WR-B-00-07

AUDIT REPORT

VEHICLE USE AT LAWRENCE LIVERMORE NATIONAL LABORATORY

SEPTEMBER 2000

U.S. DEPARTMENT OF ENERGY
OFFICE OF INSPECTOR GENERAL
OFFICE OF AUDIT SERVICES

September 20, 2000

MEMORANDUM FOR THE MANAGER, OAKLAND OPERATIONS OFFICE

FROM: Lawrence R. Ackerly, Regional Manager (Signed)
Western Regional Audit Office
Office of Inspector General

SUBJECT: INFORMATION: Audit Report on "Vehicle Use at Lawrence Livermore National Laboratory"

BACKGROUND

The main site of Lawrence Livermore National Laboratory (Livermore) occupies one square mile. For on-site transportation of its 7,300 full-time equivalent employees, Livermore leased vehicles from General Services Administration (GSA), operated a taxi service, and provided bicycles. A network of sidewalks and paved trails was available for persons bicycling or walking between site facilities. In Fiscal Year 1999 Livermore leased about 1,260 motor vehicles from GSA at a cost of about $3.6 million.

Congress enacted requirements for Federal agencies to efficiently manage and reduce the cost of Federal fleet operations. Audits at other Department of Energy facilities had determined that contractors' vehicle fleets were too large and did not meet congressional requirements to reduce the cost of fleet operations. Thus, our audit objective was to determine if the allotment of government vehicles at Livermore was too large.

RESULTS OF AUDIT

Although we found no significant problems with the allotments of nondiscretionary operational vehicles and other purpose vehicles, the allotment of 516 on-site discretionary vehicles was too large. Not one of 31 randomly selected on-site discretionary vehicles met the laboratory's use standard of 9.2 trips per day. In fact, Livermore would need to reduce the number of on-site discretionary vehicles by 363 to meet its established usage standard. The vehicle fleet was larger than necessary because Oakland allowed Livermore to count and report trips based on mileage rather than trips. Livermore could reduce its vehicle lease costs by at least $690,000 per year by returning vehicles that do not meet the local use standards. We recommended that vehicles not meeting the use standard be returned to GSA. We also recommended changes to the methodology for measuring vehicle use.

MANAGEMENT REACTION

Management did not concur with the results, conclusions, and recommendations in the audit report.

VEHICLE USE AT LAWRENCE LIVERMORE NATIONAL LABORATORY

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INTRODUCTION AND OBJECTIVE

The main site of Lawrence Livermore National Laboratory (Livermore) occupies one square mile.[1] To meet the transportation needs of its 7,300 full-time equivalent employees, Livermore leased vehicles from the General Services Administration (GSA), operated an on-site taxi service, and provided bicycles.

In Fiscal Year (FY) 1999 Livermore leased about 1,260 motor vehicles from GSA at a cost of about $3.6 million. Livermore assigned each vehicle to one of three major categories.

On-site Discretionary Vehicles. These 616 vehicles[2]--mainly cars, vans, and light duty trucks--were to be used primarily for on-site transportation of lab employees and light materials.

Nondiscretionary Operational Vehicles. These 565 vehicles--mainly trucks and vans--were used primarily for plant maintenance and utility repairs on the site.

Other Purpose Vehicles. These 79 vehicles were used for such purposes as off-site travel and emergency responses.

Congress enacted the Consolidated Omnibus Budget Reconciliation Act of 1985 requiring agencies to take actions to improve the management and efficiency of their fleet and to reduce the cost of the fleet operations. Audits at other Department of Energy (DOE) facilities had determined that contractors' vehicle fleets were too large (see Appendix 3).

The audit objective was to determine if the allotment of government vehicles at Livermore was too large.

CONCLUSIONS AND OBSERVATIONS

Although we found no significant problems with the allotments of nondiscretionary operational vehicles and other purpose vehicles, the allotment of on-site discretionary vehicles was too large. Specifically, not one of 31 randomly selected on-site discretionary vehicles met the laboratory's own usage standard. Based on actual usage, Livermore would need to return 363 vehicles to GSA before the standard would be met, an action that would reduce leasing cost by at least $690,000 per year.

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[1] In addition, Livermore has Site 300, an approximately 11 square-mile-site located about 15 miles southeast of Livermore.

[2] We eliminated from our review 100 vehicles that Livermore replaced sometime during the fiscal year. Therefore, only 516 on-site discretionary vehicles were included in our review.

The vehicle fleet was larger than necessary because Oakland Operations Office (Oakland) approved procedures for measuring use that did not count the actual number of trips taken. Rather, Oakland allowed Livermore to count and report trips based on mileage.

In addition to government vehicles, Livermore personnel have other options for getting around the site. Livermore's taxi service operated on an on-call basis with five shuttle buses, each having a capacity of 8 or 16 persons. These taxis could transport employees anywhere on the site within seven minutes. A review of one month's dispatch logs showed typical ridership to be about four individuals at any given time. Our personal observations confirmed the low ridership. During the day that we rode a 16-passenger shuttle bus, the greatest number of riders observed was six, though there were typically only one or two riders at a time.

Livermore also had about 800 bicycles available for employee use on the site. A network of sidewalks and paved trails was available for persons bicycling or walking between site facilities. Another alternative for on-site transportation was employee use of privately-owned vehicles on a reimbursement basis.

In our opinion, DOE should consider these issues when preparing its yearend assurance memorandum on internal controls.

_____(Signed)_____
Office of Inspector General

Allotment Of On-Site Discretionary Vehicles Too Large

Vehicles Do Not Meet Local Use Standard

The allotment of on-site discretionary vehicles at Livermore was too large. Specifically, none of 31 randomly selected vehicles had met Livermore's standard of 9.2 trips per day. In fact, a majority of the 31 vehicles (28 of 31) were used less than half of the standard of 9.2 trips per day. Actual use of the 31 vehicles is shown in the following table.

Actual Use of 31 Sample Vehicles

Number of Vehicles	Average Daily Trips
4	1
3	2
12	3
9	4
3	5-6

A projection of the sample results showed that none of the 516 vehicles at Livermore met the required usage of 9.2 trips per day. Based on current usage of these 516 vehicles, Livermore could meet its requirement of 9.2 trips per day with 153 on-site discretionary vehicles, which is 363 fewer vehicles than it has. Therefore, the fleet was larger than necessary.

Use Standards Minimize Fleet Size

DOE's policy is to keep the number of motor vehicles at the minimum needed to satisfy program requirements. To implement this policy, DOE's Property Management Regulation (41 CFR 109-38.51, Utilization of Motor Vehicles) recommends two methods for determining the appropriate number of vehicles for a site. One method is the use of DOE-wide standards, for example, 12,000 miles per year for sedans. The other method--establishing local use standards--is recommended for situations where DOE-wide standards may not be relevant. In either case, the Property Management Regulation requires that DOE and its contractors maintain individual motor equipment use records, such as trip tickets or vehicle logs, to evaluate the appropriateness of assignment and adequacy of use being made.

In 1992, the laboratory contracted with a transportation consulting firm to develop a means to efficiently move people and material around the lab. The consultant's report cited the constrained size of the laboratory as the basis for discarding DOE-wide mileage standards and implementing a trip standard for on-site discretionary vehicles. According to the consultant's report, trip counts provided an easily defined tool to size the vehicle fleet. Trip counts also made fleet sizing adjustments much easier to correlate; for example, an increase in use of

taxis correlated directly to a decrease in trips in government vehicles, thereby decreasing fleet size. The consultant found that on-site discretionary vehicles were averaging 7.5 trips per day, with the average trip being eight-tenths of a mile. At nearly 250 days per year and eight-tenths of a mile per trip, the consultant noted that a given vehicle would travel only around 1,500 miles per year, or 125 miles per month, a distance far short of the then DOE minimal requirement of 555 miles per month.

Based on Livermore's trip information and other data taken from vehicle logs and surveys, the consultant calculated a use standard of 9.2 trips per day for on-site discretionary vehicles. Livermore adopted the standard with the approval of Oakland. Livermore's performance was measured against this standard as part of its contract with DOE.

Usage Measured By Miles Driven Rather Than Trips Taken

Although the standard was 9.2 trips per day, usage was measured by converting mileage to trips rather than by counting trips. Reporting to Oakland quarterly, Livermore divided total miles driven by all on-site discretionary vehicles by eight-tenths, and then divided the resulting "trip count" by the number of vehicles. Based on this methodology, all on-site discretionary vehicles were justified in FY 1999. This methodology for measuring trips appeared in the consultant's report.

Several basic problems, however, existed with this methodology. First, the number of trips actually taken was never identified. Having adopted a trip standard because a mileage standard was deemed inappropriate, use was effectively measured by miles. A vehicle incurring 153 miles per month (or 1,840 miles per year) meets what is held forth as a trip standard. As shown earlier, none of the sampled vehicles made 9.2 trips per day and most made 3 or fewer trips per day. Second, the methodology allowed off-site trips to inflate reported use. For example, one vehicle was used for a trip to Walnut Creek, California, a round trip of 62 miles. Livermore's mileage-to-trips method for reporting vehicle use made this one trip count as 77 trips (62 miles divided by .8). Finally, the use reported was the average for all on-site discretionary vehicles rather than the use of individual vehicles. This allowed vehicles with few monthly miles to be retained because their low use was offset by vehicles putting on more than 153 miles per month.

To determine if vehicles were actually driven 9.2 trips per day would require that users maintain vehicle logbooks or trip reports for each vehicle. However, Livermore did not have such a requirement. Of

the 88 vehicles for which we requested documentation that would show the number of trips each day, Livermore had documentation for only 31; thus, there was no documentation for 57 of the vehicles. Livermore stated that it did not require vehicle users to maintain logbooks because of inherent human error in keeping them. Such records, however, would provide sufficiently detailed information to allow management to assess the number of vehicles at the laboratory as being too few, too many, or about right.

In spite of these problems, Oakland allowed Livermore to calculate and report vehicle usage this way to support its performance measurements. For FY 1999, Oakland rated Livermore's performance as outstanding for vehicle utilization. We determined, however, that the logic used to justify the retention of Livermore's on-site discretionary vehicles was faulty and actual trips did not support the retention of a large number of such vehicles.

Potential For Savings

Livermore could reduce its vehicle lease costs by at least $690,000 per year by returning 363 underused on-site discretionary vehicles to GSA. As noted in the transportation consultant's report, greater use of alternative means of on-site transportation already available-- taxis, bicycles, sidewalks, trails, and privately-owned vehicles--correlates directly with fewer government-owned vehicles. Thus, more use of these alternative transportation means should enable additional reductions in the number of vehicles.

RECOMMENDATIONS

We recommend that the Manager, Oakland Operations Office require Livermore to:

1. Modify its on-site discretionary vehicle utilization procedures to:

   (a) use vehicle logs or trip tickets to count and report the actual number of on-site trips made by each on-site discretionary vehicle; and,

   (b) report actual trips by individual vehicle in the quarterly vehicle utilization reports.

2. Return to GSA those vehicles that do not meet the local use standard of 9.2 trips per day.

MANAGEMENT COMMENTS

Management did not concur with the reported results, conclusions, and recommendations and stated that the Livermore fleet size projected in the report is materially misstated. Oakland stated that the fleet is fully utilized at the institutional level. Management stated that the Office of Inspector General (OIG) did not use the methodology that Oakland approved for determining utilization of on-site discretionary vehicles in (1) reporting the usage results of the 31 vehicles and (2) projecting the audit's sample results to Livermore's entire on-site discretionary fleet. As a result, the projected cost saving of $690,000 annually based on eliminating 363 vehicles is unrealistic. In fact, all 31 vehicles met the trip standard or were identified as underutilized and subsequently rotated to other Livermore organizations.

Oakland stated that a trip was defined as eight-tenths of a mile to ensure site-wide consistency in the application of the utilization criteria. The methodology used to measure use was felt to be the most efficient and cost effective method available. It eliminates the ambiguity of "What is a trip?" and allows Livermore to collect, record, monitor, and report utilization data electronically. This saves significant effort in the field and within the Fleet Management organization in terms of collecting, maintaining, deciphering, and transcribing trip data each month from 516 manual logs.

Management also stated that the OIG used non-mandatory sign-out logs for its sample. Oakland stated that it had told the auditors that Livermore does not use vehicle logs to calculate utilization. The logs the auditors reviewed were merely sign-out sheets intended to track who is using the vehicle and had never been used to track utilization. The auditors equated a single sign-out entry in the vehicle log to one "trip." In fact, multiple destinations often accompany a single sign-out. Each destination should be considered a separate trip, not the singular sign-out entry used in the report. At a minimum, the auditors should have interviewed employees to establish an understanding of the sign-out procedures prior to making projections to the Laboratory's discretionary vehicle fleet size.

AUDITOR COMMENTS

We disagree that the report's projected fleet size or savings are misrepresented. Based on the consultant's study, Livermore determined that a mileage standard was inappropriate and adopted a trip standard. We agree that trips may be a better method to use than mileage because of the constrained size of the laboratory, but we disagree with the methodology of using actual mileage driven by all vehicles and dividing that by eight-tenths to arrive at the number of trips. Using

this mileage-to-trip methodology does not address trip counts. Rather, it is an attempt to retrofit a mileage standard to a trip standard. If Oakland believes that 1,840 miles per year is a justifiable use standard for Livermore's on-site discretionary vehicles, then the standard should be presented for what it is, 1,840 miles per year. Approving a standard based on trips and then measuring trips by miles merely obscures what the standard really is, a mileage standard of 1,840 miles per year.

In addition, management stated that the mileage-to-trip calculation eliminates the ambiguity of "What is a trip?" The study addressed this issue by stating: "A trip is easily defined as the movement of a vehicle from point A to point B in support of a Laboratory activity. By measuring trip counts to size the fleet we have an easily defined tool." (underscoring added).

Oakland implied that a measurement of trips could not be done electronically as mileage currently is. With computer-based technology readily available in today's electronic environment, we disagree with this comment. Manual input may be required but would not require the significant effort implied by management.

As stated by Oakland, vehicle logs were not required to be kept by Livermore. Therefore, to determine the actual number of trips taken, we used the best available data source--the vehicle sign-out logs--to measure actual use. This same approach was used in the consultant study to develop the recommended usage standard of 9.2 trips per day. While we agree that one sign-out could equate to more than one trip, or that a vehicle could have been used without being signed out on occasion, the logs were the most credible documentary evidence of use that existed. In fact, for a majority of the organizations from which we received vehicle sign-out logs, it was standard practice to sign out for the use of a vehicle. In determining the number of trips for the 31 randomly selected vehicles in our review, we counted trips based on the destinations recorded on the vehicle logs. For example, if the log noted that an individual checked out a vehicle and traveled to three different locations before returning, we counted that as three trips. Finally, while it is conceivable that some individuals used vehicles without documenting their use on the vehicle log, such instances would have to occur frequently before the vehicles reviewed could meet the criteria of 9.2 trips per day.

Appendix 1

SCOPE

The audit was performed at Oakland Operations Office in Oakland, California, and at Lawrence Livermore National Laboratory, in Livermore, California, from August 1999 to May 2000.

METHODOLOGY

To accomplish the audit objective, we:

- interviewed DOE and Livermore personnel;
- examined Federal and DOE property management regulations;
- examined vehicle use standards and analyzed use data for a sample of on-site discretionary vehicles, nondiscretionary operational vehicles, and other purpose vehicles;
- reviewed vehicle justification files;
- observed taxi ridership;
- reviewed contract provisions for Government Performance and Results Act of 1993 performance measures related to the audit objective; and,
- reviewed prior OIG audit reports.

We used statistical sampling methods to select the initial sample of 28 on-site discretionary vehicles, 16 nondiscretionary operational vehicles, and 6 other purpose vehicles. With minor exception, we found that nondiscretionary operational vehicles and other purpose vehicles met the applicable local use standards. Only 11 out of the 28 selected on-site discretionary vehicles had logs or sign-out sheets available for review and none of the 11 met the local use standard. We then expanded the sample of on-site discretionary vehicles by randomly selecting 60 additional vehicles for review. Of the 60 vehicles, only 20 had vehicle logs or sign-out sheets available for review. We statistically evaluated the total sample of 31 on-site discretionary vehicles as described in Appendix 2.

The audit was performed in accordance with generally accepted government auditing standards for performance audits and included tests of internal controls and compliance with laws and regulations to the extent necessary to satisfy the audit objective. Accordingly, we assessed the significant internal controls with respect to fleet

management operations over GSA leased vehicles, including the controls for using, justifying, and monitoring the fleet. Since we relied on computer-processed data stored on Livermore's Fleet Management System, we assessed the reliability of the data on a test basis and concluded that the data could be relied upon. Because our review was limited, it would not necessarily have disclosed all internal control deficiencies that may have existed at the time of our audit. We discussed the finding with representatives of Oakland on June 2, 2000, and Livermore on June 5, 2000.

Appendix 2

Sampling Objectives, Technique, And Evaluation

Objectives

The sampling objective was to determine the number of on-site discretionary vehicles that did not meet the minimum average use criteria of 9.2 trips per day.

Technique

We used the U.S. Army Audit Agency statistical sampling software to randomly select and evaluate the sample. The sampling universe and sampling units consisted of 516 on-site discretionary vehicles in use at Livermore during FY 1999. We established a confidence level of 90 percent with an expected error rate of 50 percent, which resulted in a sample size of 31 vehicles. The sampling units were individual vehicles accounted for in Livermore's Fleet Management System.

We used attribute sampling. The attribute tested was whether a vehicle averaged 9.2 trips per day as required by Livermore's Fleet Management Policies and Procedures. Any vehicle that did not meet the required 9.2 trips per day was considered a sampling error. Vehicle trips were counted based on available vehicle sign-out and log sheets maintained by the vehicle users. Because vehicle sign-out and log sheets were not available for all vehicles we had to select 88 vehicles from the random numbers generated to review usage for 31 vehicles. During the survey phase, which reviewed usage for the months of August and September 1999, 28 vehicles were selected to obtain documentation for 11. During audit verification, which reviewed usage for January and February 2000, we had to select 60 vehicles in order to obtain documentation for 20.

Evaluation

Based on our review of sign-out and vehicle log sheets, none of the 31 vehicles met the usage requirement of 9.2 trips per day. As a result, we are 90 percent confident that none of the 516 vehicles met the daily usage criteria of 9.2 trips per day.

We also used the sample to estimate the number of vehicles needed to meet Livermore's usage requirements. To do so, we determined the number of trips actually taken by the sample units and projected the number of total trips that would have been taken by all 516 on-site discretionary vehicles. The number of total trips was then divided by the standard of 9.2 trips. Based on this projection, Livermore could justify 153 vehicles to meet its established usage standard. Therefore, 363 of the 516 vehicles could be returned to GSA.

Appendix 3

Related Office Of Inspector General Reports

- *Vehicle Fleet Management at the Idaho National Engineering and Environmental Laboratory*, WR-B-99-02, March 8, 1999

  45 percent of light vehicles (232 of 514) were used less than 80 percent of the local mileage standards.

- *Audit of Light Vehicle Fleet Management in the Department of Energy*, DOE/IG-0362, December 5, 1994

  46 percent of vehicles (2,776 of 5,999) at four operations offices were used less than local use standards.

- *Audit of Light Vehicle Fleet Management at the Idaho National Engineering Laboratory*, WR-B-93-7, September 29, 1993

  41 percent of vehicles (232 of 567) were used less than 80 percent of the local mileage standards.

- *Management of Light Vehicles at the Savannah River Site*, ER-L-91-11, September 10, 1991

  22 percent of light vehicles (311 of 1,436) were used less than the local mileage standard.

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