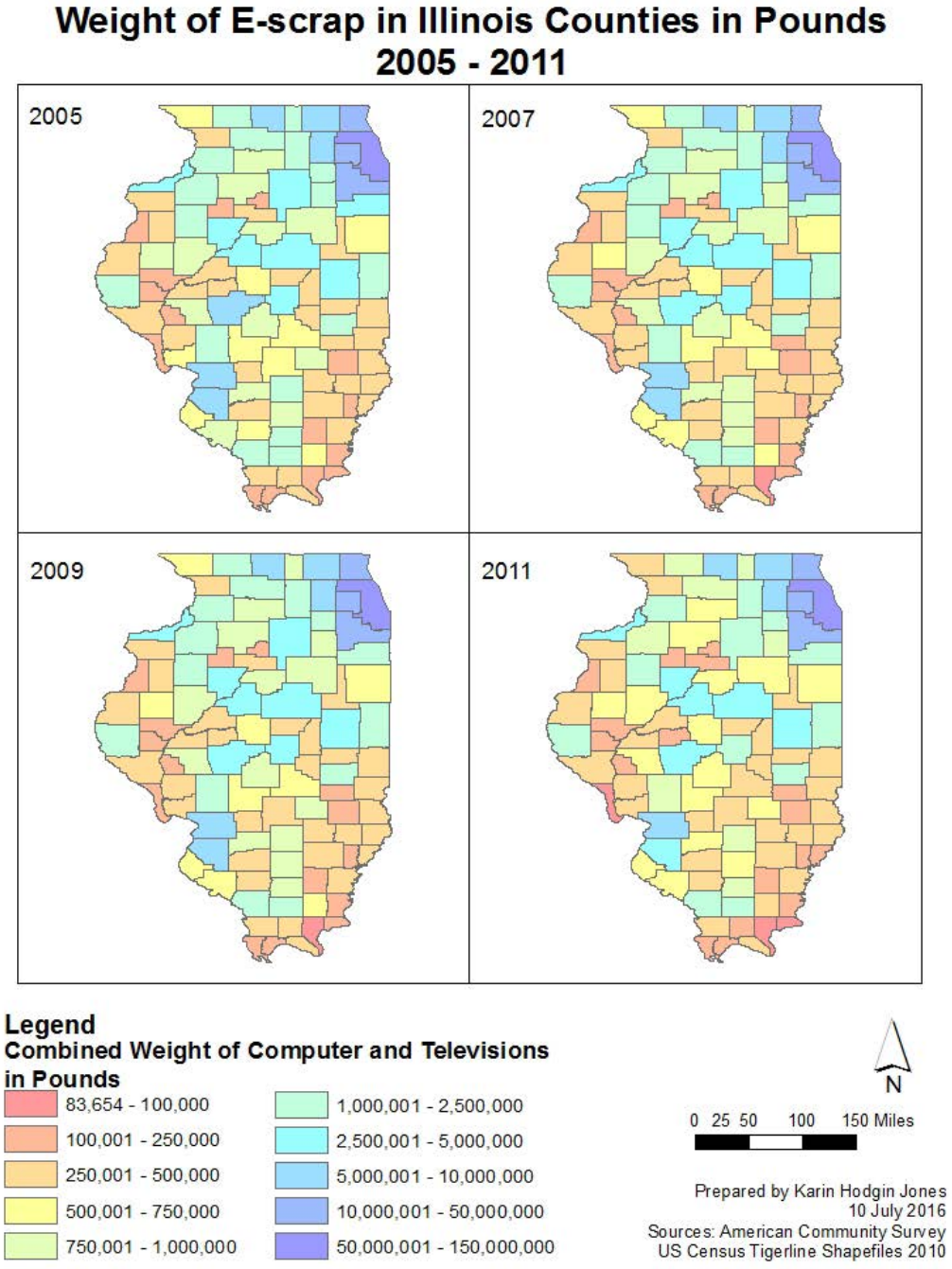
The EPA collection data (Table 7) and the industry data about televisions (Table 8) show that though there has been a significant shift in the design of televisions, their weight hasn't changed as substantially over time. In 2005 and 2007, the average weight for CRTs devices was 57 pounds (Table 7) but by 2011 that average increased to 64 pounds according to industry data (Table 8). Flat panel televisions and monitors averaged 23 – 24 pounds for all years from both sources. There is minimal evident change. Data on proportions of CRT and flat panel ownership might reflect a downward weight shift like that found in the computer class.



Map 5 Estimated Weight of Televisions in Illinois Households by County, 2005 -2011

Combined Weights of Devices Show Variation in Counties and Regions

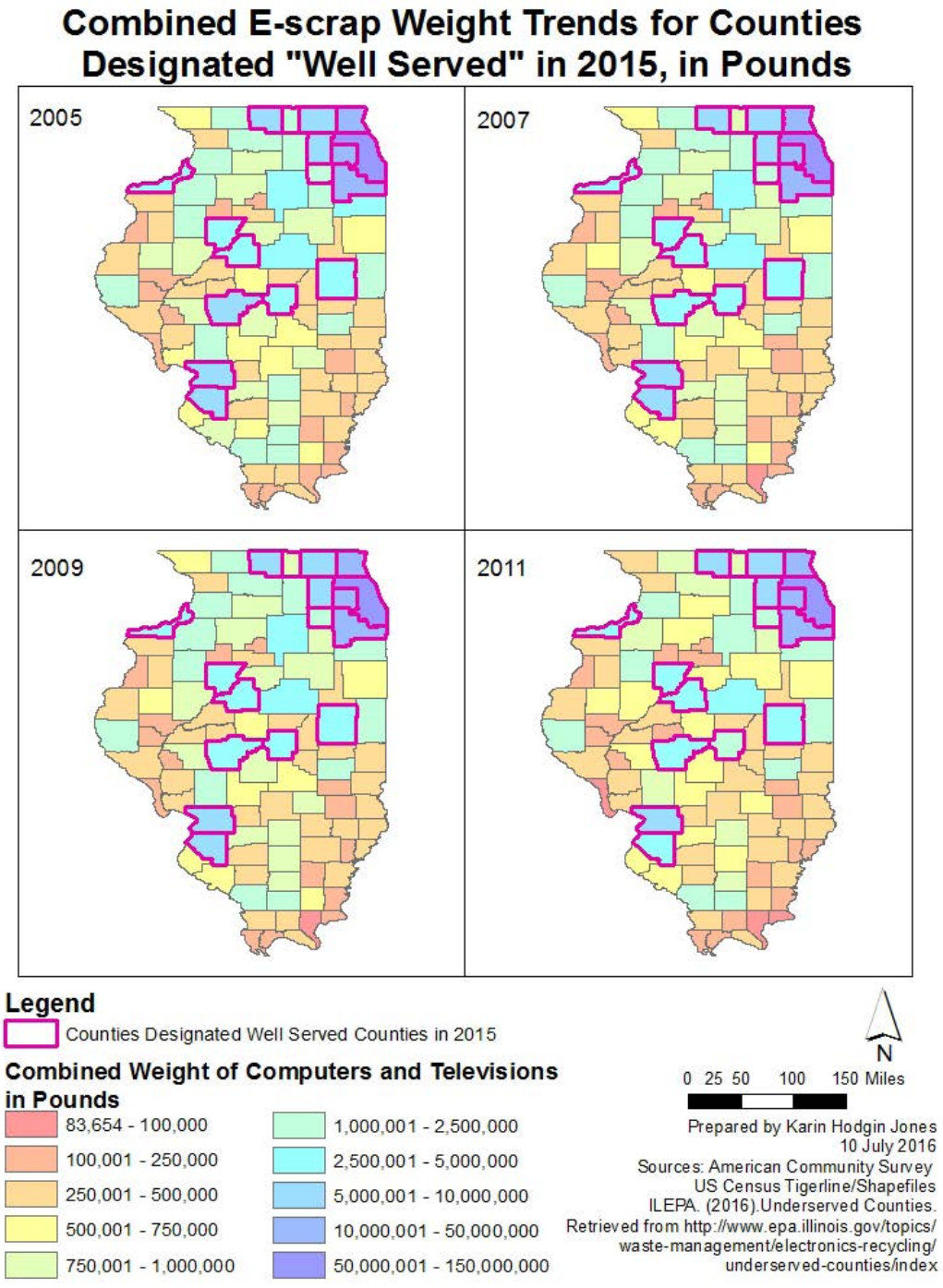
Though NE Chicago Metro Area counties consistently have 10 Million pounds or more of computers and televisions in households every year most counties have at least 250,000 pounds of televisions and computers in households every year. Twenty-three counties have 1 -10 Million, 24 counties have 500,000 - 1 Million pounds, 31 counties have 250,000 - 500,000 pounds and only three counties have less than 100,000 pounds each year. Statewide, there were 295,375,261 pounds in 2005, 264,438,490 in 2007, 266,777,657 in 2009 and in 2011; there were 228,483,936 pounds of computers and televisions in households in the state.



Map 6 Combined Weights of Televisions and Computers in Illinois Counties, 2005 - 2011

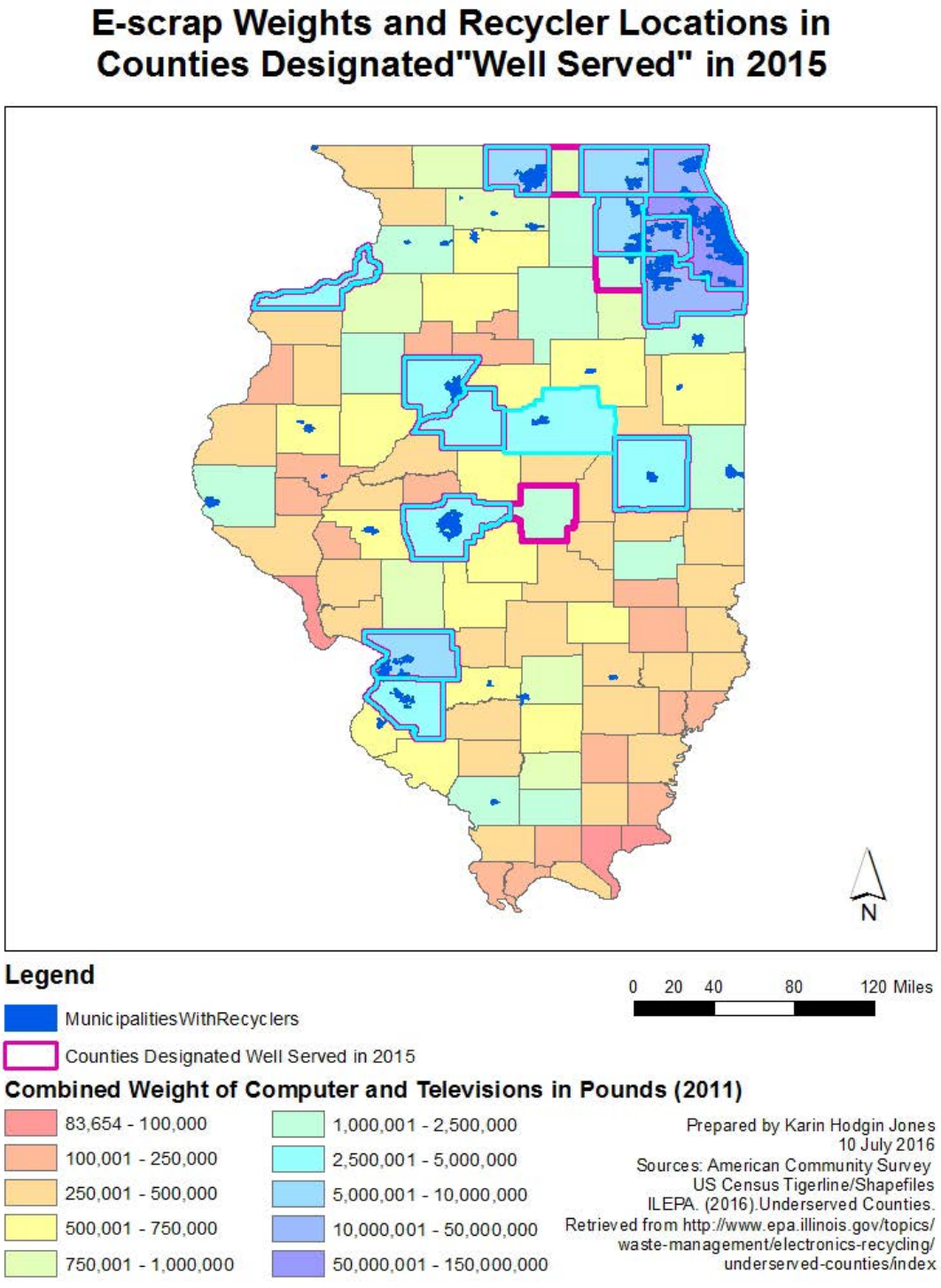
Illinois Counties With Lower Collection Consistently Poorly Served

All but three of the Counties designated "Well Served" in 2015 consistently had more than 2.5 Million pounds of computers and televisions in households per year since 2005 and all but one of the counties in the state that have more than 2.5 Million pounds per year are "Well Served." Twelve counties directly adjacent to the well-served counties have between 1 million and 2.5 Million pounds of electronics in homes each year. This helps to make sense of the problem with the 2 for 1 program for collection.



Map 7 Combined E-scrap Weights and Trends for Counties Designated "Well Served" in 2015

Counties designated "Well Served" in 2015 generally have a higher density of recyclers in their metropolitan areas than the underserved counties that have high weights of electronics (Appendix L). As has been noted in multiple reports, this is an urban-rural problem.[22] Map 8 shows weights from 2011. It is clear from the geographic distribution of counties with very high e-scrap weights that are designated underserved make the 2 for 1 credits for collection extremely valuable. With current quotas for collection easily met within their own counties or in adjacent counties.

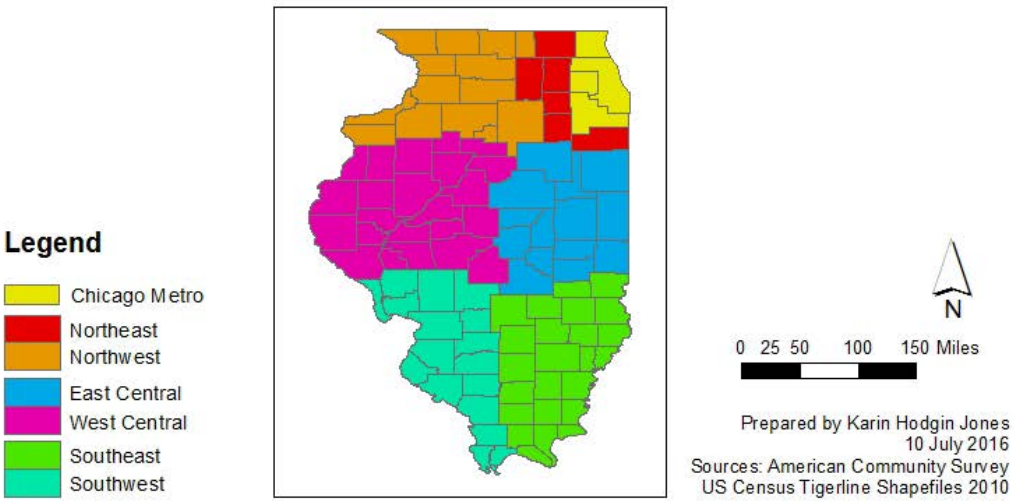


Map 8 E-scrap Weights and Locations of Recyclers Relative to Counties Designated "Well Served" in 2015

Estimate of E-scrap emerging in Illinois Counties in 2017 and 2019

In 2017, there will be an estimated 264 million pounds of computers and televisions ready for EOL in the state. In 2019 there will be estimated 249 million pounds. Appendices J and K detail the weight of computers and televisions by county that will need EOL between 2013 and 2023 using the device purchase date plus average life expectancy method outlined in this report. Map 9 show what weight and percentage of total e-scrap will emerge by region. While Appendices J and K demonstrate the application of the methodology from this report at the county level, a regional analysis shows the disproportionate amount of e-scrap emerging throughout the state more clearly. This regional analysis is essential for developing useful recommendations for future collection strategies.

Computer and Television E-scrap in Need of End-of-Life Management in Illinois Regions in 2017 and 2019



Combined Computer and Television Weights for E-scrap Emerging for End-of-Life Management by Region

Region	2017 Weight in Pounds	2017 % of State Total	2019 Weight in Pounds	2019 % of State Total
Chicago	151,856,880	57.6%	152,291,972	61.2%
Northeast	21,357,702	8.1%	18,781,105	7.5%
Northwest	20,631,548	7.8%	17,761,699	7.1%
East Central	17,395,927	6.6%	14,987,892	6.0%
West Central	22,114,505	8.4%	18,944,530	7.6%
Southeast	10,670,355	4.0%	9,120,457	3.7%
Southwest	19,724,057	7.5%	16,950,251	6.8%

The Combined weights reflect the weight of computers purchased in 2009, 2011 + the average 8.75 years before computers enter End-of-Life Management and televisions purchased in 2005, 2007 + the average 11.65 years before televisions enter End-of-Life Management.

Source: Weight Estimates Source: Office of Solid Waste U.S. Environmental Protection Agency. (July, 2008). Electronics Waste Management in the United States Approach I. Retrieved from http://nepis.epa.gov/Exe/ZyPURL.cgi?Dockey=P1001FPK.txt

Map 9 Computer and Television E-scrap in Need of EOL Management in Illinois Regions in 2017 and 2019

Recommendations

The Illinois Counties Solid Waste Management Association conference in Springfield in May, 2016, brought industry professionals, recyclers, manufacturers and their representatives, policy makers, non-profit organizations, community planners and government officials together to attempt to form a way forward after the unexpected consequences of the July 2015 amendment to the IEPPR Act. Recommendations for how to fix the problem focused on several issues that have been addressed or analyzed in this report.

Is the current weight requirement adequate?

The 2010 IEPPR Act established a mandated collection goal at 2.2 pounds per Illinois resident. There was substantial debate around whether this weight or an increase to 5 pounds per resident is adequate to compel manufacturers and collectors to increase collection of e-scrap statewide.

How have fee prohibitions impacted collection?

Prohibiting collection of all fees for collecting e-scrap has had multiple effects.
BestBuy implemented a nationwide fee to collect monitors and televisions not purchased in their stores. They discontinued all collection of these devices in Illinois to avoid breaking the law. Community planners and governments that organize collection events are uncertain if they may or should pay for any part of the event or if that would violate the fee prohibition.

Do incentives and 2 for 1 credits for rural collection improve collection?

Recyclers expressed multiple concerns about collection timing and processing mandates. Specifically, recyclers expressed a concern that low quotas and multiple device collection credits, such as 2 for 1 credits, make it difficult for recyclers to understand how much scrap they will receive from a contract with manufacturers participating in take-back programs. They expressed a desire to have policy changes clarify by when in the fiscal or calendar year contracts must be secured for the next year's recycling. They also expressed great concern over the efforts in the recent amendment to mitigate the costs of dealing with heavy lead glass CRTs. The July 2015 amendment does two conflicting things; it permits the storage of lead glass in sealed containers at landfills for future storage and requires that certified recyclers are certified through the R2 or e-Stewards certification programs. R2 and e-Stewards certifications do not permit recyclers that they certify to store lead glass. The recyclers indicated that the only way to comply with the law and be certified through R2 or e-Stewards is to refuse to collect lead glass. Though recyclers indicated that there is adequate recycling capacity to process lead glass, the low value, high shipping costs and challenges to certification caused by the recent amendment make collecting CRTs and televisions with lead glass nearly impossible.

Do higher quotas have a negative impact on manufacturers in the Illinois economy?

Manufacturers and their representatives indicated a desire to see the quotas decreased, an increase in credits for collecting in rural counties and a stronger reliance on community collection events rather than a heavier emphasis on manufacturer take-back programs. Manufacturers cited issues that they believed decrease their competitiveness with other manufacturers including: different laws, enforcement and reporting protocols in different states, lack of participation by all manufacturers operating in the state that give bad actors a competitive edge over manufacturers who comply with the law,

Proposed Policy Shifts

The Product Stewardship Institute made specific recommendations to address all of the concerns outlined above with an expression of support for "extended producer responsibility" laws for manufacturer take-back programs. The speaker described a number of approaches that states take to draft policy for e-scrap management.

Centralized Programs Rely Heavily on Government Coordination

Centralized programs have a state agency that plays a role in establishing contracts and the programs have standards for the convenience of collection for individuals. The locations of collection are established based on either geography or population density by an established standard of X sites per county or X sites per town of more than Y population. PSI analysis suggests that these programs successfully capture more than 5 pounds per person.

Performance Goal programs require buy-in and shared responsibility by all participants

Performance Goal Driven programs, found in Illinois, Minnesota, Indiana, Wisconsin, New York, Pennsylvania and New Jersey, are based on the amount of pounds that a manufacturer is required to collect and this figure is based on the weight of recent sales of electronics. The result is low performance for television collection and the lack of explicit financing requirements for all parties in the collection and recycling stream lead to low overall collection. There is a coordinating body that helps to prevent free market distortions in the private market through enforcement of mandated collections quotas and quasi-public assistance with collection. These programs typically collect between 3 and 5 pounds per person.

Performance Goal Programs rely on convoluted public-private partnerships

PSI is critical of the Performance model because it produces a goal that is too low for the amount of scrap in the stream, it treats collection goals as a cap instead of a base, if collectors achieve goals early in the year they may discontinue collection until the next year and destabilize recyclers that require year round source material to remain in business, collection infrastructure shrinks, CRTs rise as a problem and solutions for their management decrease. The Performance Goal Driven model is not optimized to handle shifts to the timing, quantity or type of scrap collected. For example, CRTs replaced by flat-panel monitors that have much lower LE and reach the e-scrap stream much faster keep weights at similar levels even as the earlier heavier devices are phased out. Any plan that uses weight of current manufacture devices that does not take into account the rate at which the new devices will enter the scrap stream can undermine future collection capacity by inappropriately lowering collection weights before heavier material has even begun to enter the scrap stream.

Minnesota, is correcting several problems with their law similar to those found in Illinois. They are removing rural incentives and making clear that the manufacturer is responsible for transportation costs for recycling.

PSI recommends that Illinois follow suit with Minnesota to eliminate the confusion of how much scrap recycling contracts will receive by eliminating 2 for 1 rural collection incentives. Instead, they recommend creating convenience standards for collection based on geography or population density and an increase the collection quota to between 5 and 7 pounds per person. They also recommend establishing a dedicated quasi-government or government agency that has audit and enforcement authority to assist with and track collection reporting and contracts for recyclers.

Changes recommended by PSI amount to a complete overhaul of the current system and were heavily echoed or supported in part by policy makers, community planners and recyclers. An additional recommendation from the policy side was the need for a manufacturer responsibility organization to which all manufacturers in the state must join. Though there was much confusion and dispute over how that would function and if it would be better at policing good and bad actors than the current ILEPA audit system, the recommendation to use this organization to collect point-of-purchase fees consumers pay for future recycling when they buy new devices to ensure those fees are used for recycling.

The Way Forward to Improve Collection and Modify the Law

The Illinois Counties Solid Waste Management Association conference in Springfield discussion proposed many of the above questions and suggestions. The following questions and answers explore potential futures raised during the conference by the Product Stewardship Institute. These questions and answers link the estimates produced in this report to the needs stated by stakeholders in the e-scrap stream.

Is 7 pounds per Resident Feasible as a Collection Goal?

Yes. In July 2010, the population of Illinois was 12,831,549 and in 2011 the combined weight of televisions and computers in Illinois households was an estimated 228,483,936 or roughly 18 pounds per person.[23] In order to meet 7-pound collection goals (using only the televisions and computers counted in this report) collectors would need to collect roughly 40% of those each year. As discussed earlier, not all of these devices are ready for EOL in every calendar year but this figure does not include the 15 covered electronic devices covered by the law or institutional and non-civilian owned devices and the current law has established the weight mandate based on contemporary device weights rather than the weights of devices that will emerge in the e-scrap stream this year. As a conservative recommendation, a 7-pound collection goal is possible, the scrap is out there and scrap emerging now is much heavier than contemporary weight estimates using 2016 models of electronic devices suggest.

Can a 7-Pound per Resident Collection Goal be met with Current Collection Strategies?

No. The current system rewards under-collection through 2 for 1 collection policies that do not effectively compel collectors to expand into less populated regions of the state or to collect heavily in "well-served" counties. Unreliable contracts and uncertainty about real weights collected once credits have been deducted compromise the profitability of recyclers. If we rely on a for-profit system for recycling in Illinois the law cannot fundamentally undercut those business' profitability.

How Can Illinois meet a 7-Pound per Resident Collection Goal?

A convenience collection system is required to expand collection throughout the state and to compel collectors to meet the 7 pounds per resident goal.

A quasi-government agency that can help with contracts, perform audits and track collection data at county and collector levels is recommended but only if it has authority to audit and enforce policy or make recommendations to an enforcement agency.

Take-back programs must be required to accept devices that they did not manufacture or were manufactured by companies that no longer exist. At the onset of a circular economy, there are externalities in the forms of technologies that came before. These devices can either be a bottleneck in the scrap stream that undermines the profitability of the entire economy or they can be absorbed immediately and fees for collection and management can be modified to help defray additional costs. Where there has been no clear policy, the default is for the costs to fall to the state and taxpayers in the form of payment for collection, shipping and hauling or in the costs of remediating illegally dumped waste or abandoned materials.

The question of fees must be addressed to allow for up-front fees for future recycling of new devices at their point of purchase. If the consumer is expected to pay a fee to purchase an item and that fee is designated for recycling, they should not pay additional fees for the lifetime of that device. However, paying a fee upfront is a fee to a consumer. This must be made clear and explicit in future policy so that manufacturers are authorized to collect these fees and consumers are aware that they have paid for the device.

If the current system relies on a multi-level public-private partnership between public collectors, manufacturers and for-profit recyclers, it must support all entities along the stream and eliminate uncertainty about who bears which costs.

Consumer education mandated in current law may improve if manufacturers are compelled to collect a much larger total weight of devices and if they are required to collect throughout the state. Enhanced education of consumers about drop-off locations may be necessary to meet quotas.

Is the Convenience Standard for Collection Adequate for Illinois?

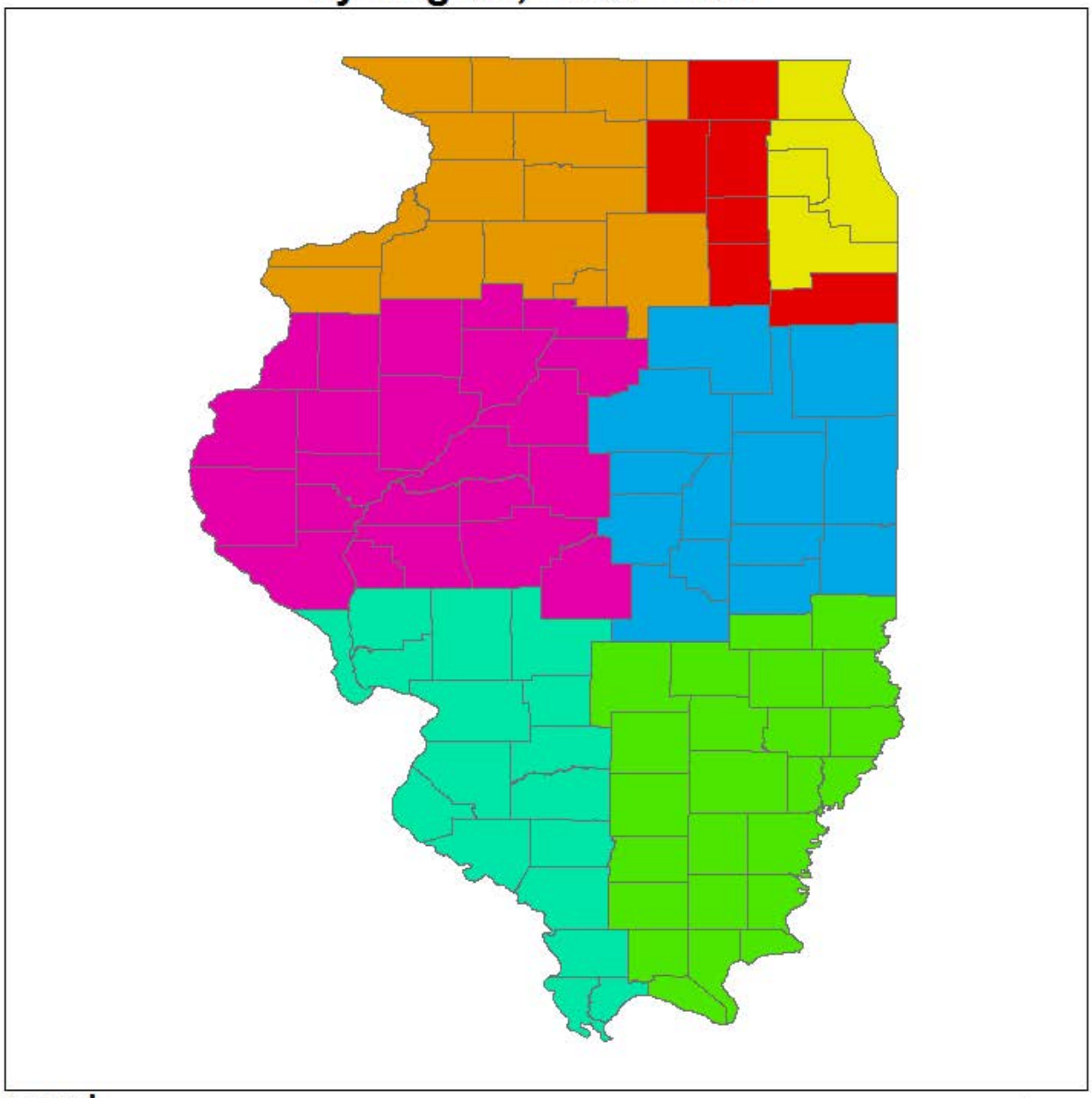
Maybe. The Convenience Standard could have unforeseen negative consequences due to how variable the population and quantity of available scrap is throughout the state. Map 9 shows how dramatically Chicago skews the state with 56% of e-scrap or more coming from just 4 counties.

The regions outlined in Map 4 suggest a way to think about proportional collection of e-scrap statewide. The southeast region of the state is least populated and will provide the lowest volume of e-scrap. Adequate coverage of these counties may be achieved through less frequent collection and stronger public partnerships to manage permanent collection facilities that citizens can access at their convenience. All other regions in the state can be expected to produce between 7% and 8% of the statewide total of e-scrap each year. For these regions, a consistent collection strategy is most beneficial. Chicago or Chicago plus the northeast region should be handled separately from the other regions in the state when anticipating quotas or timelines for collection events.

Illinois needs policies that deal with Chicago separately from the other 98 counties in the state.

If a 1 collection point per 10,000 resident formula is applied statewide, counties downstate that have populations below 10,000 will have to partner with neighboring counties to manage collection. If a mandate of a fixed number of collection sites per county is adopted, Chicago metro counties could be severely underserved. The 7-pound per resident

Proportion of E-scrap in Illinois Counties by Region, 2005 - 2011



Legend

- Chicago Metro
- Northeast
- Northwest
- East Central
- West Central
- Southeast
- Southwest

Regional E-scrap Percentages

Region	2005	2007	2009	2011
Chicago	58%	57%	57%	56%
Northeast	8%	9%	9%	10%
Northwest	8%	8%	8%	8%
East Central	7%	7%	7%	6%
West Central	8%	8%	8%	8%
Southeast	4%	4%	4%	4%
Southwest	/%	/%	/%	/%

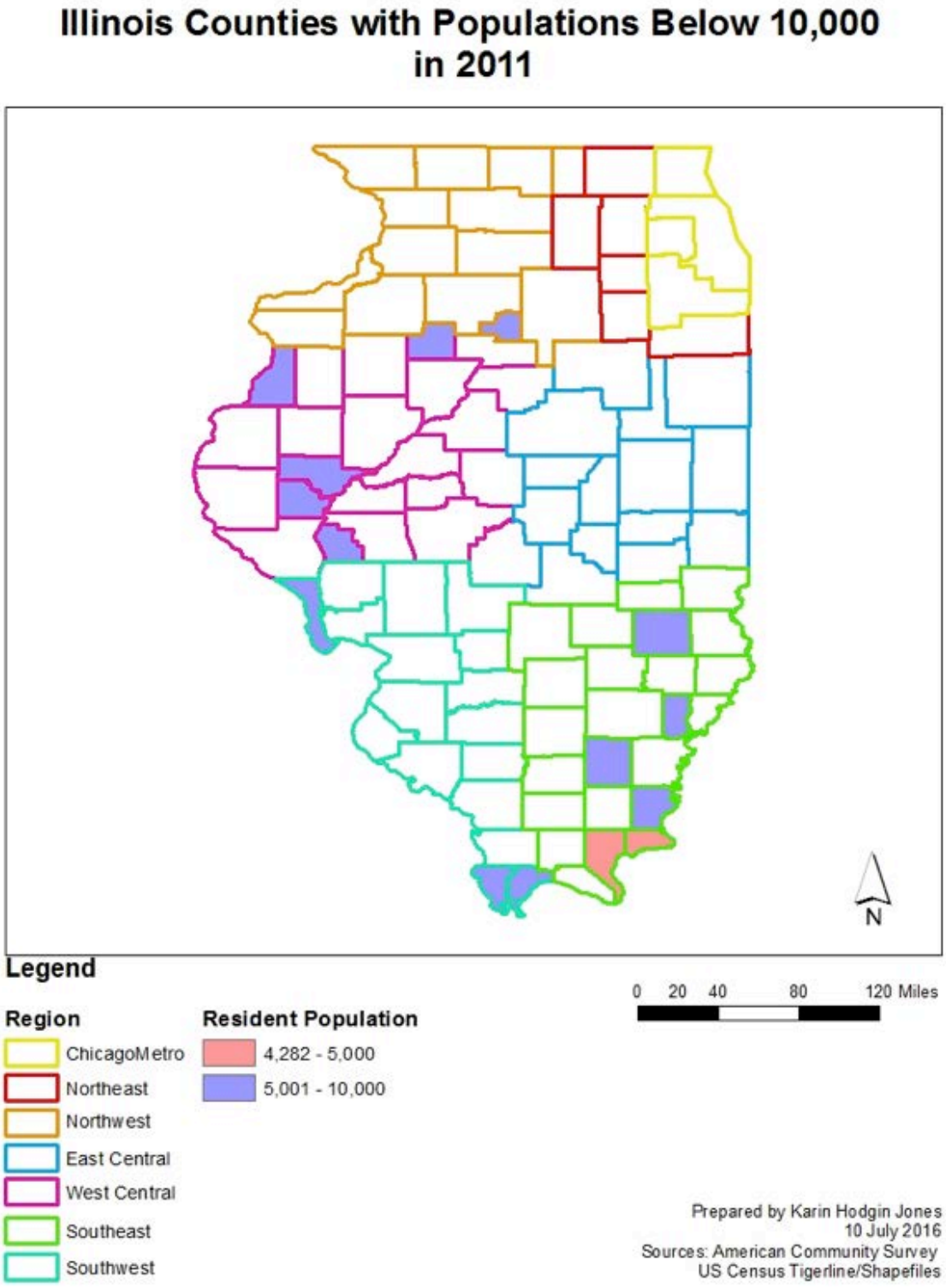
N

0 12.5 25 50 75 Miles

Prepared by Karin Hodgin Jones
10 July 2016
Sources: American Community Survey
US Census Tigerline Shapefiles 2010

Map 9 Proportion of E-scrap in Illinois Counties by Region

collection goal can easily be met without collecting at all in downstate counties with low populations (Map 10. A combination of a minimum number of convenience collection sites with a population mandate or 1 unit per 10,000 residents should mitigate any problems.



Map 10 Counties with Populations below 10,000 in Illinois in 2011.

Is There a Long-term Benefit to Storing Lead Glass at Landfills?

By all accounts, no, there is no benefit to storing lead glass in landfills for consumers, governments, community planners that manage collection events or recyclers. Collectors who currently receive credits for collecting and storing these materials as if they were processed in that same year have no incentive to retrieve and process them later.

Though it was a short-term effort to take the rising burden of costs associated with handling lead glass off of multiple participants in the scrap stream, it has the potential to create massive financial burdens later. Collectors that accept devices with lead glass still pay to store or ship them. Storing lead glass in landfills defers costs temporarily but if the overall cost of processing lead glass increases because current capacity shrinks for lack of raw material, the costs will emerge later and options will be few. Policies defer action are a gamble and future costs may be extraordinary.

Final Comments

E-scrap collection and recycling are a very small aspect of state policy but the impacts of those policies are felt in all communities in the state. The public-private partnership model that Illinois currently implements has such varied impacts on communities that e-scrap management is at once a public health concern, it is an economic and employment concern across collector, manufacturer and recycler industries, it is a community planning issue and it is a cost to consumers through purchases, state residents through taxes used to fund or subsidize parts of the system and industries through their mandated participation in collection and recycling.

The establishment of a circular economy takes a proactive stance toward future costs and should be pursued as the primary driver of future policy. However, where the law so far has encouraged flexibility and options for collectors as a way to incentivize participation, the lack of clarity that this flexibility has created has undermined the fledgling system.

The weight, consistency and quality of e-scrap may change through many years so extremely fixed policy that severely over or underestimates emerging scrap is not beneficial. Proactive analysis of emerging technology, proportional presence of device types in communities and anticipated LE and timeline before entering EOL management should be adopted by policymakers as a matter of regular review. With this foresight, policies regarding collection weights, locations of collection facilities, the proportional role of public and private partners can be made clearer to all in the e-scrap stream.

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Appendix

Appendix A

Raw Data from ILEPA Legislative reports 2012 - 2015								
	2011 Manufacturers recycled (lbs)	2011 collection site recycled (lbs)	2012 (78) manufacturers recycled (lbs)	2012 collection site recycled (lbs)	2013 manufacturers recycled (lbs)	2013 collection site recycled (lbs	2014 manufacturers recycled (lbs)	2014 collection site recycled (lbs
Totals Collected (pre-credit value)	32, 374,467	32399627.00	39496978.00	73814288.00	51657615.83	64680280.95	43544058.00	69935641.73
Computers (laptop, notebook,			4201669.16	8345999.30	2832319.39	4899947.73	2492425.07	4689524.24
Monitors			5776271.60	9863554.23	4821805.58	6962270.50	3568888.11	5311762.00
Printers / scanners / fax machines			4042809.75	11244346.06	3341120.18	5270662.62	3874023.30	5383382.00
Televisions			21556828.88	34303357.25	26957182.61	34269019.10	25886334.52	39030667.82
EED			1578584.88	2615452.72	1914872.81	2373129.10	2455861.43	9506235.67
Cable Receivers			103833.99	470469.00	445079.83	706925.00		
Digital Converter Boxes			22908.01	112069.80	42493.10	4899947.73		
DVD Player/Recorders			329950.37	1413279.36	1264559.44	2013182.75		
Electronic Keyboards			412284.67	1405336.54	988976.57	1527308.10		
Electronic Mice			192656.71	751969.24	521217.35	717918.00		
Portable Digital Music Players			183672.01	84844.90	168523.08	203276.80		
Satellite Receivers			256970.99	1,014,506.25	2496309.12	3119423.25		
Small Scale Servers			10216.98	357486.30	38937.10	262080.00		
Video Game Consoles			472686.54	445622.15	378843.33	628921.00		
Videocassette Recorders			355633.61	1384930.25	962155.82	1630008.00		
remaining CEDs (2014 report item)							5266525.60	6014070.00
Cell Phones Portable Digital Assistant (PDA) Computer Cable Zip Drive								
2012 data http://www.epa.illinois.gov/Assets/iepa/waste-management/electronics-recycling/2015-legislative-report.pdf								

Appendix B

Central Illinois Region Recyclers 2015

Kline Recycling and Asset Management	Recycler		Gilman		IL
Greenpath Recycling (Pathway Services Unlimited, Inc)	Recycler		Jacksonville		IL
TriCounty Regional Collection Facility			Macomb		IL
Quincy Recycle			Quincy		IL
West Central Cleaners			Rushville		IL
Bryant Industries, Inc.		Collector	Danville	Vermillion	IL
Mervis Industries		Collector	Danville	Vermillion	IL
Midwest Fiber	Recycler	Collector	Normal	McLean	IL
Goodwill Industries of Central Illinois		Collector	Peoria	Peoria	IL
M&M Recycling/International Depot Services	Recycler	Collector	Peoria	Peoria	IL
B&K Technology Solutions dba Advanced Technology Recycling	Recycler	Collector	Pontiac	Livingston	IL
BLH Computers	Recycler	Collector	Springfield	Sangamon	IL
Computer Banc	Recycler	Collector	Springfield	Sangamon	IL
Land of Lincoln Goodwill Industries, Inc.		Collector	Springfield	Sangamon	IL
Mack's Twin City Recycling		Collector	Urbana	Champaign	IL
Cimco Recycling	Recycler		Sterling		IL
River Valley Recycling, LLC	Recycler		Kankakee		IL
Chicago Region - North Recyclers					
Belmont Trading Company			Buffalo Grove		IL
Electronics Recycling Services International (ERS Chicago)	Recycler		Buffalo Grove		IL
Genesis Electronic Recycling			Buffalo Grove		IL
Solid Waste Agency of Lake County			Gurnee		IL
McHenry Township Road District			Johnsburg		IL
ARCOA (Asset Recycling Company of America)	Recycler		Waukegan		IL
Chicgao Region - Chicago Loop west, central and south Recyclers					
Adelman's Resource Solutions			Chicago		IL
Alpha Metals Corp	Recycler		Chicago		IL
City of Chicago			Chicago		IL
Sims Metal Management			Chicago		IL
Sipi Metals Corporation	Recycler		Chicago		IL
USMe LLC	Recycler		Chicago		IL
Village of Addison			Addison		IL
AE Computers, Ltd.			Berwyn		IL
Recom Inc.	Recycler		Bolingbrook		IL
Com2 Computer and Technologies	Recycler		Carol Stream		IL
Intercon Solutions, Inc.	Recycler		Chicago Heights		IL
SouthSTAR Services dba EcoSafe Processors	Recycler		Chicago Heights		IL
Salvation Army			Des Plaines		IL
Chicago Logistic Service Incorporated			Elgin		IL
Credential Wholesalers Inc.			Elgin		IL
MRK Group, Ltd.			Elgin		IL
eWorks ESI Midwest	Recycler		Elk Grove Village		IL
Groot Industries, Inc.			Elk Grove Village		IL
Village of Flossmoor			Flossmoor		IL
Vanguard Archives LLC			Franklin Park		IL
Elgin Recycling Inc.	Recycler		Gilberts		IL
AVA Electronics Computer Recycling	Recycler		Glendale Heights		IL
Supply-Chain Services	Recycler		Lombard		IL
American Recycling & Disposal Inc.			Maywood		IL
3S International, LLC	Recycler		Tinley Park		IL
Sims Recycling Solutions	Recycler		West Chicago		IL
Xtreme Environmental Solutions			West Chicago		IL

Chicago Region - West Outer-ring Suburbs Recyclers			
Association for Individual Development		Aurora	IL
Buesse & Sons Inc. dba Cartridge World		Batavia	IL
HOBI International, Inc.	Recycler	Batavia	IL
Computer Recycling Center, LLC		Crystal Lake	IL
Echelon Computers Inc.	Recycler	Crystal Lake	IL
Kreider Services (Secure Recycling Services)	Recycler	Dixon	IL
A-Team Recyclers, LLC	Recycler	Joliet	IL
All American Recycling, LLC	Recycler	Joliet	IL
Recycle-It Of Chicago		Joliet	IL
New Life Electronics Recycling, Inc.	Recycler	Oswego	IL
AP1H Electronic Recycling		Plainfield	IL
Kuusakoski US	Recycler	Plainfield	IL
Vintage Tech Recyclers	Recycler	Romeoville	IL
EverLights Inc.		Skokie	IL
Shore Community Service	Recycler	Skokie	IL
Solid Waste Agency of Northern Cook County (SWANCC)		Wheeling	IL
Northern Illinois - Recyclers			
T&T Iron & Metals Inc.	Recycler	East Dubuque	IL
Moring Disposal Inc.		Forreston	IL
Keep Northern Illinois Beautiful, Inc.		Loves Park	IL
KAS Recycling, Inc.	Recycler	Morrison	IL
Ogle County Solid Waste Management Department		Oregon	IL
City of Rochelle		Rochelle	IL
Behr Iron and Metals	Recycler	Rockford	IL
Goodwill Industries of Northern Illinois		Rockford	IL
East St. Louis / St. Louis Metro Area Recyclers			
Component Level Recycling	Recycler	Belleville	IL
J&C E-Recycling	Recycler	Belleville	IL
RNA Worldwide LLC	Recycler	Belleville	IL
St. Clair Associated Vocational Enterprises, Inc.		Belleville	IL
Eagle Recycling Services		Carlyle	IL
Power Recycling, Inc.	Recycler	Collinsville	IL
CID E-Cycling	Recycler	Edwardsville	IL
Totall Metal Recycling	Recycler	Granite City	IL
Interco Trading Company	Recycler	Madison	IL
Wissehr Recycling		Waterloo	IL
Didion Orf Recycling, Inc.	Recycler	St. Peters	MO
Keystone Recycling (formerly Keystone IT)		Fenton	MO
MERS/Missouri Goodwill Industries		St. Louis	MO
MRC Electronic Recycling (Midwest Recycling Center)	Recycler	Barnhart	MO
Spectrum Ecycle Solutions Inc.		St. Louis	MO
Southern Central Illinois / St. Louis region Recyclers			
Centralia Recycling Center		Centralia	IL
Secure Processors, LLC	Recycler	Flora	IL
Jackson County Health Dept.		Murphysboro	IL
Recyclers near Indiana -Central Illinois Border			
Devine Owens Electronic Recycling	Recycler	Gary	IN
Trinity Metals	Recycler	Indianapolis	IN
Source: http://epadata.epa.state.il.us/land/eWaste/crr-list.asp			

Table 2.4
Life Span Assumptions By Product Type-Residential Sector (Number of Years Before Collection)

Product Type	Assumption	Basis
PCs - Desktop	25% - 7 years	Median of each quartile
	25% -10 years	
	25% -14 years	
	25% -18 years	
PC's Portable	20% - 4 years	1st - 4th quartiles
	15% - 5 years	
	20% - 6 years	
	45% - 7 years	
PC Monitors - CRT	25% - 5 years	Median of each quartile
	25% - 8 years	
	25% - 10 years	
	25% -13 years	
PC Monitors - flat panel	100% - 9 years	mean of all observations
PC Hard copy peripherals	25% - 4 years	Median of each quartile
	25% - 7 years	
	25% - 10 years	
	25% - 14 years	
PC Keyboards	100% - 5 years	Median of all observations
TVs - CRT <19"	25% - 8 years	Median of each quartile
	25% - 13 years	
	25% - 17 years	
	25% - 23 years	
TVs - CRT > 19"	25% - 7 years	Median of each quartile
	25% - 12 years	
	25% - 15 years	
	25% - 20 years	
TVS - Projection	100% - 8 years	Mean of all observations
TVs - Flat Panel	100% - 9 years	No data assumed the same as PC flat panel monitors

Source: Office of Solid Waste U.S. Environmental Protection Agency. (July, 2008). Electronics Waste Management in the United States Approach I. Retrieved from http://nepis.epa.gov/Exe/ZyPURL.cgi?Dockey=P1001FPK.txt

Appendix D

Net Computer Related Electronic Units Manufactured or Imported for Sale in the U.S. 1999 - 2010

Product code	3341111	3341121	3341191	3341131
Product descriptions	Computers, digital, analog, hybrid and other	Flexible, rigid disk drives, computer storage equipment	Printers, Scanners, Monitors, Keyboards, Peripherals	Optical scanning devices and ink recognition equipment
Year	Quantity	Quantity	Quantity	Quantity
1999	37,564.3	175,599.0	482,281.1	0.0
2000	43,478.3	162,075.2	391,486.3	0.0
2001	36,770.0	327,003.8	207,490.0	0.0
2002	39,018.9	169,008.3	244,982.8	0.0
2003	49,243.1	167,272.6	222,936.2	0.0
2004	53,530.0	179,937.2	242,909.8	0.0
2005	61,252,086.0	3,228,711.0	64,709,862.0	0.0
2006	67,858,684.0	3,024,369.0	60,021,697.0	0.0
2007	65,799,137.0	118,349,310.0	1,925,152.0	50,277,890.0
2008	75,474,383.0	242,293,625.0	3,521,294.0	78,506,147.0
2009	86,701,498.0	216,229,275.0	3,180,239.0	67,673,311.0
2010	85,377,754.0	237,103,330.0	3,955,145.0	82,012,902.0

Methodology: All item subcodes have been merged under a parent 7 digit code and values shown are sums of all items and category subcodes that fall under 3341111, 3341121, 3341191 or 3341131

The data is based on domestic manufacturing, export and import data using the equation: Domestic Manufactured Units - Exported Units + Units Imported for consumption.

US Census Data suppresses some manufacturing totals to protect sensitive information and industries. Where this information has been suppressed, the values have been normalized by using the Import totals alone in place of domestic production minus export + import.

Source: US Census Bureau. (1999). Consumer Electronics. Retrieved from http://www.census.gov/industry/1/ma36m99.pdf?cssp=SERP

Source: US Census Bureau. (2000). Consumer Electronics. Retrieved from http://www.census.gov/industry/1/ma36m00.pdf?cssp=SERP

Source: US Census Bureau. (2001). Consumer Electronics. Retrieved from http://www.census.gov/industry/1/ma334m01.pdf?cssp=SERP

Source: US Census Bureau. (2002). Consumer Electronics. Retrieved from http://www.census.gov/industry/1/ma334m02.pdf?cssp=SERP

Source: US Census Bureau. (2003). Consumer Electronics. Retrieved from http://www.census.gov/industry/1/ma334m03.pdf?cssp=SERP

Source: US Census Bureau. (2004). Consumer Electronics. Retrieved from http://www.census.gov/industry/1/ma334m04.pdf?cssp=SERP

Source: US Census Bureau. (2005). Consumer Electronics. Retrieved from http://www.census.gov/industry/1/ma334m05.pdf?cssp=SERP

Source: US Census Bureau. (2006). Computers and Peripheral Equipment: 2006 Summary. Retrieved from http://www.census.gov/industry/1/mq334r065.pdf

Source: US Census Bureau. (2007). Computers and Peripheral Equipment: First Quarter: 2007. Retrieved from http://www.census.gov/industry/1/ma334m01.pdf?cssp=SERP

Source: US Census Bureau. (2007). Computers and Peripheral Equipment: Second Quarter: 2007. Retrieved from http://www.census.gov/industry/1/ma334m01.pdf?cssp=SERP

Source: US Census Bureau. (2007). Computers and Peripheral Equipment: Third Quarter: 2007. Retrieved from http://www.census.gov/industry/1/mq334r073.pdf

Source: US Census Bureau. (2007). Computers and Peripheral Equipment: Fourth Quarter: 2007. Retrieved from http://www.census.gov/industry/1/mq334r074.pdf

Source: US Census Bureau. (2008). Computers and Peripheral Equipment - Summary 2008. Retrieved from https://www.census.gov/manufacturing/cir/historical_data/mq334r/mq334r085.xls

Source: US Census Bureau. (2009). Computers and Peripheral Equipment - Summary 2008. Retrieved from https://www.census.gov/manufacturing/cir/historical_data/mq334r/mq334r095.xls

Source: US Census Bureau. (2010). Computers and Peripheral Equipment - Summary 2008. Retrieved from https://www.census.gov/manufacturing/cir/historical_data/mq334r/mq334r105.xls

Appendix E

Estimated Number of Households in Illinois Counties 2000 - 2013

Total Number of Households 2000 US	Estimated Number of Households for years 2001 - 2005 Extrapolated from US Census Bureau Census				Estimated Number of Households for 2005 - 2006 / 2007 - 2009 Extrapolated from US Census Bureau				Total Number of Illinois Households US Census Bureau ACS Data				
Counties	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**
Adams	26,860	26,861	26,863	26,864	26,866	26,867	28,436	27,362	27,367	27,553	26,888	26,934	26,517	26,569
Alexander	3,808	3,759	3,710	3,662	3,613	3,564	3,515	3,467	3,418	3,369	3,393	3,326	3,246	3,179
Bond	6,155	6,295	6,436	6,576	6,716	6,856	6,997	7,137	7,277	7,418	7,190	7,140	7,076	7,038
Boone	14,597	14,888	15,178	15,469	15,760	16,051	16,341	16,632	16,802	17,258	18,273	17,994	17,755	17,605
Brown	2,108	2,173	2,238	2,302	2,367	2,432	2,497	2,561	2,626	2,691	2,770	2,759	2,754	2,751
Bureau	14,182	14,263	14,344	14,425	14,507	14,588	14,669	14,750	14,780	14,602	14,360	14,103	14,181	13,868
Calhoun	2,046	2,049	2,052	2,055	2,057	2,060	2,063	2,066	2,069	2,072	2,055	2,037	2,018	2,017
Carroll	6,794	6,759	6,724	6,690	6,655	6,620	6,585	6,550	6,516	6,481	6,271	6,190	6,111	6,055
Cass	5,347	5,369	5,390	5,412	5,433	5,455	5,476	5,498	5,519	5,541	5,481	5,456	5,406	5,390
Champaign	70,597	71,261	71,924	72,588	73,251	73,915	73,960	75,038	76,482	77,759	78,977	78,920	79,246	79,100
Christian	13,921	13,934	13,947	13,960	13,972	13,985	13,998	14,011	13,793	13,863	14,134	14,352	14,333	13,913
Clark	6,971	6,957	6,944	6,930	6,916	6,903	6,889	6,875	6,862	6,848	6,645	6,577	6,515	6,488
Clay	5,839	5,813	5,787	5,761	5,734	5,708	5,682	5,656	5,630	5,604	5,593	5,545	5,509	5,476
Clinton	12,754	12,867	12,980	13,093	13,207	13,320	13,433	13,546	13,730	13,987	14,169	14,288	14,048	13,964
Coles	21,043	20,985	20,928	20,870	20,812	20,754	20,697	20,639	20,925	21,452	21,274	20,952	20,932	21,014
Cook	1,974,181	1,966,918	1,959,654	1,952,391	1,945,127	1,937,864	1,932,197	1,935,764	1,939,190	1,939,904	1,930,689	1,923,985	1,927,303	1,931,524
Crawford	7,842	7,857	7,872	7,887	7,902	7,917	7,932	7,947	7,962	7,978	7,978	7,940	7,879	7,851
Cumberland	4,368	4,373	4,377	4,382	4,386	4,391	4,395	4,400	4,404	4,409	4,447	4,429	4,400	4,388
DeKalb	31,674	32,256	32,838	33,419	34,001	34,583	35,020	35,451	36,409	37,145	38,270	37,767	37,386	37,439
De Witt	6,770	6,757	6,743	6,730	6,716	6,703	6,689	6,676	6,662	6,649	6,696	6,654	6,598	6,578
Douglas	7,574	7,614	7,654	7,694	7,734	7,773	7,813	7,853	7,893	7,933	8,037	7,983	7,931	7,929
DuPage	325,601	326,589	327,577	328,564	329,552	330,540	336,658	335,292	338,050	338,213	334,675	334,762	334,764	336,540
Edgar	7,874	7,849	7,825	7,800	7,776	7,751	7,727	7,702	7,678	7,653	7,541	7,463	7,376	7,306
Edwards	2,905	2,878	2,851	2,825	2,798	2,771	2,744	2,717	2,690	2,664	2,694	2,677	2,666	2,667
Effingham	13,001	13,035	13,068	13,102	13,136	13,170	13,203	13,237	13,277	13,465	13,634	13,608	13,761	13,425
Fayette	8,146	8,126	8,106	8,086	8,065	8,045	8,025	8,005	8,068	8,265	8,256	8,395	8,156	8,053
Ford	5,639	5,646	5,653	5,660	5,667	5,674	5,680	5,687	5,694	5,701	5,668	5,635	5,596	5,574
Franklin	16,408	16,370	16,332	16,294	16,255	16,217	16,179	16,141	16,014	15,793	16,052	16,105	16,112	16,133
Fulton	14,877	14,862	14,847	14,832	14,817	14,802	14,787	14,772	14,790	14,924	14,594	14,704	14,557	14,558
Gallatin	2,726	2,692	2,657	2,623	2,589	2,554	2,520	2,485	2,451	2,417	2,318	2,274	2,228	2,198
Greene	5,757	5,742	5,726	5,711	5,695	5,680	5,665	5,649	5,634	5,618	5,616	5,564	5,509	5,489
Grundy	14,293	14,636	14,980	15,323	15,666	16,009	16,353	16,696	17,056	17,031	18,168	18,518	18,051	18,119
Hamilton	3,462	3,449	3,435	3,422	3,408	3,395	3,381	3,368	3,355	3,341	3,395	3,376	3,359	3,352
Hancock	8,069	8,021	7,974	7,926	7,879	7,831	7,784	7,736	7,688	7,641	7,722	7,662	7,595	7,549
Hardin	1,987	1,969	1,951	1,933	1,915	1,897	1,879	1,861	1,843	1,824	1,768	1,743	1,719	1,702
Henderson	3,365	3,334	3,302	3,271	3,239	3,208	3,176	3,145	3,113	3,082	2,997	2,952	2,898	2,863
Henry	20,056	20,023	19,990	19,957	19,924	19,891	19,858	19,825	19,966	20,304	20,628	20,326	20,143	20,268
Iroquois	12,220	12,138	12,056	11,974	11,891	11,809	11,727	11,645	12,031	12,027	11,787	11,728	11,889	11,987
Jackson	24,215	24,252	24,288	24,325	24,361	24,398	24,434	24,471	24,172	24,328	23,393	23,469	23,189	23,550
Jasper	3,930	3,931	3,931	3,932	3,933	3,934	3,934	3,935	3,936	3,937	3,916	3,894	3,867	3,857
Jefferson	15,374	15,441	15,507	15,574	15,641	15,708	15,774	15,841	15,683	15,771	15,233	15,462	15,185	15,032
Jersey	8,096	8,173	8,249	8,326	8,403	8,480	8,556	8,633	8,769	8,718	8,526	8,753	8,742	9,011
Jo Daviess	9,218	9,364	9,510	9,656	9,802	9,948	10,094	10,240	10,144	9,982	9,708	9,524	9,532	9,482
Johnson	4,183	4,337	4,492	4,646	4,801	4,955	5,109	5,264	5,418	5,573	5,104	5,066	5,041	5,046
Kane	133,901	138,139	142,377	146,614	150,852	155,090	161,812	160,402	163,555	163,537	169,394	169,288	169,535	170,209
Kankakee	38,182	38,498	38,814	39,129	39,445	39,761	40,240	40,249	40,342	40,125	40,957	41,113	41,515	41,333
Kendall	18,798	20,305	21,812	23,319	24,826	26,333	29,941	28,793	30,903	32,011	37,568	38,030	38,486	38,145
Knox	22,056	21,996	21,936	21,876	21,817	21,757	21,697	21,637	21,722	21,746	21,909	21,674	21,592	21,311
Lake	216,297	219,447	222,597	225,746	228,896	232,046	233,322	233,617	235,330	235,420	239,553	239,348	240,273	242,245
La Salle	43,417	43,624	43,831	44,039	44,246	44,453	45,941	45,375	45,540	45,085	44,720	44,181	44,023	44,048
Lawrence	6,309	6,359	6,408	6,458	6,507	6,557	6,606	6,656	6,706	6,755	6,767	6,741	6,684	6,654
Lee	13,253	13,287	13,321	13,355	13,388	13,422	13,456	13,490	13,701	13,819	13,635	13,615	13,591	13,433
Livingston	14,374	14,425	14,476	14,527	14,577	14,628	14,679	14,730	14,608	14,489	14,359	14,329	14,351	14,400
Logan	11,113	11,086	11,060	11,033	11,007	10,980	10,954	10,927	10,623	10,991	11,081	10,955	10,338	10,228
McDonough	12,360	12,435	12,509	12,584	12,659	12,734	12,808	12,883	12,899	12,962	12,945	12,755	12,697	12,426

McHenry	89,403	92,247	100,288	108,330	116,371	103,623	106,751	105,901	107,497	107,906	108,854	108,703	108,995	108,550
McLean	56,746	57,166	61,811	66,457	71,102	58,846	61,700	61,177	62,412	63,123	63,109	63,160	63,314	64,570
Macon	46,561	46,479	49,998	53,517	57,036	46,150	46,761	46,343	46,166	45,664	44,861	44,719	45,580	45,186
Macoupin	19,253	19,298	19,343	19,388	19,434	19,479	19,524	19,569	19,718	19,659	19,327	19,413	19,647	19,137
Madison	101,953	102,872	111,018	119,163	127,309	106,550	107,745	107,271	107,072	107,360	106,658	107,103	107,047	106,844
Marion	16,619	16,584	16,549	16,514	16,478	16,443	16,408	16,373	16,115	16,489	16,110	15,992	15,748	15,813
Marshall	5,225	5,226	5,228	5,229	5,230	5,232	5,233	5,234	5,236	5,237	5,126	5,077	5,007	4,962
Mason	6,389	6,363	6,337	6,310	6,284	6,258	6,232	6,205	6,179	6,153	5,992	5,915	5,831	5,780
Massac	6,261	6,249	6,238	6,226	6,214	6,202	6,191	6,179	6,167	6,156	6,195	6,176	6,124	6,088
Menard	4,873	4,897	4,920	4,944	4,968	4,991	5,015	5,038	5,062	5,086	5,101	5,092	5,071	5,055
Mercer	6,624	6,634	6,643	6,653	6,662	6,672	6,681	6,691	6,701	6,710	6,647	6,599	6,542	6,504
Monroe	10,275	10,484	10,694	10,903	11,113	11,322	11,532	11,741	11,967	12,214	12,619	12,378	12,443	12,476
Montgomery	11,507	11,475	11,444	11,412	11,380	11,348	11,317	11,285	11,399	11,658	11,804	11,529	10,750	10,278
Morgan	14,039	13,991	13,942	13,894	13,845	13,797	13,748	13,700	13,940	14,112	14,188	14,078	13,738	13,681
Moultrie	5,405	5,455	5,505	5,555	5,605	5,655	5,705	5,755	5,805	5,855	5,913	5,909	5,914	5,924
Ogle	19,278	19,421	19,565	19,708	19,852	19,995	20,139	20,282	20,425	20,263	20,815	20,540	20,812	20,770
Peoria	72,733	73,016	78,645	84,274	89,904	74,146	73,958	74,136	74,526	74,795	75,238	75,433	76,007	75,978
Perry	8,504	8,518	8,532	8,546	8,561	8,575	8,589	8,603	8,628	8,624	8,165	7,973	8,030	7,988
Piatt	6,475	6,504	6,533	6,561	6,590	6,619	6,648	6,677	6,705	6,734	6,710	6,684	6,645	6,622
Pike	6,876	6,860	6,843	6,827	6,810	6,794	6,777	6,761	6,745	6,728	6,659	6,614	6,548	6,509
Pope	1,769	1,757	1,745	1,733	1,721	1,709	1,697	1,685	1,674	1,662	1,778	1,767	1,753	1,746
Pulaski	2,893	2,863	2,833	2,803	2,774	2,744	2,714	2,684	2,654	2,624	2,515	2,474	2,433	2,404
Putnam	2,415	2,418	2,420	2,423	2,426	2,429	2,431	2,434	2,437	2,440	2,402	2,396	2,378	2,361
Randolph	12,084	12,108	12,132	12,156	12,180	12,204	12,228	12,252	12,074	11,967	11,728	11,872	12,072	12,017
Richland	6,660	6,628	6,597	6,565	6,534	6,502	6,471	6,439	6,407	6,376	6,492	6,472	6,447	6,459
Rock Island	60,712	60,522	65,092	69,661	74,230	59,764	60,849	60,173	60,588	60,156	60,262	60,242	60,758	60,724
St. Clair	96,810	97,623	105,320	113,017	120,713	100,876	101,064	101,362	102,370	103,261	103,730	103,118	101,778	102,075
Saline	10,992	11,048	11,105	11,161	11,217	11,274	11,330	11,386	11,443	11,499	10,470	10,068	10,170	9,890
Sangamon	78,722	79,025	85,189	91,353	97,516	80,239	80,869	81,172	81,604	82,370	82,030	82,827	82,927	82,503
Schuyler	2,975	2,958	2,941	2,924	2,908	2,891	2,874	2,857	2,840	2,823	3,023	3,008	2,988	2,984
Scott	2,222	2,213	2,203	2,194	2,185	2,175	2,166	2,157	2,147	2,138	2,158	2,140	2,120	2,107
Shelby	9,056	9,060	9,064	9,068	9,072	9,076	9,080	9,084	9,149	9,203	9,025	8,862	8,915	8,935
Stark	2,525	2,520	2,515	2,510	2,505	2,500	2,495	2,490	2,485	2,480	2,444	2,392	2,384	2,367
Stephenson	19,785	19,721	19,657	19,593	19,528	19,464	19,400	19,336	19,638	19,952	19,727	19,374	19,420	19,141
Tazewell	50,327	50,751	54,752	58,753	62,754	52,447	52,405	52,692	52,923	53,542	54,041	54,416	54,302	54,416
Union	7,290	7,300	7,310	7,320	7,329	7,339	7,349	7,359	7,369	7,379	7,212	7,153	7,091	7,061
Vermilion	33,406	33,340	35,835	38,330	40,825	33,075	32,882	32,857	32,675	32,447	31,922	31,502	31,486	31,666
Wabash	5,192	5,168	5,145	5,121	5,097	5,074	5,050	5,026	5,003	4,979	4,876	4,816	4,755	4,720
Warren	7,166	7,166	7,165	7,165	7,165	7,165	7,164	7,164	7,164	7,164	7,127	7,096	7,061	7,076
Washington	5,848	5,866	5,884	5,902	5,920	5,938	5,956	5,974	5,992	6,010	5,960	5,898	5,853	5,827
Wayne	7,143	7,098	7,053	7,008	6,962	6,917	6,872	6,827	6,782	6,737	6,765	6,726	6,664	6,643
White	6,534	6,478	6,422	6,366	6,310	6,254	6,198	6,142	6,085	6,029	5,944	5,899	5,851	5,829
Whiteside	23,684	23,708	23,733	23,757	23,782	23,806	23,831	23,855	23,881	24,051	23,444	23,154	22,878	23,447
Will	167,542	174,934	190,947	206,961	222,974	204,500	210,567	210,889	215,201	216,725	221,699	222,413	222,401	222,313
Williamson	25,358	25,429	25,499	25,570	25,640	25,711	25,781	25,852	25,955	26,887	26,717	26,565	26,383	26,778
Winnebago	107,980	108,266	116,631	124,996	133,361	109,408	109,258	110,162	110,820	112,538	112,862	113,203	112,594	112,759
Woodford	12,797	12,954	13,111	13,268	13,425	13,582	13,739	13,896	14,063	14,196	14,316	14,122	14,276	14,346

2005 - 2013 County Population Source: U.S. Census Bureau, 2005, 2006 - 2008, 2008 - 2010, 2010 - 2013 American Community Survey

2000 - 2009 County Households Estimates use an equal interval increase based on the following formula: U.S. Census Bureau, 2008 - 2013 American Community Survey Population for 2009 minus U.S. Census Bureau, 2000, Decennial Census Data Population for 2000 divided by 9. The 1/9 value for each county is then added to the next year to create an equal interval distribution for all missing years.

2000 - 2007 County Households Estimates use an equal interval increase based on the following formula: U.S. Census Bureau, 2008 - 2013 American Community Survey Population for 2009 minus U.S. Census Bureau, 2000, Decennial Census Data Population for 2000 divided by 9. The 1/9 value for each county is then added to the next year to create an equal interval distribution for all missing years.

2000 - 2005 County Population Estimates use an equal interval increase based on the following formula: U.S. Census Bureau, 2008 - 2013 American Community Survey Population for 2009 minus U.S. Census Bureau, 2000, Decennial Census Data Population for 2000 divided by 9. The 1/9 value for each county is then added to the next year to create an equal interval distribution for all missing years.

Appendix F

Estimate of Number of Computers in Illinois by County													
Counties	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Adams	13,699	13,699	14,476	15,253	16,031	16,808	18,611	18,699	19,494	20,417	20,623	20,362	20,922
Alexander	1,942	1,917	2,000	2,079	2,156	2,230	2,301	2,369	2,434	2,496	2,603	2,514	2,561
Bond	3,139	3,211	3,468	3,734	4,008	4,289	4,579	4,877	5,184	5,496	5,515	5,398	5,583
Boone	7,444	7,593	8,180	8,783	9,404	10,041	10,695	11,366	11,968	12,788	14,015	13,603	14,009
Brown	1,075	1,108	1,206	1,307	1,412	1,521	1,634	1,751	1,871	1,994	2,124	2,086	2,173
Bureau	7,233	7,274	7,730	8,191	8,656	9,126	9,601	10,080	10,528	10,820	11,014	10,662	11,189
Calhoun	1,043	1,045	1,106	1,167	1,228	1,289	1,350	1,412	1,474	1,535	1,577	1,540	1,592
Carroll	3,465	3,447	3,624	3,798	3,971	4,141	4,310	4,477	4,641	4,802	4,810	4,679	4,821
Cass	2,727	2,738	2,905	3,073	3,242	3,412	3,584	3,757	3,931	4,106	4,204	4,124	4,266
Champaign	36,004	36,343	38,760	41,215	43,709	46,241	48,407	51,281	54,478	57,619	60,575	59,664	62,525
Christian	7,100	7,106	7,516	7,926	8,337	8,749	9,162	9,575	9,825	10,272	10,841	10,850	11,309
Clark	3,555	3,548	3,742	3,935	4,127	4,318	4,509	4,699	4,888	5,074	5,096	4,972	5,140
Clay	2,978	2,965	3,118	3,271	3,422	3,571	3,719	3,865	4,010	4,152	4,290	4,192	4,347
Clinton	6,505	6,562	6,995	7,434	7,880	8,333	8,792	9,257	9,780	10,364	10,868	10,802	11,084
Coles	10,732	10,702	11,278	11,850	12,419	12,984	13,546	14,105	14,905	15,896	16,317	15,840	16,515
Cook	1,006,832	1,003,128	1,056,058	1,108,567	1,160,658	1,212,328	1,264,623	1,322,901	1,381,285	1,437,469	1,480,838	1,454,533	1,520,642
Crawford	3,999	4,007	4,242	4,478	4,715	4,953	5,192	5,431	5,672	5,911	6,119	6,003	6,217
Cumberland	2,228	2,230	2,359	2,488	2,617	2,747	2,877	3,007	3,137	3,267	3,411	3,348	3,472
DeKalb	16,154	16,450	17,696	18,976	20,289	21,635	22,921	24,227	25,934	27,524	29,353	28,552	29,498
De Witt	3,453	3,446	3,634	3,821	4,008	4,193	4,378	4,562	4,746	4,927	5,136	5,030	5,206
Douglas	3,863	3,883	4,125	4,368	4,615	4,863	5,114	5,367	5,622	5,878	6,164	6,035	6,258
DuPage	166,057	166,560	176,531	186,559	196,644	206,786	220,343	229,139	240,793	250,616	256,696	253,080	264,129
Edgar	4,016	4,003	4,217	4,429	4,640	4,849	5,057	5,264	5,469	5,671	5,784	5,642	5,819
Edwards	1,482	1,468	1,537	1,604	1,669	1,733	1,796	1,857	1,916	1,974	2,066	2,024	2,103
Effingham	6,631	6,648	7,043	7,439	7,838	8,239	8,642	9,046	9,457	9,978	10,457	10,288	10,857
Fayette	4,154	4,144	4,368	4,591	4,813	5,033	5,252	5,471	5,747	6,124	6,332	6,347	6,435
Ford	2,876	2,879	3,046	3,214	3,381	3,549	3,718	3,887	4,056	4,225	4,347	4,260	4,415
Franklin	8,368	8,349	8,801	9,251	9,700	10,146	10,589	11,031	11,407	11,703	12,312	12,175	12,712
Fulton	7,587	7,580	8,001	8,422	8,841	9,260	9,678	10,095	10,535	11,059	11,194	11,116	11,485
Gallatin	1,390	1,373	1,432	1,489	1,545	1,598	1,649	1,699	1,746	1,791	1,778	1,719	1,758
Greene	2,936	2,928	3,086	3,243	3,398	3,553	3,707	3,861	4,013	4,163	4,307	4,207	4,347
Grundy	7,289	7,465	8,072	8,700	9,348	10,015	10,703	11,410	12,149	12,620	13,935	14,000	14,242
Hamilton	1,766	1,759	1,851	1,943	2,034	2,124	2,213	2,302	2,390	2,476	2,604	2,553	2,650
Hancock	4,115	4,091	4,297	4,501	4,701	4,899	5,094	5,287	5,476	5,662	5,923	5,792	5,992
Hardin	1,013	1,004	1,051	1,097	1,143	1,187	1,230	1,272	1,312	1,352	1,356	1,318	1,356
Henderson	1,716	1,700	1,779	1,857	1,933	2,007	2,079	2,149	2,217	2,283	2,299	2,231	2,287
Henry	10,229	10,212	10,773	11,332	11,889	12,444	12,997	13,548	14,222	15,045	15,822	15,366	15,893
Iroquois	6,232	6,190	6,497	6,799	7,096	7,388	7,675	7,958	8,570	8,912	9,041	8,866	9,380
Jackson	12,350	12,368	13,089	13,812	14,536	15,263	15,992	16,723	17,218	18,027	17,942	17,743	18,296
Jasper	2,004	2,005	2,119	2,233	2,347	2,461	2,575	2,689	2,804	2,917	3,004	2,944	3,051
Jefferson	7,841	7,875	8,357	8,843	9,333	9,827	10,324	10,826	11,171	11,686	11,684	11,689	11,981
Jersey	4,129	4,168	4,446	4,728	5,014	5,305	5,600	5,900	6,246	6,460	6,539	6,617	6,897
Jo Daviess	4,701	4,776	5,125	5,483	5,849	6,223	6,607	6,998	7,226	7,397	7,446	7,200	7,521
Johnson	2,133	2,212	2,421	2,638	2,865	3,100	3,344	3,597	3,859	4,129	3,915	3,830	3,977
Kane	68,290	70,451	76,727	83,248	90,014	97,024	105,906	109,619	116,500	121,181	129,925	127,982	133,763
Kankakee	19,473	19,634	20,917	22,218	23,537	24,874	26,337	27,506	28,736	29,733	31,414	31,081	32,755
Kendall	9,587	10,356	11,754	13,241	14,814	16,474	19,596	19,677	22,012	23,720	28,815	28,751	30,365
Knox	11,249	11,218	11,821	12,421	13,018	13,611	14,201	14,787	15,473	16,114	16,804	16,386	17,036
Lake	110,311	111,918	119,957	128,179	136,582	145,168	152,709	159,654	167,626	174,446	183,737	180,947	189,575
La Salle	22,143	22,248	23,621	25,005	26,401	27,810	30,068	31,009	32,438	33,408	34,300	33,401	34,734
Lawrence	3,218	3,243	3,453	3,667	3,883	4,102	4,324	4,549	4,776	5,006	5,190	5,096	5,274
Lee	6,759	6,776	7,179	7,583	7,989	8,397	8,807	9,219	9,759	10,240	10,458	10,293	10,723
Livingston	7,331	7,357	7,801	8,248	8,698	9,151	9,607	10,066	10,405	10,736	11,013	10,833	11,323
Logan	5,668	5,654	5,960	6,265	6,568	6,869	7,169	7,468	7,567	8,144	8,499	8,282	8,157
McDonough	6,304	6,342	6,741	7,145	7,554	7,966	8,383	8,804	9,188	9,605	9,929	9,643	10,018

McHenry	45,596	47,046	54,045	61,510	69,439	64,827	69,869	72,373	76,570	79,958	83,491	82,179	85,997
McLean	28,940	29,155	33,310	37,734	42,427	36,814	40,383	41,808	44,456	46,774	48,405	47,749	49,955
Macon	23,746	23,704	26,944	30,387	34,033	28,871	30,605	31,671	32,884	33,837	34,408	33,808	35,963
Macoupin	9,819	9,842	10,424	11,009	11,596	12,186	12,778	13,373	14,045	14,567	14,824	14,676	15,501
Madison	51,996	52,465	59,828	67,661	75,965	66,658	70,519	73,309	76,267	79,554	81,807	80,970	84,460
Marion	8,476	8,458	8,918	9,376	9,833	10,287	10,739	11,189	11,479	12,218	12,356	12,090	12,425
Marshall	2,665	2,665	2,817	2,969	3,121	3,273	3,425	3,577	3,729	3,881	3,931	3,838	3,950
Mason	3,258	3,245	3,415	3,583	3,750	3,915	4,079	4,241	4,401	4,559	4,596	4,472	4,601
Massac	3,193	3,187	3,361	3,535	3,708	3,880	4,052	4,223	4,393	4,561	4,751	4,669	4,831
Menard	2,485	2,497	2,652	2,807	2,964	3,122	3,282	3,443	3,606	3,769	3,913	3,850	4,001
Mercer	3,378	3,383	3,580	3,777	3,975	4,174	4,373	4,573	4,773	4,972	5,098	4,989	5,162
Monroe	5,240	5,347	5,763	6,191	6,631	7,083	7,547	8,024	8,524	9,051	9,679	9,358	9,818
Montgomery	5,869	5,852	6,167	6,480	6,791	7,100	7,407	7,712	8,120	8,639	9,054	8,716	8,482
Morgan	7,160	7,135	7,513	7,889	8,261	8,631	8,998	9,363	9,929	10,457	10,882	10,643	10,839
Moultrie	2,757	2,782	2,967	3,154	3,344	3,538	3,734	3,933	4,135	4,338	4,535	4,467	4,666
Ogle	9,832	9,905	10,544	11,190	11,846	12,509	13,181	13,861	14,549	15,015	15,965	15,528	16,421
Peoria	37,094	37,238	42,382	47,851	53,646	46,386	48,406	50,665	53,085	55,423	57,708	57,027	59,970
Perry	4,337	4,344	4,598	4,853	5,108	5,364	5,621	5,879	6,146	6,390	6,263	6,028	6,336
Piatt	3,302	3,317	3,520	3,726	3,932	4,141	4,351	4,563	4,776	4,990	5,147	5,053	5,243
Pike	3,507	3,498	3,688	3,876	4,064	4,250	4,436	4,620	4,804	4,986	5,107	5,000	5,167
Pope	902	896	940	984	1,027	1,069	1,111	1,152	1,192	1,231	1,363	1,336	1,383
Pulaski	1,475	1,460	1,527	1,592	1,655	1,717	1,776	1,834	1,891	1,945	1,929	1,870	1,920
Putnam	1,232	1,233	1,304	1,376	1,448	1,519	1,591	1,663	1,736	1,808	1,843	1,811	1,876
Randolph	6,163	6,175	6,538	6,902	7,268	7,635	8,003	8,373	8,600	8,868	8,995	8,975	9,525
Richland	3,397	3,381	3,555	3,728	3,899	4,068	4,235	4,400	4,564	4,725	4,980	4,893	5,086
Rock Island	30,963	30,866	35,078	39,553	44,293	37,388	39,826	41,122	43,157	44,576	46,221	45,543	47,938
St. Clair	49,373	49,788	56,757	64,171	72,030	63,108	66,146	69,271	72,918	76,516	79,561	77,957	80,303
Saline	5,606	5,635	5,984	6,337	6,693	7,053	7,415	7,781	8,151	8,521	8,030	7,611	8,024
Sangamon	40,148	40,303	45,908	51,870	58,188	50,198	52,929	55,473	58,127	61,036	62,917	62,617	65,429
Schuyler	1,517	1,509	1,585	1,660	1,735	1,808	1,881	1,952	2,023	2,092	2,319	2,274	2,357
Scott	1,133	1,128	1,187	1,246	1,304	1,361	1,418	1,474	1,530	1,584	1,655	1,618	1,673
Shelby	4,619	4,621	4,885	5,149	5,413	5,678	5,943	6,208	6,517	6,819	6,922	6,700	7,034
Stark	1,288	1,285	1,355	1,425	1,495	1,564	1,633	1,702	1,770	1,838	1,875	1,808	1,881
Stephenson	10,090	10,058	10,593	11,125	11,653	12,177	12,697	13,214	13,988	14,784	15,131	14,647	15,322
Tazewell	25,667	25,883	29,506	33,360	37,445	32,811	34,299	36,010	37,697	39,675	41,449	41,138	42,844
Union	3,718	3,723	3,939	4,156	4,373	4,591	4,810	5,029	5,249	5,468	5,532	5,408	5,595
Vermilion	17,037	17,003	19,311	21,764	24,360	20,692	21,521	22,454	23,274	24,043	24,484	23,816	24,842
Wabash	2,648	2,636	2,772	2,908	3,042	3,174	3,305	3,435	3,564	3,690	3,740	3,641	3,752
Warren	3,655	3,655	3,861	4,068	4,275	4,482	4,689	4,896	5,103	5,308	5,466	5,365	5,571
Washington	2,982	2,992	3,171	3,351	3,533	3,715	3,898	4,083	4,268	4,454	4,572	4,459	4,618
Wayne	3,643	3,620	3,801	3,979	4,154	4,327	4,498	4,666	4,831	4,992	5,189	5,085	5,258
White	3,332	3,304	3,461	3,614	3,765	3,912	4,056	4,197	4,335	4,468	4,559	4,459	4,616
Whiteside	12,079	12,091	12,790	13,489	14,191	14,893	15,597	16,303	17,010	17,822	17,982	17,504	18,051
Will	85,446	89,216	102,901	117,512	133,049	127,935	137,816	144,122	153,288	160,593	170,043	168,144	175,474
Williamson	12,933	12,969	13,741	14,518	15,300	16,085	16,874	17,667	18,488	19,923	20,492	20,083	20,816
Winnebago	55,070	55,215	62,852	70,972	79,576	68,446	71,509	75,285	78,937	83,391	86,565	85,581	88,837
Woodford	6,526	6,607	7,066	7,534	8,011	8,497	8,992	9,497	10,017	10,519	10,980	10,676	11,264

2005 - 2013 County Population Source: U.S. Census Bureau, 2005, 2006 - 2008, 2008 - 2010, 2010 - 2013 American Community Survey

2000 - 2009 County Households Estimates use an equal interval increase based on the following formula: U.S. Census Bureau, 2008 - 2013 American Community Survey Population for 2009 minus U.S. Census Bureau, 2000, Decennial Census Data Population for 2000 divided by 9. The 1/9 value for each county is then added to the next year to create an equal interval distribution for all missing years.

2000 - 2007 County Households Estimates use an equal interval increase based on the following formula: U.S. Census Bureau, 2008 - 2013 American Community Survey Population for 2009 minus U.S. Census Bureau, 2000, Decennial Census Data Population for 2000 divided by 9. The 1/9 value for each county is then added to the next year to create an equal interval distribution for all missing years.

2000 - 2005 County Population Estimates use an equal interval increase based on the following formula: U.S. Census Bureau, 2008 - 2013 American Community Survey Population for 2009 minus U.S. Census Bureau, 2000, Decennial Census Data Population for 2000 divided by 9. The 1/9 value for each county is then added to the next year to create an equal interval distribution for all missing years.

Household Computer Ownership Source: U.S. Census Bureau, Current Population Survey, October 1984, 1989, 1993, 1997, 2000, 2001, 2003, 2007, 2009, 2010, 2011, 2012.

Household Computer Ownership for 1992, 2005 and all television, dvd/vcr ownership data Source: Siebens, Julie (September 2013). Extended Measures of Well-Being: Living Conditions in the United States: 2011. Source: Retrieved from https://www.census.gov/prod/2013pubs/p70-136.pdf

Total number of Households 1990 US and Illinois source: US Census Bureau (2016). Census 1990. Retrieved from http://www.socialexplorer.com/tables/C1990/R11164959

In 2007 and 2009 the Current Population Survey did not ask about computer ownership. The estimates presented here for those years reflect adjustments made based on the ratio of computer ownership to Internet access in 2003 and 2010

Appendix G

Estimated number of Televisions in Illinois by county													
Counties	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Adams	26,269	26,378	26,396	26,414	26,432	26,451	28,013	26,972	26,994	27,195	26,485	26,476	26,066
Alexander	3,724	3,692	3,646	3,600	3,555	3,509	3,463	3,417	3,371	3,325	3,342	3,269	3,191
Bond	6,020	6,182	6,324	6,466	6,608	6,750	6,893	7,035	7,178	7,321	7,083	7,018	6,956
Boone	14,276	14,620	14,915	15,210	15,506	15,802	16,098	16,395	16,573	17,034	17,999	17,688	17,453
Brown	2,062	2,134	2,199	2,264	2,329	2,394	2,460	2,525	2,590	2,656	2,728	2,712	2,707
Bureau	13,870	14,006	14,095	14,184	14,273	14,362	14,451	14,540	14,579	14,412	14,145	13,863	13,940
Calhoun	2,001	2,012	2,016	2,020	2,024	2,028	2,033	2,037	2,041	2,045	2,025	2,003	1,984
Carroll	6,645	6,638	6,608	6,578	6,547	6,517	6,487	6,457	6,427	6,397	6,177	6,084	6,007
Cass	5,229	5,272	5,296	5,321	5,346	5,370	5,395	5,419	5,444	5,469	5,399	5,363	5,314
Champaign	69,044	69,978	70,675	71,372	72,070	72,769	72,860	73,969	75,440	76,748	77,792	77,578	77,899
Christian	13,615	13,683	13,704	13,726	13,747	13,769	13,790	13,811	13,605	13,683	13,922	14,108	14,089
Clark	6,818	6,832	6,823	6,814	6,805	6,796	6,787	6,777	6,768	6,759	6,545	6,465	6,404
Clay	5,711	5,708	5,686	5,664	5,642	5,620	5,598	5,575	5,553	5,531	5,509	5,451	5,416
Clinton	12,473	12,636	12,755	12,874	12,994	13,113	13,233	13,353	13,543	13,805	13,956	14,045	13,809
Coles	20,580	20,608	20,564	20,520	20,477	20,433	20,389	20,345	20,640	21,173	20,955	20,596	20,576
Cook	1,930,749	1,931,513	1,925,605	1,919,688	1,913,762	1,907,827	1,903,456	1,908,179	1,912,769	1,914,685	1,901,729	1,891,277	1,894,539
Crawford	7,669	7,716	7,735	7,755	7,775	7,795	7,814	7,834	7,854	7,874	7,858	7,805	7,745
Cumberland	4,272	4,294	4,301	4,308	4,315	4,323	4,330	4,337	4,344	4,352	4,380	4,354	4,325
DeKalb	30,977	31,675	32,267	32,860	33,453	34,047	34,499	34,946	35,913	36,662	37,696	37,125	36,750
De Witt	6,621	6,635	6,626	6,617	6,608	6,599	6,590	6,581	6,572	6,563	6,595	6,541	6,486
Douglas	7,407	7,477	7,521	7,565	7,609	7,653	7,697	7,741	7,786	7,830	7,916	7,847	7,797
DuPage	318,438	320,710	321,885	323,061	324,238	325,417	331,650	330,514	333,444	333,816	329,655	329,071	329,073
Edgar	7,701	7,708	7,689	7,670	7,650	7,631	7,612	7,592	7,573	7,554	7,427	7,336	7,250
Edwards	2,841	2,826	2,802	2,777	2,753	2,728	2,703	2,679	2,654	2,629	2,653	2,632	2,620
Effingham	12,715	12,800	12,841	12,883	12,924	12,965	13,007	13,048	13,096	13,290	13,429	13,377	13,527
Fayette	7,967	7,980	7,965	7,950	7,935	7,921	7,906	7,891	7,958	8,158	8,132	8,252	8,017
Ford	5,515	5,544	5,555	5,565	5,575	5,586	5,596	5,606	5,617	5,627	5,583	5,539	5,500
Franklin	16,047	16,075	16,048	16,021	15,993	15,966	15,938	15,911	15,796	15,588	15,811	15,831	15,838
Fulton	14,550	14,594	14,589	14,584	14,578	14,573	14,567	14,561	14,588	14,730	14,375	14,454	14,310
Gallatin	2,666	2,643	2,611	2,579	2,547	2,515	2,482	2,450	2,418	2,385	2,284	2,235	2,190
Greene	5,630	5,638	5,627	5,615	5,604	5,592	5,580	5,569	5,557	5,545	5,531	5,470	5,416
Grundy	13,979	14,373	14,719	15,066	15,414	15,761	16,109	16,458	16,824	16,810	17,895	18,203	17,744
Hamilton	3,386	3,387	3,375	3,364	3,353	3,342	3,331	3,320	3,309	3,298	3,344	3,319	3,301
Hancock	7,891	7,877	7,835	7,794	7,752	7,710	7,668	7,626	7,584	7,541	7,606	7,532	7,466
Hardin	1,943	1,934	1,917	1,900	1,884	1,867	1,851	1,834	1,817	1,801	1,741	1,713	1,690
Henderson	3,291	3,274	3,245	3,216	3,187	3,158	3,129	3,100	3,071	3,042	2,952	2,901	2,849
Henry	19,615	19,663	19,643	19,623	19,603	19,583	19,563	19,542	19,694	20,040	20,319	19,980	19,801
Iroquois	11,951	11,919	11,846	11,773	11,700	11,626	11,553	11,479	11,867	11,871	11,610	11,529	11,687
Jackson	23,682	23,815	23,866	23,917	23,968	24,020	24,071	24,122	23,843	24,012	23,042	23,070	22,795
Jasper	3,844	3,860	3,863	3,866	3,870	3,873	3,876	3,879	3,882	3,886	3,858	3,828	3,802
Jefferson	15,036	15,163	15,238	15,313	15,389	15,464	15,540	15,615	15,469	15,566	15,005	15,199	14,927
Jersey	7,918	8,026	8,106	8,187	8,267	8,348	8,429	8,510	8,650	8,605	8,398	8,604	8,593
Jo Daviess	9,015	9,195	9,345	9,494	9,644	9,794	9,944	10,094	10,006	9,852	9,562	9,362	9,370
Johnson	4,091	4,259	4,414	4,568	4,723	4,878	5,033	5,189	5,344	5,500	5,028	4,980	4,955
Kane	130,955	135,652	139,903	144,159	148,420	152,686	159,405	158,116	161,327	161,411	166,853	166,410	166,653
Kankakee	37,342	37,805	38,139	38,474	38,809	39,145	39,641	39,675	39,792	39,603	40,343	40,414	40,809
Kendall	18,384	19,940	21,433	22,928	24,426	25,925	29,496	28,383	30,482	31,595	37,004	37,383	37,832
Knox	21,571	21,600	21,555	21,510	21,465	21,419	21,374	21,329	21,426	21,463	21,580	21,306	21,225
Lake	211,538	215,497	218,729	221,965	225,205	228,449	229,851	230,288	232,124	232,360	235,960	235,279	236,188
La Salle	42,462	42,839	43,070	43,301	43,532	43,764	45,258	44,728	44,920	44,499	44,049	43,430	43,275
Lawrence	6,170	6,244	6,297	6,350	6,402	6,455	6,508	6,561	6,614	6,667	6,665	6,627	6,571
Lee	12,961	13,048	13,089	13,131	13,173	13,214	13,256	13,298	13,514	13,639	13,430	13,384	13,360
Livingston	14,058	14,165	14,224	14,283	14,342	14,402	14,461	14,520	14,409	14,301	14,144	14,085	14,107
Logan	10,869	10,887	10,868	10,848	10,829	10,810	10,791	10,771	10,478	10,848	10,915	10,769	10,162
McDonough	12,088	12,211	12,292	12,373	12,455	12,536	12,618	12,699	12,723	12,793	12,751	12,538	12,481

McHenry	87,436	90,587	98,546	106,515	114,495	102,017	105,163	104,392	106,032	106,503	107,221	106,855	107,142
McLean	55,498	56,137	60,737	65,344	69,956	57,934	60,782	60,305	61,562	62,302	62,162	62,086	62,238
Macon	45,537	45,642	49,129	52,620	56,116	45,435	46,065	45,683	45,537	45,070	44,188	43,959	44,805
Macoupin	18,829	18,951	19,007	19,064	19,120	19,177	19,233	19,290	19,449	19,403	19,037	19,083	19,313
Madison	99,710	101,021	109,089	117,167	125,256	104,898	106,142	105,742	105,613	105,964	105,058	105,282	105,227
Marion	16,253	16,285	16,261	16,237	16,213	16,188	16,164	16,140	15,895	16,275	15,868	15,720	15,480
Marshall	5,110	5,132	5,137	5,141	5,146	5,151	5,155	5,160	5,164	5,169	5,049	4,990	4,922
Mason	6,248	6,248	6,226	6,205	6,183	6,161	6,139	6,117	6,095	6,073	5,902	5,815	5,732
Massac	6,123	6,137	6,129	6,122	6,114	6,106	6,099	6,091	6,083	6,075	6,102	6,071	6,019
Menard	4,766	4,808	4,835	4,861	4,887	4,914	4,940	4,967	4,993	5,020	5,025	5,006	4,985
Mercer	6,478	6,514	6,528	6,541	6,555	6,568	6,582	6,596	6,609	6,623	6,547	6,487	6,431
Monroe	10,049	10,296	10,508	10,721	10,934	11,147	11,360	11,574	11,804	12,055	12,430	12,168	12,231
Montgomery	11,254	11,269	11,245	11,221	11,197	11,173	11,148	11,124	11,244	11,506	11,627	11,333	10,567
Morgan	13,730	13,739	13,700	13,661	13,622	13,583	13,544	13,505	13,750	13,929	13,975	13,839	13,504
Moultrie	5,286	5,357	5,409	5,462	5,514	5,567	5,620	5,673	5,726	5,779	5,824	5,809	5,813
Ogle	18,854	19,072	19,225	19,378	19,532	19,685	19,839	19,993	20,147	20,000	20,503	20,191	20,458
Peoria	71,133	71,701	77,279	82,863	88,454	72,997	72,858	73,080	73,511	73,823	74,109	74,151	74,715
Perry	8,317	8,365	8,384	8,403	8,423	8,442	8,461	8,480	8,510	8,512	8,043	7,837	7,893
Piatt	6,333	6,387	6,419	6,452	6,484	6,516	6,549	6,582	6,614	6,647	6,609	6,570	6,532
Pike	6,725	6,736	6,724	6,712	6,700	6,689	6,677	6,665	6,653	6,641	6,559	6,502	6,437
Pope	1,730	1,725	1,715	1,704	1,694	1,683	1,672	1,661	1,651	1,640	1,751	1,737	1,723
Pulaski	2,829	2,812	2,784	2,757	2,729	2,701	2,674	2,646	2,618	2,590	2,477	2,432	2,392
Putnam	2,362	2,374	2,378	2,383	2,387	2,391	2,395	2,399	2,404	2,408	2,366	2,355	2,337
Randolph	11,818	11,890	11,921	11,952	11,984	12,015	12,046	12,077	11,909	11,811	11,552	11,670	11,867
Richland	6,513	6,509	6,482	6,455	6,428	6,401	6,374	6,347	6,320	6,293	6,395	6,362	6,337
Rock Island	59,376	59,433	63,961	68,494	73,033	58,838	59,944	59,316	59,762	59,374	59,358	59,218	59,725
St. Clair	94,680	95,866	103,490	111,124	118,767	99,312	99,561	99,918	100,975	101,919	102,174	101,365	100,048
Saline	10,750	10,849	10,912	10,974	11,036	11,099	11,161	11,224	11,287	11,350	10,313	9,897	9,997
Sangamon	76,990	77,603	83,709	89,823	95,944	78,995	79,666	80,015	80,492	81,299	80,800	81,419	81,517
Schuyler	2,910	2,905	2,890	2,875	2,861	2,846	2,831	2,816	2,801	2,787	2,978	2,956	2,937
Scott	2,173	2,173	2,165	2,157	2,149	2,142	2,134	2,126	2,118	2,110	2,126	2,104	2,084
Shelby	8,857	8,897	8,907	8,916	8,926	8,935	8,945	8,955	9,024	9,083	8,890	8,711	8,763
Stark	2,469	2,475	2,471	2,468	2,465	2,461	2,458	2,455	2,451	2,448	2,408	2,351	2,343
Stephenson	19,350	19,366	19,315	19,264	19,214	19,163	19,112	19,060	19,370	19,693	19,431	19,045	19,090
Tazewell	49,220	49,837	53,801	57,769	61,742	51,634	51,625	51,941	52,202	52,846	53,230	53,491	53,379
Union	7,130	7,168	7,183	7,197	7,211	7,226	7,240	7,254	7,269	7,283	7,104	7,032	6,971
Vermilion	32,671	32,740	35,212	37,688	40,166	32,562	32,393	32,389	32,230	32,025	31,443	30,966	30,951
Wabash	5,078	5,075	5,055	5,035	5,015	4,995	4,975	4,955	4,935	4,914	4,803	4,735	4,674
Warren	7,008	7,037	7,041	7,045	7,049	7,054	7,058	7,062	7,066	7,071	7,020	6,975	6,941
Washington	5,719	5,760	5,782	5,803	5,825	5,846	5,868	5,889	5,911	5,932	5,871	5,798	5,754
Wayne	6,986	6,970	6,930	6,890	6,850	6,810	6,770	6,730	6,689	6,649	6,664	6,611	6,551
White	6,390	6,361	6,310	6,259	6,208	6,157	6,105	6,054	6,003	5,951	5,855	5,799	5,752
Whiteside	23,163	23,282	23,320	23,359	23,398	23,437	23,476	23,515	23,556	23,738	23,092	22,760	22,489
Will	163,856	171,785	187,629	203,494	219,379	201,330	207,435	207,884	212,269	213,908	218,374	218,632	218,620
Williamson	24,800	24,971	25,056	25,141	25,227	25,312	25,398	25,484	25,601	26,537	26,316	26,113	25,934
Winnebago	105,604	106,317	114,604	122,902	131,210	107,712	107,633	108,592	109,310	111,075	111,169	111,279	110,680
Woodford	12,515	12,721	12,883	13,046	13,209	13,371	13,535	13,698	13,871	14,011	14,101	13,882	14,033

2005 - 2013 County Population Source: U.S. Census Bureau, 2005, 2006 - 2008, 2008 - 2010, 2010 - 2013 American Community Survey

2000 - 2009 County Households Estimates use an equal interval increase based on the following formula: U.S. Census Bureau, 2008 - 2013 American Community Survey Population for 2009 minus U.S. Census Bureau, 2000, Decennial Census Data Population for 2000 divided by 9. The 1/9 value for each county is then added to the next year to create an equal interval distribution for all missing years.

2000 - 2007 County Households Estimates use an equal interval increase based on the following formula: U.S. Census Bureau, 2008 - 2013 American Community Survey Population for 2009 minus U.S. Census Bureau, 2000, Decennial Census Data Population for 2000 divided by 9. The 1/9 value for each county is then added to the next year to create an equal interval distribution for all missing years.

2000 - 2005 County Population Estimates use an equal interval increase based on the following formula: U.S. Census Bureau, 2008 - 2013 American Community Survey Population for 2009 minus U.S. Census Bureau, 2000, Decennial Census Data Population for 2000 divided by 9. The 1/9 value for each county is then added to the next year to create an equal interval distribution for all missing years.

Household Computer Ownership Source: U.S. Census Bureau, Current Population Survey, October 1984, 1989, 1993, 1997, 2000, 2001, 2003, 2007, 2009, 2010, 2011, 2012.

Household Computer Ownership for 1992, 2005 and all television, dvd/vcr ownership data Source: Siebens, Julie (September 2013). Extended Measures of Well-Being: Living Conditions in the United States: 2011. Source: Retrieved from https://www.census.gov/prod/2013pubs/p70-136.pdf

Total number of Households 1990 US and Illinois source: US Census Bureau (2016). Census 1990. Retrieved from http://www.socialexplorer.com/tables/C1990/R11164959

In 2007 and 2009 the Current Population Survey did not ask about computer ownership. The estimates presented here for those years reflect adjustments made based on the ratio of computer ownership to Internet access in 2003 and 2010

Appendix H

Estimated Weight of Computers in Illinois Counties in Pounds

Avg. Weight	22	22	22	22	22	22	15	15	15	15	7	7	7
Year	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Adams	590,920	590,951	590,982	591,012	591,043	591,074	426,540	410,430	410,505	413,295	188,216	188,538	185,619
Alexander	83,776	82,703	81,630	80,557	79,483	78,410	52,730	51,998	51,266	50,535	23,752	23,279	22,721
Bond	135,410	138,496	141,582	144,669	147,755	150,841	104,951	107,055	109,159	111,263	50,333	49,977	49,535
Boone	321,134	327,530	333,925	340,321	346,717	353,113	245,119	249,480	252,030	258,870	127,911	125,958	124,285
Brown	46,376	47,801	49,226	50,651	52,077	53,502	37,450	38,422	39,394	40,365	19,389	19,312	19,279
Bureau	312,004	313,789	315,574	317,359	319,145	320,930	220,033	221,250	221,700	219,030	100,520	98,721	99,267
Calhoun	45,012	45,075	45,138	45,201	45,265	45,328	30,948	30,991	31,034	31,078	14,388	14,260	14,125
Carroll	149,468	148,702	147,937	147,171	146,406	145,640	98,778	98,256	97,734	97,212	43,898	43,327	42,775
Cass	117,634	118,108	118,582	119,055	119,529	120,003	82,143	82,466	82,789	83,112	38,368	38,189	37,845
Champaign	1,553,134	1,567,733	1,582,332	1,596,932	1,611,531	1,626,130	1,109,400	1,125,570	1,147,230	1,166,385	552,839	552,440	554,722
Christian	306,262	306,545	306,828	307,111	307,393	307,676	209,972	210,165	206,895	207,945	98,938	100,464	100,331
Clark	153,362	153,062	152,761	152,461	152,161	151,861	103,337	103,132	102,927	102,722	46,512	46,038	45,606
Clay	128,458	127,883	127,308	126,732	126,157	125,582	85,232	84,840	84,447	84,055	39,152	38,814	38,564
Clinton	280,588	283,077	285,566	288,055	290,545	293,034	201,493	203,190	205,950	209,805	99,183	100,016	98,336
Coles	462,946	461,676	460,407	459,137	457,867	456,597	310,451	309,585	313,875	321,780	148,918	146,664	146,524
Cook	43,431,982	43,272,187	43,112,392	42,952,598	42,792,803	42,633,008	28,982,955	29,036,460	29,087,850	29,098,560	13,514,823	13,467,895	13,491,121
Crawford	172,524	172,855	173,187	173,518	173,849	174,181	118,986	119,211	119,437	119,663	55,843	55,580	55,155
Cumberland	96,096	96,196	96,296	96,397	96,497	96,597	65,930	65,998	66,066	66,135	31,129	31,004	30,800
DeKalb	696,828	709,628	722,427	735,227	748,026	760,826	525,300	531,765	546,135	557,175	267,890	264,369	261,702
De Witt	148,940	148,644	148,348	148,053	147,757	147,461	100,340	100,138	99,936	99,735	46,869	46,578	46,189
Douglas	166,628	167,506	168,383	169,261	170,139	171,017	117,201	117,799	118,397	118,996	56,259	55,882	55,520
DuPage	7,163,222	7,184,954	7,206,685	7,228,417	7,250,148	7,271,880	5,049,870	5,029,380	5,070,750	5,073,195	2,342,725	2,343,334	2,343,348
Edgar	173,228	172,688	172,148	171,608	171,068	170,528	115,901	115,532	115,164	114,796	52,784	52,242	51,630
Edwards	63,910	63,320	62,730	62,140	61,550	60,960	41,162	40,760	40,357	39,955	18,855	18,740	18,660
Effingham	286,022	286,764	287,505	288,247	288,989	289,731	198,049	198,555	199,155	201,975	95,438	95,256	96,327
Fayette	179,212	178,769	178,326	177,883	177,439	176,996	120,377	120,075	121,020	123,975	57,792	58,765	57,092
Ford	124,058	124,210	124,362	124,514	124,666	124,819	85,207	85,311	85,415	85,518	39,675	39,446	39,169
Franklin	360,976	360,137	359,298	358,459	357,619	356,780	242,687	242,115	240,210	236,895	112,364	112,735	112,784
Fulton	327,294	326,964	326,634	326,304	325,974	325,644	221,805	221,580	221,850	223,860	102,158	102,928	101,899
Gallatin	59,972	59,216	58,460	57,704	56,948	56,192	37,797	37,282	36,766	36,251	16,229	15,918	15,595
Greene	126,654	126,315	125,976	125,637	125,298	124,960	84,969	84,738	84,507	84,276	39,310	38,951	38,564
Grundy	314,446	321,998	329,551	337,103	344,655	352,207	245,291	250,440	255,840	255,465	127,176	129,626	126,357
Hamilton	76,164	75,869	75,574	75,278	74,983	74,688	50,722	50,521	50,320	50,118	23,763	23,635	23,510
Hancock	177,518	176,471	175,425	174,378	173,331	172,285	116,753	116,040	115,326	114,612	54,052	53,634	53,164
Hardin	43,714	43,317	42,920	42,522	42,125	41,728	28,180	27,909	27,638	27,367	12,375	12,200	12,034
Henderson	74,030	73,337	72,645	71,952	71,259	70,567	47,641	47,169	46,697	46,224	20,978	20,661	20,289
Henry	441,232	440,506	439,780	439,054	438,328	437,602	297,870	297,375	299,490	304,560	144,396	142,282	141,001
Iroquois	268,840	267,033	265,226	263,419	261,611	259,804	175,907	174,675	180,465	180,405	82,509	82,096	83,223
Jackson	532,730	533,535	534,339	535,144	535,948	536,753	366,516	367,065	362,580	364,920	163,751	164,283	162,323
Jasper	86,460	86,476	86,493	86,509	86,526	86,542	59,017	59,029	59,040	59,051	27,415	27,258	27,071
Jefferson	338,228	339,696	341,163	342,631	344,099	345,567	236,614	237,615	235,245	236,565	106,631	108,234	106,295
Jersey	178,112	179,800	181,487	183,175	184,863	186,551	128,344	129,495	131,535	130,770	59,682	61,271	61,194
Jo Daviess	202,796	206,008	209,220	212,432	215,644	218,856	151,410	153,600	152,160	149,730	67,956	66,668	66,724
Johnson	92,026	95,423	98,820	102,217	105,614	109,011	76,642	78,958	81,274	83,590	35,731	35,465	35,287
Kane	2,945,822	3,039,054	3,132,285	3,225,517	3,318,748	3,411,980	2,427,180	2,406,030	2,453,325	2,453,055	1,185,758	1,185,016	1,186,745
Kankakee	840,004	846,952	853,899	860,847	867,794	874,742	603,600	603,735	605,130	601,875	286,699	287,791	290,605
Kendall	413,556	446,710	479,864	513,018	546,172	579,326	449,115	431,895	463,545	480,165	262,976	266,210	269,402
Knox	485,232	483,915	482,598	481,281	479,965	478,648	325,453	324,555	325,830	326,190	153,363	151,718	151,144
Lake	4,758,534	4,827,830	4,897,125	4,966,421	5,035,716	5,105,012	3,499,830	3,504,255	3,529,950	3,531,300	1,676,871	1,675,436	1,681,911
La Salle	955,174	959,732	964,291	968,849	973,408	977,966	689,115	680,625	683,100	676,275	313,040	309,267	308,161
Lawrence	138,798	139,888	140,979	142,069	143,160	144,250	99,096	99,840	100,583	101,327	47,367	47,188	46,791
Lee	291,566	292,311	293,056	293,801	294,545	295,290	201,842	202,350	205,515	207,285	95,445	95,305	95,137
Livingston	316,228	317,347	318,466	319,585	320,703	321,822	220,187	220,950	219,120	217,335	100,513	100,303	100,457
Logan	244,486	243,901	243,317	242,732	242,148	241,563	164,304	163,905	159,345	164,865	77,567	76,685	72,366
McDonough	271,920	273,564	275,207	276,851	278,495	280,139	192,124	193,245	193,485	194,430	90,615	89,285	88,879

McHenry	1,966,866	2,029,434	2,206,345	2,383,256	2,560,167	2,279,706	1,601,265	1,588,515	1,612,455	1,618,590	761,978	760,921	762,965
McLean	1,248,412	1,257,652	1,359,850	1,462,048	1,564,247	1,294,612	925,500	917,655	936,180	946,845	441,763	442,120	443,198
Macon	1,024,342	1,022,534	1,099,951	1,177,369	1,254,786	1,015,300	701,415	695,145	692,490	684,960	314,027	313,033	319,060
Macoupin	423,566	424,559	425,552	426,545	427,539	428,532	292,858	293,535	295,770	294,885	135,289	135,891	137,529
Madison	2,242,966	2,263,193	2,442,393	2,621,592	2,800,792	2,344,100	1,616,175	1,609,065	1,606,080	1,610,400	746,606	749,721	749,329
Marion	365,618	364,845	364,072	363,299	362,525	361,752	246,122	245,595	241,725	247,335	112,770	111,944	110,236
Marshall	114,950	114,980	115,009	115,039	115,069	115,098	78,496	78,517	78,537	78,557	35,880	35,538	35,047
Mason	140,558	139,981	139,405	138,828	138,251	137,674	93,476	93,082	92,689	92,296	41,947	41,406	40,818
Massac	137,742	137,484	137,226	136,968	136,711	136,453	92,860	92,684	92,508	92,333	43,363	43,229	42,865
Menard	107,206	107,726	108,246	108,766	109,286	109,806	75,222	75,577	75,931	76,286	35,708	35,647	35,496
Mercer	145,728	145,939	146,149	146,360	146,571	146,782	100,222	100,366	100,509	100,653	46,529	46,192	45,796
Monroe	226,050	230,657	235,265	239,872	244,480	249,087	172,974	176,115	179,505	183,210	88,333	86,646	87,101
Montgomery	253,154	252,456	251,759	251,061	250,363	249,665	169,751	169,275	170,985	174,870	82,628	80,703	75,250
Morgan	308,858	307,793	306,727	305,662	304,596	303,531	206,226	205,500	209,100	211,680	99,316	98,546	96,166
Moultrie	118,910	120,009	121,109	122,208	123,307	124,406	85,572	86,321	87,071	87,820	41,390	41,364	41,398
Ogle	424,116	427,271	430,427	433,582	436,738	439,893	302,079	304,230	306,375	303,945	145,705	143,780	145,684
Peoria	1,600,126	1,606,343	1,730,190	1,854,037	1,977,883	1,631,212	1,109,370	1,112,040	1,117,890	1,121,925	526,666	528,031	532,049
Perry	187,088	187,399	187,710	188,021	188,333	188,644	128,833	129,045	129,420	129,360	57,155	55,811	56,210
Piatt	142,450	143,084	143,718	144,351	144,985	145,619	99,718	100,150	100,582	101,014	46,970	46,788	46,515
Pike	151,272	150,911	150,549	150,188	149,826	149,465	101,662	101,415	101,169	100,922	46,610	46,301	45,837
Pope	38,918	38,656	38,393	38,131	37,868	37,606	25,461	25,282	25,103	24,924	12,443	12,370	12,268
Pulaski	63,646	62,990	62,333	61,677	61,021	60,364	40,710	40,262	39,815	39,367	17,604	17,315	17,031
Putnam	53,130	53,190	53,250	53,310	53,370	53,431	36,471	36,512	36,553	36,594	16,817	16,769	16,644
Randolph	265,848	266,376	266,904	267,432	267,960	268,488	183,420	183,780	181,110	179,505	82,096	83,104	84,504
Richland	146,520	145,826	145,131	144,437	143,742	143,048	97,059	96,586	96,112	95,639	45,447	45,304	45,126
Rock Island	1,335,664	1,331,493	1,432,014	1,532,535	1,633,056	1,314,808	912,735	902,595	908,820	902,340	421,834	421,694	425,306
St. Clair	2,129,820	2,147,710	2,317,039	2,486,368	2,655,696	2,219,272	1,515,960	1,520,430	1,535,550	1,548,915	726,110	721,826	712,446
Saline	241,824	243,063	244,303	245,542	246,781	248,021	169,950	170,795	171,640	172,485	73,290	70,476	71,190
Sangamon	1,731,884	1,738,559	1,874,159	2,009,760	2,145,360	1,765,258	1,213,035	1,217,580	1,224,060	1,235,550	574,210	579,789	580,489
Schuyler	65,450	65,079	64,708	64,337	63,966	63,595	43,108	42,855	42,602	42,349	21,160	21,053	20,914
Scott	48,884	48,679	48,473	48,268	48,062	47,857	32,490	32,350	32,209	32,069	15,108	14,983	14,842
Shelby	199,232	199,320	199,408	199,496	199,584	199,672	136,200	136,260	137,235	138,045	63,175	62,034	62,405
Stark	55,550	55,440	55,330	55,220	55,110	55,000	37,425	37,350	37,275	37,200	17,109	16,744	16,686
Stephenson	435,270	433,859	432,448	431,037	429,625	428,214	291,002	290,040	294,570	299,280	138,089	135,618	135,940
Tazewell	1,107,194	1,116,522	1,204,546	1,292,569	1,380,593	1,153,834	786,075	790,380	793,845	803,130	378,287	380,912	380,114
Union	160,380	160,597	160,814	161,031	161,248	161,465	110,238	110,386	110,534	110,682	50,487	50,072	49,639
Vermilion	734,932	733,476	788,364	843,253	898,142	727,650	493,230	492,855	490,125	486,705	223,454	220,514	220,402
Wabash	114,224	113,704	113,184	112,663	112,143	111,623	75,752	75,397	75,042	74,688	34,131	33,715	33,285
Warren	157,652	157,646	157,641	157,635	157,629	157,624	107,467	107,463	107,459	107,455	49,886	49,672	49,427
Washington	128,656	129,052	129,449	129,845	130,242	130,638	89,342	89,612	89,883	90,153	41,722	41,289	40,974
Wayne	157,146	156,153	155,160	154,167	153,174	152,181	103,082	102,405	101,728	101,051	47,358	47,079	46,649
White	143,748	142,515	141,281	140,048	138,814	137,581	92,964	92,123	91,282	90,441	41,606	41,292	40,957
Whiteside	521,048	521,585	522,123	522,660	523,198	523,735	357,459	357,825	358,215	360,765	164,108	162,078	160,146
Will	3,685,924	3,848,539	4,200,836	4,553,133	4,905,431	4,499,000	3,158,505	3,163,335	3,228,015	3,250,875	1,551,893	1,556,891	1,556,807
Williamson	557,876	559,429	560,981	562,534	564,086	565,639	386,721	387,780	389,325	403,305	187,019	185,955	184,681
Winnebago	2,375,560	2,381,843	2,565,872	2,749,902	2,933,931	2,406,976	1,638,870	1,652,430	1,662,300	1,688,070	790,034	792,421	788,158
Woodford	281,534	284,988	288,442	291,896	295,350	298,804	206,085	208,440	210,945	212,940	100,212	98,854	99,932

Weight Estimates Source: Office of Solid Waste U.S. Environmental Protection Agency. (July, 2008). Electronics Waste Management in the United States Approach I. Retrieved from http://nepis.epa.gov/Exe/ZyPURL.cgi?Dockey=P1001FPK.txt

2005 - 2013 County Population Source: U.S. Census Bureau, 2005, 2006 - 2008, 2008 - 2010, 2010 - 2013 American Community Survey

2000 - 2009 County Households Estimates use an equal interval increase based on the following formula: U.S. Census Bureau, 2008 - 2013 American Community Survey Population for 2009 minus U.S. Census Bureau, 2000, Decennial Census Data Population for 2000 divided by 9. The 1/9 value for each county is then added to the next year to create an equal interval distribution for all missing years.

2000 - 2007 County Households Estimates use an equal interval increase based on the following formula: U.S. Census Bureau, 2008 - 2013 American Community Survey Population for 2009 minus U.S. Census Bureau, 2000, Decennial Census Data Population for 2000 divided by 9. The 1/9 value for each county is then added to the next year to create an equal interval distribution for all missing years.

2000 - 2005 County Population Estimates use an equal interval increase based on the following formula: U.S. Census Bureau, 2008 - 2013 American Community Survey Population for 2009 minus U.S. Census Bureau, 2000, Decennial Census Data Population for 2000 divided by 9. The 1/9 value for each county is then added to the next year to create an equal interval distribution for all missing years.

Appendix I

Estimated Weight of Televisions in Illinois Counties in Pounds

Avg Weight	41	41	41	41	41	41	41	41	41	41	41	41	41
Year	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Adams	1,101,260	1,101,317	1,101,375	1,101,432	1,101,490	1,101,547	1,165,876	1,121,842	1,122,047	1,129,673	1,102,408	1,104,294	1,087,197
Alexander	156,128	154,128	152,128	150,128	148,128	146,128	144,128	142,128	140,128	138,128	139,120	136,350	133,078
Bond	252,355	258,107	263,858	269,610	275,361	281,113	286,865	292,616	298,368	304,120	294,805	292,724	290,136
Boone	598,477	610,396	622,316	634,235	646,154	658,073	669,993	681,912	688,882	707,578	749,193	737,754	727,955
Brown	86,428	89,084	91,740	94,396	97,052	99,708	102,364	105,020	107,676	110,332	113,565	113,111	112,922
Bureau	581,462	584,789	588,116	591,443	594,769	598,096	601,423	604,750	605,980	598,682	588,760	578,223	581,421
Calhoun	83,886	84,004	84,121	84,239	84,357	84,475	84,592	84,710	84,828	84,945	84,272	83,525	82,735
Carroll	278,554	277,127	275,701	274,274	272,847	271,420	269,994	268,567	267,140	265,713	257,114	253,774	250,541
Cass	219,227	220,110	220,993	221,876	222,759	223,642	224,525	225,408	226,291	227,173	224,726	223,680	221,661
Champaign	2,894,477	2,921,685	2,948,892	2,976,100	3,003,307	3,030,515	3,032,360	3,076,558	3,135,762	3,188,119	3,238,057	3,235,720	3,249,086
Christian	570,761	571,288	571,815	572,342	572,870	573,397	573,924	574,451	565,513	568,383	579,494	588,432	587,653
Clark	285,811	285,251	284,692	284,132	283,573	283,013	282,453	281,894	281,334	280,775	272,428	269,649	267,121
Clay	239,399	238,327	237,255	236,183	235,111	234,039	232,967	231,895	230,823	229,751	229,320	227,337	225,876
Clinton	522,914	527,553	532,192	536,831	541,469	546,108	550,747	555,386	562,930	573,467	580,929	585,808	575,968
Coles	862,763	860,397	858,030	855,664	853,298	850,932	848,565	846,199	857,925	879,532	872,234	859,032	858,212
Cook	80,941,421	80,643,622	80,345,822	80,048,023	79,750,223	79,452,424	79,220,077	79,366,324	79,506,790	79,536,064	79,158,249	78,883,385	79,019,423
Crawford	321,522	322,140	322,757	323,375	323,992	324,610	325,227	325,845	326,462	327,080	327,078	325,540	323,051
Cumberland	179,088	179,275	179,461	179,648	179,835	180,021	180,208	180,395	180,581	180,768	182,327	181,597	180,400
DeKalb	1,298,634	1,322,488	1,346,342	1,370,195	1,394,049	1,417,903	1,435,820	1,453,491	1,492,769	1,522,945	1,569,070	1,548,447	1,532,826
De Witt	277,570	277,019	276,467	275,916	275,365	274,813	274,262	273,711	273,159	272,608	274,519	272,814	270,535
Douglas	310,534	312,170	313,805	315,441	317,077	318,713	320,348	321,984	323,620	325,256	329,515	327,311	325,190
DuPage	13,349,641	13,390,141	13,430,641	13,471,140	13,511,640	13,552,140	13,802,978	13,746,972	13,860,050	13,866,733	13,721,675	13,725,242	13,725,324
Edgar	322,834	321,828	320,821	319,815	318,808	317,802	316,795	315,789	314,782	313,776	309,163	305,991	302,404
Edwards	119,105	118,006	116,906	115,807	114,707	113,608	112,509	111,409	110,310	109,211	110,437	109,765	109,295
Effingham	533,041	534,423	535,806	537,188	538,570	539,952	541,335	542,717	544,357	552,065	558,994	557,928	564,201
Fayette	333,986	333,160	332,334	331,508	330,683	329,857	329,031	328,205	330,788	338,865	338,496	344,195	334,396
Ford	231,199	231,482	231,766	232,049	232,333	232,616	232,900	233,183	233,467	233,750	232,383	231,043	229,420
Franklin	672,728	671,164	669,600	668,036	666,473	664,909	663,345	661,781	656,574	647,513	658,132	660,305	660,592
Fulton	609,957	609,342	608,727	608,112	607,497	606,882	606,267	605,652	606,390	611,884	598,354	602,864	596,837
Gallatin	111,766	110,357	108,948	107,539	106,130	104,722	103,313	101,904	100,495	99,086	95,057	93,234	91,343
Greene	236,037	235,405	234,774	234,142	233,511	232,879	232,248	231,616	230,985	230,353	230,242	228,140	225,876
Grundy	586,013	600,088	614,162	628,237	642,312	656,387	670,461	684,536	699,296	698,271	744,888	759,238	740,091
Hamilton	141,942	141,392	140,842	140,291	139,741	139,191	138,641	138,091	137,540	136,990	139,186	138,432	137,701
Hancock	330,829	328,878	326,928	324,977	323,027	321,076	319,125	317,175	315,224	313,273	316,589	314,142	311,388
Hardin	81,467	80,727	79,986	79,246	78,506	77,765	77,025	76,285	75,544	74,804	72,483	71,455	70,484
Henderson	137,965	136,674	135,383	134,092	132,801	131,511	130,220	128,929	127,638	126,347	122,868	121,016	118,835
Henry	822,296	820,943	819,590	818,237	816,884	815,531	814,178	812,825	818,606	832,464	845,748	833,366	825,863
Iroquois	501,020	497,652	494,284	490,916	487,549	484,181	480,813	477,445	493,271	493,107	483,267	480,848	487,449
Jackson	992,815	994,314	995,814	997,313	998,813	1,000,312	1,001,812	1,003,311	991,052	997,448	959,113	962,229	950,749
Jasper	161,130	161,161	161,191	161,222	161,253	161,283	161,314	161,345	161,375	161,406	160,575	159,654	158,561
Jefferson	630,334	633,069	635,805	638,540	641,275	644,010	646,746	649,481	643,003	646,611	624,553	633,942	622,585
Jersey	331,936	335,081	338,227	341,372	344,517	347,662	350,808	353,953	359,529	357,438	349,566	358,873	358,422
Jo Daviess	377,938	383,924	389,910	395,896	401,882	407,868	413,854	419,840	415,904	409,262	398,028	390,484	390,812
Johnson	171,503	177,834	184,164	190,495	196,826	203,156	209,487	215,817	222,148	228,479	209,281	207,722	206,682
Kane	5,489,941	5,663,691	5,837,441	6,011,190	6,184,940	6,358,690	6,634,292	6,576,482	6,705,755	6,705,017	6,945,154	6,940,808	6,950,935
Kankakee	1,565,462	1,578,410	1,591,358	1,604,305	1,617,253	1,630,201	1,649,840	1,650,209	1,654,022	1,645,125	1,679,237	1,685,633	1,702,115
Kendall	770,718	832,505	894,292	956,079	1,017,866	1,079,653	1,227,581	1,180,513	1,267,023	1,312,451	1,540,288	1,559,230	1,577,926
Knox	904,296	901,842	899,388	896,934	894,479	892,025	889,571	887,117	890,602	891,586	898,269	888,634	885,272
Lake	8,868,177	8,997,319	9,126,461	9,255,602	9,384,744	9,513,886	9,566,202	9,578,297	9,648,530	9,652,220	9,821,673	9,813,268	9,851,193
La Salle	1,780,097	1,788,592	1,797,087	1,805,583	1,814,078	1,822,573	1,883,581	1,860,375	1,867,140	1,848,485	1,833,520	1,811,421	1,804,943
Lawrence	258,669	260,701	262,733	264,766	266,798	268,830	270,862	272,895	274,927	276,959	277,433	276,389	274,063
Lee	543,373	544,761	546,149	547,537	548,926	550,314	551,702	553,090	561,741	566,579	559,035	558,215	557,231
Livingston	589,334	591,419	593,504	595,589	597,675	599,760	601,845	603,930	598,928	594,049	588,719	587,489	588,391
Logan	455,633	454,544	453,454	452,365	451,275	450,186	449,096	448,007	435,543	450,631	454,321	449,155	423,858
McDonough	506,760	509,823	512,887	515,950	519,013	522,076	525,140	528,203	528,859	531,442	530,745	522,955	520,577

McHenry	3,665,523	3,782,127	4,111,825	4,441,523	4,771,221	4,248,543	4,376,791	4,341,941	4,407,377	4,424,146	4,463,014	4,456,823	4,468,795
McLean	2,326,586	2,343,806	2,534,266	2,724,727	2,915,187	2,412,686	2,529,700	2,508,257	2,558,892	2,588,043	2,587,469	2,589,560	2,595,874
Macon	1,909,001	1,905,631	2,049,909	2,194,187	2,338,465	1,892,150	1,917,201	1,900,063	1,892,806	1,872,224	1,839,301	1,833,479	1,868,780
Macoupin	789,373	791,224	793,075	794,926	796,776	798,627	800,478	802,329	808,438	806,019	792,407	795,933	805,527
Madison	4,180,073	4,217,768	4,551,732	4,885,695	5,219,658	4,368,550	4,417,545	4,398,111	4,389,952	4,401,760	4,372,978	4,391,223	4,388,927
Marion	681,379	679,938	678,497	677,056	675,616	674,175	672,734	671,293	660,715	676,049	660,510	655,672	645,668
Marshall	214,225	214,280	214,336	214,391	214,446	214,502	214,557	214,612	214,668	214,723	210,154	208,149	205,278
Mason	261,949	260,874	259,799	258,725	257,650	256,575	255,500	254,425	253,350	252,276	245,687	242,523	239,074
Massac	256,701	256,220	255,740	255,259	254,779	254,298	253,818	253,337	252,856	252,376	253,986	253,200	251,064
Menard	199,793	200,762	201,731	202,700	203,669	204,638	205,607	206,576	207,545	208,514	209,149	208,788	207,908
Mercer	271,584	271,977	272,369	272,762	273,155	273,548	273,940	274,333	274,726	275,118	272,527	270,551	268,231
Monroe	421,275	429,862	438,448	447,035	455,621	464,208	472,794	481,381	490,647	500,774	517,379	507,498	510,163
Montgomery	471,787	470,487	469,186	467,886	466,586	465,286	463,985	462,685	467,359	477,978	483,964	472,689	440,750
Morgan	575,599	573,613	571,628	569,642	567,657	565,671	563,686	561,700	571,540	578,592	581,708	577,198	563,258
Moultrie	221,605	223,654	225,702	227,751	229,799	231,848	233,897	235,945	237,994	240,042	242,427	242,277	242,472
Ogle	790,398	796,279	802,159	808,040	813,920	819,801	825,681	831,562	837,425	830,783	853,415	842,140	853,292
Peoria	2,982,053	2,993,640	3,224,445	3,455,250	3,686,055	3,039,986	3,032,278	3,039,576	3,055,566	3,066,595	3,084,758	3,092,753	3,116,287
Perry	348,664	349,244	349,824	350,404	350,983	351,563	352,143	352,723	353,748	353,584	334,765	326,893	329,230
Piatt	265,475	266,656	267,837	269,019	270,200	271,381	272,562	273,743	274,925	276,106	275,112	274,044	272,446
Pike	281,916	281,243	280,569	279,896	279,222	278,549	277,875	277,202	276,528	275,855	273,004	271,190	268,476
Pope	72,529	72,040	71,551	71,062	70,573	70,083	69,594	69,105	68,616	68,127	72,878	72,455	71,856
Pulaski	118,613	117,390	116,167	114,943	113,720	112,497	111,274	110,051	108,827	107,604	103,109	101,418	99,756
Putnam	99,015	99,127	99,239	99,351	99,463	99,575	99,687	99,799	99,911	100,023	98,499	98,220	97,485
Randolph	495,444	496,428	497,412	498,396	499,380	500,364	501,348	502,332	495,034	490,647	480,848	486,752	494,952
Richland	273,060	271,766	270,472	269,178	267,883	266,589	265,295	264,001	262,707	261,413	266,187	265,352	264,311
Rock Island	2,489,192	2,481,418	2,668,753	2,856,088	3,043,422	2,450,324	2,494,809	2,467,093	2,484,108	2,466,396	2,470,742	2,469,922	2,491,078
St. Clair	3,969,210	4,002,551	4,318,118	4,633,685	4,949,252	4,135,916	4,143,624	4,155,842	4,197,170	4,233,701	4,252,930	4,227,838	4,172,898
Saline	450,672	452,982	455,291	457,601	459,911	462,220	464,530	466,840	469,149	471,459	429,270	412,788	416,970
Sangamon	3,227,602	3,240,041	3,492,751	3,745,462	3,998,172	3,289,799	3,315,629	3,328,052	3,345,764	3,377,170	3,363,230	3,395,907	3,400,007
Schuyler	121,975	121,284	120,593	119,901	119,210	118,519	117,828	117,136	116,445	115,754	123,939	123,312	122,494
Scott	91,102	90,719	90,336	89,953	89,571	89,188	88,805	88,422	88,039	87,656	88,488	87,756	86,933
Shelby	371,296	371,460	371,624	371,788	371,952	372,116	372,280	372,444	375,109	377,323	370,025	363,342	365,515
Stark	103,525	103,320	103,115	102,910	102,705	102,500	102,295	102,090	101,885	101,680	100,211	98,072	97,730
Stephenson	811,185	808,555	805,925	803,295	800,666	798,036	795,406	792,776	805,158	818,032	808,807	794,334	796,220
Tazewell	2,063,407	2,080,791	2,244,835	2,408,879	2,572,924	2,150,327	2,148,605	2,160,372	2,169,843	2,195,222	2,215,681	2,231,056	2,226,382
Union	298,890	299,294	299,699	300,103	300,508	300,912	301,317	301,721	302,125	302,530	295,710	293,281	290,741
Vermilion	1,369,646	1,366,932	1,469,224	1,571,517	1,673,810	1,356,075	1,348,162	1,347,137	1,339,675	1,330,327	1,308,802	1,291,582	1,290,926
Wabash	212,872	211,903	210,933	209,964	208,994	208,025	207,055	206,086	205,116	204,147	199,912	197,472	194,954
Warren	293,806	293,795	293,785	293,774	293,764	293,753	293,742	293,732	293,721	293,711	292,187	290,936	289,499
Washington	239,768	240,507	241,246	241,985	242,724	243,463	244,202	244,941	245,679	246,418	244,370	241,834	239,989
Wayne	292,863	291,012	289,161	287,311	285,460	283,609	281,758	279,908	278,057	276,206	277,384	275,750	273,230
White	267,894	265,595	263,296	260,998	258,699	256,400	254,101	251,802	249,504	247,205	243,695	241,851	239,891
Whiteside	971,044	972,046	973,047	974,049	975,050	976,052	977,053	978,055	979,121	986,091	961,204	949,314	937,998
Will	6,869,222	7,172,278	7,828,831	8,485,385	9,141,939	8,384,500	8,633,247	8,646,449	8,823,241	8,885,725	9,089,659	9,118,933	9,118,441
Williamson	1,039,678	1,042,571	1,045,465	1,048,358	1,051,252	1,054,145	1,057,039	1,059,932	1,064,155	1,102,367	1,095,397	1,089,165	1,081,703
Winnebago	4,427,180	4,438,890	4,781,853	5,124,817	5,467,781	4,485,728	4,479,578	4,516,642	4,543,620	4,614,058	4,627,342	4,641,323	4,616,354
Woodford	524,677	531,114	537,551	543,988	550,425	556,862	563,299	569,736	576,583	582,036	586,956	579,002	585,316

Weight Estimates Source: Office of Solid Waste U.S. Environmental Protection Agency. (July, 2008). Electronics Waste Management in the United States Approach I. Retrieved from http://nepis.epa.gov/Exe/ZyPURL.cgi?Dockey=P1001FPK.txt

2005 - 2013 County Population Source: U.S. Census Bureau, 2005, 2006 - 2008, 2008 - 2010, 2010 - 2013 American Community Survey

2000 - 2009 County Households Estimates use an equal interval increase based on the following formula: U.S. Census Bureau, 2008 - 2013 American Community Survey Population for 2009 minus U.S. Census Bureau, 2000, Decennial Census Data Population for 2000 divided by 9. The 1/9 value for each county is then added to the next year to create an equal interval distribution for all missing years.

2000 - 2007 County Households Estimates use an equal interval increase based on the following formula: U.S. Census Bureau, 2008 - 2013 American Community Survey Population for 2009 minus U.S. Census Bureau, 2000, Decennial Census Data Population for 2000 divided by 9. The 1/9 value for each county is then added to the next year to create an equal interval distribution for all missing years.

2000 - 2005 County Population Estimates use an equal interval increase based on the following formula: U.S. Census Bureau, 2008 - 2013 American Community Survey Population for 2009 minus U.S. Census Bureau, 2000, Decennial Census Data Population for 2000 divided by 9. The 1/9 value for each county is then added to the next year to create an equal interval distribution for all missing years.

Appendix J

Estimated Weight of Computers Emerging for End of Life Management in Illinois Counties (in Pounds)

Device Purchased Year	2005	2007	2009	2010	2011
Average Years before EOL	8.75	8.75	8.75	8.75	8.75
Year Device Needs EOL	**2013**	**2015**	**2017**	**2018**	**2019**
Adams	591,074	410,430	413,295	188,216	188,538
Alexander	78,410	51,998	50,535	23,752	23,279
Bond	150,841	107,055	111,263	50,333	49,977
Boone	353,113	249,480	258,870	127,911	125,958
Brown	53,502	38,422	40,365	19,389	19,312
Bureau	320,930	221,250	219,030	100,520	98,721
Calhoun	45,328	30,991	31,078	14,388	14,260
Carroll	145,640	98,256	97,212	43,898	43,327
Cass	120,003	82,466	83,112	38,368	38,189
Champaign	1,626,130	1,125,570	1,166,385	552,839	552,440
Christian	307,676	210,165	207,945	98,938	100,464
Clark	151,861	103,132	102,722	46,512	46,038
Clay	125,582	84,840	84,055	39,152	38,814
Clinton	293,034	203,190	209,805	99,183	100,016
Coles	456,597	309,585	321,780	148,918	146,664
Cook	42,633,008	29,036,460	29,098,560	13,514,823	13,467,895
Crawford	174,181	119,211	119,663	55,843	55,580
Cumberland	96,597	65,998	66,135	31,129	31,004
De Witt	147,461	100,138	99,735	46,869	46,578
DeKalb	760,826	531,765	557,175	267,890	264,369
Douglas	171,017	117,799	118,996	56,259	55,882
DuPage	7,271,880	5,029,380	5,073,195	2,342,725	2,343,334
Edgar	170,528	115,532	114,796	52,784	52,242
Edwards	60,960	40,760	39,955	18,855	18,740
Effingham	289,731	198,555	201,975	95,438	95,256
Fayette	176,996	120,075	123,975	57,792	58,765
Ford	124,819	85,311	85,518	39,675	39,446
Franklin	356,780	242,115	236,895	112,364	112,735
Fulton	325,644	221,580	223,860	102,158	102,928
Gallatin	56,192	37,282	36,251	16,229	15,918
Greene	124,960	84,738	84,276	39,310	38,951
Grundy	352,207	250,440	255,465	127,176	129,626
Hamilton	74,688	50,521	50,118	23,763	23,635
Hancock	172,285	116,040	114,612	54,052	53,634
Hardin	41,728	27,909	27,367	12,375	12,200
Henderson	70,567	47,169	46,224	20,978	20,661
Henry	437,602	297,375	304,560	144,396	142,282
Iroquois	259,804	174,675	180,405	82,509	82,096
Jackson	536,753	367,065	364,920	163,751	164,283
Jasper	86,542	59,029	59,051	27,415	27,258
Jefferson	345,567	237,615	236,565	106,631	108,234
Jersey	186,551	129,495	130,770	59,682	61,271
Jo Daviess	218,856	153,600	149,730	67,956	66,668
Johnson	109,011	78,958	83,590	35,731	35,465
Kane	3,411,980	2,406,030	2,453,055	1,185,758	1,185,016
Kankakee	874,742	603,735	601,875	286,699	287,791
Kendall	579,326	431,895	480,165	262,976	266,210
Knox	478,648	324,555	326,190	153,363	151,718
La Salle	977,966	680,625	676,275	313,040	309,267
Lake	5,105,012	3,504,255	3,531,300	1,676,871	1,675,436
Lawrence	144,250	99,840	101,327	47,367	47,188
Lee	295,290	202,350	207,285	95,445	95,305
Livingston	321,822	220,950	217,335	100,513	100,303
Logan	241,563	163,905	164,865	77,567	76,685
Macon	1,015,300	695,145	684,960	314,027	313,033
Macoupin	428,532	293,535	294,885	135,289	135,891
Madison	2,344,100	1,609,065	1,610,400	746,606	749,721

Appendix K

Estimated Weight of Televisions Emerging for End of Life Management in Illinois Counties (in Pounds)

Device Purchased Year	2005	2007	2009	2010	2011
Average Years before EOL	11.65	11.65	11.65	11.65	11.65
Year Device Needs EOL	**2017**	**2019**	**2021**	**2022**	**2023**
Adams	1,165,876	1,122,047	1,102,408	1,104,294	1,087,197
Alexander	146,128	142,128	138,128	139,120	136,350
Bond	281,113	292,616	304,120	294,805	292,724
Boone	658,073	681,912	707,578	749,193	737,754
Brown	99,708	105,020	110,332	113,565	113,111
Bureau	598,096	604,750	598,682	588,760	578,223
Calhoun	84,475	84,710	84,945	84,272	83,525
Carroll	271,420	268,567	265,713	257,114	253,774
Cass	223,642	225,408	227,173	224,726	223,680
Champaign	3,030,515	3,076,558	3,188,119	3,238,057	3,235,720
Christian	573,397	574,451	568,383	579,494	588,432
Clark	283,013	281,894	280,775	272,428	269,649
Clay	234,039	231,895	229,751	229,320	227,337
Clinton	546,108	555,386	573,467	580,929	585,808
Coles	850,932	846,199	879,532	872,234	859,032
Cook	79,452,424	79,366,324	79,536,064	79,158,249	78,883,385
Crawford	324,610	325,845	327,080	327,078	325,540
Cumberland	180,021	180,395	180,768	182,327	181,597
De Witt	274,813	273,711	272,608	274,519	272,814
DeKalb	1,417,903	1,453,491	1,522,945	1,569,070	1,548,447
Douglas	318,713	321,984	325,256	329,515	327,311
DuPage	13,552,140	13,746,972	13,866,733	13,721,675	13,725,242
Edgar	317,802	315,789	313,776	309,163	305,991
Edwards	113,608	111,409	109,211	110,437	109,765
Effingham	539,952	542,717	552,065	558,994	557,928
Fayette	329,857	328,205	338,865	338,496	344,195
Ford	232,616	233,183	233,750	232,383	231,043
Franklin	664,909	661,781	647,513	658,132	660,305
Fulton	606,882	605,652	611,884	598,354	602,864
Gallatin	104,722	101,904	99,086	95,057	93,234
Greene	232,879	231,616	230,353	230,242	228,140
Grundy	656,387	684,536	698,271	744,888	759,238
Hamilton	139,191	138,091	136,990	139,186	138,432
Hancock	321,076	317,175	313,273	316,589	314,142
Hardin	77,765	76,285	74,804	72,483	71,455
Henderson	131,511	128,929	126,347	122,868	121,016
Henry	815,531	812,825	832,464	845,748	833,366
Iroquois	484,181	477,445	493,107	483,267	480,848
Jackson	1,000,312	1,003,311	997,448	959,113	962,229
Jasper	161,283	161,345	161,406	160,575	159,654
Jefferson	644,010	649,481	646,611	624,553	633,942
Jersey	347,662	353,953	357,438	349,566	358,873
Jo Daviess	407,868	419,840	409,262	398,028	390,484
Johnson	203,156	215,817	228,479	209,281	207,722
Kane	6,358,690	6,576,482	6,705,017	6,945,154	6,940,808
Kankakee	1,630,201	1,650,209	1,645,125	1,679,237	1,685,633
Kendall	1,079,653	1,180,513	1,312,451	1,540,288	1,559,230
Knox	892,025	887,117	891,586	898,269	888,634
La Salle	1,822,573	1,860,375	1,848,485	1,833,520	1,811,421
Lake	9,513,886	9,578,297	9,652,220	9,821,673	9,813,268
Lawrence	268,830	272,895	276,959	277,433	276,389
Lee	550,314	553,090	566,579	559,035	558,215
Livingston	599,760	603,930	594,049	588,719	587,489
Logan	450,186	448,007	450,631	454,321	449,155
Macon	1,892,150	1,900,063	1,872,224	1,839,301	1,833,479
Macoupin	798,627	802,329	806,019	792,407	795,933
Madison	4,368,550	4,398,111	4,401,760	4,372,978	4,391,223

Appendix J

Marion	361,752	245,595	247,335	112,770	111,944
Marshall	115,098	78,517	78,557	35,880	35,538
Mason	137,674	93,082	92,296	41,947	41,406
Massac	136,453	92,684	92,333	43,363	43,229
McDonough	280,139	193,245	194,430	90,615	89,285
McHenry	2,279,706	1,588,515	1,618,590	761,978	760,921
McLean	1,294,612	917,655	946,845	441,763	442,120
Menard	109,806	75,577	76,286	35,708	35,647
Mercer	146,782	100,366	100,653	46,529	46,192
Monroe	249,087	176,115	183,210	88,333	86,646
Montgomery	249,665	169,275	174,870	82,628	80,703
Morgan	303,531	205,500	211,680	99,316	98,546
Moultrie	124,406	86,321	87,820	41,390	41,364
Ogle	439,893	304,230	303,945	145,705	143,780
Peoria	1,631,212	1,112,040	1,121,925	526,666	528,031
Perry	188,644	129,045	129,360	57,155	55,811
Piatt	145,619	100,150	101,014	46,970	46,788
Pike	149,465	101,415	100,922	46,610	46,301
Pope	37,606	25,282	24,924	12,443	12,370
Pulaski	60,364	40,262	39,367	17,604	17,315
Putnam	53,431	36,512	36,594	16,817	16,769
Randolph	268,488	183,780	179,505	82,096	83,104
Richland	143,048	96,586	95,639	45,447	45,304
Rock Island	1,314,808	902,595	902,340	421,834	421,694
Saline	248,021	170,795	172,485	73,290	70,476
Sangamon	1,765,258	1,217,580	1,235,550	574,210	579,789
Schuyler	63,595	42,855	42,349	21,160	21,053
Scott	47,857	32,350	32,069	15,108	14,983
Shelby	199,672	136,260	138,045	63,175	62,034
St. Clair	2,219,272	1,520,430	1,548,915	726,110	721,826
Stark	55,000	37,350	37,200	17,109	16,744
Stephenson	428,214	290,040	299,280	138,089	135,618
Tazewell	1,153,834	790,380	803,130	378,287	380,912
Union	161,465	110,386	110,682	50,487	50,072
Vermilion	727,650	492,855	486,705	223,454	220,514
Wabash	111,623	75,397	74,688	34,131	33,715
Warren	157,624	107,463	107,455	49,886	49,672
Washington	130,638	89,612	90,153	41,722	41,289
Wayne	152,181	102,405	101,051	47,358	47,079
White	137,581	92,123	90,441	41,606	41,292
Whiteside	523,735	357,825	360,765	164,108	162,078
Will	4,499,000	3,163,335	3,250,875	1,551,893	1,556,891
Williamson	565,639	387,780	403,305	187,019	185,955
Winnebago	2,406,976	1,652,430	1,688,070	790,034	792,421
Woodford	298,804	208,440	212,940	100,212	98,854

Weight Estimates Source: Office of Solid Waste U.S. Environmental Protection Agency. (July, 2008). Electronics Waste Management in the United States Approach I. Retrieved from http://nepis.epa.gov/Exe/ZyPURL.cgi?Dockey=P1001FPK.txt

2005 - 2013 County Population Source: U.S. Census Bureau, 2005, 2006 - 2008, 2008 - 2010, 2010 - 2013 American Community Survey

2000 - 2009 County Households Estimates use an equal interval increase based on the following formula: U.S. Census Bureau, 2008 - 2013 American Community Survey Population for 2009 minus U.S. Census Bureau, 2000, Decennial Census Data Population for 2000 divided by 9. The 1/9 value for each county is then added to the next year to create an equal interval distribution for all missing years.

Census Bureau, 2008 - 2013 American Community Survey Population for 2009 minus U.S. Census Bureau, 2000, Decennial Census Data Population for 2000 divided by 9. The 1/9 value for each county is then added to the next year to create an equal interval distribution for all missing years.

2000 - 2005 County Population Estimates use an equal interval increase based on the following formula: U.S. Census Bureau, 2008 - 2013 American Community Survey Population for 2009 minus U.S. Census Bureau, 2000, Decennial Census Data Population for 2000 divided by 9. The 1/9 value for each county is then added to the next year to create an equal interval distribution for all missing years.

Appendix K

Marion	674,175	671,293	676,049	660,510	655,672
Marshall	214,502	214,612	214,723	210,154	208,149
Mason	256,575	254,425	252,276	245,687	242,523
Massac	254,298	253,337	252,376	253,986	253,200
McDonough	522,076	528,203	531,442	530,745	522,955
McHenry	4,248,543	4,341,941	4,424,146	4,463,014	4,456,823
McLean	2,412,686	2,508,257	2,588,043	2,587,469	2,589,560
Menard	204,638	206,576	208,514	209,149	208,788
Mercer	273,548	274,333	275,118	272,527	270,551
Monroe	464,208	481,381	500,774	517,379	507,498
Montgomery	465,286	462,685	477,978	483,964	472,689
Morgan	565,671	561,700	578,592	581,708	577,198
Moultrie	231,848	235,945	240,042	242,427	242,277
Ogle	819,801	831,562	830,783	853,415	842,140
Peoria	3,039,986	3,039,576	3,066,595	3,084,758	3,092,753
Perry	351,563	352,723	353,584	334,765	326,893
Piatt	271,381	273,743	276,106	275,112	274,044
Pike	278,549	277,202	275,855	273,004	271,190
Pope	70,083	69,105	68,127	72,878	72,455
Pulaski	112,497	110,051	107,604	103,109	101,418
Putnam	99,575	99,799	100,023	98,499	98,220
Randolph	500,364	502,332	490,647	480,848	486,752
Richland	266,589	264,001	261,413	266,187	265,352
Rock Island	2,450,324	2,467,093	2,466,396	2,470,742	2,469,922
Saline	462,220	466,840	471,459	429,270	412,788
Sangamon	3,289,799	3,328,052	3,377,170	3,363,230	3,395,907
Schuyler	118,519	117,136	115,754	123,939	123,312
Scott	89,188	88,422	87,656	88,488	87,756
Shelby	372,116	372,444	377,323	370,025	363,342
St. Clair	4,135,916	4,155,842	4,233,701	4,252,930	4,227,838
Stark	102,500	102,090	101,680	100,211	98,072
Stephenson	798,036	792,776	818,032	808,807	794,334
Tazewell	2,150,327	2,160,372	2,195,222	2,215,681	2,231,056
Union	300,912	301,721	302,530	295,710	293,281
Vermilion	1,356,075	1,347,137	1,330,327	1,308,802	1,291,582
Wabash	208,025	206,086	204,147	199,912	197,472
Warren	293,753	293,732	293,711	292,187	290,936
Washington	243,463	244,941	246,418	244,370	241,834
Wayne	283,609	279,908	276,206	277,384	275,750
White	256,400	251,802	247,205	243,695	241,851
Whiteside	976,052	978,055	986,091	961,204	949,314
Will	8,384,500	8,646,449	8,885,725	9,089,659	9,118,933
Williamson	1,054,145	1,059,932	1,102,367	1,095,397	1,089,165
Winnebago	4,485,728	4,516,642	4,614,058	4,627,342	4,641,323
Woodford	556,862	569,736	582,036	586,956	579,002

Weight Estimates Source: Office of Solid Waste U.S. Environmental Protection Agency. (July, 2008). Electronics Waste Management in the United States Approach I. Retrieved from http://nepis.epa.gov/Exe/ZyPURL.cgi?Dockey=P1001FPK.txt

2005 - 2013 County Population Source: U.S. Census Bureau, 2005, 2006 - 2008, 2008 - 2010, 2010 - 2013 American Community Survey

2000 - 2009 County Households Estimates use an equal interval increase based on the following formula: U.S. Census Bureau, 2008 - 2013 American Community Survey Population for 2009 minus U.S. Census Bureau, 2000, Decennial Census Data Population for 2000 divided by 9. The 1/9 value for each county is then added to the next year to create an equal interval distribution for all missing years.

Census Bureau, 2008 - 2013 American Community Survey Population for 2009 minus U.S. Census Bureau, 2000, Decennial Census Data Population for 2000 divided by 9. The 1/9 value for each county is then added to the next year to create an equal interval distribution for all missing years.

2000 - 2005 County Population Estimates use an equal interval increase based on the following formula: U.S. Census Bureau, 2008 - 2013 American Community Survey Population for 2009 minus U.S. Census Bureau, 2000, Decennial Census Data Population for 2000 divided by 9. The 1/9 value for each county is then added to the next year to create an equal interval distribution for all missing years.

Appendix L

Locations of Recyclers and Collectors in Illinois					
Company Name			Address	City	State
Village of Addison	Collector		1 Friendship Plaza	Addison	IL
Association for Individual Development	Collector		309 West New Indian Trail Court	Aurora	IL
Buesse & Sons Inc. dba Cartridge World	Collector		821 North Randall Road	Batavia	IL
HOBI International, Inc.	Collector	Recycler	1202 Nagel Blvd.	Batavia	IL
Component Level Recycling	Collector	Recycler	915 South Charles Street	Belleville	IL
J&C E-Recycling	Collector	Recycler	621 Atlanta Drive	Belleville	IL
RNA Worldwide LLC	Collector	Recycler	5921 Gateway Industrial Drive	Belleville	IL
St. Clair Associated Vocational Enterprises, Inc.	Collector		3001 Save Road	Belleville	IL
AE Computers, Ltd.	Collector		6221 W. Roosevelt Road	Berwyn	IL
Recom Inc.	Collector	Recycler	351 Remington Blvd	Bolingbrook	IL
Belmont Trading Company	Collector		900 Corporate Grove Drive	Buffalo Grove	IL
Electronics Recycling Services International (ERS Chicago)		Recycler	1500 Busch Parkway	Buffalo Grove	IL
Genesis Electronic Recycling	Collector		151 Hastings Drive	Buffalo Grove	IL
Eagle Recycling Services	Collector		26099 Wiedle Road	Carlyle	IL
Com2 Computer and Technologies	Collector	Recycler	140 E. Fullerton Avenue	Carol Stream	IL
Centralia Recycling Center	Collector		1758 West McCord Street	Centralia	IL
Adelman's Resource Solutions	Collector		3051 E. 106th Street	Chicago	IL
Alpha Metals Corp		Recycler	341 North California Avenue	Chicago	IL
City of Chicago	Collector		1150 North North Branch	Chicago	IL
Sims Metal Management	Collector		2500 S. Paulina Street	Chicago	IL
Sipi Metals Corporation		Recycler	1720 N. Elston Ave.	Chicago	IL
USMe LLC	Collector	Recycler	2500 West Fulton	Chicago	IL
Intercon Solutions, Inc.	Collector	Recycler	1001 Washington Avenue	Chicago Heights	IL
SouthSTAR Services dba EcoSafe Processors		Recycler	1005 West End Avenue	Chicago Heights	IL
Power Recycling, Inc.	Collector	Recycler	9200 Collinsville Road	Collinsville	IL
Computer Recycling Center, LLC	Collector		7510 Virginia Rd.	Crystal Lake	IL
Echelon Computers Inc.		Recycler	7510 Virginia Road	Crystal Lake	IL
Bryant Industries, Inc.	Collector		1404 Warrington Avenue	Danville	IL
Mervis Industries	Collector		3295 East Main	Danville	IL
Salvation Army	Collector		10 West Algonquin Road	Des Plaines	IL
Kreider Services (Secure Recycling Services)	Collector	Recycler	629 Palmyra Av	Dixon	IL
T&T Iron & Metals Inc.	Collector	Recycler	5158 Barge Terminal Road	East Dubuque	IL
CJD E-Cycling	Collector	Recycler	5257 North State Route 157	Edwardsville	IL
Chicago Logistic Service Incorporated	Collector		501 Davis Road	Elgin	IL
Credential Wholesalers Inc.	Collector		1280 St. Charles Street	Elgin	IL
MRK Group, Ltd.	Collector		801 N. State St.	Elgin	IL
eWorks ESI Midwest	Collector	Recycler	1201 Estes	Elk Grove Village	IL
Groot Industries, Inc.	Collector		2500 Landmeier Road	Elk Grove Village	IL
Secure Processors, LLC	Collector	Recycler	#1 Commercial Drive	Flora	IL
Village of Flossmoor	Collector		2800 Flossmoor Road	Flossmoor	IL
Moring Disposal Inc.	Collector		306 E. Main Street	Forreston	IL
Vanguard Archives LLC	Collector		3431 Powell Street	Franklin Park	IL
Elgin Recycling Inc.	Collector	Recycler	46 East End Drive	Gilberts	IL
Kline Recycling and Asset Management	Collector	Recycler	410 East Crescent Street	Gilman	IL

AVA Electronics Computer Recycling	Collector	Recycler	2000 Bloomingdale Road	Glendale Heights	IL
Totall Metal Recycling	Collector	Recycler	3101 Missouri Avenue	Granite City	IL
Solid Waste Agency of Lake County	Collector		1311 N. Estes St.	Gurnee	IL
Greenpath Recycling (Pathway Services Unlimited, Inc)	Collector	Recycler	1905 West Morton Avenue	Jacksonville	IL
McHenry Township Road District	Collector		3703 Richmond Rd.	Johnsburg	IL
All American Recycling, LLC		Recycler	2285 New Lenox Road	Joliet	IL
A-Team Recyclers, LLC	Collector	Recycler	359 Airport Drive	Joliet	IL
Recycle-It Of Chicago	Collector		1220 Cambria Drive	Joliet	IL
River Valley Recycling, LLC	Collector	Recycler	288 W. South Tec Drive	Kankakee	IL
Supply-Chain Services	Collector	Recycler	250 W. North Ave.	Lombard	IL
Keep Northern Illinois Beautiful, Inc.	Collector		5417 North Second St.	Loves Park	IL
TriCounty Regional Collection Facility	Collector		223 South Randolph St	Macomb	IL
Interco Trading Company	Collector	Recycler	10 Fox Industrial Dr.	Madison	IL
American Recycling & Disposal Inc.	Collector		2100 W. Madison Street	Maywood	IL
KAS Recycling, Inc.	Collector	Recycler	649 W. Lincolnway	Morrison	IL
Jackson County Health Dept.	Collector		415 Health Department Road	Murphysboro	IL
Midwest Fiber	Collector	Recycler	422 South White Oak Road	Normal	IL
Ogle County Solid Waste Management Department	Collector		909 W. Pines Road	Oregon	IL
New Life Electronics Recycling, Inc.	Collector	Recycler	150 Kendall Point Drive	Oswego	IL
Goodwill Industries of Central Illinois	Collector		2319 E. War Memorial Drive	Peoria	IL
M&M Recycling/International Depot Services	Collector	Recycler	204 Morton St.	Peoria	IL
AP1H Electronic Recycling	Collector		12006 Spalding School Drive	Plainfield	IL
Kuusakoski US	Collector	Recycler	13543 South Route 30	Plainfield	IL
B&K Technology Solutions dba Advanced Technology Recycling	Collector	Recycler	601 E. Prairie Street	Pontiac	IL
Quincy Recycle	Collector		535 Main	Quincy	IL
City of Rochelle	Collector		888 Treatment Plan	Rochelle	IL
Behr Iron and Metals	Collector	Recycler	1100 Seminary St.	Rockford	IL
Goodwill Industries of Northern Illinois	Collector		615 N. Longwood Street	Rockford	IL
Vintage Tech Recyclers	Collector	Recycler	1105 Windham Parkway	Romeoville	IL
West Central Cleaners	Collector		427 West Adams Street	Rushville	IL
EverLights Inc.	Collector		8027 Lawndale	Skokie	IL
Shore Community Service		Recycler	8350 Laramie	Skokie	IL
BLH Computers	Collector	Recycler	1832 Stevenson Dr.	Springfield	IL
Computer Banc	Collector	Recycler	1617 Groth Street	Springfield	IL
Land of Lincoln Goodwill Industries, Inc.	Collector		1220 Outer Park Drive	Springfield	IL
Cimco Recycling	Collector	Recycler	13509 Galt Road	Sterling	IL
3S International, LLC	Collector	Recycler	8450 West 185th Street	Tinley Park	IL
Mack's Twin City Recycling	Collector		2808 N. Lincoln Ave.	Urbana	IL
Wissehr Recycling	Collector		3456 Loehr Road	Waterloo	IL
ARCOA (Asset Recycling Company of America)	Collector	Recycler	345 Lakewood Avenue	Waukegan	IL
Sims Recycling Solutions	Collector	Recycler	1600 Harvester Lane	West Chicago	IL
Xtreme Environmental Solutions	Collector		1 N 048 Ridgeland Avenue	West Chicago	IL
Solid Waste Agency of Northern Cook County (SWANCC)	Collector		77 West Hintz Road	Wheeling	IL
Source: http://epadata.epa.state.il.us/land/eWaste/crr-list.asp					