5.16 Waste Disposal

This chapter describes external costs associated with disposal of vehicle wastes.

Definition

Waste disposal external costs include damage costs associated with the inappropriate disposal of used tires, batteries, junked cars, oil and other harmful materials resulting from motor vehicle production and maintenance. It can also include any public costs devoted to the proper disposal of such materials.

A separate but related issue is uncompensated costs and risks associated with the transport of hazardous materials. These external costs are not considered in this chapter.

Discussion

Motor vehicles produce various harmful waste products that can impose externalities.[1] Many junked cars sit for years before they are recycled and some must be disposed of at public expense. Tire piles create environmental and health hazards, especially when they catch fire.[2] Although efforts are underway to find uses for waste tires, none have eliminated landfill waste disposal.[3] Motor vehicle wastes are the major source of moderate-risk wastes produced in typical jurisdictions, as indicated below.[4]

Moderate Risk Waste	**Percent**
Used Oil (Primarily Automobile)	*50%*
Batteries (Primarily Automobile)	*15%*
Antifreeze (Primarily Automobile)	*7%*
Cleaners, Paints, Adhesives	21%
Pesticides, Other	7%

These wastes impose a variety of environmental, human health, aesthetic, and financial costs, through improper disposal, residual impact even when proper disposal is observed, and because some disposal efforts are subsidized by general taxes. Some new laws and policies are intended to internalize these costs. Crankcase oil recycling is encouraged, vendors are required to recycle used car batteries, and in some states a tire tax is dedicated to tire disposal. It is uncertain to what degree these policies reduce external disposal costs. Although electric vehicles do not create waste oil, they do produce used batteries, hulks and tires, which may have disposal problems.[5]

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[1] *Indicators of the Environmental Impacts of Transportation*, Office of Policy and Planning, USEPA (http://itre.ncsu.edu/cte), 1999.

[2] *1992 Washington State Waste Characterization Study*, Washington Dept. of Ecology (Olympia), 1993.

[3] *Green Car; End-of-Life Vehicle Management*, EDF (www.edf.org/programs/ppa/vlc/eol.html), 1999.

[4] *Problem Waste Study (Moderate Waste)*, Washington Department of Ecology (Olympia), 1990, p. 12.

[5] Frank Kreith, Paul Norton and DenaSue Potestio, "Electric Vehicles: Promise and Reality," *Transportation Quarterly*, Vol 49, No. 2, Spring 1995, pp. 5-21.

There is potential overlap between water quality costs described in the previous chapter and waste costs described here, since both include waste crankcase oil. Water quality costs cover impacts of oil and other fluids that drip during vehicle use. Waste costs address impacts of oil and other fluids after their useful life, during disposal. A review of the previous chapter will show that there is no overlap in calculating these costs.

Estimates:

- Douglass Lee estimates the following external disposal costs:

Table 5.16-1 **Automobile External Waste Disposal Cost Estimate**[6]

Product	Annual Volume	Unit Costs	Total Annual Cost
Waste Oil	960 million quarts	$0.50	$0.5 billion
Scrapped cars	2.82 million	$25	$0.7 billion
Used tires	3 billion	$1	3.0 billion
Total			*$4.2 billion, 0.2¢ per VMT*

Variability

Impacts depend on vehicle design, construction and user waste management.

Equity and Efficiency Issues

Water disposal externalities are an external cost, and therefore inequitable and inefficient.

Conclusions

Waste disposal has been a significant problem of automobile production and use. Lee's estimate that U.S. external motor vehicle waste costs total $4.2 billion per year seems reasonable. Although it may overstate some waste costs if new management efforts are successful, it excludes other wastes altogether. This cost is applied equally to all motor vehicles, including electric cars. As described in chapter 5.15 (Water Pollution), although public transit buses and trams may produce more waste per vehicle, their waste tends to be managed better than those of private vehicles, so costs are considered equal.

[6] *Full Cost Pricing of Highways*, National Transportation Systems Center (Cambridge), p. 31.

Estimate **Waste Disposal Costs (1996 U.S. Dollars per Vehicle Mile)**

Vehicle Class	Urban Peak	Urban Off-Peak	Rural	Average
Average Car	0.002	0.002	0.002	0.002
Compact Car	0.002	0.002	0.002	0.002
Electric Car	0.002	0.002	0.002	0.002
Van/Light Truck	0.002	0.002	0.002	0.002
Rideshare Passenger	0.00	0.00	0.00	0.00
Diesel Bus	0.002	0.002	0.002	0.002
Electric Bus/Trolley	0.002	0.002	0.002	0.002
Motorcycle	0.002	0.002	0.002	0.002
Bicycle	0.00	0.00	0.00	0.00
Walk	0.00	0.00	0.00	0.00
Telework	0.00	0.00	0.00	0.00

Automobile Cost Range

Due to the uncertainty of this cost and its relatively small magnitude, the minimum cost is zero. The maximum is 2.5 times the estimate used here.

Minimum	Maximum
$0.00	$0.005

Information Resources

FHWA (1999), *The Environmental Guidebook*, Federal Highway Administration, FHWA-99-005 (www.fhwa.dot.gov/environment/guidebook/index.htm).

USEPA (1999), *Indicators of the Environmental Impacts of Transportation*, Office of Policy and Planning, USEPA (www.itre.ncsu.edu/cte).

USEPA Waste Division (www.epa.gov/epaoswer/osw/topics.htm) provides information on various types of waste related to transportation, including antifreeze, batteries, crude oil, drip pads, industrial wastes, solvents, tires, underground storage tanks and used oil.

Zero Waste, *Tire Dumps* (www.zerowasteamerica.org/Tires.htm).