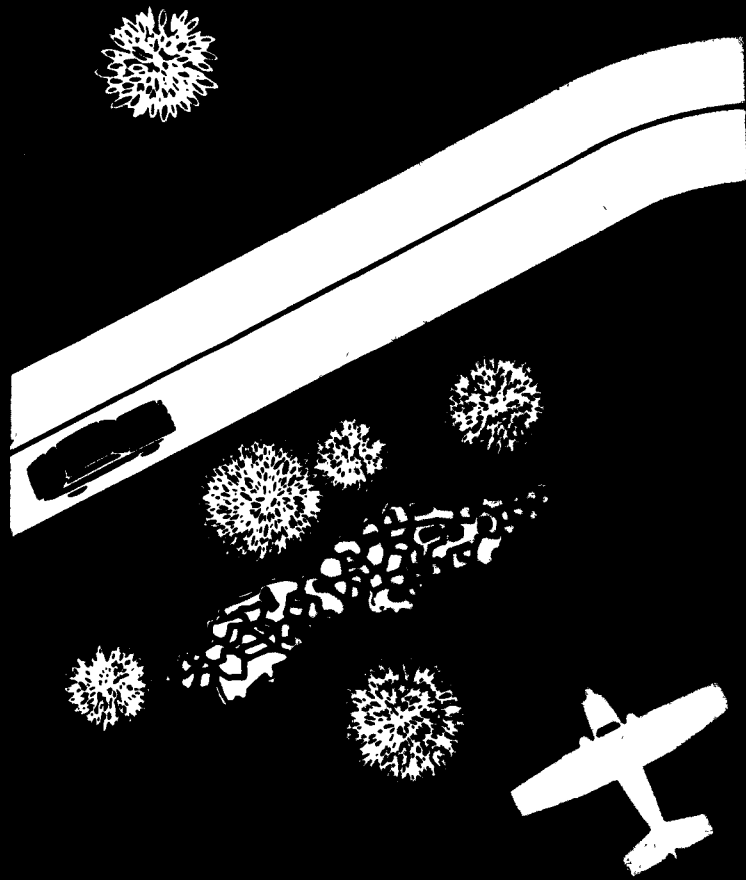


SW32TS





AERIAL AND AUTOMOTIVE RECONNAISSANCE  
OF SOLID WASTE DISPOSAL SITES  
IN A RURAL COUNTY

*This report (SW-32ts) was written  
by THOMAS J. SORG*

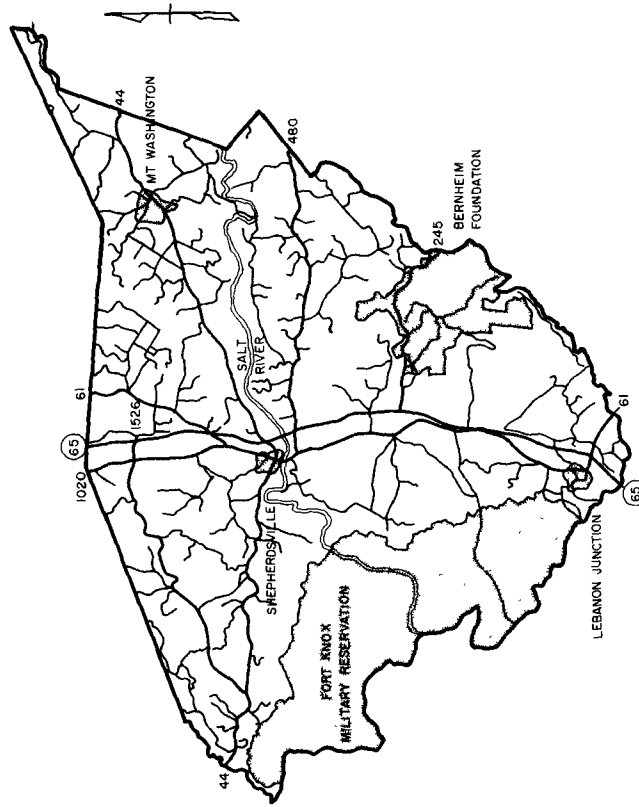
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AERIAL AND AUTOMOTIVE RECONNAISSANCE  
OF SOLID WASTE DISPOSAL SITES  
IN A RURAL COUNTY

As part of a comprehensive study designed to evaluate the solid waste management needs of Bullitt County in Kentucky, Federal solid waste management personnel conducted air and ground surveys to identify and assess the disposal sites in the area.

Each survey was carried out in summer and covered 240 square miles in the county, which had an estimated population of 21,750 in 1967; about 25 percent of its inhabitants resided in the incorporated cities of Shepherdsville, Mt. Washington, and Lebanon Junction. The county is covered with hills, many of which rise 200 to 500 feet above the



*The survey included all of Bullitt County (above), with the exception of the three incorporated cities and two undeveloped areas.*

440-foot elevation of Shepherds-ville, the county seat. The topography and the sparse population have contributed to the branch-like development of the road system.

Three observers gathered information from a light, high-wing air-

craft flown by a commercial pilot.

• The plane flew at 1,500 to 2,000 feet during a four-hour flight at an indicated air speed of 90 to 100 mph; visibility was more than 15 miles. The five-day ground survey was conducted by one man who drove over public roads. Both teams used county maps (scale, 1 inch=1 mile) to mark the locations of all the sites detected. Within the county are a 49-square-mile section of Fort Knox Military Reservation and a 14-square-mile forest preserve of the Bernheim Foundation. These two areas and the three incorporated cities were excluded from the surveys. The cities were omitted after the aerial team found it practically impossible to pinpoint the locations of junked cars and backyard dumps because of the large number involved, the population density, the speed of the

aircraft, and the lack of detail on the road maps.

### Results and Costs

Five large disposal sites, all open dumps like the one below, were easily detected from the air and photographed with a standard 35-mm camera. The general type of operation was ascertained with little

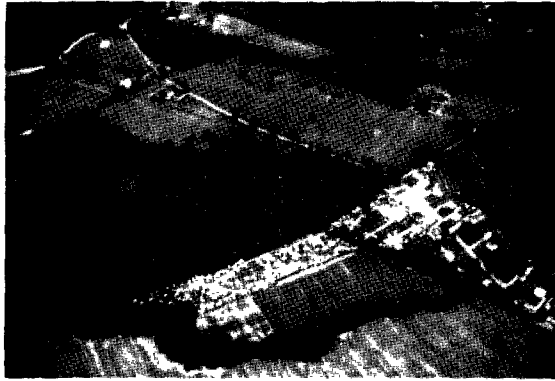


*Disposal sites can be identified from the air.*

difficulty, but no details regarding the nature of the wastes could be obtained.

The aerial survey found 82 sites containing one or more junked cars; the ground observer located 256.





*The aerial survey of 240 square miles required a 4-hour flight by three observers and cost \$212.*

There were only 32 duplicate sightings. The ground surveyor had no trouble counting cars, but aircraft speed reduced the accuracy of the airborne team if more than 20 to 30 vehicles were present. Aerial reconnaissance located 116 small dumping areas; the automobile survey found 110.

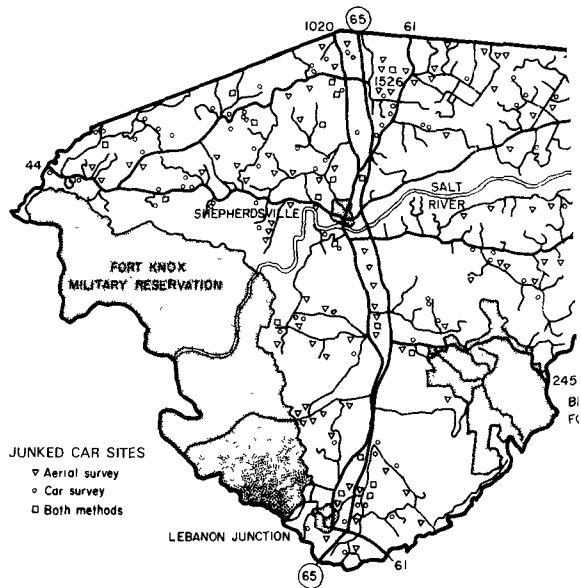
The four-hour flight involved a total of 12 man-hours at a cost of \$10 per hour for the observers and \$23 per hour for the plane and pilot. The automobile survey was conducted by one man during a five-day work

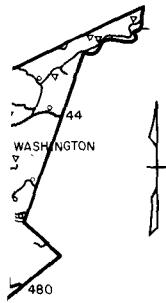
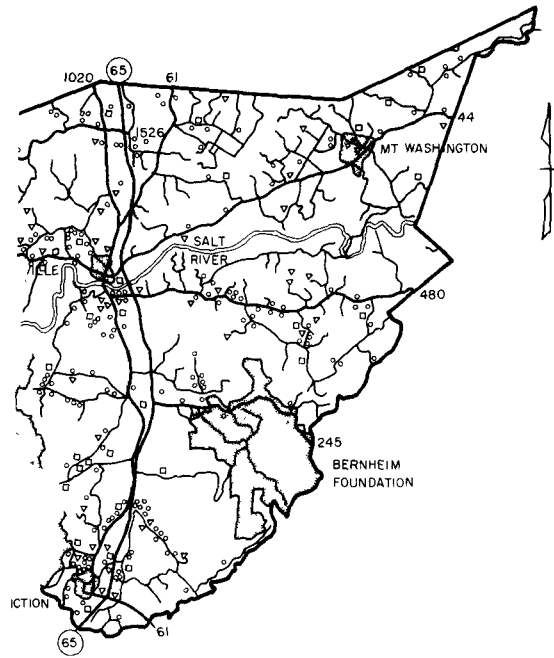
The survey was conducted by both ground and air. Although the two search methods resulted in two different sets of figures, the percentage of duplicate sightings was small.



SMALL DISPOSAL AREAS  
 ▽ Aerial survey  
 ○ Car survey  
 □ Both methods

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*Of the 338 junked car sites observed by the two surveys, only 32 were duplicate sightings.*

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ON

week (40 man-hours). The road miles driven and surveyed per day were estimated at 100 and 50, respectively. Cost figures were \$10 per hour for manpower and \$10 per day and 10¢ per mile for the car.

RESULTS AND COSTS OF THE TWO SURVEYS

	Aerial survey	Roadside survey	Duplicate sightings
Major disposal sites	5	0*	0
Junked car sites	82	256	32
Small dumping areas	116	110	19
Man-hours	12	40	
Cost(\$)	212	500	

\*Locations provided before survey.

Assessment and Recommendations

After analyzing the operational factors involved and the data collected, the participating personnel agreed that:

1. Since relatively few duplicate sightings were recorded, both air and ground surveillance should be undertaken if comprehensive information is needed. Aerial reconnaissance, which is cheaper because it is quicker, will suffice if the only requirement is to get a general "feel" of the solid waste disposal situation in the area.

2. The aerial search could have been completed in about an hour if there had not been a requirement to pinpoint on a map all the sites detected. The time spent by the ground observer would not, however, have been shortened appreciably.

3. Terrain and season influenced both information collection methods. The aircraft personnel had no trouble finding small dumping areas and junked car sites that were

out in the open--even though in  
hollows--or large junked car sites.  
On the other hand, they missed many  
small "targets" hidden under trees.



*Many small dumping areas were  
hidden from the view of the aerial  
survey team.*



*Ground surveillance revealed 256  
junked car sites.*

The ground observer found these but failed to detect some large junked graveyards because their owners had complied with a State law and had shielded them from view. Line-of-sight restrictions imposed by terrain and foliage also denied him other information.

4. An automobile search is time-consuming, but the surveyor can personally inspect most sites and talk with any operators present.

5. Two members of the airborne team lacked flying experience, and this might have affected the results. Because of the meandering road system, the pilot had to change direction frequently, and this made it difficult for these two surveyors to pinpoint their position. If, therefore, there is a requirement that the locations of all small dump-sites and

individual junked cars be plotted,  
the use of an experienced flying  
team would be advisable.

The general conclusion was  
that officials in rural counties  
should seriously consider carrying  
out aerial surveys--preferably in  
conjunction with road trips--as  
they move to initiate or strengthen  
their solid waste management  
programs.

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