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Hazards of Winter Driving in the City of Rochester 1969-70 to 1979-80

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THE ROCHESTER COMMITTEE FOR SCIENTIFIC INFORMATION
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Summary

It is a pleasure to report that in the City of Rochester in the winter of 1979-80 there were 1200 fewer automotive accidents than in any of the ten preceding years. It was a mild winter, but the winter of 1972-73 was equally mild and there were 1600 more accidents.

In the City the number of summertime accidents has shown no trend over the past eleven years, with a range of 1191 accidents from high to low. This was a better record than the rest of the county where summer accidents climbed by over 2000 between 1970 and 1978.

Since 1974-75 Rochester has reduced its salt usage to below 25,000 tons a year. In the six following years we have had two extremely severe winters as well as the one very mild one. In bad winters property damage accidents are high. Personal injury accidents do not rise. This is true under both the new and the old salting policies. Bulletin #255 develops a model to find the contribution of salt to preventing accidents under the two salting policies.

Although there are more accidents overall in the winter, there are more accidents in which people are hurt in the summer. The winter of 1979-80 had fewer injury accidents than any of the ten preceding winters and the lowest use of road salt.

Background - Getting the Data

Records of highway accidents and of the amount of deicing salt spread on the streets in winter are kept separately by the City of Rochester and the County of Monroe. Past RCSI Bulletins have dealt extensively with salt use in the County, but never before with the City. Rochester, as well as the rest of Monroe County, has decreased its use of deicing salt by at least 50% and now, for the first time, we present 11 years' worth of data for the City of Rochester.

The Rochester Police Department has kindly furnished us with a complete count of monthly accidents classified into injury, property damage and fatality. During the summer the number of accidents with injuries is surprisingly constant from year to year.

Salt use data were provided by the Rochester Department of Environmental Services. The City of Rochester salts only arterials; side streets are not salted.

Weather data for Monroe County including Rochester, taken at the Monroe County Airport, were obtained from the government publication "Local Climatological Data". Snow days, inches of snow and inches of standard snow were taken directly from the appropriate daily precipitation and the maximum/minimum temperature columns. Deicing load was calculated. Deicing load is a correction for the fact that on a cold day more salt is needed to melt the same amount of snow or ice. The calculation is described in detail in RCSI Bulletin #201 (1).

Winter is counted as the six months during which it snows in Rochester (November through April). Summer is defined as the three months preceding (August, September, October) and the three months following (May, June, July) each winter. The accidents during the summer serve as a yardstick for comparing the accident rate when it was cold and snowy with the accident rate when it was not, with as close a match as we could get for driving patterns and cars.

The data for the following discussion are summarized in Figures 1 and 2. Numbers are in the Appendix.

There Is a Turn for the Better in the City

Summer accidents in the City rose slightly through 1972-73, remained higher until 1975-76; then they went down in number. 1979-80 had the best record of the ten years that we studied. Winter accidents started to rise in 1973-74, climbed steeply until 1978, and then dropped sharply. In the winter of 1979-80 there were fewer accidents than in any of the past ten winters. The record is improving, but there were still 13,100 automotive accidents in the City of Rochester in the 1979-80 year.

The record in the County was worse. Accidents rose steadily from 1969 to 1978, winter and summer (2).

A Lot of Snow Leads to Accidents in Rochester

We measured snow two ways: the number of days on which it snowed and the number of inches deposited throughout the year (Figure 1). In the City, heavy snowfall correlated with more accidents (Figure 2). In the single worst year for accidents, 1977-78, when there were over 9,000 accidents during the winter in the City there were also 160 inches of snowfall, 20 more inches than any other year in the study. That was almost a historical record.

In general, the number of accidents was higher in winters with more days on which it snowed and lower in winters with fewer snow days. 1976-77 was a freak year: it had more snowy days than any other, but only an average amount of snowfall and it was not particularly cold. It was one of the highest years for accidents.

Personal Injury Accidents Decrease in Winter

Fortunately, the accidents that rise in winter time are those not involving personal injuries. More people were injured in the City in the summer than in the winter. In Figure 2 the winter to summer difference in the number of injury accidents was surprisingly constant from 1969-70 to 1978-79. By 1979-80 there was a decrease in injury accidents; a 4% decrease in the summer and a 6% decrease in the winter.

Injury accidents were also higher in number during the summer than the winter in the County (3). We accounted for this by noting that people drive more and faster during summer months. This is probably also true in the City: city driving is probably not as fast as country driving, but winter weather still slows it down.

The Role of Salt

The use of salt was reduced in the City beginning in 1974-75. For a first impression we can compare the five years of high salt use with the six years of lower salt use by looking at increases in accidents in winter (that is, at the gap between summer and winter accidents in Figure 2). The years in which salting was reduced include both the year with the least increase in winter accidents and the two years with the greatest increases in winter accidents. Those peaks were clearly related to weather as the worst year for accidents had the worst weather conditions and the best year for accidents had the mildest weather conditions. The role of salt is not so clear. For example, one must take into consideration temperature at which it works. To untangle the contribution of salting to preventing accidents from the contribution of weather we had to resort to mathematical modeling. This is done in two forthcoming RCSI Bulletins (4, 5).

References

- (1) Brown, Winton, "*Deicing Load and Saltfall in Monroe County*" RCSI Bulletin #201, December 1976
- (2) Holmes, L., G. Pike and G. Berg, "*The Contribution of Winter Weather and Salt Use to Winter Accidents on Monroe County Roads*" RCSI Bulletin #237. Technical Appendix. February 1980
- (3) Holmes, L., "*Accidents and Salting in Monroe County*" RCSI Bulletin #196, February 1976
- (4) Brown, W., Brown, C.Jr., and G. Berg, "*Road Salt Use and Accidents in Winter: A Model for the City of Rochester and the County of Monroe*" RCSI Bulletin #255, September 1981
- (5) Brown, W. and G. Berg, "*Road Salt Use and Injuries: A Model for the City of Rochester and the County of Monroe*" to be published

FIGURE 1

WINTER WEATHER
and
SALT USE
in
ROCHESTER

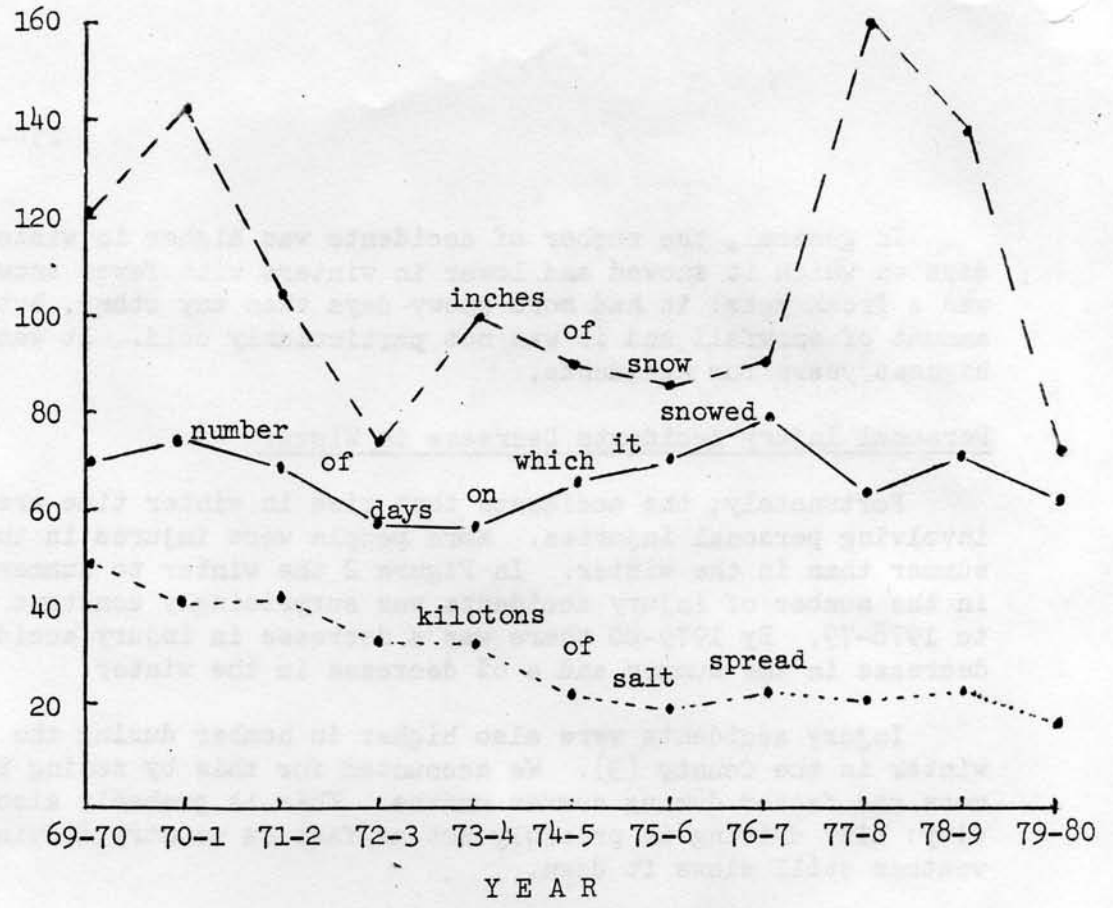


FIGURE 2

- Winter
- - - Summer
- ✓ More than 160 inches of snow
- More than 100 inches of snow
- Heavy deicing load (Table 1)
- △ Snow on more than 80 days

