Death Count May Be Too Low

How often do cars and other passenger vehicles slide into and under the rear of big truck rigs, killing the people in the passenger vehicles? Underride crashes may happen more than twice as often as the National Highway Traffic Safety Administration (NHTSA) recognizes.

Institute researchers analyzing NHTSA data files have discovered that many states don’t identify any fatal rear-end truck crashes as involving underride. These omissions lead researchers to conclude that many more deaths may be occurring in underrides than the average of 72 annually that NHTSA recognizes.

In California, for example, 24 percent of all 1989 passenger vehicle occupant deaths that occurred in rear-end truck and parked vehicle crashes are identified in NHTSA data files as involving underride. But, in 36 states and the District of Columbia, not a single one of the 400 passenger vehicle occupant deaths in such crashes is identified as involving underride. (See table on page 2.)

Institute researchers scrutinized police reports for the 1989 California crashes identified as underrides and verified them as such. “It’s more than likely a coding problem that’s keeping more crashes nationwide from being properly identified as underrides,” says Institute President Brian O’Neill. Police reports don’t always include enough information to determine whether individual crashes involve underride, so the crashes don’t get coded as such in NHTSA’s data system.

As many as 151 deaths in underride crashes may be occurring each year — not the 72 NHTSA recognizes — if the proportion of underride crashes in California holds true for the nation as a whole.

“If underrides are underreported, and it appears they are, then it’s all the more reason to get on with federal rulemaking for improved underride guards,” O’Neill says. NHTSA’s recent proposal to require lower, stronger guards on truck trailers is the agency’s sixth announced plan to upgrade a 1953 underride regulation that’s still in force. Proposals were issued — then abandoned — in 1967, 1969, 1970, 1977, and 1981. (See Status Report, Vol. 27, No. 2, Feb. 8, 1992.)

Referring to the likely underreporting of underrides, the Institute says NHTSA should amend its data-gathering processes to more accurately identify such crashes. Plus, Institute researchers have identified the following shortcomings in NHTSA’s proposed underride guard requirements:

Guards Too High The proposed 22-inch maximum ground clearance for rear underride guards is preferable to the 30 inches now allowed, but it’s still way too high. It will fail to prevent many underrides and won’t take full advantage of automobile safety technology like air bags, the Institute says. A 20-year-old NHTSA
study recommends 18-inch clearance from the ground. At least one U.S. freight carrier regularly sets the rear impact guards on its trucks at 19.5 inches.

NHTSA notes that loaded trailers probably sit closer to the ground than unloaded ones, so underride guards are likely to be positioned lower than 22 inches. Not enough lower, the Institute counters. The trailers with the heaviest loads examined by Institute researchers sank only an inch or two. Some stayed the same height or even rose when loaded.

Truck underride guards should be set no higher than 18 instead of 22 inches from the ground, the Institute advises. Otherwise, a guard that’s set too high can contact a car halfway up the hood instead of at the bumper. This means crush space is reduced, and higher crash forces are transmitted to car occupants. Another reason for lower guards involves air bags. More cars than ever have them — soon all new ones will — and a truck underride guard that’s too high means the bags’ sensors may be activated too late for maximum occupant crash protection.

Too Many Exemptions NHTSA is proposing rear underride requirements only for the trailers of combination rigs. The proposed rule also should apply to single-unit trucks weighing more than 10,000 pounds, the Institute says, because such vehicles account for 36 percent of all truck miles traveled and 25 percent of all deaths in crashes in which cars hit the backs of trucks.

Inadequate Tests NHTSA’s own tests show the failure of underride guards that would meet the agency’s proposed requirements. The contractor who conducted the tests concluded that the part of the truck rig to which the guard is attached would have to be strengthened to prevent failure. However, NHTSA isn’t proposing to require such strengthening for underride guards. Nor is the agency planning for manufacturers to conduct tests to determine how much added strength is needed.
Underride guards should be either tested as installed on vehicles or at least tested with the truck frame parts to which the guards would be attached, the Institute advises. The guard or trailer manufacturer should certify that the entire assembly meets federal requirements and won’t fail.

NHTSA should also conduct crash tests to monitor the new underride standard. For example, tests should be conducted to find out whether guards would trigger air bag deployment early enough in the crash sequence to afford full protection to passenger vehicle occupants.

Energy Absorption Not Required
Care should be taken so underride guards aren’t completely rigid, the Institute says. Automobile occupants are best protected by energy-absorbing guards, the Institute notes, so NHTSA’s final rule should require such guards. The proposed rule would permit some energy-absorbing designs but might exclude others.

Side Underrides, Front Overrides
The Institute also says NHTSA should be addressing side underrides, noting that deaths in such crashes “are at least as common as those associated with rear underride crashes.” A similar number of deaths result from trucks overriding the fronts of passenger vehicles.

Get on with it, the Institute advises NHTSA. “Twenty years is long enough” to wait for improved rear underride guards.

What Others Say . . .

Among comments on NHTSA’s underride proposal from organizations other than the Institute are those of the Advocates for Highway and Auto Safety, which expresses its “deepest disappointment over the character” of NHTSA’s proposal.

Furthermore, the Advocates group says, “close inspection of the administrative record of this rulemaking shows NHTSA has consistently ignored, discarded, or rationalized countervailing evidence . . . that the agency’s design approach to truck underride crashes cannot meet the needs of the American automobile fleet.” This group calls on NHTSA to withdraw its underride proposal and substitute more stringent requirements.

New York State’s Attorney General points out that NHTSA’s plan to apply underride requirements only to tractor-trailers “should be reconsidered” in light of the “modest costs” of applying requirements to single-unit trucks too. A trucking industry group, the Specialized Carrier and Rigging Association, agrees that underride rules should apply to single-unit trucks.

The American Trucking Associations (ATA) has a different view. It supports NHTSA’s modest proposal to improve rear underride guards, including the 22-inch height requirement, even though it claims that currently mandated guards have “generally been adequate” and that an underride crash “is essentially a fatal encounter above 35 mph” no matter what kind of guard is fitted to a truck.

This kind of caution is in keeping with previous ATA comments. After years of dialogue about how best to improve underride guards, this organization noted in 1986 that “minor changes of the present regulation are all that is necessary.”

ATA’s alternative to improving truck underride guards involves vehicle conspicuity. Making truck rigs easier for motorists to see “in certain cases . . . might help completely avoid the incident” of underride, ATA claims.
Record Response to FHWA's Proposed Ban on Radar Detector Use in Commercial Vehicles

A federal proposal to ban radar detectors in commercial vehicles engaged in interstate commerce is supported by more than 5,000 law enforcement officers, corporations, and concerned citizens including police and transportation officials in 42 states. No previous Federal Highway Administration (FHWA) proposal has generated as many responses as this one, according to a longtime FHWA recordkeeper.

The proposed rule is the latest in a series of attempts to prohibit radar detector use in trucks and buses. The institute, together with the American Automobile Association, American Trucking Associations, International Association of Chiefs of Police, and National Safety Council, petitioned FHWA in 1988 and again in 1990 to impose such a ban. Advocates for Highway and Auto Safety, Public Citizen, and the National Association of Governors' Highway Safety Representatives joined the 1990 petition. (See Status Report, Vol. 25, No. 7, Aug. 11, 1990.) Finally, the U.S. Congress directed the Department of Transportation to propose the radar detector ban no later than January 15, 1992.

"Radar detectors have only one demonstrable purpose— to help speeding drivers avoid radar speed limit enforcement," says Allan F. Williams, the institute's senior vice president for research, in comments supporting the ban. The Institute cites research showing that high-speed travel is associated with increased injury and death. Radar detectors encourage illegal high speeds, and the use of radar detectors is highest in large trucks. Speeding trucks are of special concern because of their large size, more limited maneuverability, and longer stopping distances compared with speeding cars.

Bans Cut Speeding, Crashes. FHWA also asked for evidence that radar detector bans reduce "speeding, accidents, injuries, and fatalities." Institute surveys found evidence that truck speed reductions can be achieved by reducing detector use. Although most truck drivers have other means of evading speed law enforcement (CB radios, for example), truck speeds were reduced significantly in Virginia after the ban was enforced. Truck speeds in New York remained about the same during the first year of the ban, but almost twice as many trucks were traveling at least 10 mph faster than the speed limit on interstate 81 in Pennsylvania, where detectors are permitted, as on I-81 in New York.

A new study in Canada comes closest to isolating the effect on crashes of radar detector use. This study compares 175 drivers who purchased insurance coverage for in-vehicle equipment including radar detectors from the Insurance Corporation of British Columbia with a matched group of other insured drivers. The comparison group was matched to the radar detector group on age, gender, vehicle value, and indicators of amount of driving. Radar detector users had about twice as many crash claims as the matched comparison group during 1986-89. The authors conclude that "within the limits of available data, we can state that the higher accident claims and convictions for the radar detector users were not likely a result of greater driving exposure." This study isn't without limitations, but it does indicate a very strong association between radar detector use and crashes.

Enforcement Is Reliable, Worth Cost to Police Forces. In Virginia and New York tell FHWA that VG-2s represent a reliable, accurate, and cost-effective method of enforcing a radar detector ban. As of April 1992, more than 37,000 vehicles had been stopped by Virginia police on the basis of VG-2 signals, with citations for radar detector violations issued in 97 percent of the stops. New York State Police told FHWA that these devices "were placed in field service in early 1991 and resulted in the issuing of over 4,000 tickets for commercial motor vehicles using a radar detector. These devices have proven extremely accurate in field operations and have been eagerly accepted and utilized by field personnel."

Lanes Too Narrow to Safely Accommodate Today's Wide Rigs

A government-sponsored study shows drivers of 102-inch wide rigs have a significantly higher time staying inside 12-foot lanes than do drivers of 96-inch wide trucks. The wider rigs crossed the outside lane edges when meeting opposing vehicles 23 percent of the time compared with 12 percent for 96-inch rigs and 5 percent for passenger cars.

Evaluation of the effects of allowing 102-inch wide tractor-trailers to operate on narrow roads was conducted by the University of North Carolina's Highway Safety Research Center and the Science Institute for the National Highway Administration (FHWA). Using video cameras, researchers collected data on mostly high-speed rural two- and multiple-lane roads, where they found that the wider rigs tend to encroach on lane edges and are engaged closer to the center line than the 96-inch wide tractor-trailers used to be the industry standard.

In 1982, Congress permitted 102-inch wide trucks to travel on interstate and other roads designed with lane widths of 12 feet or more. Since the law was passed, however, many such roads have been reconfigured to increase the number of lanes, decreasing lane widths to 10 or 11 feet in some places. But because the roads were originally designed for wider lanes, FHWA interpreted the law to continue to permit the wider rigs to travel in the narrowed lanes. Citing safety concerns, officials in some states have limited 102-inch wide tractor-trailers to relatively few roads. For some time, however, the trucking industry has pressured FHWA to override state concerns and include more roads among those allowing wider rigs. "If roadway improvements cannot be economically justified," the researchers state, "consideration then should be made to prohibit the larger trucks (102-inch doubles and semis longer than 45 feet) on selected roadways with inadequate geometry."

In another study, the U.S. General Accounting Office (GAO), an arm of Congress, says not enough is known about the safety performance of longer commercial vehicles, or LCVs, which exceed 25 feet. LCVs include tractor-trailer combinations such as Rocky Mountain doubles—tractors hauling 45- or 48-foot trailers combined with a 26- or 28-foot "pup," or two 45- or 48-foot trailers, or triples. Such truck rigs are permitted in 20 states, mostly western ones, but they are prohibited elsewhere.

Different states have reached "widely different conclusions" about the safety of multiple-trailer trucks, GAO notes. Chief among concerns about LCVs are tendencies for the trailers to sway and for quick steering movements to be amplified toward the rear of the vehicle in a "crack the whip" effect. Trailer sway—that is, the side-to-side movement of multiple trailers—can be worsened by poor maintenance conditions between trucks, uneven roads, rutted highways, or wind gusts. Off-tracking, which occurs when trailer rear wheels fail to follow the path of the tractor's front wheels, also appears to be more of a problem for LCVs than for combination vehicles that aren't as long. Braking is a cause for concern, too, chiefly because the rigs require longer stopping distances and have more brakes to keep properly adjusted. Another concern is that LCVs often lack the acceleration needed to move smoothly with traffic, the report says. "Two key factors that could impact the future safety of LCVs are projections for an increase in traffic density and a shortage of experienced truck drivers," GAO points out. It adds that LCVs operating in western states are likely to encounter heavier traffic in future years than they do today.

Lanes Too Narrow to Safely Accommodate Today's Wide Rigs
Shippers Spell Relief: L-O-N-G-E-R H-O-U-R-S

Bush’s Regulatory Relief Package Could Compromise Interstate Truck Safety

The Federal Highway Administration (FHWA) will soon issue a revised hours-of-service proposal that would allow truckers to legally pack more driving time into fewer days. The action is part of a larger regulatory relief package ordered by the White House.

In a Transportation Department report to President Bush, FHWA recommends that truckers be allowed to restart their log-keeping clocks after only 24 hours off duty. This would let drivers work as many as 120 hours during 8 days, including as many as 100 hours of driving. As it stands now, drivers can spend no more than 70 hours working, including driving time, during 8 days. The proposal came at the behest of the Interstate Truckload Carriers Conference, an affiliate of the American Trucking Associations (ATA).

“If this proposal is adopted, we’re likely to see a bad situation grow worse,” says Allan F. Williams, senior research vice president of the Institute. “Studies indicate that driver fatigue plays a substantial role in heavy truck crashes.”

Evidence is conclusive that many long distance drivers are overtired, Williams notes. A recent Institute survey found nearly three-fourths of long distance haulers saying they routinely drive or work more than current rules allow. More than one-fourth indicated they regularly work 100 hours or more per week. Nineteen percent admitted they had fallen asleep at the wheel during the month preceding the interview. (See Status Report, Vol. 27, No. 2, Feb. 8, 1992.)

Another regulatory relief proposal involves the definition of “commercial motor vehicle.” FHWA says it will change the definition to exclude vehicles with a gross vehicle weight rating of less than 26,001 pounds in order to end federal safety regulation of many single-unit trucks and their drivers. Typical of this weight class are soft drink trucks and other delivery vans used in short distance hauling. Vehicles in this weight range traveled over 18 billion miles in 1987, the latest year for which travel data are available. In 1989, a total of 672 medium trucks (less than 26,000 pounds) were involved in fatal crashes.

The proposed definition change is less than welcome to ATA’s John Collins, vice president for law, who says that without federal regulation the smaller trucks could be subject to a confusing array of state regulations. “Uniformity promotes safety,” says Collins, noting that many commercial delivery trucks routinely operate across state lines to cover metropolitan areas.

Another proposal would drop accident reporting requirements for commercial motor carriers because, FHWA points out, state police agencies now are responsible for placing reports into a national data base. FHWA says the police reports are more accurate and less biased than those from trucking companies.

cant deterioration in truck drivers’ steering performance over a six-day period.

Vernon McDougall, director of safety and health for the Teamsters Union, says the effect of the regulatory change will be to legalize currently illegal and dangerous scheduling practices. “What it’s doing is, practices acknowledged to be dangerous today will simply be legal when this goes through,” says McDougall. The proposed change could go even further, giving shippers more power to demand tighter delivery schedules from a trucking industry now under enormous competitive pressure to meet those demands.

Another regulatory relief proposal involves the definition of “commercial motor vehicle.” FHWA says it will change the definition to exclude vehicles with a gross vehicle weight rating of less than 26,001 pounds in order to end federal safety regulation of many single-unit trucks and their drivers. Typical of this weight class are soft drink trucks and other delivery vans used in short distance hauling. Vehicles in this weight range traveled over 18 billion miles in 1987, the latest year for which travel data are available. In 1989, a total of 672 medium trucks (less than 26,000 pounds) were involved in fatal crashes.

The proposed definition change is less than welcome to ATA’s John Collins, vice president for law, who says that without federal regulation the smaller trucks could be subject to a confusing array of state regulations. “Uniformity promotes safety,” says Collins, noting that many commercial delivery trucks routinely operate across state lines to cover metropolitan areas.

Another proposal would drop accident reporting requirements for commercial motor carriers because, FHWA points out, state police agencies now are responsible for placing reports into a national data base. FHWA says the police reports are more accurate and less biased than those from trucking companies.

Speed Limiters in Europe

Beginning January 1, 1994, new trucks and buses registered in the European Community must be equipped with speed limiters. The regulation has been under consideration since last year. (See Status Report, Vol. 26, No. 7, Aug. 3, 1991.) It calls for trucks weighing more than 12 metric tons to be fitted with speed limiters set at 90 kmh (approximately 56 mph) and for buses over 10 metric tons to be limited to 100 kmh (62 mph). Member states are authorized to require limiters to be set at less than 85 kmh (53 mph) on vehicles registered in their countries that transport dangerous goods.

The requirements will be phased in for existing vehicles. January 1, 1995 is the deadline for trucks and buses registered between January 1, 1988 and January 1, 1994 that are used internationally. If a vehicle is used in only one country and only for “national transport operations,” its owner has until January 1, 1996 to have a speed limiter installed.

Last year the United Kingdom implemented its own regulations requiring trucks weighing more than 7.5 metric tons to be equipped with speed limiters set at 60 mph and restricting all long distance buses to 70 mph. The new European Community regulation replaces national limits, but vehicles registered before January 1988 are exempt.
Ways to Reduce Tractor-Trailer Occupant Deaths

When it comes to fatal tractor-trailer crashes, the deaths usually involve occupants of the other vehicle, not the truck. In 1991, though, 422 of the people who died in tractor-trailer crashes were truck occupants. A new study from the University of Michigan Transportation Research Institute (UMTRI) focuses on deaths among tractor-trailer occupants.

About 59 percent of fatally injured tractor-trailer drivers died in crashes involving rollover during 1980-86. Forty percent died in frontal crashes. Eighty percent of the crashes with truck driver fatalities involved a single vehicle. About a third of the fatally injured drivers were ejected.

Using data from their own files plus information from the National Highway Traffic Safety Administration and case studies compiled by the National Transportation Safety Board, UMTRI researchers found that tractor-trailer drivers are about 10 times as likely to be injured in rollover crashes as nonrollovers. “Existing cab structures . . . are not sufficient to withstand the forces produced during rollover,” the researchers explain.

The position of the cab matters when it comes to surviving a crash. Some rigs are cabover style, with the occupant compartment located above the engine. Restrained drivers in this kind of rig have a 40 percent higher risk of death than restrained drivers in rigs with conventional cabs located behind the engine. Intrusion into the cab was severe enough to preclude driver survival in 80 percent of the deaths of drivers in cabover rigs, compared with 65 percent of driver deaths in conventional rigs. Cabover drivers also have a 50 percent higher risk of ejection in fatal frontal impacts.

In addition to describing the relationship between tractor-trailer collision types and severities and the likelihood of occupant survival, UMTRI researchers also examined the effects of specific measures to reduce tractor-trailer occupant deaths. Their suggestions include these:

1. Prevention of ejection by itself has the potential to “prevent 16 percent of all tractor-trailer driver fatalities . . . . Restraint use has been shown to be effective in preventing ejection. However, windshield retention would also prevent the majority of ejections.”

2. “The next focus must be on maintaining sufficient survival space for the occupant, particularly in rollover” crashes.

Improved cab structure would prevent 23 percent of tractor-trailer driver deaths, the UMTRI researchers estimate.

3. Improving the interior of the occupant compartment, particularly the steering column, would reduce deaths. But researchers add that “restraint use is likely to be necessary for the occupant to benefit from improved structural integrity.”

“Crashworthiness of Large-Truck Cabs” by Kenneth L. Campbell and Kathleen P. Sullivan appears in UMTRI Research Review, Vol. 22, No. 4. This publication is available from UMTRI, 2901 Baxter Road, Ann Arbor, MI 48109.
On The Inside

Underride deaths may be significantly undercounted in NHTSA data files, new Institute research indicates.................. p.1

Differing views of NHTSA's proposal to reduce underride deaths and injuries .....p.3

Proposed ban on radar detectors draws record response.................................p.4

Wide truck rigs hard to contain in narrower road lanes, studies show................p.5

New hours-of-service regulation would allow more hours behind the wheel and could compromise truck safety................p.6

Speed limiters on trucks and buses in the European Community.....................p.6

Tractor-trailer occupant deaths could be reduced, and UMTRI tells how..............p.7