URBAN CRASHES
Identifying Types Is 1st Step

Worried about the red light runner who just missed you by the skin of a fender? You should be. New Institute research shows running red lights and other traffic controls like stop and yield signs is the most frequent type of urban crash.

To identify and classify types of urban crashes, Institute researchers studied police reports of 4,526 individual crashes on public roads in four urban areas during 1990 and 1991. The diagrams and narrative descriptions, which form the heart of the police reports, were used to classify crashes in Akron, Ohio; New Orleans, Louisiana; Yonkers, New York; and Arlington County, Virginia.

Because both injury and property damage crash rates are highest in the most urban areas — even after taking

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numbers of vehicles and population size into account — increased attention to urban crashes is needed,” says the Institute’s senior vice president for research, Allan F. Williams.

Of the 13 crash types classified by the researchers, five account for more than three-fourths of all crashes in the four urban areas: running red lights, stop signs, or yield signs (22 percent); stopped or stopping vehicle hit from the rear (18 percent); running off the road and striking an object (14 percent); swerving into another occupied lane (13 percent); and turning left and colliding with an oncoming vehicle (9 percent).

These five crash types, which account for 83 percent of injury crashes, are the top ranking five in each urban area, but the rank order differs slightly. Running red lights and other traffic controls ranks first in Arlington County and New Orleans. This kind of crash accounts for about a third of all New Orleans crashes. However, stopped or stopping vehicles hit from the rear account for the most frequent crash type in Akron.

Major crash types have distinguishing characteristics. Not surprisingly, running red lights and other traffic controls occurs mostly at intersections. Left-turning crashes are also associated with traffic signals at intersections. Rear-end crashes occur at intersections and between intersections with equal frequency. Run-off-the-road crashes are most likely to occur at night.

Injuries were reported in more than a third of crashes typed as left turn oncoming, running traffic control, stopped or stopping, and running off the road. But injuries were reported in only 16 percent of crashes resulting from lane changing maneuvers.

“The finding that five crash types constitute the great majority of police-reported cases . . . allows cities to focus their countermeasure planning,” the researchers say.

They add that “running traffic control devices — the most common type — might be reduced by changes in signal timing, such as lengthening the clearance intervals, and by increased signal and sign visibility, increased sight distances, reduced speed near intersections, and stronger enforcement — for example, by the use of red-light cameras.”

Crashes involving pedestrians or bicycles and crashes on freeways or private property are excluded from the Institute’s study.

Institute research conducted in 1985 found daytime running lights to be effective in reducing car-to-car crashes during daylight hours. Such lights are wired to turn on automatically whenever the ignition is started. They make vehicles more conspicuous and, therefore, less likely to be in multiple-vehicle crashes.

**NHTSA Says OK, Will Let Automakers Offer Daytime Running Lights**

The use of daytime running lights is an effective, low-cost method of reducing car-to-car crashes. In urban areas, where traffic congestion is heavy and there are numerous demands on drivers' attention, such lights are particularly important.

Daytime running lights are especially effective in preventing head-on and front-corner collisions. But automakers couldn't provide such lights, until now, without running afoul of some state laws on vehicle lighting. Now the National Highway Traffic Safety Administration (NHTSA) is permitting automakers to offer daytime running lights as options on vehicles in all 50 states, preempting state laws that inadvertently bar their use.

The NHTSA rule was issued in response to a petition from General Motors. The Institute had filed a similar petition in 1985, based on studies showing that daytime running lights are an inexpensive way to reduce daytime collisions between motor vehicles. After initially granting the Institute's 1985 petition, NHTSA terminated rulemaking in 1988, saying the matter wasn't clearly a national safety issue and auto manufacturers "tended to oppose, rather than support, the proposal." (See *Status Report*, Vol. 23, No. 8, Aug. 13, 1988.) Now NHTSA has reversed itself by issuing a new rule that allows carmakers to offer the lights.

"Studies of daytime running lights have repeatedly demonstrated their benefits, and we're glad their use is now permitted," says Allan F. Williams, the Institute's senior vice president for research. Institute and other studies conducted in the United States, Canada, and Scandinavia consistently show substantial reductions in two-vehicle daytime crashes with the addition of daytime running lights.

Such lights are mandatory in Sweden, Norway, and Finland. Canada requires them on all vehicles manufactured after December 1, 1989.

The new U.S. rule will permit light intensity levels up to 7,000 candela, the same as Canadian specifications. An earlier NHTSA proposal had called for lights no brighter than 2,600 candela, slightly less than that of a headlamp's low beam, which the Institute and a number of automakers found too restrictive. The new rule also satisfies most concerns raised by states that have their own vehicle lighting specifications.

"This rule is a good first step," says Williams. The Institute prefers a higher minimum intensity than the 500 candela NHTSA specified. Williams says NHTSA's own research demonstrates that, unless the intensity exceeds 1,600 candela, daytime running lights don't improve drivers' ability to detect other vehicles in common roadway situations.

**Canadian Data Support (Again) Effectiveness of Daytime Running Lights**

Recent information about the effectiveness of daytime running lights comes from the Vehicle Information Centre of Canada, a counterpart of the Highway Loss Data Institute in the United States. This organization has compared the relative insurance claim frequency during 1990-91 of 1989 models without daytime running lights to 1990 models equipped with the lights.

The comparison shows that "the implementation of daytime running lights... resulted in reducing the frequency of collision accidents." There was a 4.1 percent reduction in relative claim frequencies among four-door vehicles. Two-door vehicles had a reduction of 6.2 percent.
**Driver Hours Plan Would Fail Purpose and Increase Risk**

A proposed rule by the Federal Highway Administration (FHWA) to increase the hours commercial vehicle drivers are permitted to drive would put them and others on the road at increased crash risk, the Institute finds FHWA. The proposal was issued even though the agency hasn't completed its own research on truck driver fatigue and alertness.

Under current hours-of-service regulations, commercial drivers can't work more than 60 hours in seven consecutive days or 70 hours in eight days. The FHWA proposal would allow drivers to drive as many as 100 hours and work as many as 120 hours during eight days.

FHWA says it wants to address "anomalies in the current hours of service limits...identified by representatives of the long haul motor carrier industry." For example, a driver who works 70 hours during five days has to go off duty for three days before driving again. The trucking industry says drivers are often stranded away from home during these days off, waiting to accumulate enough off-duty time to resume driving. The proposed rule would allow the on-duty time limitation "to begin anew" after a driver is off duty for 24 consecutive hours or more.

**Survey Results**

Although FHWA says its intent is to help stranded drivers spend more time at home, Institute interviews with 461 long haul tractor-trailer drivers at truck inspection stations in Maryland, Oklahoma, Oregon, and Virginia suggest the proposal wouldn't accomplish this purpose. Fewer than a third of the drivers surveyed said they ever get stranded away from home for several days and, among those who do get stranded, 41 percent hadn't been in that situation for the past two months.

When drivers were asked if they expect to spend more, less, or the same amount of time at home under the proposed rule change, 47 percent said the same, 31 percent said more, 20 percent said less, and 2 percent didn't respond.

Forty-five percent of truckers said they would spend more time on the road under the new rule. 47 percent said their time on the road would remain the same, 6 percent said it would decrease, and 2 percent said they didn't know.

FHWA says its new rule would "make it clear that any driver may decline to drive under the proposed rule if the driver has 70 hours prior to going off duty for 24 hours. To see how much drivers agree to drive when tired under current rules, which already allow ill or fatigued drivers to decline work, the Institute asked drivers if they ever accept new work even when feeling really tired. Fifty-one percent replied yes.

When asked if it would be easier or harder under the proposed rule to refuse work, 61 percent of truck drivers said no difference, 20 percent said easier, 18 percent said harder, and 2 percent didn't know or didn't respond.

**Driver Fatigue Already a Problem**

In addition to new survey findings, the Institute submitted FHWA's key research findings on fatigue including studies on shift work, circadian rhythms, sleep deprivation, and sleep quality. These indicate that current hours-of-service regulations on truck drivers are already inadequate and present a compromise with safety.

An earlier Institute study of tractor-trailer drivers found 19 percent saying they had fallen asleep at the wheel one or more times during the past month. (See Status Report, Vol. 27, No. 2, Feb. 8, 1992.)

Tractor-trailer drivers who violate work rules, mostly by working longer than the limit of 60 or 70 hours, reported falling asleep 77 percent more often than drivers who adhere to work hour limits.

**How Others Responded**

About half of the first 32,000 responses FHWA logged in were from truckers belonging to the International Brotherhood of Teamsters, which opposes the new rule.

FHWA's proposal comes at the behest of the Interstate Truckload Carriers Conference, an affiliate of the American Trucking Associations, and the majority of trucking companies tell FHWA they favor the change. SoMich Transfer says, "A great deal of time is now spent policing our drivers' hours. The proposed change would greatly reduce this time, make the monitoring of hours much easier, and have no adverse effect on highway safety."

But a significant number of medical experts, safety groups, and law enforcement agencies oppose the change. Advocates for Highway and Auto Safety notes that FHWA had earlier proposed a decrease in on-duty time and rejected a petition in 1980 similar in content to the current proposal. In both cases, FHWA cited research demonstrating the strong causal link between excessive driving time, fatigue, and increased crashes.

"We are convinced that this proposed rule change will be detrimental to [truckers'] health and safety and to the safety of all Americans who share the highways with truck drivers," says the Teamsters union. FHWA envisions enhanced compliance because "the new rules would be so loose that many of the dangerous driving behaviors that violate today's rules on hours in a seven- or eight-day period would no longer be violations under the new rules. This is equivalent to saying that, if we raise the speed limits high enough, we will have to issue fewer speeding tickets — it also makes about that much sense."

Also opposed to the change are numerous law enforcement groups, including police in Washington, Idaho, and Maine. Comments from the California Highway Patrol are typical: "Tired drivers have slowed reaction times, decreased visual acuity, and are more likely to fall asleep...any potential gain in productivity or profit is offset by the potential for dangerous conditions created by fatigue-driven drivers."

Senators John C. Danforth and J. James Exon cite research from the Institute and elsewhere to tell FHWA its proposal "lies in the face of safety problems...It is inappropriate to greatly expand permissible driving hours when drivers operating under the current rules show such evidence of fatigue." Exon is chairman of the Subcommittee on Surface Transportation, and Danforth is the ranking Republican on the Commerce, Science, and Transportation Committee.

**Insulin-Using Drivers Pose Danger on Road**

The Federal Highway Administration (FHWA) should drop its planned waiver for insulin-using commercial drivers, the Institute says, because of "new evidence that medical specialists cannot identify in advance a large proportion of the insulin-using persons who will experience a severe hypoglycemic reaction.

Hypoglycemia, or low blood sugar, is an undesirable side effect of insulin treatment that can lead to mental confusion and, in severe cases, to incapacity or even coma. About 30 percent of insulin-treated patients experience severe hypoglycemia over one to three years.

The "risk for commercial motor vehicle crashes likely will increase if persons with insulin-treated diabetes are permitted to operate commercial trucks," says Allan F. Williams, the Institute's senior vice president for research. "This increased risk will disproportionally affect other road users rather than the diabetic drivers."

FHWA's own assessment estimates that insulin-using drivers would crash twice as often as others, even if drivers with a history of severe hypoglycemia were screened and denied commercial licenses.

A recent study by the National Institute of Health found that 30 percent of severe episodes of hypoglycemia weren't preceded by warning symptoms. Fifty-one percent of such episodes were preceded by symptoms that patients failed to recognize as related to hypoglycemia.

Institute says the proposed study, based on a control group of volunteers, isn't likely to meet requirements for valid scientific information. "The Institute suggests examining the many studies on diabetic drivers of cars, saying that "any increased crash risk observed in diabetic drivers of passenger cars would likely be even greater among truck drivers."
Downsizing Increases Overall Insurance Losses, HLDI Reports

Small 1979-89 model cars had higher insurance injury and collision claim frequencies than large 1979-89 cars. Plus, the injury and collision losses for smaller cars relative to larger cars worsened during the 11-year period. These are the main findings of a new Highway Loss Data Institute (HLDI) report.

HLDI is an affiliate organization of the Insurance Institute for Highway Safety that collects and publishes information on the injury, property damage (collision), and theft losses of cars, vans, pickups, and utility vehicles.

Six size classes based on wheelbase (the distance between a car’s front and rear axle) were used to examine changes in the insurance claims experience of large and small cars during the period of downsizing by manufacturers. The size class with the largest cars shrank from 18 percent of total exposure for 1979 models to 9 percent for 1989 models.

Insurance injury claim frequencies were related to size class. Cars with shorter wheelbases registered higher claim frequencies throughout the 11 model years, HLDI reports. Injury claim frequencies for the smallest size class were 50 percent higher, relative to the largest, among 1979 models. The difference increased to more than double by the 1989 model year.

Downsizing resulted in an overall insurance injury claim frequency 7-10 percent higher than would have occurred if the mix of sizes in the automobile fleet hadn’t changed.

Collision claim frequencies for small automobiles increased while those for large automobiles declined or stayed unchanged during the period 1979-89. Among 1989 models, cars in the smallest size class had collision claim frequencies 38 percent higher than cars in the largest of the six size classes.

The new HLDI report points out that “the shift toward more small cars with higher collision losses has resulted in higher overall collision losses. For the 1989 model year, the difference amounted to about $10 per insured vehicle year… The impact of the shift toward more small cars, with their attendant higher claim frequencies, has been to increase overall collision claim frequencies for the more recent models by about four to seven percent.”


GM, Chrysler Vans Show Lowest Losses in HLDI Collision Report

Insurance collision losses are as much as seven times higher among 1990-92 model cars with the worst records than among cars with the best records. This is the main finding of a new report from the Highway Loss Data Institute.

Passenger vans manufactured in the United States by Chrysler and General Motors have the best collision results, with losses 40-50 percent better than overall for passenger cars.

The Dodge Stealth, manufactured in Japan, has the worst collision results. Its losses per insured car are three and a half
Risk of Crash Fire Spurs NHTSA Analysis Of GM Pickup Trucks

An engineering analysis of General Motors pickup trucks with "side-saddle" gas tanks outside the frame rails is underway at the National Highway Traffic Safety Administration (NHTSA). The agency wants to know if the fuel tank design poses an unacceptable fire hazard in crashes.

The Center for Auto Safety and Public Citizen petitioned NHTSA last year to open a defect investigation. The Institute, after reviewing fatal crash data for 1975-87 GM pickups, found them subject to an increased risk of fire, at least in fatal crashes, and urged NHTSA to grant the petition. About 4.7 million trucks could be affected, according to NHTSA.

In addition, NHTSA is seeking comments on whether federal fuel system performance requirements in front, rear, and side crashes should be improved.

Analysis of the GM data indicates that side impact test requirements need to be strengthened, Institute President Brian O'Neill tells NHTSA. He points out that GM vehicles with side-saddle fuel tanks constitute an unnecessarily high risk of fire in fatal crashes though they apparently comply with federal requirements.

To assess the potential excess fire risk in GM C/K pickups with side-saddle fuel tanks, the institute examined all crashes in which 1975-90 models of these trucks had an occupant fatality during 1987-91. Both the relative frequency of fire in these crashes and the rate of fatal crashes and crash fires per million years of vehicle registration were analyzed. The Institute also looked at the fatal crash experience of comparably sized Ford and Chrysler pickups for the same model years during the same calendar years.

Compared with both Fords and Chryslers, a greater proportion of the GM pickups with fatalities experienced crash fires (7 percent compared with 5 percent), and the rate of fatal crashes with fires was 40 to 50 percent greater for the GM trucks. In side impact crashes with occupant fatalities, fires were about twice as likely for GM pickups as for Fords or Chryslers.

GM added a protective shield to 1984-87 C/K pickups. Despite this change, the Institute found the risk of fire in crashes with fatalities still more than 40 percent higher for all crash configurations and twice as high for side impacts.

If the excess fire risk is due to the mounting location of the fuel tanks, the incidence of fire should be greater in side impacts. It should be greatest when the impact is on the side where the tank is typically located. Fuel tanks on GM C/K pickups were on the passenger side of 1973-80 models and on the driver side of 1981-87s. As expected, the Institute found that the difference in fire incidence between GM and other pickups is greater for passenger side crashes than for driver side crashes in 1975-80 models and somewhat greater for driver side crashes in 1981-87 models.

Beginning with 1988 models, GM C/K pickups began to be fitted with fuel tanks mounted inside frame rails. Institute analyses show the excess fire risk associated with previous model years isn't found among these redesigned pickups.
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