

The goal of the Federal Motor Carrier Safety Administration (FMCSA) is to reduce the number and severity of large truck-involved crashes through more commercial motor vehicle and operator inspections and compliance reviews, stronger enforcement measures against violators, expedited completion of rulemaking proceedings, scientifically sound research, and effective commercial driver's license testing, record keeping, and sanctions.

The Office of Data Analysis and Information Systems develops and maintains systems for collecting and analyzing motor carrier data, and disseminates information on the motor carrier industry.

This Analysis Brief has been produced by the Analysis Division within FMCSA's Office of Data Analysis and Information Systems. The Division analyzes motor carrier data pertaining to crashes, inspections, compliance reviews, and drug and alcohol testing; and supports research on the effectiveness of FMCSA inspection and compliance review programs.



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## Drug and Alcohol Testing Survey

*In 1997, it is estimated that 1.3 percent of drivers with a commercial driver's license (CDL drivers) used controlled substances, and 0.2 percent used alcohol. In 1998, it is estimated that 1.5 percent of CDL drivers used controlled substances and 0.4 percent used alcohol. These year-to-year differences in the estimates are not statistically significant. On the basis of these findings, FMCSA's required testing rate for CDL drivers remained at 50 percent for controlled substances and 10 percent for alcohol for calendar years 1998 and 1999.*

### Background

The Federal Motor Carrier Safety Administration (FMCSA) requires all motor carriers operating vehicles that must be driven by someone holding a commercial driver's license (CDL) to have drug and alcohol testing programs. Such vehicles include trucks with gross combination ratings of over 26,000 pounds, trucks carrying specific hazardous materials that require the vehicle to be placarded in accordance with FMCSA regulations, and buses that are designed to carry 16 or more passengers, including the driver. Carriers must randomly test a fixed percentage of their CDL drivers for both alcohol (for which 10 percent of all drivers must be tested annually) and for a specified set of controlled substances (for which 50 percent of all drivers must be tested annually).

In the case of alcohol, a driver is in violation of FMCSA regulations when the alcohol breath content is 0.02 grams per 210 liters of breath (equivalent to a blood alcohol content (BAC) of 0.02 grams per deciliter). Drivers testing at this level are not permitted to perform safety sensitive functions for at least 24 hours. In addition, drivers who test at the .04 g/dl level or higher must be evaluated by a substance abuse professional and undergo additional testing before being allowed to return to duty. For controlled substances, drivers are tested for marijuana, cocaine, opiates, amphetamines, and PCP. The cutoff levels for identifying the use of these drugs are based on guidelines set by the Department of Health and Human Services (see **Table 1**).

In addition to random testing, the FMCSA's drug and alcohol testing regulations require motor carriers to perform the following types of nonrandom testing: pre-employment testing (for controlled substances only, and only if the driver has not recently been in a drug and alcohol testing program); post-accident testing (if the crash involved a fatality, or if the crash involved a towaway or hospital-related injury and the truck driver received a citation); and testing of any driver who is suspected by a supervisor of using drugs or alcohol while at work. **Table 2** presents the testing requirements for CDL drivers.

Motor carriers must make their annual drug and alcohol summary data available to the FMCSA upon request. This summary information includes the number of drivers tested and the number who tested positive for each test category. Each year, the FMCSA estimates drug and alcohol usage rates for CDL drivers, based upon a



statistical sample of such summary information collected from motor carriers (in the case of alcohol, FMCSA defines the positive usage rate in terms of testing at or above the 0.04 BAC level). Estimates from the annual survey are used to evaluate the agency's required random testing rates (the percentage of employees that need to be tested annually by each carrier) for both alcohol and controlled substances. Currently, these rates are set at 50 percent of the carrier's CDL drivers for controlled substances and 10 percent of its CDL drivers for alcohol.

## Regulatory History

The FMCSA drug testing requirements for motor carriers began in 1989, when interstate motor carriers domiciled in the U.S. with 50 or more CDL drivers were required to implement controlled substance testing programs (49 CFR part 391 subpart H). Interstate carriers with fewer than 50 CDL drivers became subject to these requirements one year later. Beginning in 1995, a new set of requirements (49 CFR part 382) took effect in response to the passage of the Omnibus Transportation Employee Testing Act of 1991. Part 382 expanded the scope of motor carriers covered by federal drug testing regulations to include large intrastate carriers (50 or more CDL drivers) by 1995 and all interstate and intrastate carriers with CDL drivers by 1996. In addition to controlled substance testing, part 382 required the implementation of alcohol testing programs. Beginning in 1996, all motor carriers operating in the U.S. (both domiciled and foreign-based) became subject to these new regulations.

**Table 1.**  
**Cutoff Levels for Identifying Drug Use Among CDL Drivers**

Substance	Cutoff Levels
Alcohol	.02 g / 210 liters breath*
Marijuana	15 ng / ml**
Cocaine	150 ng / ml
Opiates (morphine, codeine) 6-Acetylmorphine	2000 ng / ml 10 ng / ml***
Amphetamines amphetamine methamphetamine	500 ng / ml 500 ng / ml****
Phencyclidine (PCP)	25 ng / ml

\*Note that FMCSA's estimated violation rate is based on a cutoff of .04 g / 210 liters.

\*\*Nanograms per milliliter (one nanogram equals one billionth of a gram).

\*\*\*Test for 6-AM when morphine concentration exceeds 2,000 ng / ml.

\*\*\*\*Specimen must also contain amphetamine at 200 ng / ml or higher.

## Methodology—Data Collection

Each year, eligible motor carriers are selected into the survey by means of a stratified random sample. In this approach, all eligible motor carriers are classified before sample selection into size class groupings (or strata), based on their number of CDL drivers. A random sample of carriers is then selected in each size class stratum. Stratification helps to ensure that the sample is representative and also increases the precision of the estimates. Both random and nonrandom testing summary data are collected from the motor carrier.

For this survey, six size class strata are used:

- 1–19 CDL drivers,
- 20–49 CDL drivers,
- 50–99 CDL drivers,
- 100–999 CDL drivers,
- 1,000 or more CDL drivers, and
- size unknown.

**Table 2.**  
**Motor Carrier Testing Requirements for CDL Drivers**

Type of Test	Drivers to be Tested
Random Controlled Substance Testing	50% of all company CDL drivers per year.*
Random Alcohol Testing	10% of all company CDL drivers per year.*
Post Accident Testing Fatal Crashes Nonfatal Crashes	All CDL drivers involved CDL drivers receiving citations, if crash involves towaway or hospital-related injury
Reasonable Suspicion Testing	Any CDL driver suspected by supervisor of using alcohol or controlled substances on the job

\*If random testing is conducted through a consortium, the number of drivers to be tested may be based on the total number of drivers covered by the consortium, rather than the total number of drivers in the company.

To maximize the precision of the survey estimates, all eligible motor carriers

from the largest size class stratum (1,000 or more CDL drivers) are selected into the sample with certainty.

In the case of random testing, the sample can be viewed as a two-stage design in which the motor carrier is selected in the first stage and a subsample of its CDL drivers is selected in the second. In the case of nonrandom testing, the sample represents a single-stage design in which each sampled motor carrier reports the results for all drivers subject to preemployment, post-accident, and reasonable suspicion testing.

## Results

### Random Testing

For the 1997 survey, 4,008 motor carriers were solicited. 1,462 of these carriers provided summary data for controlled substance random testing and 1,294 provided data for random alcohol testing. For the 1998 survey, 4,019 carriers were solicited, of which 1,266 provided random testing data for controlled substances and 1,130 provided random testing data for alcohol. (This decrease in the number of carriers providing random alcohol testing data from 1997 to 1998 was to be expected, since FMCSA's required driver testing rate for alcohol dropped from 25 percent to 10 percent of CDL drivers beginning in 1998; as a result of this change, the number of carriers in consortia with no drivers selected for alcohol testing increased.) Survey estimates based on random testing for each year are shown in **Table 3** (results for calendar year 1996 are also shown for purposes of comparison).

As indicated in the table, the positive rate for controlled substance use in 1997 is estimated to be 1.3 percent with a standard error estimate of .16 percent. Based on these results, a 95 percent confidence interval on this estimate ranges from 1.0 to 1.6 percent ( $0.013 \pm 1.96 \times 0.0016$ ). Thus, if the survey had been replicated, one would have expected the estimate to have fallen within this range in 95 out of 100 replications. The positive rate for alcohol use in 1997 is estimated to be 0.2 percent with a standard error estimate of 0.1 percent. These results suggest that a 95 percent confidence interval for the positive rate for alcohol ranges roughly from zero percent to 0.4 percent.

The positive rate for controlled substance use in 1998

**Table 3.**  
Estimated Positive Rates from  
Random Drug and Alcohol Testing  
1996, 1997, and 1998

Areas of Testing	Positive Rate		
	1996	1997	1998
Controlled Substances	2.2%	1.3%	1.5%
(Standard error estimate)	(0.4%)	(0.16%)	(0.2%)
Alcohol (>=0.04 BAC)	0.2%	0.2%	0.4%
(Standard error estimate)	(0.03%)	(0.1%)	(0.1%)

Source: Federal Motor Carrier Safety Administration

is estimated to be 1.5 percent of all CDL drivers, with an estimated standard error of 0.2 percent. Based on these results, a 95 percent confidence interval for this estimate ranges from 1.1 percent to 1.9 percent ( $0.015 \pm 1.96 \times 0.002$ ). The positive rate for alcohol use in 1998, based on random testing, is estimated at 0.4 percent, with a standard error estimate of approximately 0.1 percent. Based on this level of precision, the 95 percent confidence interval for the estimate ranges approximately from 0.2 percent to 0.7 percent.

Based on the results of the 1996 survey, the alcohol random testing rate for motor carriers was lowered from 25 percent to 10 percent of each carrier's CDL drivers for calendar year 1998, in accordance with federal regulations (49 CFR, part 382). These regulations stipulate that when the required testing rate for alcohol is 25 percent or higher, the FMCSA may lower the testing rate to 10 percent if the positive rate for alcohol usage among CDL drivers is estimated from the survey to be less than 0.5 percent for 2 consecutive years.

The survey results for calendar years 1997 and 1998 suggest that the positive rates for controlled substance use and alcohol use are approximately the same for the 2 years. (The differences in the year-to-year estimates are not statistically significant and cannot be shown to be a product of real differences in the population over time, rather than a product of statistical sampling error.) Furthermore, the 1997 and 1998 survey estimates do not suggest that the required random testing rate for controlled substances or alcohol should be changed. For the controlled substance random testing rate to be lowered (now at 50 percent of CDL drivers), the controlled substance usage rate estimated from the survey must be less than 1 percent for 2 consecutive years, in accordance with FMCSA regulations. For random alcohol testing, the testing rate is currently at the minimum allowable by FMCSA (10 percent). In

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**Availability**

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**Key Words**

motor carriers, CDL drivers, alcohol usage, controlled substance usage, positive rate, testing rate, random testing, nonrandom testing, sample survey.

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order for this rate to be raised, the alcohol usage rate from the survey must be estimated to be more than 0.5 percent in a given survey year.

**Nonrandom testing**

The number of tested drivers evaluated by the survey each year has been too small to produce reliable estimates of a usage rate for many of the nonrandom testing categories, particularly for alcohol testing. In 1997, the largest number of nonrandom tests captured by the survey was in pre-employment controlled substance testing, where over 280,000 cases were reported. On the basis of these cases, it is estimated that in 1997, 2.0 percent of CDL drivers undergoing pre-employment testing tested positive for controlled substances. In 1998, the results were the same, based on over 260,000 cases.