

conflict unfortunately in their significance. A distinctive portable sign for road under repairs, instead of the red flag, is much needed

The placing of signs is another matter of importance in the training of drivers. For example: drivers are continually failing to see "no left turn" signs, which, unfortunately, are of various types and positions. Such failures frequently tend to an embarrassing, if not actually dangerous, situation for the driver, and the emotional results are not conducive to good habit formation.

The lack of standard positions for semaphores is another common cause of confusion, and one-way street signs are far from satisfactorily standardized, both as regards type and position. Standardization is the fundamental need in all features of signs and signals, if safety is to be increased. But bad standardization is worse than none. Preceding the establishment of standards, experimental investigation is badly needed in regard to matters which have hitherto been too much subject to theory and guess

## A SURVEY OF ACCIDENTS INVOLVING TRUCKS AT HARTFORD, CONNECTICUT, JANUARY 1-JULY 1, 1927

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### FOREWORD

A purpose of the following study is to emphasize two aspects in the field of research:

1. The effort which business may make in research and in the application of research to its problems
2. The method of applying a statistical approach to a local situation.

All the figures in the following study are taken solely from state records, including the allocation of causes.

This study is being printed in pamphlet form with charts, and will be amplified with preliminary pages, emphasizing the chief causes and suggesting tentative remedies.

The situation has been presented to the truck owners and drivers through the Hartford Chamber of Commerce

The main point which has been emphasized is that the remedies are tentative, that the truck owners and drivers must make their own

conclusions as to the situation, and keep applying methods which seem to be remedial until conclusive results have been obtained.

The chief point of the survey is to emphasize the importance of localized statistics and localized efforts toward obtaining relief.

WHAT HAPPENED IN HARTFORD: A STUDY OF THE LOCATIONS AND  
CAUSES OF 409 TRUCK ACCIDENTS

Are motor trucks involved in a large number of street accidents?

Are they responsible for all accidents in which they figure?

What are the causes of motor-truck accidents? To what extent are they due to the layout of streets, to careless operation of commercial vehicles, or to adverse road and weather conditions?

How can such accidents be reduced?

In an effort to obtain definite answers to these questions, the National Automobile Chamber of Commerce selected Hartford, Connecticut, a city of approximately 175,000 people, as the scene of its first investigations. This city was chosen because its size made possible a comprehensive study in a comparatively short time, and because complete data on motor-vehicle accidents were available in the office of the Connecticut Commissioner of Motor Vehicles in the same city.

Through the courtesy of Commissioner Robbins B Stoeckel, the state records were made available and the co-operation of Miss Ethel Usher, Statistician of the Connecticut Motor-Vehicle Department, was accorded the investigator.

*Survey Covers First Half of 1927*

The period selected for study was from January 1st to June 30th, 1927, which included both bad and fair weather months. As all accidents resulting in property damage of \$10 or more as well as in personal injury or death are reported in Connecticut, the total number of accidents in this period is probably larger than the figures for other cities of similar size in which slight property damage accidents are not reported. In fact, a large proportion of the Hartford accidents resulted only in property damage.

*Motor Trucks Involved in 28 Per Cent of Accidents*

It was found that motor trucks were involved in 425, or 28 per cent, of the 1481 motor-vehicle accidents of all kinds reported in this period.

Of the 425 truck accidents, 16 could not be analyzed as to cause or fault because some necessary information was lacking. But analysis of the 409 accidents for which complete data were available revealed that truck operators were at fault in 228, or 56 per cent, of these accidents. They were not at fault in the remaining 181 accidents in which they were involved.

*Truck Drivers at Fault in 56 Per Cent of Accidents Involving Trucks*

The 228 accidents in which truck drivers were at fault were examined as to causes, as they are the ones for which remedies may be found by truck operators. These accidents were due to the following groups of causes:

- 67 due to inattention of truck operators
- 40 due to operators' failure to grant right of way
- 39 due to skidding of trucks
- 36 due to careless backing of trucks
- 9 due to trucks following other vehicles too closely
- 37 due to scattering causes (3 or less accidents due to each).

"Inattention of truck operators," which was the cause of the largest number of accidents is a term used by the Connecticut Motor-Vehicle Department to describe the cause of those accidents which were not specifically traced to failure to grant right of way, skidding, careless backing, following vehicles too closely. Although inattention may have been a factor in the accidents traced to other causes, it was not held to be a primary one.

*Inattention Is Greatest Accident Cause*

The results of the inattention of truck operators were that 24 trucks side-swiped other vehicles, 19 trucks ran front against side into other vehicles, 12 trucks ran into the rear ends of vehicles, and 12 ran into parked vehicles.

Thirty-four of these accidents happened at street intersections, 27 occurred within blocks, and 6 took place at the intersection of private driveways with streets.

It might be well to point out that in addition to the 67 accidents traced to the inattention of truck operators, there were 41 accidents due to the inattention of other motor-vehicle operators. In other words, 108 of the 409 accidents analyzed for this period were due to this one cause.

*Failure to Grant Right of Way Next Greatest Cause*

The next most important cause of accidents for which truck operators were to blame was failure to grant right of way. In 31 of the 40 accidents of this kind trucks ran front against side into moving motor vehicles, 4 ran into the rear ends of vehicles, 3 side-swiped other vehicles, and 2 ran head on into moving motor vehicles.

Of these 40 accidents, 34 were caused by drivers of trucks registered in Hartford, 5 were caused by trucks from other parts of Connecticut or from other states, and 1 was the fault of the driver of a truck of unknown origin. It is, therefore, evident that the bulk of these accidents cannot be laid to operators from other localities who might be unfamiliar with Hartford right-of-way customs at certain odd-shaped intersections.

*Seventy-three Right-of-Way Accidents*

In addition to the 40 right-of-way accidents in which truck operators were to blame, there were 33 accidents of this kind in which the truck operators involved were not at fault. This makes a total of 73 truck accidents due to failure to grant right of way, or 17 per cent of the 409 accidents analyzed.

It was found that approximately two-thirds of all right-of-way accidents occurred in the congested part of Hartford. This applies to both the accidents caused by truck operators and those caused by operators of other vehicles.

*Right-of-Way Accidents at Protected and Unprotected Corners*

Seventy-one of these accidents were at street intersections, the other two happening at the junction of private driveways and streets. Of the 40 accidents of this kind caused by truck operators, four happened at three street intersections at which there were traffic officers. Four operators failed to grant right of way at those intersections, two of them at hours when no traffic officers were on duty. Four other intersections were protected by traffic lights, and 29 of the 36 intersections which were the scenes of this type of accidents were entirely unprotected.

It was discovered that there was a serious need for protection of some kind at the intersections of Sheldon Street with Prospect, Woodbridge, and Commerce Streets, as Sheldon Street is approached at those intersections by up-grades or down-grades, and there are many

blind corners at those points. Protection was badly needed at those intersections not only because of their hazardous nature, but because a large number of trucks are routed through Sheldon and Commerce Streets on their way to and from the bridge leading to Springfield and Boston.

Although trucks from Massachusetts and from other parts of Connecticut use this route, it was found that 4 of the 5 right-of-way accidents on Sheldon Street during this 6-month period were caused by trucks registered in Hartford. Those accidents, therefore, cannot be laid to drivers operating over a street unfamiliar to them.

#### *New Traffic Lights to Decrease Accidents*

It should be said here that since the end of the period covered by this survey traffic lights have been placed at the 3 Sheldon Street intersections mentioned. The results of these installations will be watched with interest during the next 6-month period.

#### *Skidding Big Accident Cause in Winter*

The next greatest cause of accidents in which truck operators were at fault was skidding. Twenty trucks skidded into other vehicles at intersections, while 19 skidded into vehicles between intersections.

Of the 39 trucks causing accidents of this kind, 19 skidded into parked vehicles, 14 skidded and side-swiped moving motor vehicles, 3 skidded front against side into moving motor vehicles, and 3 skidded into the rear of moving vehicles. Almost all of these accidents occurred during the early months of the year, when the streets were covered with ice and snow. Next to inattention, skidding was the chief cause of accidents outside the congested part of the city.

#### *Careless Backing a Leading Accident Cause*

The next largest group of accidents caused by trucks were those due to careless backing. Of the 36 accidents due to this cause, 18 occurred at street intersections, 10 occurred between intersections, and 8 happened at the junction of private driveways with streets. Twenty-seven trucks backed into moving motor vehicles, and 9 backed into parked vehicles.

*Following Vehicles Too Closely Causes Collisions*

Of the 9 accidents due to trucks following other vehicles too closely, 8 happened at intersections, and 1 within a block. Weather and street surfaces were both favorable when most of these accidents occurred, so that skidding was not a contributory cause of the resulting collisions.

*Fifty Pedestrian-Truck Accidents*

There were 50 accidents in which trucks ran into pedestrians. As 22 children under 16 years of age were involved in these accidents, it was not possible to determine accurately what proportion of them were the fault of truck operators, there being some question as to what constitutes sufficient caution on the part of drivers in regard to children. The state records, based on the information available, held that truck drivers were at fault in 9 of the 50 pedestrian accidents. Two accidents were fatal to pedestrians, 1 an adult, the other a child. Trucks were not held to blame for either of these.

*Seventeen Jaywalkers Hit*

Thirty of the 50 pedestrian accidents happened at street crossings, 3 at driveway crossings, 17 pedestrians were within blocks when struck. Pedestrian accidents occurred in the approximate ratio of 3 in the congested section to 1 in uncongested sections.

Only 2 of the trucks involved in accidents during this period were found to have faulty brakes. No accidents were due to the overloading of motor trucks.

*Congestion Influences Frequency of Skidding and Right-of-Way Accidents*

An examination of the records of all accidents, both those in which truck operators were at fault and those in which they were not, to determine the distribution of accidents over the city, revealed that approximately the same number of accidents occurred in all the uncongested sections taken together as occurred within the more congested section alone. However, analysis of the accidents happening within and without the congested section revealed that the bulk of accidents within each area were due to causes which vary in importance in each area.

For instance, while inattention accounts for an equal number of accidents within each area, the next greatest cause of accidents within the congested section is failure to grant right of way, while outside the congested section skidding is the second greatest cause of accidents. In the congested section skidding accidents are only one-half as frequent as in the uncongested areas, while failure to grant right of way is, in turn, responsible for only about one-half as many accidents outside the congested section as in the more heavily-used areas. Accidents due to careless backing were equally frequent in both areas, as were those due to the failure of operators to signal and those due to following other vehicles too closely.

#### HOW CAN ACCIDENTS BE REDUCED

The initial step in the Hartford situation has been to call meetings of the drivers and operators.

Detailed maps of the city locating the accidents and the different types of accidents have been prepared.

Thus when inattention has been discussed, these accidents have been mapped out and the subject discussed with the geographical conditions in mind.

This method has also been used with respect to right-of-way accidents, etc.

By application of attention to the specific situations, it has been possible to concentrate upon actual practice in its relationship to theory.

A completed program for preventive methods in Hartford is being worked out on an experimental basis. Certain corners heretofore unprotected are now having police protection.

Drivers have also been warned of certain protected corners where accidents have occurred, emphasizing the point that individual responsibility cannot be shirked.

This study has purposely avoided making conclusive preliminary recommendations for accident relief, holding that such recommendations will be evolved by the drivers and operators familiar with local conditions as the records are continuously studied.