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*The Financial Impact of Converting From Manual to
Automatic Controlled Salting Trucks*

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THE ROCHESTER COMMITTEE FOR SCIENTIFIC INFORMATION
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Background and Summary

The Monroe County Department of Public Works, the Monroe County Salt Task Force, the Sierra Club and the Rochester Committee for Scientific Information have all been working together over the last five years to develop and monitor a program for the reduction of deicing salt use in Monroe County. As a result, salt use has been reduced in this County over 60% without any increase in accident rate. However, salt use in the County is still high and uneven - some towns using much more than others per two-lane mile.

The latest step taken by the County was to set an upper limit on the amount of salt that would be reimbursed per truck run (RCSI Bulletin #221). No limit was put on the number of runs, so at really difficult times a truck could make an extra run at full reimbursement. The County also offered to negotiate higher salt limits for particularly difficult places, but never received a request.

Some towns used more salt than allowed and were not reimbursed for overuse. They carried their problem to the County Legislature Transportation Committee and asked for reimbursement. The Transportation Committee agreed. Other committees or the full Legislature must now consider the problem.

Those interested in reducing the use of salt understand that the town departments of public works who actually do the spreading of salt have a number of problems - including lumping of salt, erratic weather, citizen complaints and costs of extra plowing. If the towns are to continue their good work they must have help. In the case of reluctant towns encouragement and a little pressure are needed.

This Bulletin describes an action that will help the towns cut costs, save the County and State money and preserve the limit on reimbursement for salting. The County Department of Public Works has spent many hours and much effort to develop a comprehensive, safe and fair program, which includes a limit on salt use. It needs the support of its own Legislature to continue its thoughtful work.

* This Bulletin was prepared for distribution to members of the Monroe County Legislature when they considered the issue of payments to Towns for spreading more salt than the limits allowed. The Legislature voted to maintain the limits.

The Need for Automatic Controllers

Spreading deicing salt at a uniform rate is difficult when the driver must manually synchronize salt flow rate with the changing speed of the truck while driving in traffic under storm conditions. Automatic, ground-speed controlled systems are available which will, if well calibrated, effectively control salt spreading to within 2% of a pre-set rate. This cuts waste. Salt use is reduced by at least 15% and field test results of as high as 40% salt savings have been reported (1). Furthermore, automatic systems leave the truck driver able to devote his full attention to safe driving. There are advantages for the motorist, too. The salt is more uniformly spread, providing a more consistent road surface for drivers.

Cost of An Automatic Control Unit

An automatic controller can be installed on existing manually controlled salt trucks. A unit of the type in use on some trucks in Monroe County costs approximately \$1000 (2).

Increased maintenance and extra training of drivers and mechanics has been judged in other states (1) to add only insignificantly to the cost of existing salting operations. Units in use locally for four years are still in good condition.

Financial Benefits of Installing Automatic Control Units

Eleven Monroe County towns had at least one automatic unit in use last winter. RCSI has examined the financial impact on each of the other eight towns of installing automatic controllers on every existing manual system in the town. The cost, of course, depends on the number of trucks.

A town saves money in two major ways when it installs automatic controls: it pays at least 15% less for salt for use on town roads (at a 1978-79 cost of about \$14.91 per ton), and it is reimbursed 45¢ extra for every hour of use of an automatic control truck on State and County roads.

Table 1 summarizes the purchase cost and two major money savings each town would have realized had it converted all units to automatic control last winter, and the approximate time to amortize the price. This figure assumes that minor costs such as extra maintenance and training are balanced by minor savings such as fewer reloadings, deadheading, and gas. Towns with many miles of salted town roads would recover their investment rapidly in salt savings. Towns that salt only a few miles of town roads would need a longer period for amortization because their savings would come primarily from the 45¢ extra reimbursement. Such towns, notably Parma, would not find installing automatic controls financially feasible.

Table 1. Estimated Costs and Savings to Eight Monroe County Towns From Automatic Salt Spreaders

Town	Number of Trucks ^a	Total Cost for Automatic Controllers	Total Savings to Towns per Year	Savings to Towns:		Years for Amortization
				in Reduced Salt Purchase ^b	in Additional Reimbursement at 0.45¢/hr ^c	
Brighton	9	\$9000	\$3711	\$3344	\$367	2.4
Clarkson	2	2000	267	151	117	7.5
Gates	8	8000	811	581	230	9.9
Henrietta	12	12000	2735	2520	215	4.4
Mendon	4	4000	1042	895	148	3.8
Parma	4	4000	235	22	212	17.0
Riga	2	2000	540	271	269	3.7
Sweden	3	3000	533	371	162	5.6

a - Figures provided by Monroe County Dept. of Public Works for 1977-78 winter.

b - Assumes 15% salt saving (based on last winter's salt use) and \$14.91 per ton - the 1978-79 cost of salt in most Monroe County towns.

c - From State and County, at \$.45/hr/truck, based on 1977-78 actual hours spent salting State and County roads.

Savings to the State and County

Look, however, at what conversion to automatic controlled salting means financially to the State and County budgets. Table 2 shows amounts of salt spread by each of the eight towns on State and County roads in 1977-78. Had all eight towns used automatic controlled salting units, the County and State would have saved a NET of \$32,706, even taking extra reimbursements into account.

Sharing the Wealth: Paying for Equipment Rather Than Overuse of Salt

Conversion to automatic controlled salting systems will be difficult for some towns under the present reimbursement system. If the State and County were to reimburse at a higher rate for the use of upgraded equipment on State and County roads, they would still profit hugely from salt savings, and the towns with many miles of State and County road and few of town road could better afford the salt spreaders.

If the County increases its "bonus" payment for automatic equipment 10 fold - paying \$4.50 instead of 45¢ per hour of spreading time - the County and State together would still save \$17,231. This bigger reimbursement, continued until the purchase price for all automatic controllers in use was paid off, would make the towns' investment in automatic controllers financially attractive, it would save the State and County money, and it would help the towns to stay within salt limits set by the Department of Public Works.

Table 2. Financial Savings to State and County From Automatic Salt Spreaders in Eight Monroe County Towns*

<u>Town</u>	<u>Tons of Salt Spread, 1977-78</u>	<u>\$ Saved from 15% Reduction in Salt^a</u>	<u>Total Hours of Salting Time^b</u>	<u>Reimbursement to Towns for Automatic Equipment^c</u>
Brighton	3423.1	\$7656	816	\$367
Clarkson	918.0	2053	259	117
Gates	3053.2	6828	511	230
Henrietta	4445.6	9943	478	215
Mendon	1167.9	2612	328	148
Parma	248.3	555	472	212
Riga	728.5	1629	598	269
Sweden	1408.4	<u>3150</u>	360	<u>162</u>
Total		\$ 34,426		\$ 1720

NET SAVING:

\$32,706

* Salt use and Salting hours data from Monroe County

Department of Public Works

a -assumes \$14.91/ton for salt - 1978-79 prices for most towns

b -figures for 1977-78 for State and County roads

c -at 45¢/hour

Care of Salt and Equipment

Finally, an automatic controller needs to be calibrated and it works best if salt flows instead of clumping. Salt clumps if it gets wet, so to get maximum benefit from the spreading machinery, salt should be stored in a covered building. The County is helping to pay for such buildings. It would be of advantage to all if the County also lent its engineering expertise for one year to the calibration of automatic spreaders and then monitored their maintenance.

An earlier RCSI Bulletin (3) noted that in many towns with automatic controlled salt trucks, salt use is still high; we have not seen, locally, the impact of automatic control of salting. This should not be construed to mean that installation of automatic units on town trucks is ineffective; controlled studies in other states have proven that they do save salt (1). Locally, salt savings due to major changes in salting policy may have masked the smaller savings due to upgraded equipment. In addition, poorly calibrated automatic equipment can spread more salt than intended, and many towns choose to set the automatic controls for rates higher than those called for in the guidelines. Both factors may account for the fact that a town such as Penfield with dry covered salt and automatic controls on trucks spread more than 800 lb/2 lane mile on many salting runs last winter. RCSI believes that the 15% reduction in salt use requires both good equipment and management committed to a policy of minimizing salt use.

References

- (1) Wm. C. Besselievre, *"Automatic Controllers for Hydraulically Powered Deicing-Chemical Spreaders."* U.S. Department of Transportation, Federal Highway Administration Office of Development. FHWA-RD-76-505, Aug. 1976
- (2) Mike and Joe Equipment Co. Inc., Rochester NY for Automated Servo Controls Inc. equipment (ASC-30A Model; other models are \$875 and \$1400)
Also consulted Fluid Controls Inc.; their models range from \$600-\$1000.
- (3) Holmes, Lindsay, *"Making It Pay to Use Less Salt: Monroe County, 1978"*
RCSI Bulletin #221, September 1978