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2. **Project title**  
E-waste: How much is around and what is people’s willingness to pay to get rid of it?  
A contingent ranking study.

3. **Issues to be addressed and their significance**  
Electronic waste (e-waste) is one of the fastest growing components of California’s waste stream.  
It is also one of the most problematic because it contains lead (Pb), mercury, cadmium,  
brominated flame-retardants and other hazardous materials that pose a threat to public health and  
to the environment if they are improperly discarded. The U.S. EPA and the California  
Department of Toxic Substances Control (DTSC) have recently issued “Universal Waste”  
regulations banning the disposal in landfills of Cathode Ray Tubes (CRTs). What to do with e-  
waste in general is now increasingly important following the recent EU directive banning various  
hazardous substances (including lead (Pb)) from electronics and similar regulations in Japan  
Banning the disposal of e-waste while discouraging e-waste exports to developing  
countries will require more recycling. Yet, the volume of e-waste is unknown. It is feared to be  
quite large, and existing recycling capacity is insufficient to process the accumulated e-waste.  
According to a study conducted for the National Safety Council, ¾ of all obsolete computers in  
the United States remain stored in people’s houses. E-waste encompasses much more than just  
computers. Pilot programs conducted in 1998-99 in San Francisco and Alameda country jointly  
with Materials for the Future Foundation to collect used electronic products were overwhelmed  
with old TVs and CRTs. This represents a potentially severe problem for waste agencies at a time  
of increasing budgetary strains. It is thus essential to find out how much e-waste is around and to  
quantify people’s willingness to pay to dispose of it.

4. **Proposed research questions**  
How much e-waste do people have stockpiled in their attics, garages, and basements? This  
includes old TVs, VCRs, stereos, computers, cell phones, PDAs, but also a variety of appliances.
How much are people willing to pay to get rid safely of this e-waste? What measures would they like to see implemented to facilitate the collection of e-waste? This includes residential pick-up, permanent drop off points, special collection events, deposit refund-systems, partnerships with manufacturers and retailers, and manufacturers take back programs.

5. Principal research tasks and methods

TASKS
(a) Investigate various recycling options and collect their costs. Review what is being done in various OECD countries.
(b) Select a random sample of Orange County residents.
(c) Design a questionnaire. This questionnaire will include socio-economic variables so the survey results can be extrapolated to California.
(d) Conduct a pilot study to test the questionnaire and the methodology.
(e) Administer the survey (by phone).
(f) Process the answers. Check the representativeness of the respondents. Estimate people’s willingness to pay for various recycling options.
(g) Make policy recommendations on recycling alternatives and funding mechanisms.

METHODS
We will use the contingent ranking (CR) method, which asks individuals to rank a set of hypothetical alternatives, which varies by price and other attributes. CR is well established in environmental economics. It has been used for example to value improvements in river quality (Smith and Desvouges, 1986), reductions in diesel smells (Lareau and Rae, 1989), or curbside waste disposal options (Caplan, Grialva, and Jakus 2002).

6. Anticipated contribution to California policy-makers
The anticipated contribution of this research is to provide guidance to local and state authorities on the magnitude of the e-waste problem and on options to tackle it.

7. Estimated costs and time frame
$40,000 for GSRs, survey expenses, and faculty salaries; one year beginning July 2003.

8. Qualifications of investigators
Jean-Daniel Saphores has expertise in environmental economics and policy, including valuation and survey methods.
Oladele Ogunseitan has expertise in public health and environmental policy.
Julie M. Schoenung has expertise in electronic materials and manufacturing, technical marketing, and engineering economics.
Andrew Shapiro has expertise in electronic materials and manufacturing, including recycling options.