

# Massachusetts Electronics Recycling Program



- Massachusetts Recycling Infrastructure 1990-1999
- Massachusetts plan for electronics
- The cost of doing nothing

## Recycling Infrastructure: DEP's Work since 1990

- Access to residential recycling increased from 10% of to 90% by 1998
- Participation in the bottle bill captures 85% of the 1.6 billion beer and soft drink containers sold in Massachusetts
- Demand for recycled products increased 500% since 1990
- Costs of operating the state's 225TPD MRF fell from \$1.6M per year to \$0, through long-term contracts
- Assignment: *create convenient access, high participation, state demand, and low cost infrastructure for electronics*

To ensure an infrastructure for curbside recycling, DEP built and contracted operation of the Springfield MRF in 1990.

Construction: \$6M

Capacity: 50,000 TPY

1990-95 operating cost: \$1.6M/Year

1995-2005 operating cost: \$0/Year



*If the state guarantees a market, municipalities can handle collection costs*

## Review of the Waste Electronics Problem:

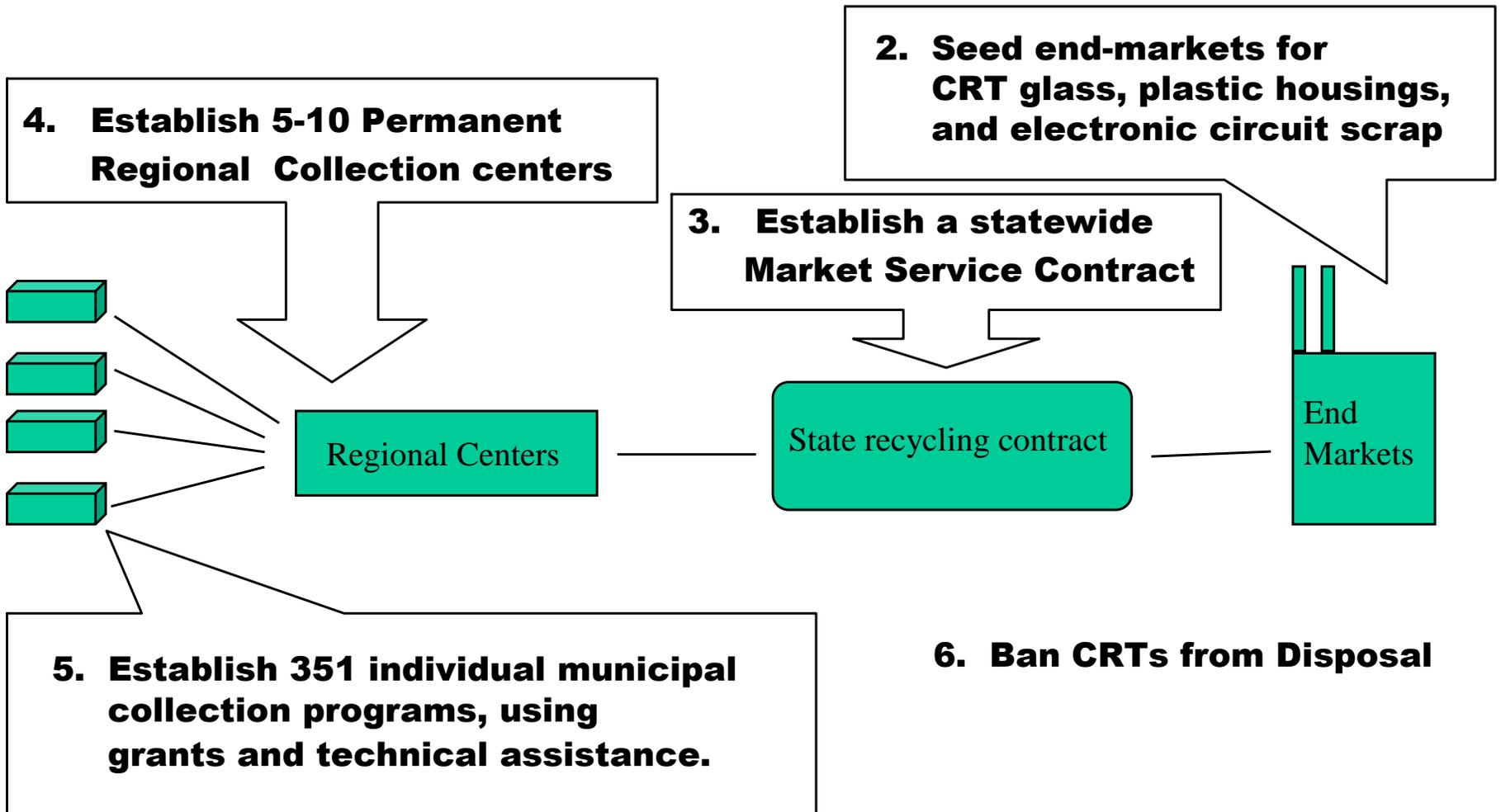
- **Massachusetts has a 46% recycling goal.** About 25,000 tons of obsolete electronics are repaired or recycled each year. Roughly the same amount is discarded in landfills and incinerators. But the largest destination is storage in attics, basements and garages.
- **Digital and HDTV may create a landslide in the year 2005.** As digital systems replace TVs, VCRs, and other analogue machines, *basements will begin to empty.* 300,000 tons may be discarded in one year.
- **A Cathode Ray Tube (CRT) may contain 4-8 lbs. of lead.** While intact, CRTs are safe to handle. However, once incinerated, the lead from CRTs concentrates in the ash, making disposal more toxic and more expensive.

# The Massachusetts Electronics Strategy

1. Exempt intact CRTs as hazardous waste
2. Develop CRT recycling markets
3. Establish a statewide Market Service Contract for municipalities.
4. Establish a grant program providing free electronics recycling for municipalities, through the state vendor or 7 intermediaries
5. Ban CRTs from solid waste disposal facilities: June 1999

# Massachusetts Cathode Ray Tube Strategy

## 1. Exempt intact CRTs from expensive hazardous waste requirements



## 1. Exempt intact CRTs as hazardous waste

*Massachusetts has demonstrated that the effect of a waste ban (covering both residential and commercial material) surpasses the equivalency tests for RCRA. Even if intact CRTs are hazardous, they are repairable so long as they are intact. A repairable, durable commodity need not be transported as a HW.*

40,000 commercial CRT generators  
(businesses, factories, sports bars,  
ATMs, schools, etc.)

*RCRA enforcement would require thousands of manifests of non-volatile, intact CRTs*

1,500 TV and computer repairers, donation centers,  
parts and materials scrap recyclers

*Universal waste rule would require registration requirements of hundreds of mom and pop repair shops*

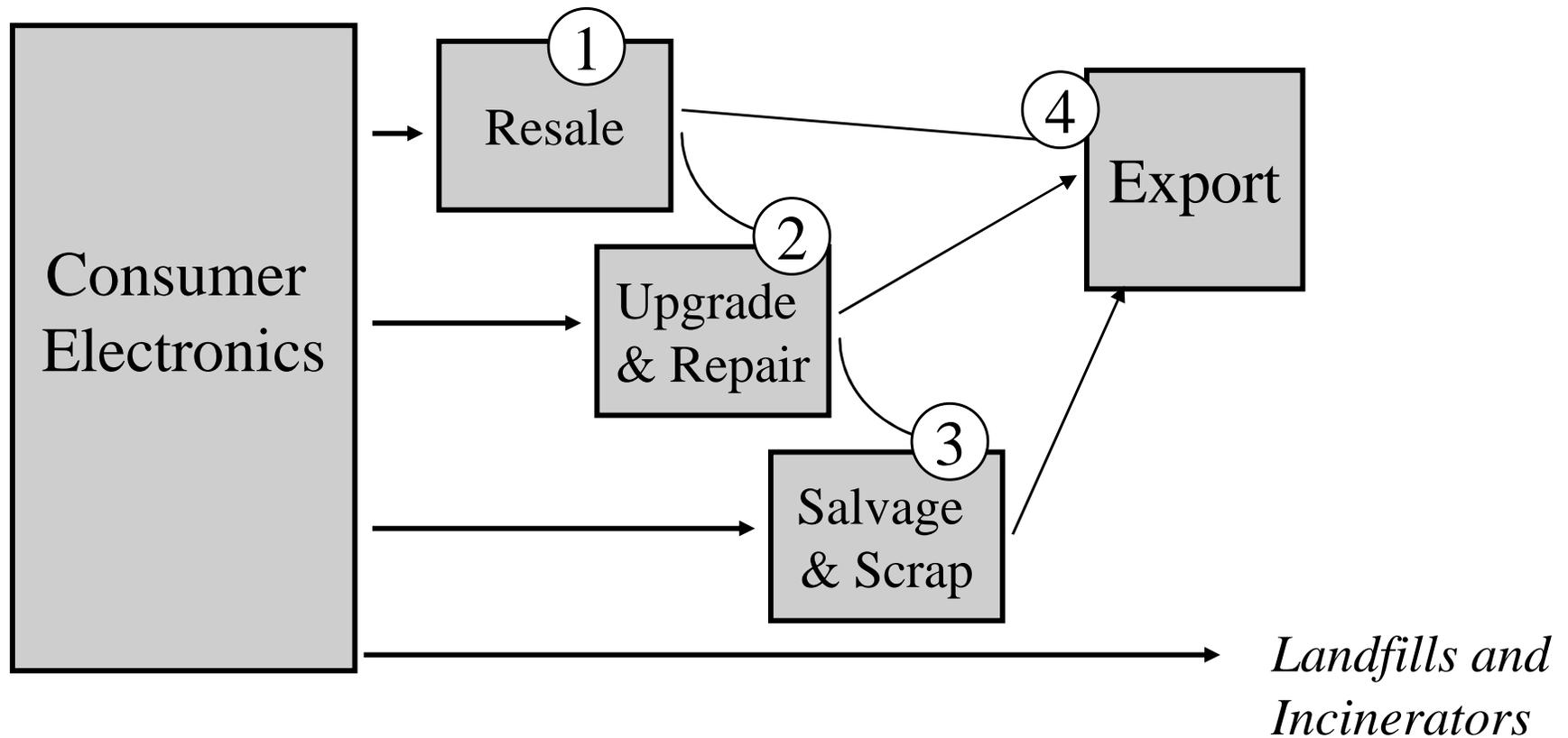
85 Solid Waste transfer and disposal facilities

2,200,000 residences

*A waste ban is the most efficient point of inspection, capturing both residential and commercial material*

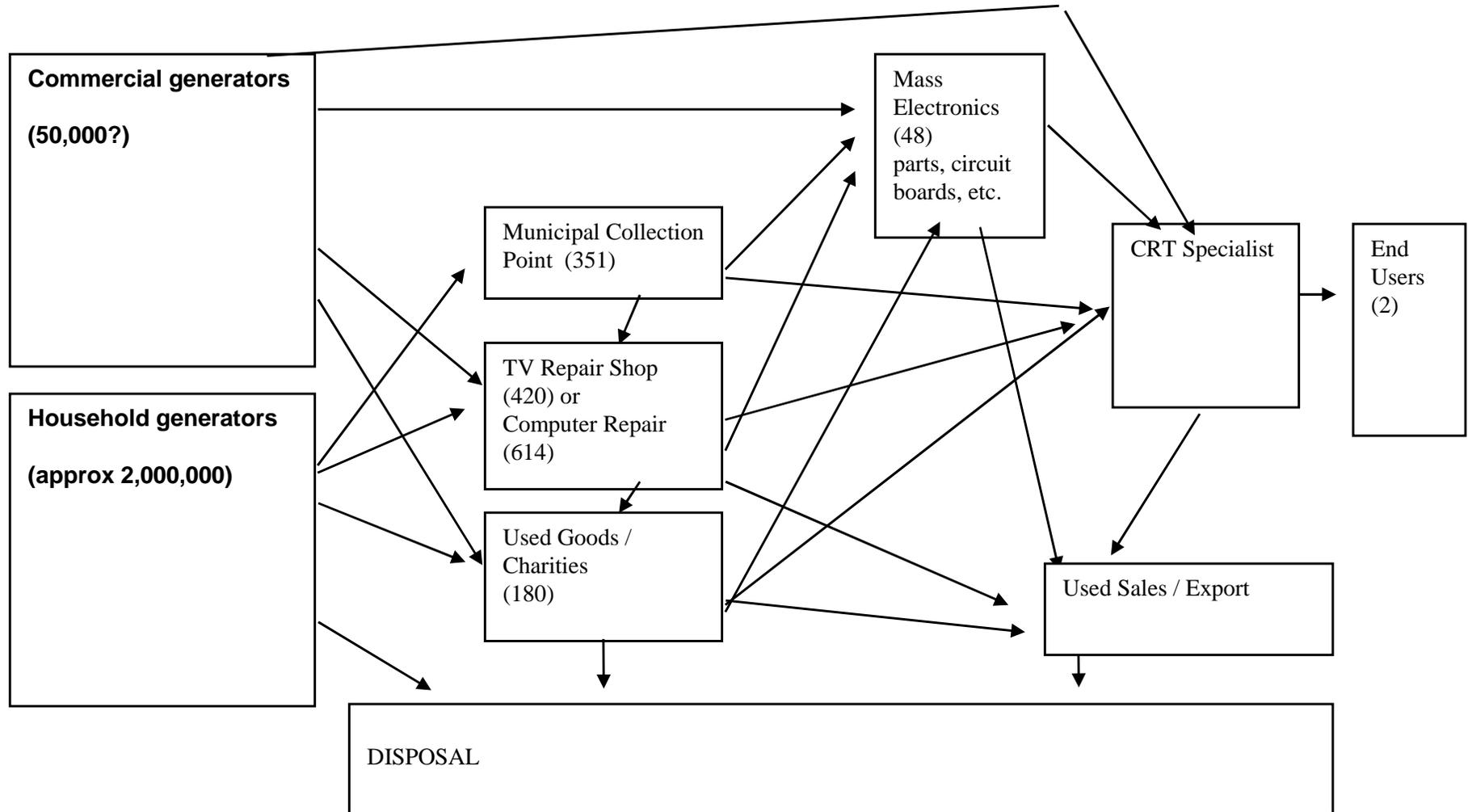
## 2. Seed and secure recycling end markets

*DEP issued a contract, jointly funded by EPA, to survey 400 TV repair shops, 600 computer repair shops, 50 electronics “recyclers”, dozens of exporters, and 400 second-hand thrift stores.*



## 2. Seed and secure recycling end markets, cont.

*The current infrastructure can divert (or “store”) an estimated 75,000 TPY of used electronics. This represents less than 25% of the capacity needed to handle projected generation in 2005.*



## 2. Seed and secure recycling end markets, cont.

To understand how residents, municipalities, and state government should efficiently incorporate that infrastructure requires a ground-level understanding of these markets. In October, 1998, the University of Massachusetts Office of Waste Management became the first “permanent regional facility”, as well as a market and operations research center.



2. Seed and secure recycling end markets, cont.

Under a joint DEP-EPA Grant, UMass performs inventories, market analysis, and time studies on TVs and PCs collected from 115,000 residents.



## 2. Seed and secure recycling end markets, cont.

### **Other market development activities:**

- \$100K grants for plastic recycling
- \$50K grant for CRT glass processing
- \$4M Recycling Loan Fund
- New “EPP” procurement language for \$50M /year state computer procurement contract

### 3. Establish a statewide Market Service Contract

*DEP selected a vendor to provide free recycling services to cities and towns for CRT and other electronics collections for the first six months. The vendor collects materials from central regional locations; by centralizing collections, costs have been cut by 40%.*

***FY1998:***      *PCs from state and municipal office buildings only*

***FY1999:***      *Add 8 permanent regional facilities, 1,335,000 residents  
\$100,000, single-payer contract*

***FY2000:***      *Rebid contract for 10-12 facilities, serving 6,000,000 residents  
\$400,000 single-payer contract*

*DEP plans to issue the Request for Responses between April and July, in advance of the September 1 Waste Ban.*

#### 4. Establish 5-10 Permanent Regional Collection Centers

*DEP has provided free recycling access to the University of Massachusetts at Amherst, three Salvation Army centers and three Goodwill charitable donation centers. In return, these parties will accept CRTs from residents and municipal governments.*

<b>PERMANENT REGIONAL FACILITY</b>				<b>PROCESSOR (STATE CONTRACT)</b>		
	Pop.Served*	Since	Tons/Date			
UMASS AMHERST	115,329	October	14.58	<b>GLOBAL RECYCLING</b>		####
GOODWILL BOSTON	825,599	March	0			
GOODWILL SPRINGFIELD	190,835	January	13.04	108,300 LBS TO DATE		61%
GOODWILL PITTSFIELD	62,234	April	0	70,000 EST. OTHER GLOBAL AC		39%
SALVATION ARMY SAUGUS	756,372	November	11.64	62.87 UNION CO. NJ		
SALVATION ARMY SPRINGFIELD	150,000	January	1.76			
CHICOPEE LANDFILL	150,000	November	10.75			
GLOBAL RECYCLING TECH	90,284	October	2.38			
<b>TOTAL TO DATE</b>	<i>1,325,901</i>		<b>54.15</b>			

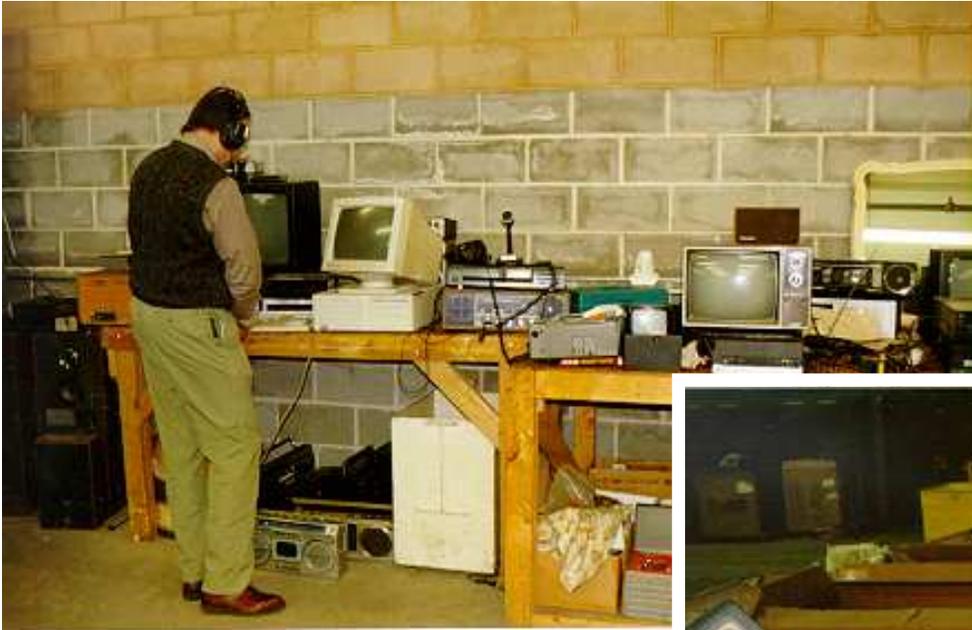
#### **Other Commodity COLLECTORS**

MUNICIPALITIES MAY COLLECT (2A) OR REFER  
RESIDENTS DIRECTLY TO REGIONAL CTRS (2B)

TV REPAIRERS MAY BEGIN TO TAKE CRTS LIKE  
GARAGES NOW TAKE TIRES, \$5/CRT

SOME USED APPLIANCE DEALERS MAY ALSO  
BEGIN ACCEPTING USED CRTS AT A FEE

**Salvation Army** and **Goodwill Industries** serve as “Permanent Regional Collection Centers”, which screen donations to see if the equipment works, but does not do complex repairs.



Equipment which does not work, or does not sell in 45 days, is placed in 8-10 pallets for collection by the state contractor



Salvation Army and Goodwill Industries provide free collection and screening in return for free recycling/disposal



#### 4. Establish 5-10 regional permanent collection sites

## Partnership

### What's in it for DEP?

- Each ton of TVs or computers “cherry picked” for resale/repair saves DEP \$300/ton
- Residents can be motivated to “donate” obsolesces to charity (especially if it’s “too good to throw away”)
- Resale, repair, salvage and exports preserve scarce market capacity for crushed leaded glass
- Several charities already collect household-by-household

### What's in it for regional hosts?

- Free recycling and disposal of unwanted, unrepairable TVs and computers
- Opportunities for consulting, disassembly, and other services (like UMass)
- Better service for customer/donors disappointed by rejected donations
- First pick of valuable discards (working appliances, textiles, valuable scrap)

### What's in it for municipalites?

- Free collection infrastructure for recycling of unwanted TVs and computers
- Avoided solid waste disposal costs of \$30-90/ton
- Better service for residents
- Reduced costs of facility ash disposal by reducing lead contamination

## 5. Establish individual municipal collection programs

DEP has provided \$100K in recycling market services for municipalities this year. Through these grants, DEP will study the effects of the following collection models on the value of the materials collected (tip fee) and the costs of collection (collection fee). Preliminary results suggest the relationship of costs (to the municipality) on the right:

<u>collection model</u>	<u>tip fee</u>	<u>collect cost</u>
<i>charitable door-to-door collections</i>	<i>low</i>	<i>low</i>
<i>modify existing “bulky” curbside collections</i>	<i>high</i>	<i>low</i>
<i>retailer take-back / drop-off programs</i>	<i>?</i>	<i>low</i>
<i>“dump and pick” separations at disposal facilities</i>	<i>very high</i>	<i>low</i>
<i>municipal drop-off programs</i>	<i>medium</i>	<i>high</i>
<i>moving company “amnesty” collections</i>	<i>?</i>	<i>low</i>

# 5. Establish individual municipal collection programs

Transport	1	2	3	4
CRTs	Residents	Municipality	PERMANENT REGIONAL FACILITY	PROCESSOR (STATE CONTRACT)
			Pop.Served* Since	Tons/Date
487	36,504	AMHERST	UMASS AMHERST 115,329	October 14.58
581	43,587	ARLINGTON	GOODWILL BOSTON 825,599	March 0
7,657	574,283	BOSTON	GOODWILL SPRINGFIELD 190,835	January 13.04
1,331	99,858	CAMBRIDGE	GOODWILL PITTSFIELD 62,234	April 0
251	18,825	GREENFIELD	SALVATION ARMY SAUGUS 756,372	November 11.64
618	46,324	HOLYOKE	SALVATION ARMY SPRINGFIELD 150,000	January 1.76
83	6,247	LEE	CHICOPEE LANDFILL 150,000	November 10.75
76	5,663	LENOX	GLOBAL RECYCLING TECH 90,284	October 2.38
200	15,032	LONGMEADOW	<b>TOTAL TO DATE</b> 1,325,901	<b>54.15</b>
144	10,772	MAYNARD		
163	12,228	MILLBURY		
344	25,803	MILTON		
89	6,700	NEWBURY		
1,093	81,968	NEWTON		
385	28,879	NORTHAMPTON		
639	47,927	PITTSFIELD		
341	25,553	SAUGUS		
2,000	150,000	SPRINGFIELD		
32	2,397	STOCKBRIDGE	17,679	1,325,901 1999 Grantees
800	60,000	UMASS/FRK Co	82,667	6,200,000 Entire state
175	13,091	WAYLAND		
190	14,260	WESTBORO		
-		GLOUCESTER		
-		LEVERETT		

**GLOBAL RECYCLING** 54.15  
 108,300 LBS TO DATE 61%  
 70,000 EST. OTHER GL 39%  
 62.87 UNION CO. NJ

## **Establish individual municipal collection programs**

### **Pilot 5 types of voluntary front-end residential collection**

*351 Massachusetts Municipalities are eligible for the Market Services Grant for CRTs. Collections will occur at both curbside and drop-off locations.*

#### ***Six collection methods are being tested through pilot programs:***

- ➡ Town drop-off programs
- ➡ Seasonal/bulky curbside programs
- ➡ One-day drop-offs at retailers
- ➡ Partnerships with charities
- ➡ Partnerships with moving companies

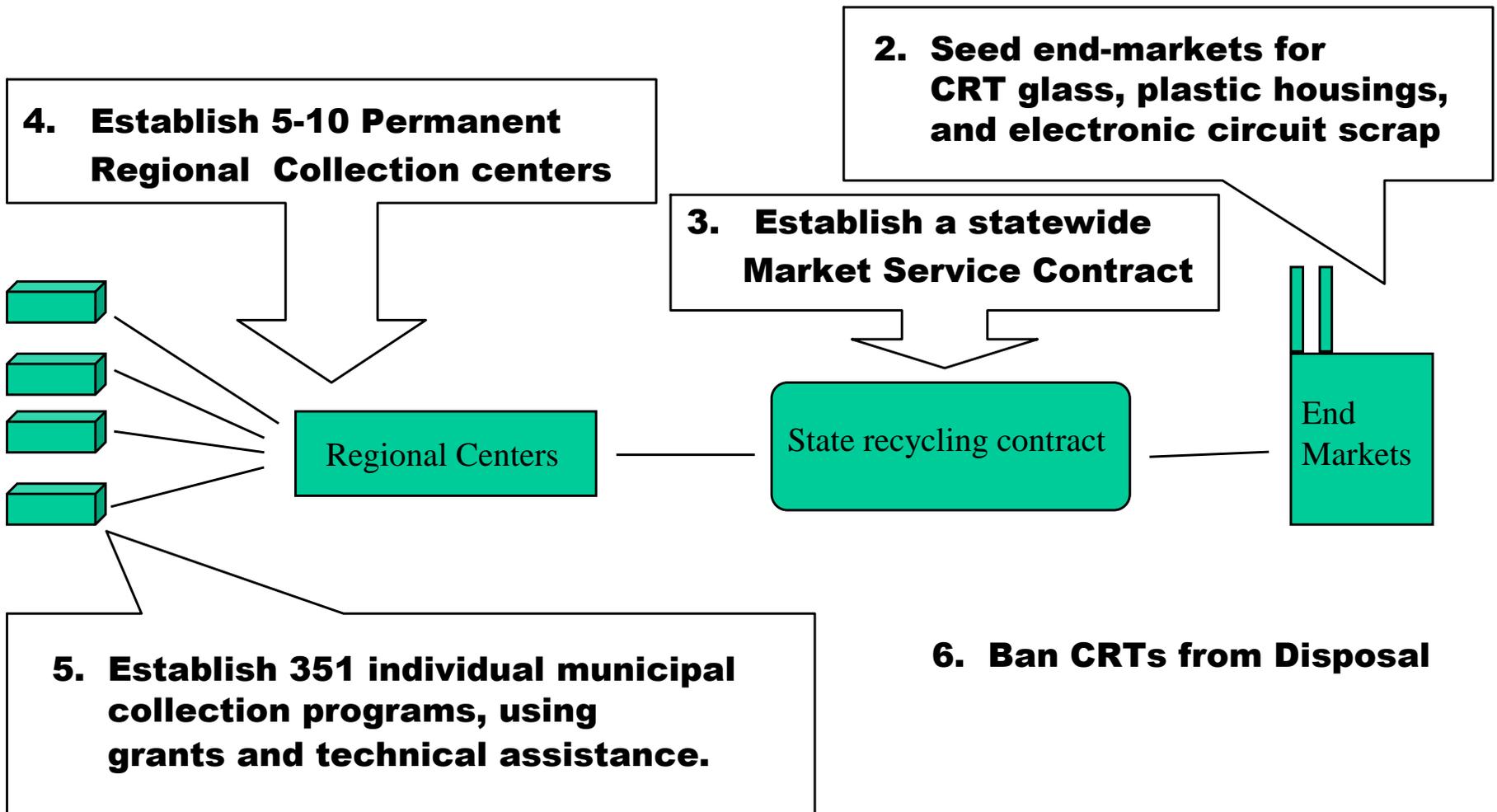
6. Ban CRTs from solid waste disposal facilities: September 1999

- *DEP will add CRTs to the list of white goods, tires, car batteries, and recyclables banned from disposal in Massachusetts landfills and incinerators.*



# Massachusetts Cathode Ray Tube Strategy

## 1. Exempt intact CRTs from expensive hazardous waste requirements



DEP expects complaints of illegal dumping to parallel those of the early 1990 waste bans on tires, white goods, and auto batteries.

67% of residential material is collected by city contract, at the curb;

large haulers will enforce the bans in order to negotiate special “bulky” hauling contracts



Illegal dumping occurs at public housing dumpsters



Small, private haulers will be slower to enforce the bans

# Suggested Reading

