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There are eight major research and technology focus areas: regulatory evaluation and reform; compliance and enforcement; driver training and performance management; driver alertness and fatigue; driver physical qualifications; car-truck proximity; HAZMAT safety and cargo tank integrity; and crash causation and profiling.

Driver physical qualifications concentrates on the research of specific medical conditions in relation to CMV driving safety, with emphasis on medical standards guidelines.



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Qualifications of Drivers — Vision and Diabetes

Introduction

The Federal Highway Administration (FHWA) began the Federal Waiver Study Program in 1992. The program was initiated as a response to ongoing assessments of existing medical standards in the Federal Motor Carrier Safety Regulations (FMCSRs) and a directive by several Congressional committees to the FHWA to undertake a thorough review of its physical qualification regulations. The FHWA is authorized by statute to establish minimum driver qualifications for those who operate commercial motor vehicles (CMVs) in interstate commerce. The waiver program allowed CMV operators who did not meet current Federal standards for specified medical conditions to drive in interstate commerce.

The conditions originally chosen for the study were vision and hearing impairments, diabetes, and epilepsy. Because of the decision in *Advocates for Highway and Auto Safety v. Federal Highway Administration* (28 F. 3d 1288, D.C. Circuit 1994), which vacated the rule authorizing the waivers, the FHWA did not initiate the hearing and epilepsy waiver study programs. Although this decision directly affected the vision waiver program, it also had an indirect effect on the other waiver study programs because of the similar approach used to pre-qualify drivers.

This tech brief summarizes the study final report, "Qualifications of Drivers — Vision, Diabetes, Hearing and Epilepsy," which is now available from the National Technical Information Service.

Purpose

The goal of the Federal Waiver Study Program was to determine the associated risk, based on accident involvement, of allowing CMV operators who do not meet Federal standards for specified medical conditions to drive interstate. The assessment was accomplished by comparing the accident involvement rates of waived drivers to drivers who did meet the current standards.

The objective of the study was to use the assessment to aid in determining if current standards could be amended without imposing additional safety risks on the public.

Methodology

Original Study Design

The Vision Waiver Program began in July 1992, when 2,686 drivers were accepted into the program. The Diabetes Waiver Program began in mid-1993 when 139 waivers were issued. To be accepted into the program, drivers must have operated a CMV with a vision deficiency or diabetic condition for the three-year period preceding the waiver program with no suspensions or revocations of their driver's license during this period. Drivers were also required to see a doctor who certified that the driver was able to operate a CMV safely, despite his medical condition.



To retain their waivers, drivers had to submit information about driving experience, including mileage driven and accident and citation information, plus show evidence of continued good health.

The original design of the study was an observational, nonrandomized model with a prospective cohort structure. A lawsuit, however, prevented the execution of the study and the program was converted to a monitoring program. Because researchers encountered difficulties recruiting volunteers for a "control" group, the accident experience of the waived drivers was compared to the data in the General Estimates System (GES), which represents a national safety norm for large trucks in the U.S.

The GES is based on a probability sample of about 45,000 police accident reports selected on an annual basis. Since 1988, GES has oversampled accidents involving large trucks; trucks are included in this sample if the vehicle is over 10,000 lbs. and at least one passenger vehicle was towed or an involved person was injured.

Safety Monitoring

Safety monitoring was designed to notify the FHWA if a threat to public safety was occurring. The monitoring involved comparing the accident rates of the waived drivers to the national rates derived from the GES. The overall accident rates of the waived group represent the cumulative number of accidents for drivers still in the program at the time of the report.

To determine if the waived drivers in the vision program posed an excessive threat to public safety, the monitoring process used the 90 percent confidence intervals associated with each cumulative accident rate. If the lower limit of that confidence interval did not exceed the national accident rate, which was treated as a constant, the drivers in that program were not considered a threat to public safety.

In determining if the waived drivers in the diabetes program posed an excessive threat to public safety, researchers decided that sampling error and confidence intervals would play no role in the decision process. This was done because the small sample of drivers who received diabetes waivers would lead to wide confidence intervals. If the accident rate of the waived group was larger than the national rate, the FHWA was notified that there could be a threat to public safety. Again, the national accident rate is treated as a constant since it is frequently expressed as an official rate without a confidence interval.

AHAS Lawsuit

A lawsuit was filed by the Advocates for Highway and Auto Safety (AHAS) challenging the Vision Waiver Program. AHAS argued that the FHWA had not given adequate opportunity for public comment on the waiver program. The case was argued on November 13, 1993 and the Court's decision was announced in August 1994. The United States Court of Appeals for the District of Columbia Circuit found that the FHWA had given ample opportunity for comment and that the comments were given due consideration.

However, the Court did find that the adoption of the Vision Waiver Program by the FHWA was contrary to law. To satisfy the Motor Carrier Safety Act of 1984, waivers must uphold the requirement that there will "not be any diminution of safety resulting from the waiver." The Court found no empirical support that the Vision Waiver Program upheld this requirement, and vacated and remanded the rule that set up the program.

Additional criteria were developed that the currently waived drivers would have to meet in order to retain their waivers, and the FHWA promised to improve its monitoring systems to promptly identify substandard performers within the waived groups.

Modified Study Design

In February and March 1995, the FHWA reissued all waivers for both the Vision Waiver Program and the Diabetes Waiver Program with a single expiration date of March 31, 1996. Drivers were informed in an accompanying letter of the new expiration date and of changes in the monitoring system and criteria for retaining waivers.

The most important difference resulting from the change in the waiver program came in the area of tracking accidents and citations. The monitoring changes meant that all incidents not only had to be scrutinized for timely reporting, but also evaluated for the severity of the incident and resultant charges against the waived driver. A check of every driver's motor vehicle history was completed monthly, rather than every 6 months, as was originally planned.

Results

There were 2,234 drivers still participating in the Vision Waiver Program in November 1995. From August 1992 to November 1995, 510 accidents were reported for these drivers. Also for this period, waived drivers self-reported a total of 299 million vehicle miles traveled (VMT). This shows an accident rate of 1.076 accidents per million VMT.

Table 1.

Comparison of accident rates of CMV drivers with vision waivers to national accident rates.

	Waiver Group Accident Rate (No. of accidents)	90% Confidence Interval	National Accident Rate (No. of accidents)
Total Accidents	1.706 (510)	1.582, 1.830	2.605 (444,000)
Accident Severity			
Property Damage Only	1.284 (384)	1.177, 1.392	2.048 (349,000)
Injury Involved	.408 (122)	.347, .469	.534 (95,000)
Fatality Involved	.013 (4)	.002, .024	.026 (4,615)

* Accident rates calculated per million vehicle miles traveled.

Table 2.

Comparison of accident rates of CMV drivers with diabetes waivers to national accident rates.

	Waiver Group Accident Rate (No. of accidents)	National Accident Rate (No. of accidents)
Total Accidents	2.309 (13)	2.605 (444,000)
Accident Severity		
Property Damage Only	1.776 (10)	2.048 (349,000)
Injury Involved	.533 (3)	.534 (91,000)
Fatality Involved	.000 (0)	.026 (4,615)

* Accident rates calculated per million vehicle miles traveled.

The data from the GES stated that there were an estimated 444,000 large truck accidents in 1994 in the United States, and the FHWA has calculated that large trucks had 170,415 million VMT in 1994. These data give an accident rate of 2.605 accidents per million VMT. A comparison of the waiver group accident rate and the national accident rate is shown in **Table 1**. Since the waiver rate was lower than the national rate, it appears that the waiver group does not present a threat to public safety.

As of November 1995, there were 118 drivers still participating in the Diabetes Waiver Program. From September 1993 to November 1995, there were 13 accidents reported for this group. For the same period, waived drivers self-reported 5.63 million miles traveled. These data give an accident rate for waived drivers. **Table 2** compares the accident rates for Diabetes Waiver Program drivers with the national accident rate in 1994. Again, the accident rate for waived drivers was less than the national accident rate, suggesting that the waived drivers are not a highway safety threat.

On March 26, 1996, the FHWA published a decision to allow remaining participants in the Vision and

Diabetes Waiver Programs to continue to operate CMVs in interstate commerce after the expiration of the waiver program. All drivers in good standing in the program were exempted from the relevant medical regulation (vision or diabetes) through an amendment to the FMCSRs. The FHWA indicated its intention to monitor driver performance through periodic checks of driving records.

Limitations

The planned prospective study was never completed. The only quantitative results available from this program were embodied in the series of monitoring reports and a final risk analysis. The risk analysis was performed to support the grandfathering of drivers to permanent waiver status after the program was closed. The generalizability of the quantitative results is, therefore, quite limited. In the first place, it was expected that those drivers receiving waivers would perform well because they were screened prior to receiving a waiver. One of the screening criteria was a three-year safe driving record prior to entering the program. This type of record is one of the better predictors of subsequent driving behavior so there was an expectation that they would perform better than the national rate. Moreover, interim risk analyses

Researcher

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Distribution

This Tech Brief is being distributed according to a standard distribution. Direct distribution is being made to the Resource Centers and Divisions.

Availability

The study final report is available from the National Technical Information Service, Telephone: (703) 605-6000. Order No. PB-98-142649.

Key Words

driver qualification, vision, diabetes, risk assessment, commercial motor vehicle, interstate commerce, commercial drivers, monitoring protocol, screening protocol, Federal Motor Carrier Safety Regulations.

Notice

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indicated that monitoring is a powerful process for producing safe driving behavior. As a result, safe driving was not only expected, but was reinforced by a form of social control. In this sense, the project was not so much a study of the behavior of the waived driver in general as it was a test of the feasibility of a waiver program.

Further Research

Vision Research

Based on limitations in the study design, the FHWA determined that the safety performance data collected under the vision waiver study program would not be used as the basis for any future adjustments to the vision standard. In November 1994, the FHWA announced its intention to initiate a separate research effort to explore performance-based alternatives to the current vision standard. Based on comments received from the publication of a Federal Register Notice and a public hearing, the FHWA decided not to proceed with its proposed plan to develop a performance-based vision standard.

In 1997, the FHWA contracted with the Beth Israel Deaconess Medical Center in Boston, Massachusetts, to establish a small panel of medical experts to review the current vision requirements and make recommendations for possible amendments to the present vision standard. The medical panel report is complete and its recommendations are under review.

Diabetes Research

The FHWA is conducting research to: 1) assess the level of risk associated with the operation of CMVs by insulin-using drivers, and 2) determine if it is practical and cost-effective to have a program that allows individuals with insulin-treated diabetes mellitus to operate a CMV. A final report on this study will be completed by January 2000.

The agency has also convened a panel of medical experts to review the diabetes regulations and guidelines under Part 391 of the FMCSRs and make recommendations for amending the current Federal diabetes standard.