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ECRU FIELD REPORT 77/3

**Two Tales of A Snowstorm:
How the Blizzard of January, 1977
Affected the Niagara Region of Ontario**

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Research Unit,
School of Journalism,
Carleton University, Ottawa**

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ECRU FIELD REPORT 77/3

**Two Tales of A Snowstorm:
How the Blizzard of January, 1977
Affected the Niagara Region of Ontario**

By: Joseph Scanlon and Brian Taylor

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Emergency Communications Research Unit,
School of Journalism
Carleton University,
Ottawa

The Emergency Communications Research Unit (ECRU) is a small, independent research unit located within the School of Journalism at Carleton University in Ottawa.

It is financed mainly through funds received from Emergency Planning Canada.

ECRU maintains on standby — six months a year — a volunteer research group capable of moving very quickly to the scene of unexpected events and, using sampling and other techniques, reconstructing what has happened, particularly what has happened in terms of communications.

Over the past few years, ECRU has done studies of the murder of a policeman, a hostage-taking, two fires, a wind-storm, a mudslide and evacuation, a building explosion and now, of three snowstorms. Most of these studies have been published and are available through Emergency Planning Canada.

In addition to these descriptive studies, ECRU is contributing to the academic literature on standby and emergency research. Material developed by ECRU and analysis of that material appears in two books and has been published or accepted for publication in four academic journals.

Members of the unit have also lectured to health, welfare, hospital, police and other officials on the implications of the team's research.

ECRU is grateful to both the Defence Research Board (our original funding agency) and to Emergency Planning Canada for the support received over the past five years.

We would like to emphasize, however, that this report, like those which preceded it, represents *independent* research. Neither EPC nor any person or group other than ECRU bears the responsibility for its findings and the opinions expressed.

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PREFACE

We gave some thought to writing this study as a single integrated report, but decided that it would be more valuable to integrate only the major findings into the following summary and conclusions.

This report, therefore, includes two separate accounts of the same storm: one, about how it affected the Niagara Region, the other about its impact on Prince Edward County. The reports were compiled by two separate research teams working under somewhat different conditions. The study is deliberately descriptive in intent, and is not tied in to other research findings.

While the teams used a similar approach with identical questionnaires and regularly consulted each other by telephone, it was discovered that the responses obtained were sufficiently different to suggest that the stories should be presented separately.

One example may indicate part of the problem. Both teams used virtually identical sampling techniques, which may have been a mistake. The Prince Edward County sample worked out well: it included people from all parts of the county, most of whom had been hit by the storm. The Niagara sample wasn't as effective: it included many urban dwellers who were not severely affected. So, while it gave an accurate reading of total storm effects on the area on a population basis, it was difficult to assess accurately the severity of the impact of the storm on the rural population which was hardest hit.

The study of Niagara was done by Brian Taylor and eight other researchers: Michel Arsenault, Cathy Filanowski, Bernadette Hardaker, Mary McGuire, Giselle Portenier, Lino Robazza, David Tait and Mary Lou Tario.

The study of Prince Edward County was done by Joseph Scanlon and seven other researchers: Greg Black, Darlene Harapiak, Valerie Marshall, Gerald Morton, Angela Sullivan, Percy Toop and Sheila MacVicar.

In past studies, it has been customary to give author credit to students who have played a major role in compiling results of field research. This time, so many of the students were involved in that task (13 of the 17 researchers had previous field experience) that this did not seem practical. Perhaps we should mention, however, that one outstanding piece of research — the study of the Ontario Provincial Police detachment at Picton by Sheila MacVicar — was developed into a separate detailed analysis of how police dealt with an emergency.

INTRODUCTION

We suspect most Canadians pride themselves on being a hardy folk.

They scoff at outsiders who see Canada as a land of ice and snow but they enjoy what they see as their ability to withstand the icy blasts of winter. They view themselves as a self-reliant people.

This report may shed some light on that vision: it is the tale of what happened in two parts of Ontario — the Niagara area and Prince Edward County — when a severe snowstorm lingered on day after day in late January, 1977.

It is not at first reading a terribly sad story. No one died during the storm in either area though there were emotional strains and some real physical damage.

But it is, in our view, a rather sobering story.

It shows, we believe, that we are rarely very far removed from threats posed by nature.

And it shows that these threats are often far more serious and far-reaching than we may suspect.

A snowstorm, for example, has a certain obvious impact: it reduces visibility, blocks roads and makes travel hazardous. But it also has resulting effects: it forces the closing of schools and industrial plants and it stops farmers from marketing their products. Inevitably, it prevents service agencies, such as police and fire departments, from operating normally. And it leads to massive overuse of the telephone system to the point at which regular calling is impossible and emergency calls become difficult.

Finally, it creates a new threat — isolation — and a new dependence — a reliance upon neighbors, upon those who have special capacities (in this case, the CB radio people and the snowmobilers) and upon the media.

By and large, we have let the story tell itself. But we think we should point out there is evidence that sophisticated technology is perhaps far less effective than many suspect.

Who would have believed, for example, that provincial snowploughs would get lost in a snowstorm or that a township plough would end up stuck for six days in a snowbank?

Who would have believed a police radio system would break down because the patrol cars — not the radios — would all be out of service?

Who would have believed that a man and transport could be buried so deeply on a highway that snowmobiles could pass over without noticing?

SUMMARY AND CONCLUSIONS

In 1976 the province of Ontario abolished its Emergency Measures Act.

This was the act which required all municipalities to have an emergency plan. It was also the act under which the province could declare an emergency and authorize expenditures out of general revenues.

When the act was abolished, there was nothing to stop local municipalities from retaining their own emergency plans and officials. That, in fact, is what happened in the Niagara region. But there was no similar plan or organization for Prince Edward County (although a plan did exist on paper for the town of Picton).

The province did not, of course, completely abandon its approach to emergencies. It did create a lead ministry concept under which specific provincial departments were to take primary responsibility for various kinds of emergencies.

While we did not examine the provincial response generally (and therefore cannot comment on the lead ministry principle as such) it should be obvious that this concept is solely for provincial rather than municipal response. There is nothing in it that solves the problems of a municipality dealing with its own local emergency.

The fact is that for all practical purposes, the legal force behind local emergency planning in Ontario is gone.

In our view, the data in this report suggest this is an error. The data on both Niagara and Prince Edward County suggest that emergency planning is necessary. Without it unexpected events such as a severe snowstorm are not dealt with in a co-ordinated, effective way.

This view is strongly reinforced by the contrast that exists between Niagara, where some emergency planning remained at the regional level, and Prince Edward County where it did not. A point-by-point examination of some of the problems of both regions suggests that Niagara, with planning, functioned better on the whole than did Prince Edward County, without it.

We don't want to suggest that Niagara was a story of success and Prince Edward County one of failure. In some areas Prince Edward County reacted better without a plan than Niagara did with one. And, in some cases, Niagara had not planned very well.

But it is clear that in four key areas — roads, police, fire, some social services, and in the use of the militia — Niagara, because of planning, was better off than Prince Edward County, at least in the sense of a controlled and co-ordinated response to an emergency.

Roads

In the case of roads, the problems were enormous in both areas. In Niagara, the lower half of the peninsula was

impassable. In Prince Edward County, roads throughout the entire area were blocked for up to eight days.

Niagara attacked this problem by using Public Works to clear major arteries first, and then tackling secondary roads. They plotted the progress of all their vehicles and in most cases were in radio contact with the operators.

However, regional roads were slow to act and municipalities grabbed a lot of additional equipment. A continuing fight developed for specialized pieces of equipment needed to supplement their own resources.

The picture was somewhat similar in Prince Edward County. The major ploughing decisions were made by the county and use of equipment was co-ordinated. (The snow blowers brought in from Trenton, for example, were directed in response to county supervision.)

However, as was the case in Niagara, a lot of the ploughing took place on a local *ad hoc* basis. A number of townships helped their own dairy farmers without in any way co-ordinating their activities with the county.

But the biggest contrast between the two was in communications.

Niagara, as mentioned, kept in touch with its equipment. Prince Edward County did not. Provincial, military, county and township ploughs were all out of touch for a great deal of the time. Some equipment simply was lost. It was impossible at times to tell who, if anyone, was ploughing any given place.

Police

In both Niagara and Prince Edward County, the regional police forces were the most important agency responding to the emergency. In the case of Niagara, the force involved was the Niagara Regional Police. In the case of Prince Edward County, it was the Ontario Provincial Police (OPP). (There is no county police force.)

But again there is a contrast.

In Niagara the regional police were, in effect, grafted onto the central Emergency Measures Organization (EMO). The chief of police, for example, spent the emergency working from the designated EMO control centre. The Welland police station acted as clearing house and operations centre for storm activities.

It is quite clear that the regional government, acting as an emergency agency, perceived the police as the most important response agency, that the police accepted the role, and that other agencies accepted this.

Even so, the central police switchboard became overloaded and police mobility virtually disappeared.

In Prince Edward County the police were equally, if not more important. They co-ordinated the activities of other

agencies. They made many of the critical decisions. And they were the major source of media information. (This was probably also true in Niagara.)

But the OPP in Prince Edward County emerged as dominant because no other agency took on any such responsibility. There was no EMO. There was no real direction from the county. Other agencies and the public called on the police for direction and leadership, and the police responded.

The difference is made clearer when one examines the timing of the response in the two areas. In Niagara the dominant role of the police emerged immediately — in Prince Edward County it became clear rather slowly.

Fires

In Niagara, the fire services responded in much the same way as the police and roads did — as an integrated part of regional government. Again, this was not the case in Prince Edward County.

The nature of the event meant that fire services in the Niagara area were called upon to deal with a non-fire variety of activities such as food stockpiling, co-ordination of CB radios and snowmobiles. This was done as part of the regional response to the snow disaster.

However, these activities, while they took place as part of the response, were not in the original plan. This meant considerable difference in the quality of individual response.

In Prince Edward County the fire services were basically not a part of a plan. There was a plan hidden away somewhere — it was not used. While some minor snowmobile activities took place from the Picton fire department, on the whole fire operations ceased.

It is true of course that much of the Niagara fire service is full-time. There is only a handful of full-time fire personnel in Prince Edward County. But it is also true that the volunteer departments in the Niagara areas became a focal point of community activity in response to the storm.

Social Services

Social and health services were also represented in the EMO control centre in Niagara and made provision for such things as food stockpiling (done at the fire stations). There was also regional direction of transport for those needing medical attention.

In Prince Edward County the various welfare and health services usually made their own arrangements for emergency activity. If they got into trouble or needed help, they turned to the provincial police. There was no evaluation of potential county needs (as was the case in Niagara) and decisions to act or not to act were made only in response to specific requests. (In Niagara, in contrast, such things as fuel shortages were sometimes anticipated.)

Military

Both Niagara and Prince Edward County called upon the Canadian Forces for assistance during the storm.

The call from Niagara was for help by the militia and it was made as a specific decision because EMO decided it needed outside help. (Police and public works vehicles were having difficulty moving and maintaining contact.) What Niagara asked for was men and vehicles to clear the first major artery south through the storm belt.

The militia, incidentally, worked under the command of the major control agency, the regional police. As it turned out, the militia provided manpower and vehicles and the police provided the communications.

The military response in Prince Edward County came in much the same way. (The request was channelled through the provincial government.) But it was for ploughs (and on two occasions for air and land transport). Again the military provided what was asked for. This time the equipment provided was under directions issued by the county roads supervisor.

Summary

On the whole it seems clear to us that the control and co-ordination was stronger in Niagara than in Prince Edward County. The clear acceptance of emergency responsibility and awareness of who had that responsibility made the difference.

This does not, however, suggest the system in Niagara was without drawbacks.

For one thing, EMO, in Niagara, got off to a slow start. The announcement that there was an emergency came some time after the storm was at its height. And it wasn't communicated to either the media or the municipalities. (In Prince Edward County, the effective school response took place partly because of prompter action.)

In addition, there were three major problem areas in the Niagara control centre itself. The function of the committee and its individual members was not originally clear and had to be worked out. The chain of command was therefore somewhat obscure. There were also communication problems. The initial lack of communication with the media persisted and the radio network link with municipalities — an existing emergency system — was hardly used, despite telephone problems. Finally the control centre itself was largely inadequate. There was not enough space, nor were there sufficient phone lines, the maps were inadequate, and transportation was lacking. For instance, runners had to maintain a link with public works road clearance offices upstairs in the same building and also to additional telephone lines located elsewhere in the basement.

Incidentally, one problem in both localities was that no one seemed to be sure what it meant when someone said a state of emergency existed. In Niagara, for example, they de-

clared several emergencies and called them different things. In Prince Edward County they discussed calling the area a disaster area but refrained because there was a suggestion that that might cost the county money.

It was also true that in some cases no one really knew what the legal implications were for various emergency acts; nor for that matter, who paid the bills.

The fact that a regional plan existed in Niagara did not mean the region always out-performed Prince Edward County. Sometimes individual agency plans in the county were more than sufficient to meet particular needs.

In Prince Edward County, for example, the schools moved rapidly to get pupils home ahead of the storm threat. They were successful because a great many people such as school bus drivers used their own initiative and the warning system worked. (There were warnings from the county and the police.) They made a decision in time and implemented it immediately in accordance with well-established procedures.

In Niagara, by contrast, hundreds of school children were stranded in schools at the height of the storm. At least one of the school boards did not act immediately upon receiving the weather warning and delayed the closing procedure until it was too late. It was also true there was no direct link between EMO and the school boards.

Also, in Niagara, even when the schools did decide to act, it became clear that the bus system, as operated, could not move quickly. (There were similar problems in Belleville, just north of Prince Edward County.)

Perhaps it is worth mentioning at this point that both the Niagara region and Prince Edward County depend on weather forecasts not specifically servicing their region. In both cases, the forecasts are issued from Toronto. In both cases, the weather conditions — above the Niagara escarpment and in the southern part of the county — were severe. The forecast system does not take this possibility into account. (The telemetry from a weather station in the county, for example, was not even being read in Toronto.)

In some cases, of course, there were similarities between the two areas.

In both communities, volunteer groups of snowmobilers and CBers organized themselves and performed herculean tasks in responding to community needs. These are well documented in the two detailed studies.

In both cases, however, these responses were not built into a community plan. EMO in Niagara had not foreseen — as part of its plan — a vital role for such groups. The provincial police in Prince Edward County activated its contacts only after the emergency developed. (The same was true of the regional police in Niagara.)

We do not want to suggest that snowmobiles and CB radios were an out-and-out blessing. In both areas they caused problems. In Niagara and Prince Edward County, for example, there was duplication of effort; the same appeals

were relayed to different agencies and responded to more than once. In Niagara it appears that only persons on snowmobiles could have reached some of the cars that were broken into. In Prince Edward County, it seems evident that some inaccurate messages carried by CBers led to a waste of resources and to possible risk.

There is another lesson here and it applies to both regions.

The development of the snowmobile and the CB radio means that we now have new ways of moving people, goods and information. It is essential that planners understand the capacity of such systems in devising means of responding to emergencies. This was basically not true in either Niagara or Prince Edward County.

Technology of course has other effects. The presence of freezers means that a power loss can have a much greater impact now than in the past. The development of regular delivery systems to stores and pickup systems from farms means people depend on transportation. (In Prince Edward County, the farmers were forced to desperate measures when some milk drivers could not get through.)

In some disasters, in the past, we have seen a rapid response from various voluntary groups such as the Salvation Army, the Red Cross, service clubs, church groups, etc. In neither Niagara nor Prince Edward County did we encounter any such co-ordinated activity. (It is possible we may have missed some.) Perhaps this resulted from the widespread unfocussed nature of the storm; whole regions were affected and all had similar needs. It was true of course that individuals looked after their neighbors, something which may have made a more organized response unnecessary.

Communications

The critical problems in both areas were, as is almost always the case in unexpected events, related to communications.

The most important communications system was the telephone.

It was the telephone which linked all the various emergency agencies and it was the telephone which bore the brunt of private communications as well.

Data obtained from Bell Canada suggest that both areas faced similar problems. Calling levels reached Christmas Day activity; the phone systems were quite simply overloaded day after day.

Although in both areas Bell Canada made appeals to individuals to restrain their use of the phone, it seems that these appeals had little effect. People had no other way of getting information so they simply kept on trying until they got through.

Bell Canada, it is true, did try to make the public aware of the phone problem. This was not true of other companies. But we think the various appeals might have had more

effect if the company had tried to explain in detail precisely why the system was malfunctioning. The evidence is clear that most people listened endlessly to the radio for any and all information about the storm and its effects. It seems to us that the public will never be in a more receptive mood to this kind of educational information.

There is absolutely no reason why the media and public service organizations cannot prepare such information on tape, well in advance of emergencies and for use when the crises arise. This should remove any possible objection from the service companies that their personnel are too busy to spend their time in this way during the storm.

Telephones aside, it seems clear that both regions failed to use alternative systems. This has already been mentioned. In Niagara an emergency radio hookup was rarely used and CB radio was not used in a co-ordinated fashion. In Prince Edward County this was also true.

(An earlier study, *The Sydney Big Storm Report*, shows clearly just how effective CB radio can be when it is integrated into a communications system operated by the emergency response organizations.)

Even where alternative radio systems did exist they were out of commission because of a number of problems, some of which could have been foreseen.

One is simply that systems based on mobile transportation break down when vehicles are not in operation. The police in both regions encountered this.

Another is that quite often inter-agency communications

are hampered by a lack of compatibility in the radio equipment being used. In Niagara, for example, it was necessary for the fire system to go through a central board because there are two frequencies. The convoys through Niagara park had to radio to headquarters to contact the snowplough, because the two working radio systems were not compatible.

Finally, the media.

It is clear from survey data that the public depends on the media in a crisis and that this dependence is overwhelmingly on the medium of radio.

In Niagara, the media met this response well, in some cases devoting their entire programming to emergency response shows. The one failure was the lack of adequate two-way communication between the emergency agencies and the media. This did lead to some inaccurate reports about roads being open or closed, etc.

The same thing was also true in Prince Edward County but to a lesser extent.

The one key station served a much larger area than Prince Edward County. So, while it devoted much of its news and public service programs to the county, it also maintained its regular programming.

Generally we believe there is some substantial evidence in our "Tale of Two Snowstorms" underlining the need for co-ordinated emergency planning, and that any plan must include an effective warning system.

ONE TALE OF A SNOWSTORM: NIAGARA REGION

INTRODUCTION

During the final days of January 1977 a low-pressure weather system moved slowly northeast across New York State bringing with it in its wake gale-force winds, very cold temperatures and lots of snow.

Lake Erie was frozen and had two feet of previously fallen snow on top of the ice. That is not unusual because the lake is shallow. What was unusual was lots more snow and four to five days of very strong prevailing winds blowing across Lake Erie and over the gently sloping terrain of Southern Ontario which led up to the edge of the Niagara Escarpment.

Most of the snow on the lake was literally blown onto the land, plastering the edge of Lake Erie with frozen drifts 30 feet thick. In subsequent days this deposit, together with more snow, swept inland and radically affected the area above the escarpment.

The major part of the population lying below the escarpment was not much affected but it was a very different story for those living on the edge of Lake Erie or in the country in between. It was as though there were three or four different storms depending upon where you were living or working.

Most of this account centres on the efforts of regional agencies headquartered below the escarpment – Emergency Measures Organization (EMO), Public Works, Regional Fire and Police, the militia – to cope with the onslaught of the storm above the escarpment where less than a third of the population lives and works. There were at least 2,000 people, many of them children, stranded by the end of the first day of the week-long storm; over-all 3,000 vehicles were left abandoned and had to be dug out and towed away.

A nine-person team from Carleton University's Emergency Communications Research Unit arrived in St. Catharines on Wednesday, just as the storm drew to a close, and spent the next two weeks trying to reconstruct the communication aspects of what had happened during the storm period.

This was accomplished in two ways: first, by drawing a sample of the Niagara Region population and interviewing them; secondly, by tracing the flow of events as they were communicated to, and dealt with, by the various agencies of regional and local governments. What follows is a summary narrative of our findings.

The Niagara Region

The neck of land jutting out from Southern Ontario which separates Lake Erie and Lake Ontario is roughly rectangular, with its furthest edge pressing up against the U.S. border.

Driving south from Toronto along the Queen Elizabeth Way (QEW), parallel to Lake Ontario, you enter the top edge of that rectangle as you pass Hamilton and drive through

Grimsby and St. Catharines, eventually ending up at historic old Fort St. George in Niagara-on-the-Lake.

On that drive the Niagara Escarpment is to your right, ever present on the horizon, sometimes a few miles away, sometimes fading into the distance. But you are always below the escarpment, sheltered by its wooded rim.

If you take the Niagara Parkway, along the second edge of the rectangle, turning south along the Canadian border parallel to the Niagara River, you pass through Niagara Falls and eventually end up at the town of Fort Erie, across from Buffalo, N.Y., where the river leaves Lake Erie.

You can then take the third edge of the rectangle, along the shore of Lake Erie, through Port Colborne and into a rural area of Southern Ontario until you reach Lowbanks, 30 miles due south of Grimsby where you started. To complete the rectangle you would then have to drive along rural roads through Wainfleet and Lincoln Townships until you hit the QEW again.

You will then have driven around the borders of the Regional Municipality of Niagara and will have touched all the important cities and towns – except for Welland which sits on the Welland Canal just north of Port Colborne.

There are 365,000 people living in this region, a third of them in St. Catharines, the region's administrative centre. The major towns towards Lake Ontario, mostly lying below the escarpment, together account for 250,000 inhabitants, leaving Welland and Pelham in the centre with 55,000 people, and about the same number spread along Lake Erie in Fort Erie and Port Colborne, and in the two rural townships of Wainfleet and Lincoln. The population is not balanced evenly throughout the peninsula. The majority of people live below or near the escarpment, where cash crops predominate.

The Escarpment

The Niagara Escarpment itself is like the edge of a gigantic saucer with its buried centre lying in the State of Michigan. In Ontario, the ragged rim of the escarpment appears in a line which runs from the Bruce Trail in the Georgian Bay area down to the Niagara Parks area. The sedimentary rocks of the escarpment itself occur in horizontal layers, including the red Queenston shale and the Lockport dolomite, a layer of hard rock which caps the escarpment throughout its course.

The Niagara Escarpment is formed from muds, sands and calcareous oozes laid down on the floors of prehistoric seas which covered this part of North America 400 million years ago. Over an immense period of time these various sediments turned to rock through a cementing and pressuring process. The final retreat of the seas, perhaps 300 million years ago, left these blankets of sediments thousands of feet thick over the whole Precambrian surface. The landscape was further altered by the Ice Ages a million years ago, followed by the most recent 10,000 years of post-glacial erosion which has made the Niagara Escarp-

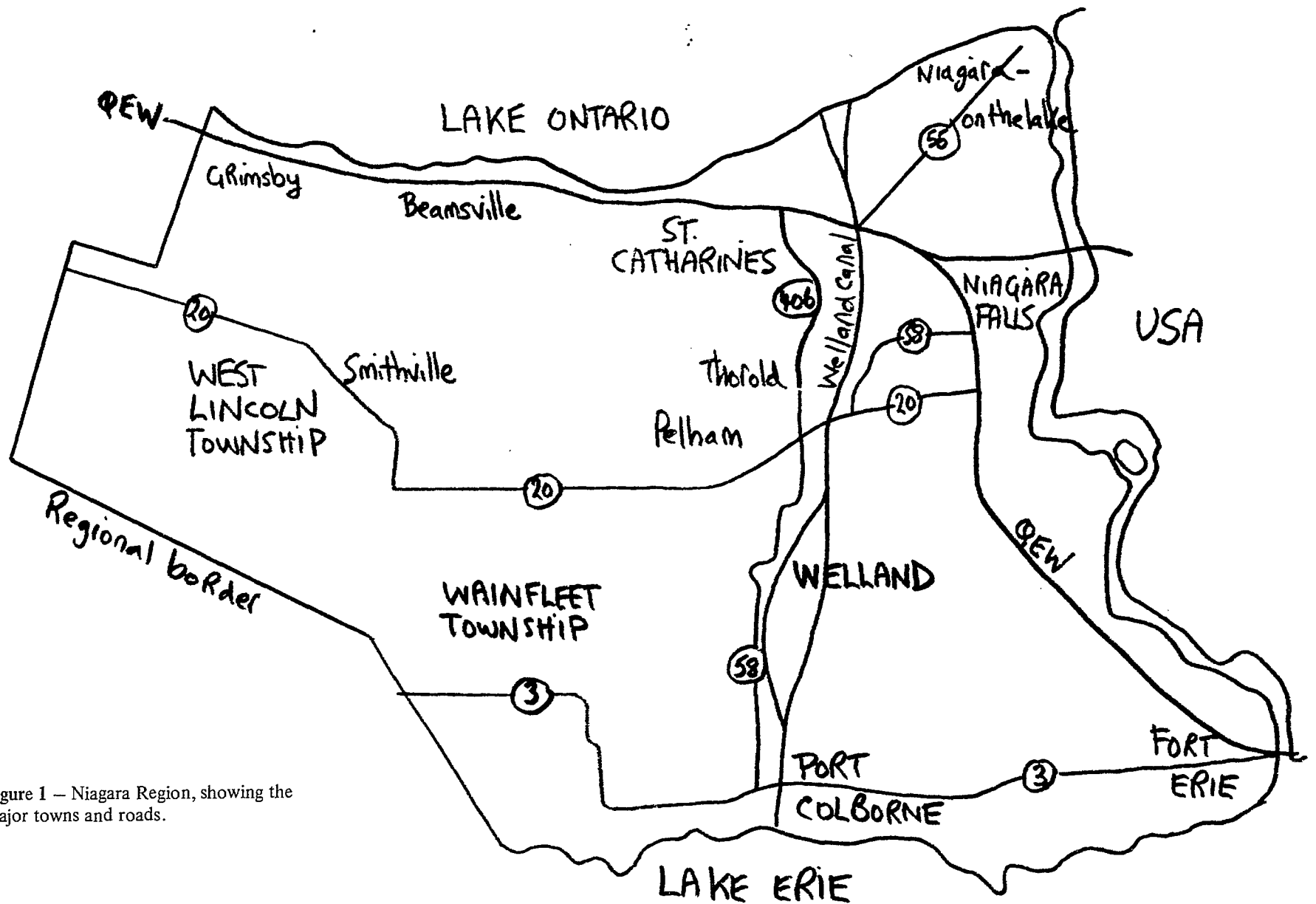


Figure 1 – Niagara Region, showing the major towns and roads.

ment, the visible remains of this deposit, what it is today.

This brief geological history of the escarpment is important for our story. In the Niagara region, most of the population does not live on the gently sloping area which lies above the escarpment, Lake Erie being a shallow continuation of this gentle rise; but rather on the edge of Lake Ontario sheltered below the rim.

The Storm

On Thursday morning, January 27 — the day before the big storm hit — there was considerable wind and blowing snow and it looked as though a snowstorm had socked in for the day. But by that afternoon the winds had dropped and the sun came out. This made a big difference to a number of people who had to make decisions the following day when faced with what looked like a similiar situation.

At 0500 hours on Friday morning, the U.S. National Weather Service in Buffalo, N.Y., sent out a 'traveller's advisory' for Buffalo and vicinity — which includes the southern part of the Niagara region — that warned of bad weather ahead. However, Canadian radio stations in the Niagara Peninsula do not rely on the U.S. weather service for their weather reports.

The routine 0600 weather forecast issued by Environment Canada called for strong northwesterly winds, with heavy drifting and blowing snow later in the morning. No advisory, or weather warning was issued at that time. The first warning came two hours later at 0800 hours which said that winds would rise sharply over Southwestern Ontario over the following four hours with near-zero visibility because of blowing snow. Wind gusts would range to 80 kilometers per hour with snow falling up to six centimeters and heavy drifting.

Variations of this forecast were issued throughout Friday. Snow squall warnings were issued at 0300 hours Saturday with forecasts of heavy snowfall, winds gusting up to 80 kph and near-zero visibility. Similar forecasts were issued throughout Saturday as the storm continued.

Winds dropped somewhat overnight providing a temporary lull but the 0500 Sunday morning forecast was again for snow squalls with up to 10 cms of snow, near-zero visibility and heavy drifting snow. Again, there was an overnight lull.

However, the Monday 0500 forecast was just as bad, with bitterly cold weather, frequent white-outs because of blowing snow, and gale-force winds with gusts in excess of 80 kph. These forecasts were repeated throughout most of Monday though the storm began to fade away late Monday and into Tuesday. By Tuesday afternoon weather conditions had returned to normal and by Wednesday the sun was out.

Friday warnings were a few hours ahead of actual conditions. But once the storm had hit, forecasts largely disappeared and the announcements became weather reports.

People listened to these weather reports on the radio and on television, they rang up the weatherman at the Niagara Regional Airport near St. Catharines, or other sources of weather information, but they all received the same reply because weather information all came from one single source: the Ontario Weather Office in Toronto.

This office prepared a series of regional weather forecasts at regular intervals which were then fed to national news and the local weather offices whose job it is to inform the public and the local mass media. The same forecasts were picked up and circulated through other communication channels, such as the Canadian Press/Broadcast News teletype system to customers, or the RCMP teletype system.

The Niagara Airport weatherman taped regular weather reports, or forecasts, for the four radio stations in the Niagara Region through this period, and most people were informed of the weather conditions in other parts of the region this way. He also, quite unusually, phoned the four school boards of the region around 0815 on Friday morning to warn them to close the schools. Some people watched, or listened to U.S. radio and TV stations in Buffalo and heard a somewhat different weather forecast, though arrived at by similiar means. Buffalo has an automatic phone-answering weather service and an FM radio weather channel operating 24 hours a day.

They did not hear from EMO, or from an EMO public announcement, because these came much later in the day when everyone was well aware that they were into a storm emergency.

ESSENTIAL SERVICES

Niagara was lucky during the storm. The essential supply services continued to operate with only minor breakdowns here and there.

The water supply system was not much affected and the regional mains which supply the municipalities were not damaged. Port Colborne had problems because of a 20-year old obsolete system with so many breaks even at normal times that pumps have to run at capacity to maintain pressure. All cities experienced freezing of individual lines — St. Catharines alone reported 300 service calls over the weekend. In Welland, sprinkler systems in department stores froze and firemen spent many hours mopping up floors.

Ontario Hydro supplies electrical power to municipalities. There were only two major breaks, both to remote small towns and both of less than 24 hours duration. The problem was getting servicemen out to do the repairs. In one case it meant walking eight miles across open country.

There were no major problems in supplying food. Some stores reported a run on clothing and sporting goods and in some areas food was stockpiled. However, EMO and Regional Police did make a special effort to guard against shortages by stockpiling food in fire stations in the Fort

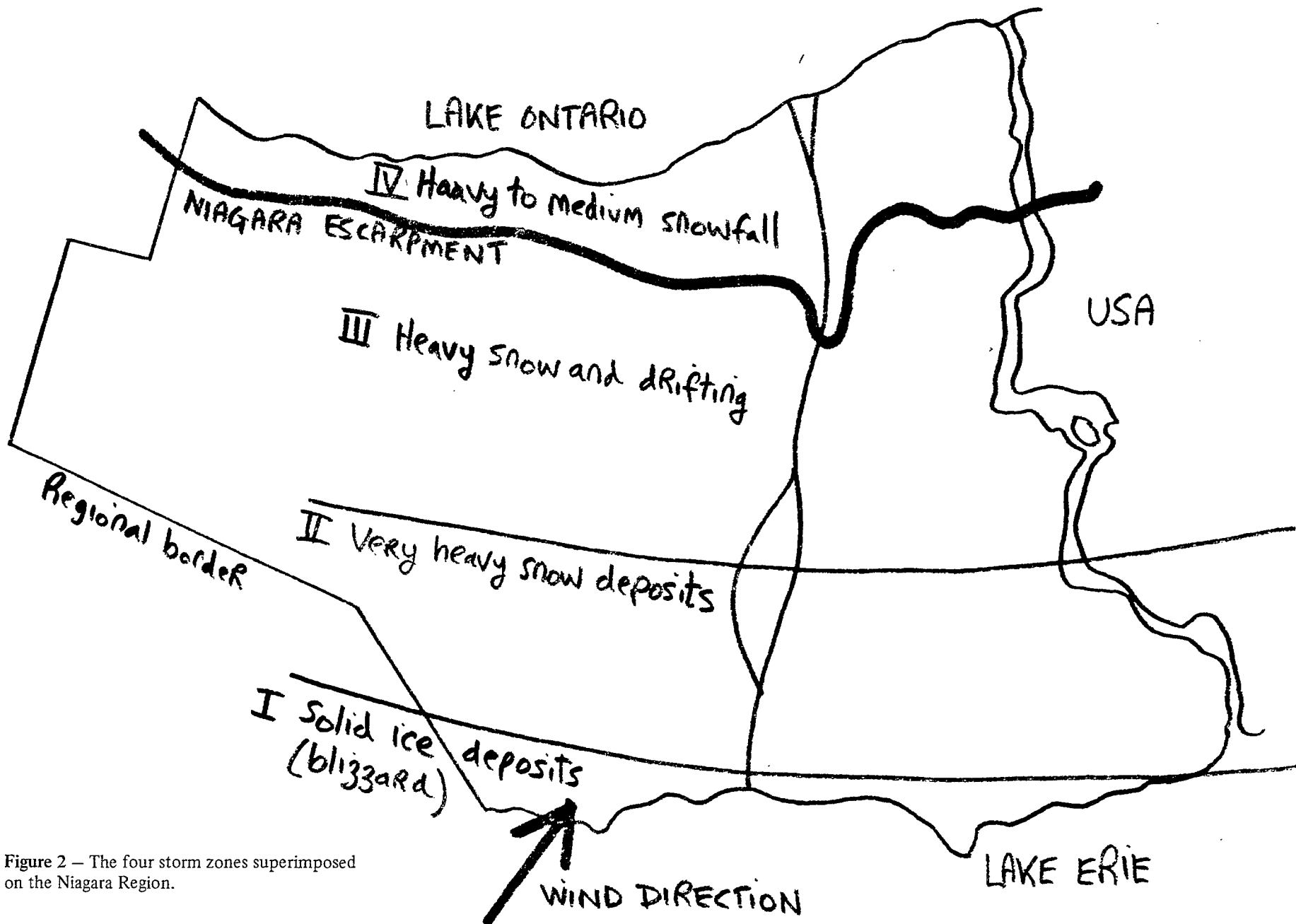


Figure 2 – The four storm zones superimposed on the Niagara Region.

Erie and Port Colborne areas after reports of impending shortages. They got in several large trailer trucks full of bread and milk from Toronto; they brought in large shipments of chicken and cattle feed; and gasoline and diesel fuel trucks were sent to strategic areas, like Welland.

Few health problems were directly attributable to the storm. Despite the marginal involvement of hospitals in emergency planning, despite a patchwork quilt of ambulance services and an almost total inability to take people out by ambulance because of blocked roads, there were no major problems.

There were of course many incidents: a woman in Welland needing dialysis was transported by snowmobile and helicopter to St. Catharines; a severely frostbitten man had to be flown out from the shore of Lake Erie by helicopter; several pregnant women were brought in by snowmobile and 4-wheel drive, including one who needed a caesarean operation; many people needed medication and were supplied by local pharmacists via snowmobilers. Most of these incidents were handled by whatever municipal agency had risen to the occasion, usually made possible by voluntary assistance from local citizens.

The School Problem

Niagara region has four school boards. Two of these look after homes lying below the escarpment: Lincoln County Board of Education and the Lincoln County Separate School Board (32,000 and 7,000 students respectively). These two boards share the same bus system and have generally co-operated in decisions about school-closing. The other two look after homes lying above the escarpment: Niagara South Board of Education and the Welland County Separate School Board (35,000 and 12,000 students respectively). These two boards have their own individual bus systems.

Generally speaking, the decisions about school-closing are made by the directors, based on advice from the bus company, the road superintendent, the school superintendent, the transportation supervisor, and school principals. All these links depend upon the public telephone system. It is unusual for the weatherman to call the boards, and weather information is usually obtained from mass media or by calling the weather office. Usually the transportation supervisor makes the decision about busing, while the area superintendent decides on the time for walking children to be dismissed.

The boards have had little to do with EMO in the past. However, two weeks before the storm hit Niagara the Lincoln County Board of Education had responded to overtures from EMO for some form of centralized contact point and had requested: 1) that they be informed of any impending dangers; and 2) that they be given the EMO telephone number (which is buried in the telephone book under the regional government sub-listings). They had not received an answer to that letter when the storm hit.

On Thursday the entire region was overwhelmed by a morning snowstorm and buses had great difficulty getting out. Many of the schools above the escarpment did not open (and in some cases remained closed through to Friday). Most schools above the escarpment and all schools below it were officially closed at 1300 hours, because it was felt that the weather would get worse. However, the storm dissipated almost immediately and the sun came out. The schools received many complaints about premature closing.

On Friday morning conditions were not that bad and, in most cases, buses were able to get out and pick up students (with the exception of the Welland County Separate School Board which had closed all its schools for a professional development day).

Around 0815 hours the Niagara Airport weatherman called all four boards and, in a most unusual departure, warned them that a bad storm was on the way and that they should close (or not open) the schools. The two Lincoln County boards started to check this out with their own contacts and by 1100 hours had decided to send the children home. The media were alerted and the bus companies organized to pick up children, starting with the handicapped. Walkers were sent home at noon. By this time the weather was much worse and several buses had a difficult time making it to the school and out again. There was considerable trouble getting some children home but, by 1800 hours that day all children living below the escarpment were at their homes, or homes of friends, except for one busload of children at Beamsville who stayed overnight at the home of the bus driver.

However, the situation was much worse above the escarpment. The decision to send Niagara South students home was made at 0930, one hour after the initial phone call from the weatherman. It took two hours to contact and reorganize the bus system and 1130 was planned as the pick-up time from school. At 1000 hours an accompanying decision was made to send walking children home at noon.

However, the storm greatly intensified in those closing morning hours and by midday it was extremely difficult to travel along many routes in the region and the schools were rapidly becoming isolated. That Friday night 1,300 children and 500 adults were stranded in 32 schools in Wainfleet, eastern Port Colborne, southern Pelham, southern Niagara Falls and northern Fort Erie.

The first contact between the boards and EMO was made late Friday night when EMO telephoned them. Plans were made for the militia to move in and help with rescue operations.

By Saturday night there were still 550 children and almost as many adults stranded in the schools. However by 1800 hours on Sunday everyone had been evacuated from all schools, though there were still several cases of these evacuees being stranded in turn on the roads, and of many children still being billeted away from home.

Of the two major educational institutions in the region, Brock University in St. Catharines closed at 1400 hours

Friday with no major problems. Niagara College has five campuses in the Niagara region: two each in Niagara Falls and St. Catharines, and the main campus in Welland. It was this one, situated on the outskirts of Welland that ran into trouble.

The president decided to close the college at 1130 Friday, mainly based on what he heard over the radio. However, transportation was difficult and quickly became impossible. That night 700 students, faculty and staff were snowbound on the main campus. Needed medication was brought in by police snowmobile that night, and all weekend donations of food arrived by 4-wheel drive, truck and snowmobile. Members of the Ham Radio Club handled both official and unofficial messages because telephone reception was difficult and at times impossible. During the Saturday night lull most people were taken out in convoys equipped with CBs organized through a local radio station. The remaining 125 persons left the college around 1000 Sunday morning in cars before the weather set in again.

COMMUNICATION SYSTEMS

The public relied almost entirely on radio for information about the storm. Newspapers were not functioning for most of the period; there are no local TV stations and cable stations were mostly off the air.

There are four radio stations, two in St. Catharines, one each in Welland and Niagara Falls. CHSC (St. Catharines) was the only one of the four which did not run a part-time or full-time hotline show during the storm. CJRN (Niagara Falls) was the first with its 'Operation Antifreeze' (a program they resort to during weather emergencies). Most of the phone-in was live and they also had officials giving information and guidance.

Three of the four stations had a direct radio link with EMO but this was hardly used, both sides preferring telephone use. Stations criticized EMO for lack of information. The radio stations, for instance, were unaware that a snow emergency had been declared mid-Friday afternoon. In fact (with the exception of CHSC) the other three stations found out about the full disaster alert three hours after it had been officially declared. They heard from Broadcast News, who got it from Canadian Press, who got it from the St. Catharines Standard (newspaper), who got it from Regional Police.

Many people were appreciative of these radio hotlines, and of consequent volunteer snowmobile activity responding to on-air requests. However, others criticized overdramatic coverage and misinformation, particularly about road conditions.

There was some TV coverage later, from Toronto and Hamilton but this was quite limited. Buffalo radio and television stations were almost exclusively concerned with the storm as it affected that city.

Use of telephones shot up dramatically during the storm.

Even agencies with alternative radio networks used the telephone consistently despite delays of several minutes in getting the signal.

Bell Canada remained operational throughout the storm despite this inordinate demand. In Fort Erie for instance, almost two thirds of the callers had to wait two minutes for a dial tone. Repeated attempts to complete calls resulted in a snow-balling effect: one exchange recorded an increase of 472 per cent over normal load during that first day. There was also an unusual amount of long distance calls: up to 35 per cent more than at Christmas, usually the busiest time of the year.

It became evident that the number of calls increased visibly at times when children were arriving home — either parents calling children or children calling their friends.

Bell Canada reports that people refused to listen to warnings that the service might break down. Commercial managers repeatedly broadcast requests (over all the radio stations), not to use the phone unless it was an emergency but the numbers of calls did not decrease.

Most of the complaints were because of overload. There was not much damage to equipment — a good deal of equipment had been placed underground following severe damage in the ice-storm in Fort Erie the previous year.

CB Clubs

CB (Citizen's Band) is GRS (or General Radio Service) in Canada but everyone uses the term CB anyway. There are a number of CB clubs in the Niagara region. The Garden City Breakers, a St. Catharines club, claims about 3,000 members and there are probably well over 10,000 sets in the Niagara region.

GRS activity was loosely co-ordinated with whatever form of organization was locally responsible for snowstorm relief work — the municipal offices, or the firehall, police station or the radio station. Mainly it was used to relay messages about stranded cars, blocked roads, requests for help. Channel 9 was used for emergencies specifically but even on other channels there was little of the usual trade-talk, gossip or bravado.

How did it work? For instance, 22 CBers moved into Welland County General Hospital and set up shop in the hospital boardroom. They used their 4-wheel vehicles to pick up and deliver staff and patients. A couple belonging to the Power City Channel Masters (Niagara Falls) used two trucks equipped with CB to determine road conditions, then passed this information through the wife at the home-base to and from the police. The Welland police detachment used members of the Rose City CB Club operating out of the police station, keeping in touch with thirteen 4-wheel drive vehicles made available to them and driven by private citizens.

The general picture is of a number of interested people with communication capacity volunteering their services to

whatever official agency came to their notice, working with them directly, or out of their homes...often in consort with snowmobilers or owners of trucks or 4-wheel drive vehicles also equipped with CB.

The major complaint was of duplication of effort due to lack of knowledge about other groups' operation in the area, and lack of information about the response to particular requests.

CB or GRS is, of course, merely another limited-frequency radio system like many others — police, fire, taxis, bus companies, trucking concerns, hospitals etc. However, GRS is low powered, its range is limited and there is a good deal of interference on the crowded bandwidth allocated to CB. If we ascend the scale we come to the domain of HAMS, or VHF amateur radio. EMO headquarters in St. Catharines had a VHF radio operator on duty, as well as a fixed frequency radio system tied into municipal offices, hospitals and radio stations.

A number of HAM members of the Niagara Peninsula Amateur Radio Club were on the air during the storm but were not co-ordinated in any particular way and not much used.

It so happened that an experiment had been scheduled for Friday by a doctor at the St. Catharines General Hospital to show the possibility of linking up hospitals using high-frequency single band AM radios rather than the normal VHF sets. Certain radio sets were to be taken out and installed in police cars, for instance, linked up with hospital locations. The experiment was not cancelled when the storm broke but it ground to a halt anyway: there were no police cruisers available, many of the hospital staff couldn't get to work and there were too many other private and public emergencies to deal with.

A private company operating in Fort Erie serves as the only communications centre in town. It operates as the base station for the six volunteer fire companies and also provides an answering service for doctors, plumbers, electricians and oil companies. The centre was busy during the storm, but complained of duplicated or even contradictory orders coming from their own fire department, Niagara Falls Fire Department, EMO, CJRN, the Fort Erie municipality and the oil companies.

Road Clearance

Road clearance involved individual municipalities working separately throughout the region, the provincial Ministry of Transport and the Regional Department of Public Works.

(A) Public Works

Under normal winter conditions, the Department of Public Works has all regional roads clear three hours after a snow-storm has subsided. This storm, however, was different — it took three days to subside. The region was unable to handle snow operations with its own equipment and had to rent equipment not normally needed in the area, such as

graders and 4-wheel drive loaders from private contractors, stone quarries and gravel pits.

There were problems. The ploughs Public Works had just ran straight up the snowbanks as they did not have the necessary V-shaped ploughs. In some areas the piled snow became so high that the snow-blowers couldn't put it over the top and front-loaders had to be brought in to dispose of the snow. It was difficult to clear the roads because of the hundreds of abandoned vehicles and crews had to wait for cranes and wreckers to be brought in to lift these cars out and clear the way.

The man in charge of co-ordinating all regional snow removal operations was in Port Colborne the Friday the storm hit. He was able to get to the yard in Welland and made that the base of his efforts until he finally got back to St. Catharines late Sunday night.

Problems with the phone lines in Welland complicated matters. It was easy enough to receive incoming calls but next to impossible to place outgoing calls. In order to get in touch with private contractors, the co-ordinator had to radio the dispatcher in St. Catharines, have the dispatcher call the private contractor and leave word with him to get in touch with the Welland yard. Long messages could not be given over the radio because they wanted to keep the radio free for urgent calls. As it was, the frequency was overworked and sometimes it took up to half an hour to get the message through.

The co-ordinator did not have his list of private contractors and their phone numbers with him in Welland. Often when he finally was able to make contact he discovered the local municipalities had got there first and had rented most of the available equipment. Throughout the weekend there was real competition going on between the region and the municipalities for extra equipment.

There were two dispatchers at the Public Works offices in St. Catharines, just upstairs from the EMO Headquarters. All regional ploughs are radio equipped and were able to keep in constant touch with the dispatcher. However, hired equipment was not radio equipped. On Tuesday morning office workers were supplied with radio-equipped vehicles to babysit the rented loaders.

Snow removal operations could have been stopped by the many stranded cars on the roadways but once the EMO snow emergency had been declared, permission came from the police chief and the regional chairman to tow cars out of the way — 3,000 vehicles were removed in this way.

Emergency calls, and calls concerning road conditions, went to the EMO bunker in the basement of the Public Works building but the dispatcher and a status map of road conditions were located on the ground floor of the same building. Someone from the EMO bunker was constantly running up and down the stairs to keep the map up to date.

Instructions would come from EMO concerning such things as snowed-in schools where children were stranded. The regional equipment would proceed to help out even if it

meant clearing roads that were not their responsibility.

Public Works tried out some innovations. They found it easier to bring the fuel to the trucks, rather than vice versa, so they made arrangements with diesel-fuel trucks to fuel the loaders on the job. Mechanics would cannibalize one loader to keep others going.

There was frequent contact between Regional Public Works and the Ontario Ministry of Transport and Communications (MTC). MTC would ask them to clear certain roads and whoever was close by would do it. On Saturday morning, MTC called Public Works to advise them that four snow-blowers were available. On Sunday they also received three highway ploughs from MTC which they used until the following Wednesday.

The region is divided into five Public Works areas, with a superintendent in each area. Area No. 4 includes Wainfleet, Port Colborne, and Fort Erie (the area hardest hit by the storm). They had real problems with zero-visibility conditions and had to pull everyone off the road on Monday morning. However, by Monday afternoon the equipment was back on all regional routes. The ploughs and the foreman would radio in to the area superintendent to let him know where the bad spots were. The information was transferred to the master map and they were able to keep constant track of which sections of the road were open. Area superintendents received some emergency calls from farmers who needed feed and if necessary they tried to respond to the rerouting loaders.

(B) The Municipalities

The town of Fort Erie rented 12 bulldozers and nine loaders from local stone quarries. They were happy to get them before the region could. Some of the rented equipment started working Friday. All the town equipment is radio equipped. They had no problems keeping in touch with their ploughs. However, extra equipment brought in was not radio equipped. The foreman went out in a half-ton radio equipped truck to keep track of them, while some of the private contractors kept track of their own equipment. Regional Public Works had problems getting into Fort Erie so the Fort Erie roads department found itself clearing some regional roads. The roads department did not keep a master map but they were able to keep track of what roads were clear.

In Port Colborne their two graders and five ploughs were not enough and the town brought in bulldozers and loaders from local companies. The town equipment was radio equipped and they assigned one radio-equipped vehicle to every three pieces of snow removal equipment without radio.

The emphasis was on emergencies. Their first priority was industrial roads where people were trapped. Twenty people were trapped at a poultry concern until Saturday. Forty people were trapped at a milling company until the same time on Saturday. Killaly St. E., a regional road, was blocked and 35 school children were trapped until late Sunday

when the city was able to clear the road. The town received one request from the Port Colborne ambulance service to go to Wainfleet where a person injured in an accident needed hospital treatment. This was handled successfully.

The township of Wainfleet received considerable help from MTC. They requested help on Saturday and were sent five trucks, one snow-blower and two D8 bulldozers. The town also rented a couple of front-end loaders from local companies. Their own equipment was radio equipped and kept in touch with the town hall. The MTC equipment was radio equipped but they could not be patched into Wainfleet's communication system, so they communicated with the yard which kept in touch with the town hall by telephone.

The township of West Lincoln also needed to bring in graders from private contractors. They abandoned snow-plough routes to respond to emergency calls (which came directly to the roads department). Farmers calling because they were out of feed were told to get in touch with their feed company, and to make arrangements with them to have their truck follow the snow-plough into the farm.

The Militia

The Lincoln and Welland Militia first became involved in the snow emergency early Friday afternoon when a call was received from Regional Police enquiring about availability of vehicles. They were informed which vehicles might be made available and how to go about getting the necessary authorization. The rather formal authorization procedure is spelled out below:

The way the military chain of command works in response to requests from civil authority:

1. Request from civil authority (usually OPP HQ in Toronto).
2. Regional Operations HQ (CFB Toronto) — a small liaison co-ordinating group.
3. Mobile Command, St. Hubert.
4. National Defence Headquarters, Ottawa — authorization given at this point.
5. Back to Regional Operations HQ through Mobile Command.
6. Central Militia Area — the HQ for all militia units in Ontario, CFB Toronto.
7. Hamilton Militia District — HQ for region which includes Niagara Peninsula.
8. Lincoln and Welland Regiment (the tasked force in this particular case).

The way the military chain of command worked during the Niagara storm:

1. Request from Regional Police (authorized by chairman of the regional municipality and passed down through the EMO of regional government).
2. Regional Operations HQ.
3. Central Militia Area (bypassing steps 3, 4, and 5 above)

was possible because of a prior call from Mobile Command allowing CMA to respond to area requests).

4. Lincoln and Welland Regiment.
5. Central Militia Area and back to Lincoln and Welland (as well as the 23rd Service Battalion and the 56th Field Artillery unit).

Essentially EMO hesitated for a day whether to bring in the militia or not — probably because of the \$10,000-a-day cost involved, or perhaps because of the question of authority.

However after police operations became hampered, and with some prompting from the militia themselves, the official call did go through on Saturday afternoon. Once done, things went quickly and by 2200 hours that same day two units (mostly 4-wheel drive vehicles and trucks) had been established in Niagara Falls and Welland, which had become a police-manned forward command post for EMO. By 1000 hours Sunday morning a Niagara Falls detachment had got to Fort Erie along the Parkway, and the next day this unit struggled along Highway 3 to Port Colborne and beyond to Wainfleet Township.

On Saturday afternoon a headquarters force was set up in the St. Catharines armoury. They had trouble with the phone lines. The armoury had only one phone line, downstairs in the main floor office. A second line was available, but that was upstairs in the officers' mess. The officer-in-charge used the downstairs line for incoming calls since that number was better known.

Communications with the EMO bunker were by phone or runner. If the phones were busy, which they often were, problems arose. On one occasion, the officer-in-charge received instructions third hand from a runner from the bunker. The message had been passed from a militia officer in the bunker to a runner to another runner to headquarters. It called on him to send five trucks out on a certain mission. This didn't sound right to him, so he phoned and discovered that the actual order was to send out one truck and have it make six stops.

At the Welland militia depot, housed in the Regional Police building, the officer-in-charge had 13 vehicles under his direction including seven 1-ton trucks, a 5-ton wrecker and two 2 1/2-ton trucks. He also helped co-ordinate the movement of five Bell G4 helicopters. The militia had been ordered to place themselves at the disposal of the senior police officer in the area.

Calls for help would come into the Welland police switchboard. A two-man team and a truck would be assigned to the job; usually one policeman and one militia man. The police cruisers were unable to move and so army vehicles were used exclusively. They were not equipped with radios, and the only time headquarters could keep in touch with them was when they were close enough to use the policemen's personal radios. Usually, a vehicle would be dispatched, its departure time noted, and then headquarters would simply have to wait for the men to check in by telephone. This was difficult because the switchboard at police headquarters was usually clogged with incoming calls.

Bell Telephone installed three additional lines at police headquarters.

The situation was similar in Niagara Falls. The command comprised 20 men and six vehicles: two 1-ton and four 2-ton. The 1-ton vehicles were more useful because they had better traction than the larger trucks. In any case, neither type of vehicle could go through more than a foot and a half of loose snow, or light drifts.

The Niagara Falls armoury was equipped with three telephones. The current situation was reported to the St. Catharines armoury every three hours. Phoning was tedious as direct dialing was impossible and they had to go through the operator.

All requests for help would be referred to the police, then assigned to the militia. Assignments included delivering fuel supplies to fire stations for distribution to snowmobilers, taking repairmen to repair oil furnaces, clearing roads and moving stalled cars off the roads.

The Niagara Falls detachment pushed through to Fort Erie, arriving there at about 1000 hours Sunday morning. They set up headquarters at the regional police station, and worked in a similar fashion to Niagara Falls and Welland. They managed to transport a pregnant woman from Fort Erie to Niagara Falls in a 1-ton truck over clogged roads. They delivered 300 loaves of bread to Ridgeway. They were called out to aid a heart-attack victim in Ridgeway, but he was dead before the militia arrived.

There were no radios in any of the trucks. Departure times of the trucks were noted and the time of return estimated from that. They were forced to depend on the men to phone in occasionally. Surprisingly, no trucks were lost, and there was always a vehicle available if needed.

The order to stand down came at 1600 hours Wednesday. In five days of operations the militia didn't lose a man or vehicle.

Snowmobiles

Snowmobilers, like the CBers are organized into regional clubs and responded to whatever organizations surfaced in their area. Many of them attached themselves to fire halls, police stations, radio stations or municipal town halls. Others operated independently, answering requests that came over the radio or CB network.

In Niagara Falls, for instance, a group of private snowmobilers operated out of a private company whose owner had access to eight machines and also had a mobile home and CB equipment. This group worked with the Regional Police.

In Smithville, the Ontario Provincial Police (OPP) ended up running a group of 26 snowmobilers who had registered with them. They would send them off in pairs to check stranded cars along the highway. In Welland, snowmobilers used the main fire hall as a focus point. They used part of

the fire hall as a repair area until a garage and workshop in a technical high school were opened up for them. CHOW, the Welland radio station, started a fund which was later used to pay for repairs to snowmobiles. The fire station issued gasoline for snowmobilers on duty, paid fire workers, monitored incoming calls and checked pairs of snowmobilers in and out.

A somewhat similar situation developed with the owners of 4-wheel drive vehicles.

Several helicopters were used, though weather conditions made it possible to fly only on Sunday and Tuesday. Five machines were made available free of charge from Niagara Helicopters and were used at the Welland police station. An OPP five-seat helicopter was also kept at Welland and a CFTO camera crew made use of this on Tuesday. Helicopters were used to bring out people stranded in the most inaccessible areas — such as a severely frostbitten 300-pound man who was at Lowlands, one of the hardest-hit areas of the lakefront.

DECISION MAKING

Regional Police is an arm of regional municipal government, as are the Mutual Aid Fire System and Public Works. All these departments are represented in EMO.

And then there are the municipalities themselves which, despite seven years of regional government, are still very much alive and kicking. Authority figures arose from municipal government — usually the mayor but quite often also the town clerk — the city engineer, or the fire chief, sometimes closely associated with the local radio station owner.

New appointments played a significant part. It was just luck that the mayors of Pelham, Fort Erie and Port Colborne were new on the job and that these were amongst the hardest hit areas. The chief of Regional Police and the EMO co-ordinator were also both new appointees.

Emergency Measures

The Emergency Measures Organization for the Niagara region came into existence with regional government, replacing two previous provincial EMO posts. It is incorporated under the Department of Public Works and, in fact, the EMO bunker is in the basement of the Public Works building in St. Catharines.

Standing operating procedures are laid out in a manual issued by the regional municipality. There are various procedures for declaring a 'disaster alert' but whatever the procedure the declaration is to be conveyed to the communications sergeant at Regional Police headquarters in St. Catharines who is then responsible for notifying a number of key personnel, all of whom have specific duties to perform.

Members of the disaster co-ordinating committee to report

to the control centre immediately following the disaster alert, are as follows:

- Director of Engineering (Chairman)
- Emergency Measures co-ordinator (Vice-chairman)
- Medical officer of health (MOH)
- Executive assistant
- Chief of Regional Police
- Regional Mutual Fire Aid co-ordinator (St. Catharines Fire Chief)
- Director of Social Services.

In addition, each municipality in the region should have its own disaster plan and there is an emergency operations control group responsible for taking action. According to the manual, responsibility for disseminating the warning to clerks of municipalities in the region should come from the regional clerk. EMO, as co-ordinator, is responsible for advising the MOH, the fire chief and Bell Telephone as required. Media are not on this list of those to be advised of the warning, nor are mayors of municipalities, though presumably they would be advised by their own municipal clerks. So what really happened?

Regional Police was first warned of the seriousness of the approaching storm by CPIC at 0945 hours on Friday. EMO heard from weather forecasts on the radio.

As the weather grew worse on Friday morning, the EMO co-ordinator contacted the chief of police and other regional officials. They considered that this was going to be a serious and lengthy storm that would effectively cripple the region. At 1330 hours on Friday a 'snow emergency' was declared by the chairman of the regional municipality.

However, the disaster co-ordinating committee members were not told to report to the control centre and it is unsure whether they all knew. Certainly most of the municipalities were unaware of this declaration and the media only became aware of it through the afternoon as they contacted EMO or the Regional Police.

The declaration of a snow emergency does not give any extra authority to the police in the region, or to other agencies. It is mainly to demonstrate to the public that a serious situation exists. The power of the police to order removal of cars obstructing snow ploughs, etc, is drawn instead from the Highway Traffic Act, sec. 86, which states that: where a policeman feels it is necessary (a) to allow movement of traffic; (b) to prevent damage or injury; (c) *in an emergency* he can direct traffic and everyone must obey him.

Finally at 1737 hours that Friday afternoon a disaster was declared (though this was in fact a verbal announcement by the chairman of regional government). The Chief of Police told his deputy who instructed the staff-sergeant communications to inform those people on his disaster list.

Media were not informed directly of this declaration. The municipalities were informed around 1900 hours when a status check was carried out — mostly by telephone rather than the fixed-frequency radio network already set up in the basement.

At that time the disaster co-ordinating committee members (those available at any rate) did meet at the control centre. The EMO co-ordinator and his deputy were already there, together with a couple of police technical staff who had been sent there at 1515 hours to man the radio network. They were joined by the medical officer of health, the fire chief, an assistant to the chief of social services (who was snowbound) and an assistant to the director of engineering (Public Works) (who was also snowbound). The chairman of regional government was himself snowbound in his house in Niagara-on-the-Lake and had conducted all his business up to that point by telephone.

This essentially made up the committee for the next few days, being supplemented on occasion by other police personnel, or with members being replaced by substitutes.

Two other major policy decisions were made through the chairman of regional government. The first was to call in the militia. This was finally decided upon after a good deal of consultation, on Saturday afternoon. And then, eventually, a stand-down from disaster situation to a snow emergency on Wednesday morning.

On Sunday, the chairman also got in touch with various senior officials of provincial government to ensure assistance with road-clearing equipment, and to clarify the legal and financial arrangements under which this emergency action was being carried out.

The mass media were not informed in any consistent way but were told of what was going on as a result of calls from them to either the EMO co-ordinator, the police chief or whoever else they called. One radio station got in touch with the chairman of regional government in his home.

The chairman of the committee, head of Public Works, was snowbound at home on Friday and didn't actually get to the control centre until Sunday. His place (and nominally his role as chairman) was taken by his deputy.

Committee priorities were seen as follows:

1. *People problem* — mostly a question of getting people who were snowbound and isolated out of their predicament and back home. These were largely the hundreds of people stranded in cars along many roads in the region, and school-children and staff stranded in many schools above the escarpment.

2. *Road problem* — mostly a question of getting major arteries cleared so that people, food, supplies and essential services could proceed.

Most of the work of the EMO committee from that point on was towards solving these problems, as well as handling the many *ad hoc* requests that surfaced at EMO control centre.

The committee took some time to work over its priorities and to get itself established into a working group. But over the next few days it did gradually establish itself as a resource group, as a department liaison group, and as a

priority decision-making group. There were weaknesses and errors but its presence was needed and felt.

For its first hours on Friday, there was some confusion as to what the duties of the bunker personnel were. Upon arriving at the EMO operations centre, members of the committee who were able to get through held a round-table discussion on procedures. The EMO co-ordinator indicated it was his responsibility to contact the mayors in the region to inform them of the disaster alert. The police chief's first concern at that point was the children trapped in schools. Between 1800 and 2100 hours on Friday, 25 schools were reached and told to keep everyone right where they were, regardless of whether or not they had supplies or heat. (This involved approximately 2,000 teachers and students.) Three or four of the schools reported power problems, mainly in the southern part of the region.

At the start of the EMO operation, numerous calls came in regarding minor, specific actions that needed to be taken. The police chief began to feel that there was no way he and the committee could deal with these from where they were, so gradually the 'nuts and bolts' decisions were passed down to men in the field, and over to the operations staff at the communications room in police headquarters. The Welland police station became the advance command post for operations in the central and southern part of the region which takes in about 60 per cent of the Lake Erie shoreline. It was this area that was the hardest hit.

The work went through stages: Saturday was devoted to trying to locate and evacuate the 2,000 schoolchildren stranded in schools and private homes, in handling minor medical emergencies and in ordering food and materials. A major decision was taken mid-Saturday afternoon when the militia was called in and dispatched to the front.

Sunday saw the evacuation of the remaining children and staff from schools, running of food and gas and diesel fuel supply convoys to Port Colborne, and a good deal of progress in road clearance.

Monday saw the first official contact with OPP on the question of closing highways in order to complete snow clearing. Vehicles on the road kept getting stranded despite repeated radio requests from the police not to travel unless absolutely necessary. On Monday road blocks were erected and a number of major roads were cleared. The road-blocks were dismantled on Tuesday.

By Tuesday night it was all over and there was a return to the snow emergency status on Wednesday morning, together with a closedown of police operations.

Problems were of two kinds:

1. *Physical location* — the centre was far too small and ill-equipped to work in. There were no large-scale maps and a runner system had to be established to the Public Works dispatchers upstairs. There were only two telephone lines and a runner system had to be established to a police hook-up from a storage room also in the basement. The radio network was not much used because most of the municipal

officials were far too busy to hover round the EMO radio set, while there seemed to be an almost obsessive compulsion to use the phone.

2. *Establishment of authority* — no clear system of authority had been established in the centre which, together with problems of personal interaction, took some time to resolve. EMO had little impact with the public at large, or with media or municipalities in the trouble belt, but worked well co-ordinating the efforts of the various departments of regional government and municipalities below the escarpment.

Regional Police

The Niagara Regional Police Force, a well-integrated succession to 13 individual police forces in pre-region days, is divided into three divisions. The first takes in the St. Catharines area, and stretches west to the region's boundary; the second is centred in Niagara Falls and covers Niagara-on-the-Lake and Fort Erie; and the third is based in Welland and covers the central and southwestern area, including Port Colborne and Wainfleet.

Communications for each division and all detachments are handled from a central board located in the police headquarters building in St. Catharines. Each local area has its own police phone number, but all these numbers put the caller in touch with the St. Catharines switchboard.

There are 27 lines going into the St. Catharines station. Roughly half of these deal with Niagara Falls while the Welland number has six lines and the Grimsby and Fort Erie numbers each have three. As well, each division has unlisted business numbers which are unknown even to police officers, so that there will always be lines free for emergency use. These numbers are kept in the safe of the staff sergeant of the communications section and in a sealed envelope in the desk of the shift sergeant.

When a citizen calls one of the police numbers, he or she is answered by a switchboard operator in the dispatch room. There are two switchboards there, but under normal conditions only one at a time is manned.

The switchboard operator first asks what division the caller is phoning from, and then ascertains whether or not the call is administrative, or if it requires police action. If it is administrative, it is switched to the desk sergeant at the appropriate division headquarters, and he deals with it. If it appears that a unit will have to be dispatched to answer the call, then the switchboard operator transfers it to the dispatcher for that division, who is sitting in the same room as himself. The dispatcher answers it on his phone, takes down the particulars, and over his radio dispatches a unit in his division. Each division is on a different radio channel, though each car is capable of picking up each of the three channels.

During the snowstorm, both switchboards were used, and operators had to be rotated at 45-minute intervals. Each division's dispatch desk was also double-teamed, with one

officer manning the phone and the other working the radio.

The switchboard was overloaded throughout Friday night. The system, as it stands, isn't really adequate for the daily demands put on it, and plans are under way to update the system. During the storm, the strain on the system was several times greater than normal. On a busy weekend, about 600 administrative and a couple of hundred action calls would be logged. During the storm the total number of calls was around three or four thousand, the bulk of which were inquiries and requests for assistance that the police could not provide, as cars were unable to move, or higher priorities were tying up manpower.

When the move to the EMO bunker occurred, a little after 1800 hours on Friday, there was not really any immediate change to the front-line running of the communications centre. It still served as the clearing house for calls and the co-ordination point for police activity, and remained as such throughout the weekend, although as the bunker swung into full operation, some specific communications were handled from there. The bunker also took over ultimate command, and handled inter-agency co-ordination. When instructions to the field were sent out directly from the bunker, however, the communications centre would always be kept up to date on the precise nature of those messages.

One of the biggest problems facing both operations centres was that phone lines were overloaded due to heavy public use and, since almost all communication to divisions, detachments and other agencies was done by phone, this meant that time was wasted waiting for dial tones. An example of this would be the Regional Police contact with the Niagara South Board of Education regarding children trapped in schools. During the course of the weekend, the police made approximately 30 calls to the board, who in turn placed roughly 20 to the police. Minutes spent each time waiting for lines add up to a sizable length of time.

On Friday afternoon the police started to monitor CB radio for road conditions, to broadcast appeals to motorists to keep off the roads and to compile lists of CBers and snowmobilers. The communications centre remained functional throughout the disaster as a clearing house for calls and co-ordination for all police activity.

Early Saturday, the police felt overwhelmed; a great many of their cruisers had had to be abandoned and, without them, they were unable to report on what was happening. It was around this time that the militia were called in as an extra striking force attached to the police. By Monday, Welland had only one cruiser operational and police officers were going out with army vehicles.

Niagara Falls detachment used snowmobiles and 4-wheel drive vehicles and on Saturday a systematic grid search of abandoned vehicles was put into effect using police on snowmobiles.

The Welland detachment was the hardest hit. By Friday night 80 people were stranded in the police station and the cruisers were no longer operating. On Saturday the snow-

mobile operation began and the militia also started its operations. A command post was set up for the combined police-militia operations, large maps were available and extra telephone lines laid in by Bell Canada.

Schools were cleared on Sunday by a combination of army trucks and snowmobiles, and stranded cars were checked. Numerous cases of vandalism were reported. In many respects the Welland detachment worked independently, feeding EMO status reports and getting assistance from them, particularly anything to do with regional government departments.

OPP

Ontario Provincial Police (OPP) are responsible for highways and various areas of the region, though this responsibility shifts each year as the region takes on more responsibility. OPP operations during the disaster were handled by individual detachment commanders and reported to headquarters in Niagara Falls.

OPP involvement with EMO began and ended with the decision to close highways to traffic on Monday. There are no direct radio links between OPP and Regional Police.

In accordance with the local EMO plan, the OPP are supposed to go to the St. Catharines office if a state of emergency is declared. An OPP inspector became aware of a state of emergency on Saturday, but he was not sent to St. Catharines because roads under OPP supervision did not appear to affect operations at the EMO headquarters at that time. On Monday the state of these roads was affecting relief operations and it was decided to close highways to traffic. OPP were contacted at that time and the inspector remained at the EMO bunker from 0930 hours Monday until late Monday night. Each time that a decision was made regarding action on highways policed by the OPP he made the necessary arrangements.

In Smithville (Lincoln County) priority was given to stranded motorists and 45 snowmobilers were used by the OPP office to help check out cars. The Welland OPP detachment also used Port Colborne and Welland snowmobilers to help search through abandoned cars.

The Niagara Falls OPP detachment was mostly concerned with the QEW, beginning with a 10-vehicle collision early on Friday. By the end of the storm more than 400 cars had been towed off the 22 miles of highway under OPP jurisdiction.

To the man in charge of the Crystal Beach OPP detachment fronting Lake Erie, the storm was a real emergency. He was first aware of the storm by answering a call down by the lake. He reports seeing the snow come across the lake so quickly that by the time he got into his car it took two people to direct him out of the spot where he had parked because the visibility was so poor.

The Crystal Beach detachment (four constables and a corporal) is the only one of the OPP detachments that did

not co-ordinate activity from its own office. When the storm hit the area all volunteer groups went to the fire station — a procedure first used in the ice storm the year before. There is no plan for this type of emergency but the fire hall is central and all the people in town know the volunteer firemen. The OPP moved to the fire hall about 1300 hours on Friday when they saw the hall opened and snowmobiles congregating.

Most incoming calls went directly to the fire station. The OPP would take calls when they were in their office and then go and tell the others at the fire hall. There was little communication between the Niagara Falls headquarters and the Crystal Beach detachment.

Niagara Parks Police maintain a unit of 18 men and five vehicles as part of the Niagara Parks Commission. Throughout the storm they conveyed people through the park to their homes in Chippawa. When other routes became blocked the park route was used because wind swept across much of the area but did not cause severe drifting as in other parts of the region.

People would wait in their cars until there were 25 to 30 vehicles assembled. A convoy system was used to take them through. The convoy consisted of a snow-blower followed by the snowplough, in turn followed by a police car with flashing lights. Next came the group of cars and then another police cruiser also with lights flashing. A snowmobile driver using a portable radio set on the police frequency would radio back to the police headquarters and they, in turn, would tell the plough operator (who was on a different frequency) to speed up or slow down.

The only official call they received over the weekend was from EMO in St. Catharines to find out if the park roads were open to Fort Erie (for the militia route).

During the storm the police did things they normally wouldn't have: they picked up a tank of oxygen in Grimsby and took it to a house in Fort Erie; they transported nurses, doctors and patients to various hospitals.

The police cars of the Parks detachment are white with green hoods. During the storm they found that it was almost impossible to follow a white police car in a white-out. Since then, arrangements have been made to paint the trunks and part of the back of the vehicles green.

Mutual Fire Aid

Fire services in the region are co-ordinated through the main fire station in St. Catharines.

Surprisingly it was a slow weekend for fires and the normal activity of the 47 fire halls became metamorphized into other activities. Many of the fire halls were used as storage and distribution depots for food supplies, and they also became a central point for snowmobilers and CB outfits carrying out rescue operations.

This differed quite a bit from one point to another. There

was not much activity below the escarpment but the nearer to Lake Erie the more involved were the fire stations.

Welland was an active centre. The mayor decided quite early to use the main fire hall as a rescue centre with snowmobilers and CBers operating from there. Welland firemen spent 1,100 man-hours mopping up burst sprinklers. There was one fire in a private home. The normal route was blocked and they tried another – they got there late, and a woman died in the fire.

There was a similar situation at Pelham where the fire hall became an emergency centre. There was some confusion over the emergency number to be used by the community in Pelham. For a while the clerk's office telephone was used, but eventually it was switched to the fire hall. The Pelham fire people had a bad scare when they had to check out a tanker truck containing gas and liquid oxygen that had become stuck.

The regional fire system is not quite so successfully integrated as the police system. Stations below the escarpment are handled centrally from St. Catharines. The alarms ring only there and are then routed to individual stations (Old Lincoln County). The others (Old Welland County) are on a different system; they receive and handle their own calls. Fort Erie uses its own private system for its six volunteer groups while Wainfleet uses a Bell Telephone system where the alarm rings in the houses of volunteers.

There are three radio frequencies: 1) Old Lincoln County; 2) Old Welland County; and 3) Ontario Fire Marshall's frequency (this is the common communication frequency for the two systems).

There were only two major fires during the storm period: a house in Welland and a hotel in Fort Erie. No. 5 station at Stevensville received a call from the Landmark Hotel but couldn't get through; No. 2 station at Jarvis finally got through, but too late, and it burned to the ground.

There was considerable snowmobile activity at Welland, Pelham and Fort Erie. Stranded Regional Police and OPP personnel helped firemen to rescue people, deliver messages, bring in supplies and distribute food.

Mayors and Municipalities

For the five municipalities below the escarpment reactions to the storm were similar.

For these mayors the storm was basically a problem for the roads department, getting the ploughs out and keeping ahead of the blowing snow. Rural roads were harder hit but transportation within the towns, while slower, was never totally halted. Over the weekend all of the mayors were in constant contact with their roads supervisors, calling them from one to four times a day. Their other major contact point was fire. Local fire departments put extra men on standby but they were rarely mobilized. Snowmobile volunteers were also co-ordinated from the fire stations but they also were seldom called upon.

Generally the mayors in these five municipalities described the storm situation as a transportation problem. None termed the situation an emergency but all indicated they were standing by.

Of the seven municipalities located above the escarpment, two are predominantly rural, agricultural areas with experienced mayors (Wainfleet and West Lincoln); two are fairly dense industrialized urban populations dominated by determined veterans of municipal politics (Welland and Niagara Falls) and the remaining three municipalities lay in the hardest hit area, all with newly elected mayors (Pelham, Port Colborne and Fort Erie).

In Fort Erie the mayor used no special emergency plan, "just the existing organizations." The police are located in the basement of the town hall and the fire department is across the street. Later, "with the militia camped across the hall in the planning department," the town clerk implied no normal communications system was really needed.

Located right at the tip of the Niagara Peninsula, Fort Erie was cut off from the outside world for two days. With no local dairies, the town had to rely on outside stocks getting through. The town has one local baker who worked overtime trying to keep up with demand for bread. Fuel was also a problem.

In Port Colborne the mayor worked closely with the city clerk and city engineer. The mayor was on the phone to his MPP Friday evening requesting additional assistance. (The MPP called MTC and by Sunday a snow-blower had made it down from Owen Sound.)

From Friday to Wednesday the mayor was constantly putting messages out over the radio. Over the weekend he was broadcasting a dozen times a day requesting people to stay off the roads, off the telephone, and to cut down on water consumption.

The mayor was in constant touch with fire, hydro and police throughout the storm by phone, although he sometimes had difficulty getting through. He said he felt his most important duty was to keep the public informed. Although he complimented all the people who offered assistance, he had "strong feelings" about the number of volunteer agencies, as well as certain senior civic officials who "just didn't come across. It's embarrassing. If it hadn't been for half a dozen people...."

The mayor also did not learn of the existence of the EMO plan until after the storm.

People in rural areas seemed to be better prepared with extra food and fuel supplies. They also seemed to accept being snowed-in as a condition of living in the country.

Although the largest of the regional municipalities, West Lincoln's problems were limited to roads. According to the township clerk there were very few real emergency calls.

A system of maps was set up by the mayor on the Friday afternoon of the storm after the municipal offices had been

closed. Road maps of the township were placed in his office at the fire hall and the roads department. While the roads and the fire department had a radio linkage to keep up to date on the latest openings and closings, the mayor spent most of his time phoning or going between these departments in order to keep informed. (The fire hall is next door to the municipal offices and the roads headquarters is a few blocks up the street.)

West Lincoln seemed to be fairly self sufficient during the storm. They needed no direct assistance from EMO; they had their own food supplies (from local grocers), plus fuel and feed distributors in their area.

The town of Pelham, directly in the heart of the region, was hard hit by the storm. Most of the storm response was funnelled through the fire department located across the street from the municipal offices. Emergency numbers were established first at the fire hall, then again on Saturday at the town hall, and then again on Sunday at the fire department. All changes were broadcast over several of the local radio stations.

The fire chief found that to keep in constant contact with the roads department he would have to tie up one of the two emergency lines out of the fire hall. Instead, he kept going across the street to the municipal offices to use their phone. He would like to see a direct communications link between the roads and fire departments.

No major problems seemed to surface in Wainfleet Township until Monday, and these were mostly related to fuel. Milk and livestock feed trucks were also unable to get through. Extra snow-removal equipment was dredged up by the mayor from many sources. Snowmobilers were organized through local community groups. The Lowbanks (the most remote point in the region) fire station became a centre for distribution of free supplies, given out by snowmobilers. The militia also played an important role in evacuating school children and transporting food.

When the storm hit in Welland the mayor went directly to his business "just up the street" because he has four 'out' lines there. He immediately began phoning people - roads, fire, police and the local radio station CHOW. He had received a message from the police superintendent asking him to make a radio appeal for snowmobile volunteers. While at CHOW the station manager asked him if he had called EMO yet. The mayor hadn't but did so right away. (The mayor estimates this was around 3:30 pm Friday which would make him one of the first municipal government officials to be in contact with EMO.) The mayor had a long talk with the EMO co-ordinator who gave him a plan outline which the mayor said he found very helpful.

Throughout the storm the mayor maintained a strong public profile. When he wasn't in touch with any of the key agencies he was on the radio, or going around encouraging and thanking volunteers.

Welland's main problem centred around the telephone tie-ups. One event crystallized the seriousness of the storm to top officials. From the very beginning the fire chief had

had difficulty in deciding how involved his department should be in the emergency response network. He was worried that with the fire department's number being used as a general emergency number, regular fire calls would have difficulty in getting through. There had already been some problems of co-ordination between the fire and roads departments. An arrangement had been made for the fire department to call roads if there was an alarm so they would be sure to have a plough to clear their path. When the fire department got a fire call and couldn't get through to roads they decided to go ahead anyway. They got stuck, a house burned down and a woman died. This really upset the mayor and chief, though it was later determined that they wouldn't have been able to make it in time to the house even with a plough. One result was that the mayor ordered a car with a two-way radio to sit permanently outside the fire station. (Both departments have their own radio networks but they are on different frequencies.) The police number was made the primary emergency number but it became so bogged down with calls, many of them from Wainfleet and Port Colborne, that the Welland mayor called the other two mayors to ask them to get their locals to call their own municipal offices.

Niagara Falls has the distinction of being the only municipality in the region to have its own peacetime disaster plan, heavily based on the EMO booklet "Standing Operating Procedures for Peacetime Disasters."

The Niagara Falls mayor spent most of his time at his office during the storm keeping in touch over the phone and monitoring CJRN.

He was very satisfied with the organizational response of his department heads during the storm. "I didn't look at the book (the disaster plan) until Tuesday...it was surprising to see how closely we had followed the plan...I don't think there was anything done that shouldn't have been done."

CONCLUSIONS

The Survey

The top-heavy distribution of population in the Niagara region, with most people living below the escarpment, was mirrored in the population sample represented in the ECRU survey. Unfortunately, as most people living below the escarpment were not badly hit by the storm, this meant that the survey results were rather bland for the majority of those contacted.

Even so, a great many people in the region seemed to have been affected by the storm, judging by the fact that over 40 percent said that they spent at least part of the week of the storm in a place different from where they would usually have been. However, 23 percent said that the storm had no effect on them, and over 80 percent said that they were not greatly affected, either physically or mentally, by the storm.

There seemed to be a considerable degree of self-help taking

place during those days; 37 percent reported that they gave help to someone; and 30 percent said that they received help; however, most people (over 80 percent) did not receive any help from any official agencies.

Forty percent of those contacted had tried to go somewhere during the storm, with 34 percent actually getting there.

Over 70 percent deliberately tried to get information about the storm, most of them getting it from radio.

Summary of Major Findings – Niagara Region

1. *Weather* information in Ontario comes from one central place and is regional rather than local in nature. There is need for more information about local conditions. EMO did not appear to have sufficient weather information, sufficiently in advance, and did not alert other agencies ahead of time.
2. Only luck and the snowmobilers prevented serious *health* problems to quite a few people who would otherwise not have been able to get to a doctor, drug-store or hospital in time. There seems to be a need for emergency health transport beyond the regular ambulances.
3. In hindsight, several of the *school* boards did not come to a decision to close the schools quickly enough to overcome the cumbersome and lengthy turn-around problem of bus transport (particularly in view of an early weather warning). There seems to have been a lack of co-ordination between the boards and EMO.
4. The *radio* was all-important as a means of informing the public of what was happening. However, there were problems: calls were not screened or checked out during the perpetual hot-line and, as a result, there was some misinformation, rumour-spreading and over-dramatization. The radio resource was not used sufficiently (or at all in some cases) by some agencies and companies providing public services (Bell Canada was a clear exception).
5. *CBers and snowmobilers* provided a real public service. However, there was an enormous amount of unnecessary duplication of effort which lead to wastage of time, money and supplies. Emergency planning should incorporate this useful resource as a source of co-ordinated community self-help.

This leads directly to the use of community resources in disaster planning. CBers and snowmobilers are part of the human resource potential, and one wonders how many other sources of energy and initiative remain unexplored. In Welland, the technical high school was opened and used as a workshop for the snowmobile machines. This is a good example of physical community resources which should be locked into the planning process. A community resource survey is a necessary part of local disaster planning.

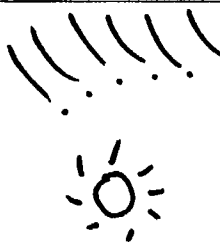


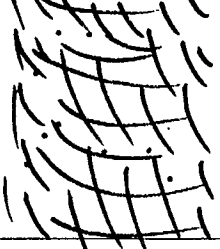



6. The *road* situation developed into an out-and-out tussle between the regional and municipal road-clearing bodies. Obviously this calls for co-ordination at the policy level and joint access to a pool of specialized equipment.
7. The bureaucratic procedure for invoking help from the *Armed Forces* should be familiar to the decision-makers, and it would be useful if this kind of extra-community help could be outlined in local disaster plans. Military vehicles are not always radio equipped and (in Niagara) this led to baby-sitting by policemen armed with somewhat inadequate pocket transistor radios. Portable communications equipment for use in the army trucks would have been useful.
8. *EMO* assumed a useful co-ordinating and decision-making role after a slow start. There seemed to be three major problem areas: the function of the committee, and the relationship of individual members of the committee, had to be worked out, and the chain of command was not always clear; there was a lack of communication between EMO and some media outlets, and some municipalities; and the control centre itself proved largely inadequate, with not enough space, telephone lines, maps or transport. In addition, there are the larger questions of the exact meaning and usefulness of the various emergency declarations; and the inevitable legal and financial implications of *ad hoc* decision-making when viewed in retrospect.
9. The *Regional Police* had the power and used it. But, even so, they suffered from an overloaded central switchboard and a high casualty rate amongst police cruisers. Snowmobiles would have been an asset. At another level there seemed to be lethargic and late co-ordination with OPP.
10. *Mutual Fire Aid* found itself fulfilling many unexpected functions: as storehouses for food and supplies; as centres for CBers and snowmobilers; as emergency ambulances and homes for the homeless. Fire halls seem to have an attraction for the community that municipal offices and police stations sometimes lack; perhaps because they are volunteer groups, or because they have a large transport facility in the centre of town. It would be a pity to disband this natural meeting and clearing house for community disasters; far better to plan for these kinds of exigencies and for these services to be prepared for the versatile roles thrust upon them.
11. The Niagara report does not have a section on the work of *voluntary agencies*. This is surprising, particularly as this omission is based on a dearth of activity, explainable perhaps by the widespread and unfocussed nature of the event. Individuals were involved but there was an absence of planned initiative from local or national organizations.
12. *Municipalities* differed in their response to the storm, sometimes as a reflection of the personality and power of the mayor. There seemed to be a greatly varying response to the emergency from a wide spectrum of city

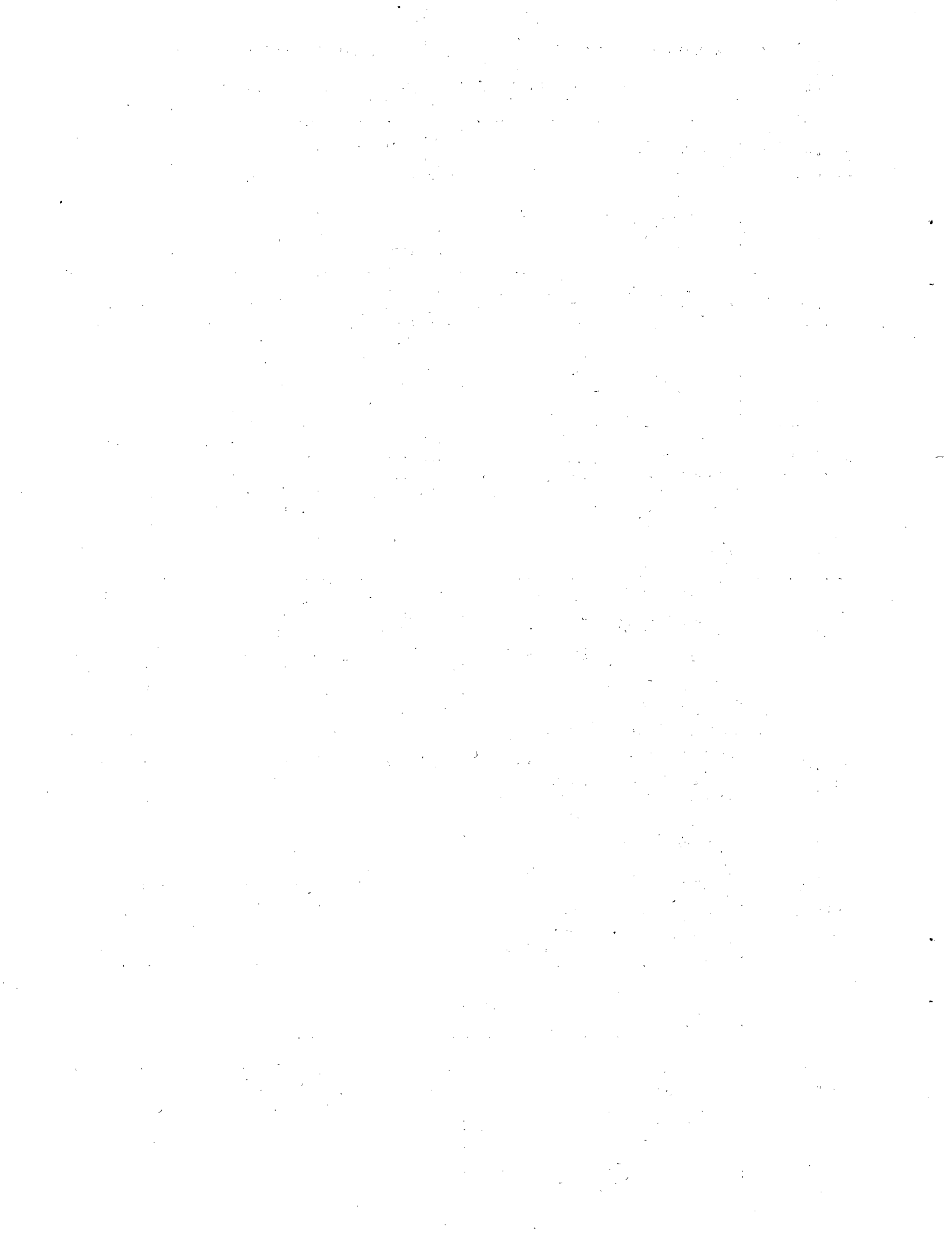
officials. This sometimes led to a lack of a co-ordinated action and considerable confusion amongst the electorate. Specific municipal plans, with a rehearsed response, would have made a considerable difference in some localities. There was some lack of communication facilities between the various municipal offices.

13. More generally, what we found in Niagara was a two-part response matching the individual nature of the peninsula. In the hardest hit rural areas, communities

responded with vigour and determination and managed to cope, though in a largely *ad hoc* way. In the larger towns, sheltered from the storm, there was a great deal more co-ordination and planning, mostly from the various regional departments, particularly Public Works and Police, with assistance from EMO. On the one hand a free-wheeling and unplanned, uncharted response with a maximum of community give-and-take; on the other, a more deliberate, planned approach which eventually meant control and clear-up.

COMPARISON OVER TIME OF MAJOR AGENCIES INVOLVED IN THE NIAGARA STORM

Fig. 10		ENVIRONMENT CANADA	FOUR SCHOOL BOARDS	MILITIA	EMO AND POLICE
THURSDAY January 27			AM Bad weather – schools closed 1300 hours. PM Weather cleared up.		
FRIDAY January 28		0800 1st weather warning – repeats at 1130, 1530 and 1930 hours.	0830 Boards called by weatherman. 0930 Niagara closed, others at 1130 (1300 children stranded).	1400 EMO enquiry. 1700 Trucks ready but waiting.	1500 Snow emergency. 1515 Technical personnel from police go to EMO HQ. 1757 Full disaster.
SATURDAY January 29		0300 snow squall warning – repeats at 1200 and 2200 hours	AM Partial evacuation (Still 550 children and 500 adults).	1445 EMO official request. Call-up set in motion. 2230 Set-up in Welland and NP.	AM School evacuation stage. 1445 Call for militia 1600 Beginning of food checks. 1805 Militia arrives- sent to Welland and NF.
SUNDAY January 30		0500 snow squall warning – repeats at 0815, 1145, 1530 and 2200 hours.	AM Partial evacuation. 1600 All evacuated from schools (some stuck).	1000 Got to Fort Erie. Road clearance work	AM Mostly school evacuation, minor medical emergencies. 0955 Militia sent to Fort Erie area. 1600 Most schools evacuated.
MONDAY January 31		0500 weather warning – repeats at 0800, 1115, 1530 and 1930 hours.	Everyone home.	Continuation of work: road to Port Colborne.	1035 Decision with OPP to close roads. 1200 Food and gas – diesel fuel sent out.
TUESDAY February 1		AM Some diminution. PM Conditions clearing.			0815 Road blocks off. AM Continuation of removing cars.
WEDNESDAY February 2				1600 Standdown order.	0800 Full disaster becomes snow emergency again. 1200 Police operations at EMO stop.



ANOTHER TALE OF A SNOWSTORM: PRINCE EDWARD COUNTY



INTRODUCTION

Prince Edward County, Ontario (population 20,640), is roughly 100 miles east of Metropolitan Toronto and 60 miles from the industrialized area surrounding Metro.

It is also not far south of Belleville and Highway 401, the four-lane highway that spans the south of Ontario from the United States border on the east (at Windsor) to the Quebec border on the west (near Montreal).

But, despite its closeness to urban sprawl, the county is little like the society not far away. Though it does have industrial activity in the form of a cement plant, an electrical appliance manufacturing firm, a mushroom factory and a shoe factory, the bulk of its business is agricultural. Its farmers produce hogs and apples, chickens, cheese, milk and beef. And, in the summer, their fresh fruit and produce provide seasonal employment in local canneries.

The population — though some residents are employed in urban jobs — is still mainly rural. Most people in the county live in rural or semi-rural areas, and the long-term forecasts (there is one for 1988) suggest this won't change for some time.

There is, of course, a small urban population in the largest community, Picton, a town of 4,600. But the bulk of the population is scattered along county and township roads in hamlets like South Bay, Cherry Valley, Demorestville, Wapoots, Northport, Milford, Black Creek and Green Point.

Like many rural areas, Prince Edward County has its problems. The number of farms is decreasing. The school-age population is falling and, according to county documents, the area is attracting older people who come to retire. On the other hand, it is losing its young people due to the general lack of job opportunities.

There is another problem, too, though all might not see it that way. It is caused by tourists and part-time summer residents. Prince Edward County is tucked along the southern part of Eastern Ontario, almost surrounded by Lake Ontario. It is tourist country, a place for summer homes, where visitors flock to camp in woods along the gorgeous, sand-banked beaches. It has excellent provincial parks.

The summer dwellers build homes not equipped with septic tanks along the water. Their presence is creating pollution. And while the campers bring summer prosperity, their departure every fall leaves seasonal unemployment.

Prince Edward County is an historic area, one settled by United Empire Loyalists. Some of their descendants live on the same land today. It is a beauty spot, especially in summer. It is also a community where local government has remained small and without frills. People rely on their own individual resources or, on occasion, the province.

THE STORM

During the final days of January, 1977, Prince Edward County was hit by the worst storm in 30 years. Oldtimers could recall one comparable — the storm of '47.

Starting on Thursday, January 27, and continuing for four more days — the storm brought more snow each day, more winds and drifting to an already snow-battered county.

This created two major effects:

- drifts so high that most major roads were blocked at least some of the time and many were blocked for days; and
- snow swirling around so much that for hours there was a white-out condition that made visibility virtually zero.

It is hard to recreate the impact of a snowstorm but the following excerpts from a woman's diary accompanied by data on the actual conditions will indicate the nature of the storm and its day-by-day buildup.

Thursday, January 27 — (The diary). Snow and high winds; high winds all night and snow drifts. Can't see out my windows. All roads blocked to Belleville. Men couldn't get to work. Worst day this winter.

(There were five centimeters of snow by noon, 12 more by nightfall. Provincial police asked motorists to stay off the roads. Provincial officials said their ploughs couldn't handle the drifts.)

Friday, January 28 — (The diary). Snow blizzard. One awful day. All roads closed. People stranded all over.

(There were seven to eight centimeters of snow in the morning, seven to eight more by midnight. Police again advised motorists to stay off the roads. Bell Canada appealed to the public to use phones only for essential calls. The winds were getting stronger: for one period on Friday, the gusts were just short of 100 kilometers, more than 60 miles an hour.)

Saturday, January 29 — (The diary). Blizzards. Winds up to 50 miles an hour. Couldn't see out at all. All roads closed. We are snowed in. What an awful feeling.

(There was only light snow that morning but there were 15 centimeters late in the day. The winds stayed at a minimum 30 kilometers with gusts up to 60. Police reported snow conditions so bad they couldn't get to the scene of accidents except by snowmobile. Many cars had been abandoned. The incessant winds continued, never dipping below 30 kilometers.)

Sunday, January 30 — (The diary). Blizzard. Snowed in for four days.

(There was light snow, about five centimeters in the morning, then heavy snow, 10 centimeters, later in the day.)

The winds continued to blow. The school board announced on Sunday that no county schools would be opened on Monday.)

Monday, January 31 – (The diary). Blizzard. Blizzard something awful. Can't get out. Can't see a thing. Hydro off since seven this morning. Came on at seven this evening. Out again at 10 p.m. until Tuesday morning at 10 a.m.

(The worst snowfall of all was recorded – seven to eight centimeters in the morning, nearly 20 more in the afternoon and evening. The winds died down a bit but the drifting continued. Radio station CJBQ in Belleville reported "Prince Edward County is virtually sealed off from the rest of the province".)

Tuesday, February 1 – (The diary). Sunny. First in a week it hasn't been blowing. Can't get out, some drifts eight feet high.

(The storm was actually over but the digging out was only just underway. There were 42 inches of snow on the ground at a weather station in the county. The highest figure in recent years for the first of February had been 15 inches in 1971. Total snowfall for the winter was already 109 inches, just 16.1 inches short of the recent record for an entire winter.)

Wednesday, February 2 – (The diary). Went to town for the first time in six days.

IMPACT

It should not be surprising to learn that a storm this severe had its effects on all aspects of life in the county.

It forced closure of the school system – a closure that started on Thursday and continued, in some cases, for five school days.

It disrupted all major industrial operations – creating loss of income for workers, loss of production for the owners and disruption of shipping schedules.

It battered the county's farmers. While exact agricultural losses were impossible to assess, it led to some lost livestock and farm products. And it forced emergency measures to stop further losses.

It also created enormous problems – especially in staffing – for the various service agencies: looking after the aged, the retarded, and the ill all had special storm-related problems.

It created difficulties for the various industries that provide essential services. Fuel oil companies, hydro, and Bell Canada all experienced enormous storm-related problems. Power crews, especially, were able to maintain service only with exhausting work under very difficult conditions.

And, finally, it affected the public – causing fright and concern to some, depression and a sense of being trapped to

others and creating a sense of a need to look after one's neighbors for almost everyone. When the storm was over not many thought it had been fun but most could recall having been, or having been treated as, real neighbors.

"It was like being in jail, actually worse than jail...you never knew if you could get out. I think what impressed me most was the way people helped other people."

The first section of this report deals with what happened in each of these areas. It tells about the closing of the schools, the impact of the storm on the major businesses and something about the problems of agriculture. It describes the problems of a nursing home, a complex for retarded people and the hospital. And it tells the response of fuel companies, Ontario Hydro, Bell Canada and the fire departments.

But that is only part of the story of this storm. Five essential elements remain:

- the first involves the attempts by various levels of government to deal with the main problem: the drifting and continuing snowfall that blocked the roads;
- the second concerns the activities of two volunteer groups that acted in response to community needs: the private radio people ("CBers") and the snowmobilers;
- the third is about the one agency that attempted to provide some over-all co-ordination and direction: the Ontario Provincial Police;
- the fourth is a picture of the key medium – radio station CJBQ, Belleville – and how it met public need for information; and
- the fifth is the story of how individuals responded, how people looked after each other, how a sense of neighborliness either developed or surfaced.

What emerges on the whole is a highly creditable story of people looking after people. On the whole, the county and its populace could be proud.

But there were a couple of missing ingredients. The first was some sense of over-all direction and control. Despite the best efforts of the OPP that was, to some extent, missing. The second concerns the problems that existed with communications. And that is an all-too-familiar story.

The Schools

The first agency to react in the face of a major storm threat was the school system – the Prince Edward County Board of Education.

The board operates a rural system with about 5,000 pupils in it and, as part of the system, has 66 buses picking up children and delivering them to 13 schools scattered about the county.

Thursday morning, the day the storm began to hit, some individual drivers decided, on their own, that the weather was too severe. They cancelled their runs and, as per arrangement, called two radio stations — CJBQ in Belleville and CKWS in Kingston — to announce the cancellations.

Some of the drivers who did operate on Thursday morning had second thoughts as the day wore on. One driver (in the South Bay area) made his morning run but by 10:30 a.m. was back at the school picking up the children, taking them home.

By the end of the day, all drivers delivering children to that school had reached the same conclusion; by mid-afternoon the school was deserted except for teachers. The teachers finally went home at 3 p.m. and that school — South Marysburg Central — did not open again for five days.

But the major school decisions were still to come.

They began Thursday evening on an isolated road at the edge of Lake Ontario at the western end of the county. There, a county plough driver found it impossible to work his way past a seven-to-eight-foot high drift. After about 15 or 20 runs, he turned back. The plough was wet and not running too well. (Later that night he headed back and ploughed the drift out from the other direction.)

As the driver and his assistant were in the barns between those runs, they ended up chatting with the county engineer. He, curious, went out to see for himself. He found the winds blowing strongly and drifting heavily in the area of Cherry Valley.

When the engineer got home that night, he started to worry and, as is the custom, he called the superintendent of schools to pass on his worries. He suggested it might be a good idea to close the schools the following morning.

The engineer did not become involved in what happened next. Friday morning — the morning after he had passed on the warning — he headed off on vacation.

The school superintendent did not act Thursday night or before school on Friday morning: like many, he was reluctant to be accused of crying 'wolf.' But he did start to worry and Friday morning he was especially conscious of weather conditions.

Deciding to check things out, he called both the OPP and the weather office at the nearby Canadian Forces base in Trenton. The first call was enough to make him still more uneasy. The OPP circulate their own special weather advisory and an officer read the latest one to the school superintendent:

"Winds are expected to increase sharply over southwestern Ontario within the next three to four hours and over the remainder of southern Ontario by early afternoon. Winds as high as 80 kilometers per hour will produce heavy blowing snow reducing visibility to near zero. Heavy drifting snow will also be widespread."

Somewhere around 11 to 11:30 a.m., the superintendent decided to act: he decided to close the schools — a decision which began a wave of activity.

First, the school board called the schools. Then, the board notified the drivers. Then, at each school, there were calls to a parent or registered guardian of each child up to children in grade four. (Lists of names are collected each fall: no young children are allowed on the school bus until someone has been notified he or she is being released early from school.)

The system is followed meticulously and that Friday it worked quite well. (It does have the effect, however, of creating a great deal of congestion in the phone system — part of the buildup in telephone traffic.)

The only known hitch occurred when the uncle of two children who had been dropped off for their grandmother, took the children himself. Their grandmother, worried when they did not arrive at her place as scheduled, called the school. The school called the police, the media were notified and the hunt began.

It ended abruptly when the uncle — rather embarrassed — realized he had broken the system and called the board to say the children were with him and were all right.

By one o'clock — just under two hours after the decision was made to close — all 5,000 children were either at home or with someone their parents had designated to look after them.

(There was a second period of telephone calling when anxious parents called the schools to find out what was happening. They were told all was well and that their children, if not home, were with someone they had designated. By 2:30 p.m., however, these calls started to drop off.)

Although the children were safe, the director and his staff were still at their office. By that time, road conditions were impassable and the telephone system — now jammed by other anxious callers — was no longer functioning. The staff managed to let people know they were trapped by using a CB radio carried by a caretaker and getting others to pass that radio message along.

The storm, of course, continued Friday night, Saturday and Sunday.

On Sunday, the chairman of the board (who had been called personally by the OPP on Friday, when the police began to worry about the storm) decided to take action himself. After checking out the weather with CFB Trenton, talking to the director and canvassing the members of the board, he (along with the separate school board) announced an unprecedented advance closing of all schools.

The media were notified Sunday evening so on Monday no schools were open.

Strangely enough, the fast-moving action by the Prince

Edward County Board was not duplicated in Hastings County directly to the north.

There, the school board hesitated before making a decision about closing — despite the pleas of anxious school bus drivers from the south (some children from northern Prince Edward County go to school in Belleville). When they finally decided to act it was too late: between two and three thousand children did not make it home.

Industry

For all but one of the larger industries in the area, the storm meant full or partial shutdowns, loss of production and loss of wages for employees. These were mostly losses that could not be restored.

The major industry, located about two miles from Picton, is a cement plant with about 270 employees. Its serious problems began Friday when some employees discovered road conditions (and OPP roadblocks) made it impossible to leave the plant.

The company, however, managed to keep its operations going until Monday evening by two means:

- it kept employees on double shifts (employees are not supposed to leave until a replacement arrives); and
- it managed to take advantage of lulls in the storm each evening to bring in new crews.

As things worked out, the men forced to keep working in the plant when a shift couldn't get in were always from a different group than the ones stranded previously.

Although operations continued, there was some loss in production.

Things finally came to a halt on Monday, not because of road conditions but because quarrying for rock — an essential step in the production operation — had to stop because of the continual whiteouts. The plant simply ran out of supplies.

As the company was shuttling employees back and forth during lulls in the storm it took an unusual precaution: it provided each convoy with a radio tuned into the plant frequency (quarrying and other equipment is radio-controlled) so that the company could go to the rescue if there were problems.

Between slowdowns and the complete shutdown the cement plant lost about three days of production. And costs did not go down. The overtime bill from the double shifts more than made up for any savings from employees not paid. And, finally, the company ran up some hotel bills when it looked after accommodation for stranded employees.

The storm has had one other small impact on the plant. It

now keeps a few emergency food supplies on hand in case employees are again stranded.

An electrical appliance firm was harder hit. It closed down on Friday when workers, worried about the storm, began leaving their jobs. (The production line cannot continue once a certain number of people leave.)

The plant remained closed for the first three days the following week — Monday, Tuesday and Wednesday. While some employees did show up for work, most, warned by radio, did not.

The plant would not have been able to operate even if its entire work force had arrived. Parts for the operation are trucked in from the United States, and road conditions prevented these necessary supplies from getting through.

A shoe company had similar problems. A minimum number of people are needed to operate its assembly line and it was forced to shut down Friday, Monday and Tuesday. It resumed operation on Wednesday but on Thursday, when storm warnings sounded, it was forced to close once more. (Workers left their jobs because they were worried about getting home and about their children who were being let out of school.)

The company suffered production losses and altogether employees lost a total of about \$6,000 in wages.

One company not badly hit by the storm was a soup firm that has a mushroom growing operation in the area. It managed to keep its plant going and to make regular deliveries.

The mushroom industry is strange in one sense: its growing operations generate biological heat and it uses power to cool rather than heat the crop. (In the event of a power failure the company might have been able to use the cooler outside air to keep going.)

The soup company normally uses regular staff Monday through Friday and brings in students from a nearby town to cover the weekends.

On Friday, there was a delay in getting the morning shift into work and the afternoon shift didn't arrive. But the company was able to get in touch with its regular weekend student workers and bring them in by snowmobile.

On Saturday and Sunday, sufficient road clearing took place to allow the students — 10 in all — to be bused to work. The company also found two boiler room engineers to replace the regular boiler room attendants who were unable to be there.

Regular deliveries from the plant take place Sunday and Wednesday. Despite the weather the company managed to get trucks through on Sunday and again Wednesday. Its delivery schedule was not interrupted.

Another firm, a construction company, had a windfall income from the storm. Normally two of its front-end

loaders are not used during the winter. Because of the storm it was able to activate these machines and rent them to the county.

Agriculture

It was extremely difficult to estimate the precise effects of the storm on agriculture.

Most farmers feeding hogs or cattle, for example, managed to get their animals fed – although they sometimes had to rely on neighbors for help when they became stranded. But they often had to use substitute feed and they sometimes missed regular delivery to market.

Those owning orchards could only sit and worry. High snow levels usually create two problems: damaged limbs from the weight of the snow; and damage caused by mice and rabbits feeding on bark (the snow levels allow the animals to reach well above the usual height). When spring arrived, farmers found many trees had been badly damaged. Losses were substantial.

In one area, however, the storm's effects were immediate and obvious. Dairy farmers were hit extremely hard. Drifting snow caused dampness in the barns and indirectly led to one farmer losing 10 purebred Holsteins. And the blocked roads meant milk deliveries were interrupted; some farmers (we identified 16) had to dump milk. And, in one case, it meant a farmer could not breed six cows. Weather conditions blocked the veterinarian from getting through.

All these problems were, to some extent, related: they meant potential loss of quota, which in the long run could mean serious loss of income. Farmers who do not deliver their quota of milk are faced with the possibility of having that quota lowered, a permanent loss.

A few farmers did manage to get by one way or another. Some resurrected the old-fashioned metal milk cans and used them to store milk. Others tried a more modern container:

"We poured the milk in green garbage bags and set the bags in the snow and that way the milk didn't spoil."

Regulations for proper storage were altered to allow for these makeshift arrangements.

Finally, a good many farmers managed to survive without such techniques, since the problems of the dairy farmers were well understood and a lot of teamwork went into trying to get the milk out without loss. A typical operation took place in one township where a milk truck driver kept a CB radio in the cab of his truck so he could contact his wife at home. Farmers, elected officials, and the roads superintendent would phone the driver's wife to find out where he was and where he was intending to go. The township then tried to co-ordinate ploughing activities with the milk truck driver.

Such co-ordination, incidentally, was essential; often roads

drifted in within an hour or so after the plough and the milk truck had gone through.

While this system worked well in the sense that it avoided some dumping, it did not work perfectly. The drivers did not follow regular routes and the farmers could not be sure a truck was coming.

One farmer tried to get a milk truck by phoning a driver's wife and asking a neighbor with a CB radio to try to get through by radio.

"I got panicky and let the milk out. Well, the driver's wife got hold of the milk truck and the neighbor got hold of someone else. I had more milk trucks than I knew what to do with."

The save-the-milk operation was the only area where elected representatives – in this case township reeves and deputy-reeves – took an extremely active part. No less than seven such elected persons took an active part in arranging for ploughing operations and four actually got out – both day and night – and, where necessary, drove the ploughs themselves. The save-the-milk operation, therefore, constituted the greatest activity of elected officials in relation to the storm.

Institutions

Loss of school time, loss of industrial production, and loss of farm products weren't the only difficulties. The storm also caused severe strains for those concerned with the old, the handicapped and the ill.

Once again, it was not possible to cover this completely but three examples may illustrate the sort of difficulties that arose.

1. Nursing Home

A nursing home which houses 40 permanent residents found itself unable to keep on hand its usual staff.

Some staff were unable to get in at all between Friday and Sunday.

The director took a number of emergency steps:

- She released the non-medical staff – the cook, the laundress, the housekeeper and the secretary, and assigned their jobs, where necessary, to medical staff.
- She set up a new shift schedule taking into account the proximity of staff to the home. (Some were close enough to walk in so could be counted on while others were unlikely to make it.)
- And, on one occasion, she managed to arrange for snowmobiles to pick up a number of staff who had tried unsuccessfully to get in by car.

(As it turned out, the snowmobiles did arrive to carry out

the task, but in the meantime the four staff had managed to make it to the home in a four-wheel-drive vehicle.)

During the storm period, aside from the regular problems of dealing with the aged, the home ran into two emergencies.

The first involved a rare event for a nursing home — the birth of a baby. A lady down the road started in labor and her husband found it impossible to get her to hospital. So, after some discussion, it was decided to take her by snowmobile to the nursing home where medical staff were at least available.

Once again events didn't work out exactly as expected. A plough showed up, agreed to help and the pregnant lady was taken to the nursing home in the cab of the snowplough.

During the actual birth the lady was in one room while in another someone talked to a physician by phone. The physician's instructions and his answers to questions were relayed from person to person, room to room via the corridor.

Later the same day — after the birth had taken place successfully — a procession involving an ambulance, a police car and a plough showed up at the nursing home. They apparently had come in response to a call for assistance.

No one seems to know who made the call. Presumably it was someone listening in on the party line who decided special assistance was needed.

The following morning another problem occurred: a lady in the home awoke with swollen glands. During the day the swelling continued and in the late afternoon the home's director called the hospital for help. The hospital said "bring the patient in."

This time, once again, the rescue party consisted of the OPP and a plough. The police had come in response to the call for help and had directed the plough to the home.

This incident indicated how the storm created different kinds of pressures. Under normal conditions, a physician could have dropped by or the woman would have been tucked into a car and bundled off to hospital. Under snow conditions however, everyone waited for a while hoping all would be well. Only later, when it was obvious that matters were serious, did they take emergency action.

Although the nursing home handled both situations quite well, everyone there was worried about its communications. One phone in the home — a pay phone — did not work at all, while the office phone seemed to be able to handle only incoming calls. Most of the urgent calls had to be made through a third phone belonging to one of the residents.

That third phone — it was the one used during the birth of the child — had been installed just two weeks earlier and existed only because the resident had pressured the telephone company, through a relative, to install it.

The nursing home handled another minor emergency. An accident victim whose car had been hit by a snow plough came in and was given first aid.

2. Complex for the Retarded

High above the town of Picton is a large complex that once was a military base and is now a complex for the mentally retarded. The area consists of accommodation for students and staff, plus school, recreational and rehabilitation facilities.

The complex houses 440 patients and employs 420 people, making it the largest employer in the county.

Unlike the regular school system, the complex cannot simply end its classes and send its pupils home when a storm strikes. It is entirely responsible for all its residents, some of whom are considered trainable, some more severely retarded. Residents range in age from 10 to 60.

The complex has other problems. The facility is spread out in a way that can make movement difficult. During the storm, for example, staff in the residential area (there are 115 homes in the complex) found it difficult to get to the area for the severely retarded. It was also difficult to move food from one area to another.

The complex ran into its first problems on Thursday when the storm began to build up; that day secretarial and clerical staff were sent home early.

Friday, things became worse and the principal of the school, after listening to radio broadcasts and finding the local school board closed, decided to end classes.

That decision meant moving 250 retarded to residential areas. It also meant checking to see that all supervisory help was available to staff the residences. Each area supervisor was asked to make sure sufficient staff was en route or on hand.

(The necessary phoning was done early enough to beat the jamming situation that developed later.)

At 1:30 p.m. three senior staff in the severely retarded area put together a special emergency plan. Then they had it mimeographed and posted. Among other things, it involved:

- identification of staff by place of residence (on hand, in Picton, or rural);
- movement of 12 residents to reduce demands on staff;
- an inventory of supplies;
- creation of three sleeping areas for non-resident staff who would have to remain overnight.

The kitchen area was also depleted of staff, with a crew of 13 down to three at one point.

In addition, the staff of the complex found itself putting other emergency plans into operation.

The complex depends on a central laundry in Kingston. Aside from the road problems, laundry service was disrupted by a broken-down truck and the absence of staff. Resident staff did the laundry themselves.

There were also concerns about communications as vehicles and persons moved through the blizzard from area to area on the complex. This was countered by careful distribution of five portable radios (each with a 50-mile radius).

The radios are normally used by night security patrols, but during the storm they were used by the plough operator, the security commissioner, the resident councillor and the maintenance man. Because of continued drifting, ploughing had to be done frequently and in a co-ordinated way. This meant the plough, trucks and buses could be co-ordinated by radio and internal telephone to move food, supplies, linen and personnel.

The distribution of food caused serious concern. Some residences ran out of milk and were low on ice and food because of the difficulty in obtaining and distributing supplies.

The plough was also used to deliver some staff to Picton and to escort an oil delivery truck to provide needed fuel when supplies ran low.

While the complex did its initial phoning prior to the major telephone buildup, it too soon ran into phone problems. The five telephone operators all arrived at work (usually by snowmobile) but they found themselves besieged by outgoing and incoming calls, including those about getting to and from work, calls to relatives and others about supplies.

The complex has a special switchboard problem; many phones in the area are blocked – can go outside only through the switchboard – to stop residents from phoning long distance. This meant staff had to go through the switchboard to make outside calls.

By Monday, when the gravity of the phone situation was realized, management ordered the operators to accept only emergency calls and the pressure was somewhat alleviated.

Finally, the complex did its bit to help the rest of the community. Some of the patients formed teams to help with snow clearing from Picton streets, while two of the staff in town with a four-wheel-drive radio-equipped vehicle responded to an emergency call in response to a request from the OPP. They went through the storm, picked up a severely injured person, radioed they were on their way in and took the accident victim to the hospital, where notification of their arrival had been relayed.

3. The Hospital

The county hospital, unlike the other two agencies, experienced relatively few unusual problems during the storm.

There were staff shortages and a few departments (such as medical records) just remained closed. And there were some staff who, kept on overtime, simply remained at the hospital. They slept there for as many as four consecutive nights.

The biggest change in hospital operations was that it became a snowmobile centre. The medical staff maintained contact with snowmobile operators and there were a number of emergency runs to and from the hospital. Some of these were to take patients in for help, others to take medical supplies to those who needed them and still others to carry physicians to patients who were too ill to move.

The one major emergency decision involved a call for help for the victim of a heart attack. The incident, described in more detail in the section on the provincial police, involved use of the hospital parking lot as an emergency landing area for a helicopter. The hospital was prepared for such an eventuality; the parking lot had been cleared according to plan in case a helicopter run became necessary.

Since the storm itself did not involve any major casualties and since power remained on, the hospital, in some ways, found normal pressures reduced. Few patients could be admitted. Few visitors disturbed hospital routine. Finally existing supplies of food and drugs were more than sufficient.

Roads

The snow caused problems everywhere but the major problem undoubtedly concerned road conditions. For at least five days and often longer – the clearing up went on for a week after the storm had ended – road travel was precarious.

As CJBQ Belleville (the main radio station in the area) reported, the Ontario Provincial Police were issuing daily warnings to motorists to stay off the roads:

- Thursday – Police asked motorists to stay off roads in the county until further notice.
- Friday – Police advised motorists to stay off the roads except for emergencies. Road blocks were set to stop traffic.
- Saturday – Police advised motorists they must travel at their own risk. Many roads were blocked by abandoned vehicles.
- Sunday – OPP issued a warning that driving was extremely dangerous. Motorists were urged to stay home.
- Monday – All Prince Edward County roads were closed due to drifting and zero visibility.

Despite these road conditions – and despite the constant pleas from the police for people to stay off the roads – people did attempt to travel.

When they did they found it both difficult and dangerous.

"We called the OPP and they said Highway 14 was impassable. It took three hours but we got there...."

"We got a mile and half down the road and had to turn back. It was very dangerous and hazardous...."

"It scared me, really scared me. I was driving down the road and I couldn't see where I was going. Most of it was one lane and I had the car touching both snow banks...even the ploughs were getting stuck...."

Some of those who drove under such conditions inevitably had accidents:

"It scared me to death. I was really worried because my father isn't well and I thought he was going to have another attack when we got stranded on the bridge...."

"Returning from shopping Friday in a completely blinding storm a young girl drove into the back of my vehicle...."

"We had an accident victim come in, he had his car run over by a snow plough. Fortunately he was on the side that didn't get run over."

One man informed us he called the police, who told him road conditions were impassable. When he called the weather office they told him the same. However, he started out and was turned back by an OPP roadblock. Finally, he slipped through and got home after several hours drive and a long wait in a pile-up. His only comment was that he had been given bad information since he had been told he couldn't get through and he had done so.

The problem of dealing with these snow conditions, and with those who caused further problems by driving in them, fell to five different levels of government: the province, three levels of government in the area (county, townships and towns), and, as a result of pleas for help, the federal government. All found they had their hands full.

The data on what happened during the storm period are so detailed that a separate study could probably be written about ploughing.

The first problem was simply the general weather conditions.

Conditions were so bad that ploughing was reduced to a crawl. Graders, for example, can usually operate at speeds approximating 25 to 30 miles per hour. During the storm they were slowed to one and a half to two miles per hour.

Regular ploughing runs took 10 to 15 times as long as normal, which meant they were often not completed as the crews faced exhaustion.

At times, it was virtually impossible for any ploughing to be done. On Monday, for example, all the main agencies simply gave up. Only the county made a couple of

emergency runs (to the hospital and to the complex for the retarded). Even the CFB snowblowers were not moved from the base at Trenton until weather conditions improved.

Then, there was continuous drifting which resulted in truly enormous drifts. This meant that roads cleared one moment were often covered by drifts the next. Ploughing crews became discouraged as they had to go back over and over again. Often, they had to replough an area just finished in order to get to a new point of attack.

"By the end of the day it didn't make the least bit of difference where we had ploughed..the roads were all blocked in again."

The drifts were so big that even the CFB snowblowers had trouble clearing them. The huge snowblowers sometimes simply rode up into the drifts and got stuck. They had to be towed clear before they could try again.

One township plough became stuck in a drift and stayed there for six days. It was finally pulled out by a snowblower and a team of shovellers. This became a popular topic of discussion in the area. Several provincial ploughs also got stuck and one provincial snowblower brought in from Kingston to help out, broke down.

Third, there was a problem with communications.

Only one level of government — for a single township — had plough-to-base radio that functioned adequately. The provincial, county and other township systems did not have such radio equipment. The CFB ploughs did have radios but the equipment was not always within radio range of its base.

Normally the communications are maintained by radio-equipped trucks, but these trucks could not operate very well during the snow.

What this lack of communications meant was that, at times, the agencies did not know where their ploughs were located. Police, trying to get through, stopped their truck in a whiteout. They later found the truck was facing head-on into a snow bank. Another truck, heading out to cope with the one major power break, took three hours to do what normally should have been a 30-minute trip

Hydro also agreed to a request from the OPP to have its Bombardier (a large, enclosed snowmobile) available for use as an emergency vehicle. However, the one request came when a baby was born at the nursing home and the Bombardier — out of radio range — could not be reached. (The crew expressed some relief: they were not too anxious to risk playing the role of midwife.)

All in all, despite the many breaks in service (most of which affected only one customer at a time), hydro managed to keep power going throughout the storm in all parts of the county.

Telephone

The telephone company, too, on the whole, managed to maintain its service; but mainly because of over-use, in many areas the system functioned in an erratic and confusing way.

The telephone system is designed so that it can handle normal peak calling loads. This means that at any given time some people can use the system because others are not.

But what appears to have happened during the storm is that almost everybody used the phone almost all the time. Traffic figures went far beyond the estimates Bell makes based on experience.

Two figures indicate the amount of calling that took place during the storm period. One is for operator-assisted long-distance calls from the area. The first figure indicates the normal load, while the second figure is the actual number of calls made: (an estimate based on past experience):

Thursday	3635	4367
Friday	3525	7272
Saturday	1800	3402
Sunday	1680	2546
Monday	3435	3900

As can be seen, people made more than double the normal number of calls on Friday and nearly double on Saturday. Calls were up about two-thirds for the five-day period.

The other set of figures deals with calls dialed directly but on which the operator assists (you state your number after you hear a "beep-beep"):

Thursday	10,890	13,030
Friday	11,000	20,512
Saturday	7,200	11,491
Sunday	11,650	20,112
Monday	11,335	14,185

Again the buildup was heaviest for Friday and Saturday but the over-all total was up roughly 50 per cent for the period.

Bell does not have figures for the exchanges actually located in the county because no special monitors were in place when the storm hit. A reasonable estimate, since operator-assisted and operator-handled long distance calls were up so much, would be that local traffic would be two to three times above normal.

The effects of all this calling were obvious to anyone living in the county. The overloading made it seem at times as if there had been a complete breakdown in phone service:

- callers had to wait for dial tones – sometimes as long as 50 seconds;
- callers who did get dial tones found that instead of getting the number they had called they were talking to a

number of other persons (in effect creating a miniature impromptu party line).

- individuals who wanted to phone out, found they were constantly tied up by incoming calls (this hampered official agencies such as the OPP).

Finally, in some cases, the switching equipment simply became overworked to the point where it would give up in the middle of a call, causing one caller to tie into another call already under way.

Despite these problems (which could not be solved by immediate technical action) most customers did not lose telephone service. By the end of the storm, only 46 customers were out of service – a number not far out of line with normal figures considering that regular repair service to individuals had to be halted from Friday until Wednesday.

There were, however, two other problems: one an irritating one for Bell, the other one, as far as we could find out, a delayed effect of the storm.

Three times a fuse at the Bloomfield exchange (located in the county) blew out and each time repair crews had to get in to fix it. Only on the third occasion was the real problem located.

Fixing a fuse is actually only a matter of five minutes work, but, one of the trips to do this job took three hours: a repair crew had to follow a plough into the exchange.

The second problem occurred in the West Lake area when a mouse got into a cable box and chewed away at the insulation on the wires. Our information is that the mouse managed to cross a few phone lines in the process.

Like all major employers in Prince Edward County, Bell found itself short of staff as traffic conditions made it difficult for employees to get to work.

The staff who were there worked endless hours of overtime for which the pay was, to quote one official, "out of sight." The hours worked rose from 139 scheduled to 220 hours on Friday, 80 to 124 on Saturday and 92 to 110 on Sunday. (The figures are a bit low because the company (with union agreement) used supervisory personnel to work the boards: regular staff were simply not available.)

Finally, there were other storm-related problems. Inevitably, ploughs and other equipment hit telephone poles and cable boxes. And later, Bell had continual breakdowns caused by human error as the storm clean-up continued.

Incidentally, it is easy for Bell to tell when a crisis hits. Friday, for example, the main switchboard simply lit up as the flood of calls began. The chief operator knew within minutes that there was a major problem.

Bell was one of the few agencies to immediately turn to the media for help. It requested CJBQ to ask that people restrict their calls to emergencies. (The station – familiar

with the problem – had already acted on its own initiative to make a similar appeal.)

Bell, as is usual, had a backup system available known as line load control, which would have given priority service to designated customers during an emergency: the police force, fire department, hospitals, etc. But Bell normally uses this service only on request: no such request was received and the service was not activated.

The survival of the telephone system was vital to the whole emergency response to the storm.

As will be shown later, the main response agency, the police, depended almost entirely on the telephone for maintaining contact with the ploughing authorities, the hospital, public, media and volunteer groups such as the snowmobilers. Even the ploughing operation depended mainly on the telephone: only one road department, serving a single township, had an adequate radio system.

Fire Department

The fire department in Picton did not play a major role in the snow emergency.

Fire records show the department answered two calls during the storm period: one concerning electrical trouble at a downtown Picton restaurant on Friday night (not serious); the other involving an oil spill on Saturday night which required cleanup (there was no fire). The department managed to answer both calls.

One fireman also played a minor role in dealing with other emergencies. He used a snowmobile to head out to the nursing home when it ran out of bread and he also took part in a fuel delivery.

The fire department has one standby emergency plan: it can make use of the Legion hall as a welfare centre if necessary. In this case, however, it was not used. During the storm the department did add another precaution: it had a plough stand by at the fire hall Monday evening from 6 to 10 p.m., in the hope the plough might be able to get fire equipment through if necessary.

Since the ploughs do not have radios and the phone system was giving trouble – especially at the overloaded plough barn end – it would have been extremely difficult for the department to call for a plough if a fire had started.

The town of Picton has an emergency plan (it became law in December, 1972) which is to be activated through the fire department when there is need for “a controlled and co-ordinated response by a number of agencies both governmental and private....”

As far as we could determine, no one in the community ever considered seriously activating this plan. (The mayor had decided to delay any decision until Tuesday – the day the storm ended.) Thus, the fire department remained relatively inactive and a steel trunk upstairs at the fire hall,

which contained copies of the plan and other emergency supplies, was never opened.

Other fire departments weren't quite so fortunate as that at Picton. One had only a false alarm, but another had a call for a relatively serious fire. The volunteer department, located in one of the worst hit areas, did not even consider responding. All the equipment was blocked by snow and all volunteers were isolated. The fire had to be dealt with by those at the scene.

Vital Supplies and Services

There are a number of supplies and services most people would consider vital and would, therefore, worry about under storm conditions.

They would worry about food and whether they would have enough to eat. They would worry about staying warm, about their fuel supply and about power. They would worry about the danger of fire. And they would worry about keeping in touch with others which, for most, meant the telephone.

On the whole, most people fared fairly well in these areas during the five days the storm battered Prince Edward County.

1. Food

Most stores in the rural areas receive major grocery deliveries from Peterborough each Thursday. Although the storm began on Thursday, that day's deliveries got through and the stores were well stocked for the storm period.

In addition, the bread truck got through on Thursday, Saturday (during a lull) and Tuesday (the day after the storm), so bread supplies held up quite well. Milk, however, became somewhat of a problem: a delivery truck became stuck on Saturday and did not complete its deliveries.

Many people in the rural areas ran what amounted to a co-operative food delivery service during the storm. A neighbor (with a snowmobile) would canvas other neighbors as to their needs. Then he or she would make the run to the store, returning with supplies for everyone in the area.

The stores themselves either stayed open longer or opened every time they had a request for supplies.

“We're not like those city stores. We like to think of ourselves as the traditional country stores.... We have people who depend on us for their staples and we make a commitment to them....”

The one product that the stores did run out of (the same thing happened in Picton) was film. It seems that people in such an emergency situation want to take pictures.

Strangely enough, the product most in demand – often

secured at considerable risk — was cigarettes. The stores all had sufficient supplies but they were sometimes amazed at how much people valued their tobacco:

"One fellow got stuck at his neighbor's. They didn't smoke and he ran out of cigarettes for five days. I would have thought, you know, if he's waited that long, why not quit completely? On Tuesday, he was in here, anxious to get some more."

One 17-year old walked two miles through the blizzard when he ran out of cigarettes:

"I could hardly see the road ahead of me, it was blowing so hard. It was sort of neat."

2. Fuel Oil

While groceries usually held out (or someone was able to get supplies) this was not always true of fuel oil.

The fuel delivery companies (there are 10 in the county) operate on an automatic delivery system. They keep their own records and, with an eye on the weather, they make sure that fuel tanks are kept filled.

When the storm hit, most people had several days fuel supply on hand.

While people were, therefore, generally in good condition, many of them did not know this. The fuel companies found themselves inundated with calls from anxious customers.

This led to a good deal of irritation. Some of the companies got rather sharp with customers who called in. They seemed to expect people would know that they were not in difficult circumstances.

None of the companies — as far as we could learn — made any attempt to broadcast a general reassurance. (CJBQ would have been happy to carry such a message.) None made any special arrangements with other firms to deal with problems when they occurred.

Undoubtedly some sort of emergency co-operative service would have been useful: our data suggest at least 15 persons ran out of fuel during the storm.

3. Power

High winds and heavy snow meant that trees were down and electrical power lines damaged. Hydro crews had constant headaches throughout the storm, and service in a number of areas was disrupted, although power was restored before the storm ended.

Power comes to the county via two submarine cables from Belleville and an overhead line from Trenton. Power authorities were worried about these main transmission lines — especially the overhead one — but all three withstood the storm.

Starting on Thursday, however, the same could not be said for smaller, local services. Lines were twisted and broken, a telephone pole was taken out by a plough, and in one isolated area a tree collapsed, knocking out local power.

The tree collapse was only one of many along the lake front. The provincial park suffered severe and permanent damage to many of its trees. Branches were broken by the weight of the snow and some trees were bent by the storm and incessant winds. Between five and ten thousand trees were killed, creating a fire hazard which delayed the opening of the park for a month. Twenty-four extra men had to be hired for three months to assist the regular 15-man crew clean up the damage. And (as of 7 October, 1977) the damage is not yet completely repaired — areas of the park are still cluttered by broken trees.

To maintain service, hydro kept crews working on six snow-mobiles and one more elaborate vehicle, a Bombardier.

Most of the crews could recall some frightening stories by the time the storm finally ended. One crew for example, had to warn crews of danger ahead (such as cars piled up in an accident), but could not get word to the ploughs. Furthermore, relief crews could not find the vehicle they were supposed to operate.

Finally, ploughing was often hindered by abandoned vehicles which blocked the roads. Ploughs without radios had to stop, turn around, and find a telephone (then perhaps wait for a dial tone) before they could call for help to remove such obstacles.

While the police did their best to respond to such calls, their best was necessarily slow. It took time to reach a tow truck, then more time for it to get to the scene.

The county plough barns, incidentally, had enormous telephone problems. At times, it seemed as if every person in the county wanted to find out exactly what was happening with the ploughs. The county roads foreman trying to manage emergency ploughing operations found himself literally harassed by endless phone calls. On the other hand, the agencies he wanted to hear from — such as the police — could not get through.

Finally, it should be mentioned that the words "plough" and "tow" do not necessarily have the same meanings under Prince Edward County snow emergency conditions as they might at other times.

In some cases, a ploughed road was a road with a one-lane tunnel leading through a huge bank of snow (sometimes 15 feet high). One stalled vehicle and the road was once again impassable.

ECRU made its own contribution to the problem. A stalled rented auto managed to tie up a plough and a milk delivery truck headed for a cheese factory.

And "towing" sometimes consisted of hauling several cars in tandem all hooked up to the same tow truck.

One towing operation involved two men with a truck trying to drag a car down the main street of Picton. The men did not appreciate that they could only move both vehicles by shovelling the snow out of their way, so they invented their own system.

They loosened the winch on the tow truck and let the cable flow out. Then they moved the truck forward until the cable was fully extended. (The truck could move on its own but not while towing a car.) Next they winched the car forward until the cable was tight. They repeated the process – loosening the cable, moving the truck, winching the car forward – until they had gone the remaining two blocks to their destination.

CFB Involvement

The involvement of the Canadian Forces Base at Trenton came about through a complicated set of phone calls.

It started when a county resident (a former service officer) phoned a local member of parliament to suggest he ask for assistance. The federal MP did so but he was told any formal request would have to come from the province.

The MP contacted the local provincial member (a member of the provincial cabinet) and passed on the suggestion. Meanwhile the base, through military channels, activated the necessary requests for permission to assist.

The MLA, working with the appropriate minister in the provincial government, managed to secure a formal request for federal aid. The request, once approved, was promptly dealt with: the men involved had already geared up for action.

For roughly a week three federal snowblowers normally used for clearing runways at CFB Trenton, stayed in the county. First, they worked on the main highways, then county roads, and finally township roads. The length of their stay indicates the size of the task.

Though they carried on until the job was finished (winning in the process the lasting admiration and thanks of most people in the township), the CFB snowblower operation was not without its difficulties

At one point, a major row ensued when there was a dispute about just who should decide where the CFB snowblowers should go. The matter was settled only after another intervention by the local MLA*. He saw to it that the CFB crews were given strict orders to answer to requests from one person only, the county roads foreman.

There is one tiny footnote to the road situation

* The involvement by the MLA in the ploughing operation was only part of his activity. His office was in constant touch with official county management, especially as the days passed and the storm did not let up. He and the township reeves and deputy reeves were by far the most active elected officials.

On January 20 – one week before the storm – the county roads committee met to discuss its plans for the coming year.

Among those present was the new warden, a man who came from the one township which had a radio-equipped plough. The committee, among other things, discussed the usefulness of acquiring a two-way radio system for the county roads department.

When the discussion ended, there was agreement: not surprisingly, it was moved and approved “that the engineer obtain quotes from two companies on acquiring this equipment (two-way radio) for the county roads department.”**

A county warden, incidentally, holds office for one year. The new warden had only assumed office in January and had never been briefed on any emergency responsibilities.

He, himself, was trapped twice during the storm – first out of the county, then en route home. He never considered putting the county on some kind of emergency footing and he was not aware of the existence of an emergency plan for the county.

Volunteer Groups

Because storm conditions played havoc with the telephone system and made regular road travel almost impossible, they encouraged an active response from those who could overcome these difficulties.

These persons fell into two main groups:

- The CB radio people who, in their cars or homes, had their own private radios; and
- the snowmobilers, people who had vehicles capable of operating despite the inclement weather.

Neither of these groups became a fully integrated part of a formal response to the problems created by the storm. Both, however, often played a substantial role and, to some extent, became involved in a semi-official relationship with the Ontario Provincial Police.

1. CB Radio

The private radio operators in Prince Edward County probably handled something like 500 to 1,000 calls during the storm. (The figures can only be estimated since no accurate log exists.)

These people began operating Friday when the storm started to tie up traffic. From then until Tuesday evening, when conditions abated, they used the 09 channel (used in

**The radios were never purchased. After reviewing estimates the county decided the cost was too high.

Canada for emergencies) to provide reports of weather and road conditions and offer assistance.

Although this group did not constitute a formal organization, they did have some pre-existing relationships. Many of them belonged to a communications club which had a theme of community service. They had been involved previously in a bike-a-thon and in the Santa Claus parade. Several held formal radio licences (not a requirement). One had experience with the Emergency Measures Organization.

One member of this group took it upon himself to keep in regular contact with the OPP. He asked the police about road conditions and accidents and he relayed this information to others listening. (He made these reports over the 09 channel about once every two hours.)

In addition, individuals moving about the county, either by car or by snowmobile, regularly reported the conditions they had observed, including information on movement of ploughs.

Finally, these private radio operators – sometimes as a group, sometimes as individuals – relayed a great many messages and, where necessary, responded to urgent messages.

One operator estimated that on Sunday alone he handled about 30 to 40 individual private messages. He would pass them on either to another radio operator or, when he could, he would use his telephone.

"I relayed information by radio, relayed it by telephone, delivered oil, organized search parties, organized deliveries – parties for food and fuel – acted as a weather man... made me feel useful."

When a request for supplies or other services came in, the responding radio operator would usually get the supplies, drive as far as he could, and then load them on a snowmobile for the rest of the trip.

A typical response involved a request from a diabetic for insulin. The private radio operator contacted the physician, got the prescription approved, then managed to find some other operators with snowmobiles to pick up the prescription at the drug store and deliver it to the caller.

On occasion, messages spread throughout the CB network that could never be confirmed. Late Friday, for example, there was a report that a seriously ill driver was coming from Napanee to Picton; such a person was never located. Another report was that an elderly couple were isolated in the northern part of the county and needed medical help. Eventually, the police found such a couple, but they needed fuel, not medical help.

Before the storm period was over, the private radio operation adopted fairly routine procedures. A call would be answered by one of the three central operators who would then switch it to another channel. Once the need seemed clear, the central operator would use channel 09 to ask for assistance.

In terms of communications, this system worked well. Most private radio operators refrained from interrupting such calls and usually only one person would service the request for help.

However, there were some problems. First, the private radio operators did not screen out genuine requests for help from requests that were not so important. Some calls were responded to without verification. Second, they did not always co-ordinate their activities with the police, who were screening calls. Third, the system did carry some rumors which probably led to unnecessary action.

2. Snowmobiles

While the CBers provided the communications links among volunteers, the snowmobilers provided the actual physical capacity to respond to requests for help. (Often, of course, the two were the same; some private radio operators had a snowmobile, and vice-versa.)

The formal snowmobile response (unlike the CB response) began as a reaction to a request from the police. A well-known snowmobiler, a man who has held executive office with snowmobilers in Ontario, was contacted by the OPP to see if assistance could be provided when needed.

The man (he is also a former area director for EMO) immediately contacted snowmobilers he knew throughout the county and constructed a network of persons willing to help. One of those standing by had called him; the rest he had located himself.

During the storm, this man and his contacts (he could not take a physically active part because of a heart condition) handled about 30 calls – most of them calls for rides or groceries.

Responding to such requests sometimes took a little time. The former EMO director himself did not have a radio. Instead he used the telephone to make his contacts, sometimes waiting five minutes for a dial tone. To speed things up, he took the list of snowmobilers to police headquarters just outside Picton.

The calls directed by this man were responded to in a strictly controlled way. Two machines went together on any call in town. Six stayed together when the trip was going out of town. And, where possible, the machines carried walkie-talkies provided by the former EMO man and first aid kits supplied by the hospital.

Although the police request helped activate the organization, the group also received some requests for assistance on its own.

On Monday, for example, a convoy was organized (in a response to a request from a physician) to deliver drugs to a terminally ill cancer patient. A snowmobiler picked up the drugs at the hospital and set off in a convoy of six with the first and last vehicle carrying the walkie talkies.

One of those involved later said, "It was real bad. The visibility was nil. With the blowing snow, you could just barely see the machine ahead of you and tell where you were going."

This trip, like many of the trips during the storm, was made along the regular road system. Normally, snowmobilers are barred from using the highways.

While many of the snowmobile trips were over-organized, others took place in response to individual calls for help or simply to aid neighbors. Sometimes these involved interaction among the private radio operators and the snowmobilers.

On Friday, for example, a man who runs a business in Belleville phoned a customer to see if she could help him get someone to feed his animals. (The man was trapped in Belleville well away from his cattle, sheep, chickens and ducks.)

The lady contacted her brother by private radio and he in turn contacted a snowmobiler. The snowmobilers made trips to the farm on Friday, Saturday, Sunday and Monday, taking in water and feed and picking up fresh eggs.

When weather conditions improved somewhat the businessman tried to get in himself, carrying with him 50 gallons of water. He found the roads impassable once he got about two miles from his farm. Once again the snowmobilers pitched in. They took him, and they hauled the water in on a trailer pulled by a snowmobile.

In addition to these requests for help there were many coordinated expeditions for such things as groceries.

One dairy farmer, for example, had his wife phone all their friends and neighbors before making a run to the nearest grocery store. She told the neighbors that if they would phone the store and charge the order, she would pick it up. Most of the neighbors were elderly and could not have made the trip themselves.

However, while some of these runs were vital and necessary, some were also dangerous and of questionable value.

On one occasion a private radio operator attempted a trip with fuel for an isolated farmhouse. He barely made it: he ran low on fuel, his battery ran out, his light went out, and he burned himself. And as it turned out, the couple had not needed the fuel in the first place.

Yet, despite such risk, we discovered only one person who had sustained any serious injury as a result of snowmobile operations. A man hurt his neck when the snowmobile on which he was riding plunged over a snowbank into the road below.

In the end, snowmobiles proved their usefulness so much that for several days after the snow was over police still held back from slapping charges against those who broke

the normal rules. And one person interviewed in the sample told us the ultimate tribute:

"As the result of the storm we now own a snowmobile."

Police

During the storm, there was, inevitably, a great deal of interaction among various groups:

- the schools were keeping in contact with the weather forecasters, county roads and the police;
- industry had contact with the police;
- dairy farmers were keeping in touch with township roads and milk truck drivers;
- the service agencies kept in touch with snowmobilers, private radio people and the police;
- the Canadian Forces were in contact with the MLA and with country roads.

But when this interaction is examined, it becomes clear that one agency was by far the most important. The Ontario Provincial Police detachment at Picton provided the newest thing to over-all leadership during the emergency period. It emerges as the most important response agency.

(The one major failure by the OPP was its failure to act on the storm warning – which it relayed to the school system – and bring in its own snowmobile and portable radio equipment from Belleville.)

In assuming its leadership role the OPP put aside many of its regular activities. Criminal investigation (never a serious problem in Prince Edward County) stopped. Accident investigation was, for the most part, halted, and accident reports were filled out later by telephone. Regulations regarding snowmobile operations on main streets and highways were not enforced, and other minor violations of the law were also ignored.

Instead of worrying about these more usual police activities, the OPP concentrated on developing a capacity to deal with the snow emergency.

First, as the snow reached major proportions on Friday, they closed off all major highways, enforcing this decision where necessary with roadblocks. (These included roadblocks at the northern boundaries, at both ends of the town of Picton and at the cement plant.)

Second, as the phones began to overload with calls for information and help, the OPP made a series of decisions about priorities. As quickly as possible, they responded to all medical emergencies, in many cases delivering the supplies themselves, and checked out other emergency calls.

One of the most impressive facets of the OPP response was the way they used friends and neighbors to help those who

needed help other than medical relief. By doing this, they kept their own resources available for major emergencies.

Third, as the major co-ordinating agency, they kept others informed about what was going on. As will be shown later, the police were the main source of information for the one key medium, radio station CJBQ, Belleville. (It has already been mentioned that the private radio operators depended on the OPP for their information.)

At one time or another the OPP was communicating with almost everyone else involved in any way with a response to the storm.

They discussed the snow emergency with the school system and among other things warned both the superintendent and the chairman of the board of the impending danger.

They maintained contact with industry. They even got into arguments with the cement plant when they decided to enforce a roadblock.

They kept in touch with the hospital and with local physicians, responding as quickly as possible to medical emergencies.

They kept in constant contact with county road crews and other ploughing agencies and with towing companies so they could help clear abandoned vehicles off the roads and inform others which roads were passable.

They kept in touch with the Canadian Forces Base at Trenton and were involved in arrangements to use a helicopter (for the one major medical emergency) and a snow vehicle (for one evacuation).

They acted as the main point of contact for the town police, keeping them informed of what was going on.

And during the emergency situation they were the key point of contact for the province. The OPP detachment in Picton gave briefings three times a day to the divisional operation headquarters in Belleville which in turn handled liaison with the Ontario Government.

As mentioned earlier, the Provincial Police originated contact with the snowmobilers and, by doing this, activated (and used) the most important emergency transportation system. As the storm developed, the OPP also improved its contact with private radio operators. A private CB radio was brought into headquarters so OPP could monitor the emergency radio traffic.

Finally, the OPP maintained regular contact with the MLA in Toronto, who, among other things, saw to it that CFB snowblowers would be made available.

These contacts were not maintained without difficulty.

Road conditions on Monday were so bad that a patrol sent from Picton to the nearest community, Bloomfield, just a few miles away, actually had to have an officer walk in front of the car to make sure it did not hit anything.

The fact that road conditions made patrols impossible, killed regular police communications. The police depend on radio-equipped patrol cars to give them mobile communications and when the cars can't move, the radio system is useless.

The other problem, of course, was the telephone.

The OPP at Picton have two phone lines and both ring from the same phone number. During the five days of the storm these phones rang constantly — one shift estimated it handled a call every three minutes. One officer asked to be relieved of answering the phone, saying he found it too exhausting.

These calls ranged from calls about lost children (the ones who were with their uncle), abandoned cars, calls looking for missing relatives, calls for supplies such as fuel and feed and calls regarding medical emergencies.

Sample data from a survey conducted by ECRU which covered all persons aged eight and up, show that 9.2 percent of the respondents reported calling the OPP during the storm. This would suggest — if each caller called once — something like 1,000 to 1,700 calls.

(If some persons called more than once and the calls were concentrated in the daytime hours, there must have been at least 300 calls each day between 7 a.m. and midnight. This would mean roughly one call every three minutes, exactly the estimate made by the OPP officer.)

A few examples indicate the kind of problems handled by the 24-member detachment:

- Saturday — two officers head out to assist a woman in labor. They find the road impassable. A farmer with a front end loader gets them closer to their destination but he, too, finally gets stopped: a four foot drift is too much. A snowmobiler comes along and tells them the trip is hopeless: he has just taken five hours to go five miles. Finally a county snowplough manages to get the woman and take her north to Trenton.
- Sunday — a call comes in about a sick woman at the nursing home. Police get most of the way, then team up with a plough, an ambulance and a private four-wheel-drive vehicle. The convoy gets back into Picton in 25 minutes, a record run.
- Monday — a physician calls saying he needs to get to the hospital for an emergency operation. A constable heads out to the physician's home by snowmobile, taking along an extra suit for the physician. Together they make it back to the hospital.
- Monday, midnight — a man calls to say his daughter has gone into labor. The OPP wait for a confirming call from the physician then head out with a snowmobile pulling a ski-boose. They take the physician to the home, then bring the whole party back to the hospital. They manage to cover the five miles in 45 minutes.

• Tuesday — a physician calls to say he has a patient with a heart condition and urgently needs help. Three constables drive to the hospital to get medical supplies, pick up the physician and head out to see the patient. There they are told the man must be taken to hospital but a ride on a snowmobile is too risky, and the physician therefore calls CFB Trenton for emergency helicopter assistance. The helicopter heads first to the hospital to pick up another OPP officer as guide (there were few landmarks on the white-covered ground below) then makes it to the house. The man is delivered by helicopter to Picton hospital, where the parking lot has been cleared as a landing area. (The man died 10 days later in Belleville hospital.)

• Tuesday — a caller phoning from the most remote point in the county asks for insulin. A crew of officers heads out by snowmobile with the insulin, but the roads prove impassable even by snowmobile so they follow the shoreline to the point and make the deliveries.

These calls were all much the same, each involving genuine hazards to health. They constituted the bulk of requests for emergency help responded to by the OPP. When only supplies were needed, the police requested people to contact their neighbors (a system which usually worked, and kept police available for real emergencies). Only once did the police head out with food; they took a baby's formula to a couple trapped by the storm.

As mentioned earlier, the OPP did not answer accidents involving only property damage but they did try to assist when injuries were involved. In one case, an officer responded and was told when he radioed for ambulance help that there was none available.

He decided to try to handle things himself. As he was getting out of his cruiser, the wind tore the door out of his hand, bending it so it would not close. He tucked everyone into the battered cruiser, tied the door down with his seat belt and drove to the hospital. (It was two weeks before the cruiser was repaired.)

The OPP action was unquestionably the most important response to the storm. It provided the main core of communication between the various agencies and provided leadership where it was needed. It also demonstrated that some form of evaluation is needed if emergency tasks are to be given their proper share of attention. (The decision to abandon other police duties and to screen requests for help meant emergencies could be properly dealt with: it is an excellent example of good decision-making under difficult conditions.)

There were, however, two or three weak spots in the OPP operations. Two were of their own making, while one was not their responsibility.

The first gap was the one mentioned earlier that occurred when the original storm warnings came in. The OPP made its warnings available to others and thus directly contributed to the successful closing of the schools, but police did not follow their own advice. Special snow emergency equipment in Belleville (snowmobiles and portable radios)

were not ordered immediately. OPP Picton, therefore, had to borrow snowmobiles and do without portable radios during the initial storm period.

The second problem concerned telephone communication. The OPP could have easily arranged to have at least one line on its telephone system unlisted and separated from the other lines. This line still would have been jammed to some extent by the general overload on the system but it could not have been tied, as the other was, by incoming calls. There did not seem to be any awareness of the potential problems caused by such a phone situation. Phones apparently are installed according to arrangements made in Toronto: Picton and Belleville (which has a similar system) are not working with systems of their own choosing.

The final problem was more general. It affected the OPP but they were not responsible for this. Quite simply, there was a lack of direction from government during the snow emergency and there was a considerable lack of general co-ordination.

It is clear that it might have been possible for one agency, possibly the OPP, to co-ordinate the various emergency activities using voluntary emergency systems such as the snowmobilers and the private radio people. Admittedly, the OPP did this to some extent, but they were reluctant, as a provincial agency, to step in to tell the county how to run its affairs.

The OPP — after a slightly delayed start — performed a leadership role. This does not however excuse the absence of effective leadership from the elected authorities in an emergency organization of some sort.

The Media

The police were undoubtedly the most important source of information, but one other source was more important as a disseminator: the media, especially radio station CJBQ in Belleville.

According to data obtained from interviews with a sample of the population, four times as many people turned to radio for information as turned to the OPP and the OPP, in turn, was well ahead of any other information source.

Among those interviewed, roughly 70 per cent said they sought information one way or another — from friends, relatives, neighbors, business contacts, and sometimes from people with CB radios. But all of these sources were mentioned relatively infrequently. Instead just more than 55 per cent of those who said they sought information said they sought it from media — and 93 per cent of those said they turned to radio.

It is equally clear that when most persons were talking about radio they had one station in mind: CJBQ in Belleville. Of those who mentioned a specific radio source, 81.7 per cent named CJBQ as that source.

The comments about radio offered during interviews were frequent and almost all positive:

"The radio was excellent. They told you everything. They made you feel a little more secure."

"On radio, it (the news) was given every hour. You phone your neighbors and they don't know any more than you do."

"I listened to the local radio station constantly. It was giving us as many reports as it could."

"I was alone nights during that awful terrible wind and I was kind of scared...I would give a lot of praise to CJBQ. I'd give them every credit in the world for what they did."

"I wasn't depending on it (radio) like people with children or people going to work but it made you feel you had a connection with the outside world...."

"Everybody got the information they wanted if they listened to radio. That's the way it's supposed to be in a disastrous situation."

Many of these people mentioned that they were not regular listeners to CJBQ or, for that matter, to any radio station. During the storm, however, they kept the radio on as a constant companion and they listened incessantly to every newscast.

A few did have some critical comments to make.

CJBQ is in Belleville and it serves the entire Quinte area. This meant, at times, its reports did not seem aimed directly at the isolated people in the county. And the station — though it obviously achieved a high level of public service — did not abandon regular programming and did not forsake commercials. Some listeners noticed both these aspects.

"The radio was wonderful. I know it isn't Prince Edward County but it's around."

"There's a world of difference between Prince Edward County and Belleville in the middle of a blizzard."

"You don't need McDonald's in the middle of a blizzard. You don't need a 'big Mac attack' in the middle of a snow-storm."

Television was watched as well but it covered the broader picture on its regular evening newscasts. People as a result felt much closer to radio. And the newspapers were only something to read after it was over: the dailies from Belleville and Kingston weren't delivered to the county during the storm and the local paper had to delay publication.

Because radio was so important, ECRU took a close look at CJBQ newscasts not just to see what was reported but where the station was getting its information.

The answer is that radio — like almost everyone else — depended mainly on the OPP.

"I was relying on the OPP. They had access to the roads crews. They were always reliable in the past. I had no reason to doubt them. There were never any instances where the cops had bad information."

What this meant was that most of what the public was told was what the OPP wanted them to hear. Radio, on the whole, did not chase its own stories. Fortunately, in the case of Prince Edward County, this did not work out too badly, since the OPP was the best informed agency and its information was not inaccurate.

This system did, however, have its flaws. It meant that a lot of other useful public service information was not aired. There was no information, for example, about fuel deliveries. There was no information about just why the phones were acting up (although there were appeals from Bell Canada, the police and the radio station, itself, for people to stay off the phones). And there was no indication of how people could reach the Cbers or snowmobilers if they wanted such volunteer emergency help.

In fact, an examination of the newscasts reveals very little of the non-police aspects of the storm. Missing are the stories about the dairy farmers and the orchard operators. Missing, too, are most of the stories about neighborly help. And missing are the specific stories of the losses to industry.

It would not be fair, of course, to suggest that CJBQ confined its reports entirely to police information. It did have frequent contacts with the school system and it announced — in accordance with carefully developed standing arrangements — cancellation of school bus runs. And it was called immediately when the decision was made to close the schools on Monday.

It kept in contact with the weather office so it could report the latest weather information. And, especially on Monday, it had a series of contacts with the local MLA who, by this time, was in active contact with persons all through the county and was deeply involved in arranging for the ploughs to come in from CFB Trenton.

Yet an analysis of named sources indicates that 57 items of news information (45 per cent of the total storm coverage) were directly attributable to the OPP. In some ways, the OPP had become a public information source — using CJBQ as its outlet for that information.

Although, as mentioned earlier, CJBQ serves a much wider audience than just Prince Edward County, storm conditions in the county gradually came to dominate the newscasts and station management began to realize a responsibility to serve those isolated by the storm.

And, finally, CJBQ did take one other step which improved its service to the county — a step which was a clear violation of its licence conditions.

The station, like many others, is supposed to lower its power at sunset, an adjustment which alters its ability to serve some of the southern parts of Prince Edward County. During the storm it did not make these adjustments, remaining at regular daytime power for its night time broadcasts. This meant people in the county got better than regular service.

Strangely enough, this alteration was an accident. When the transmitter equipment (located in the county) was to switch over on Friday, the automatic system simply refused to function. The station went off the air for 60 seconds, after which the staff took over manually and resumed daytime signal patterns and power.

Station management say they would do the same again — this time deliberately — if similar emergency conditions prevailed.

It seems clear that Canada should adapt its regulations to allow such emergency broadcasting.

The Public

The detailed survey data are revealing not only about radio but also for what they tell about the way the public reacted to the storm. Most of the quotes in this report were taken not from officials but from members of the public selected at random so our picture of what happened would be as real as possible.

The survey data show that many people were confined or isolated during the storm and that this both worried them and caused depression.

"You feel closed in...like sitting in a house...gives you a sense of closed in, claustrophobia..."

"It depressed me. I missed getting out and seeing people. It made you feel like you were in a hole and couldn't get out. I hated it."

"It makes you depressed you can't have no milk or groceries or liquor...I feel like going and getting drunk..."

"It was a bad experience. We couldn't see a tree out in the yard. It was a bad experience. I hope it doesn't happen again. It just changes your life completely. You just sit at home and think of nothing but survival, and when you're going to get out, thinking of food and fuel and praying the hydro doesn't go out..."

(Fifteen per cent of those interviewed reported being worried. Ten per cent said they felt confined. Six point five per cent reported being depressed.)

Aside from emotional reactions to the storm, people ran into real physical problems. Number one, of course, was snow removal — not only a headache but a potential health hazard for those who were old or out of shape. Others reported missing work, getting stuck in an auto, or — the most common complaint — running out of food supplies.

For many, the solution to the food problem was to rely on neighbors for help, and most found they could do so. Neighbors shared food and those with transportation (usually snowmobiles) were quick to help others:

"The guy across the street ploughed out all the driveway and a lady baked us apple pies..."

"I took my neighbors food. A couple of snowmobilers did go to the store for me."

"I think what impressed me was the way people helped other people. Not only CB radio and snowmobile and police but people who made the deliveries for other people."

"The neighbors shovelled for us when the road was open a shade. They also handled the mail when the mailbox was knocked down. You've come to a very fine community here. Friends of ours brought out food by skidoo on Monday...my husband and I made sure our elderly neighbors were okay, that they had food and stuff..."

The only thing we didn't establish was whether such neighborliness was an outcome of the storm or simply a regular fact of rural living:

"Gives you a chance to help your neighbors. The same guy I helped, he ploughed my driveway after it was all over and another lent me a snowmobile to get around in..."

"I got neighbors to come and plough me out and made arrangements to plough the other neighbors out, too. You don't even think of that as help. That's something you do when you live out in the country."

In addition to neighborliness, the survey data also reinforced our findings about telephones. People reported calling the police, the weather office, business contacts, relatives and friends. Furthermore, a significant number said that if they had trouble getting through they just kept calling.

The following table shows the percentage who reported talking about the storm to others, as broken down into three types of people: friends, neighbors and relatives. In each case, as can be seen, the phone rather than personal contact was used more frequently:

	In Person per cent	By Phone per cent
Talked to friends	4.7	15.9
Talked to neighbors	4.7	15.0
Talked to relatives	7.5	12.1

(Incidentally, a quarter of the respondents said they had trouble contacting these people, almost always involving the difficulty of getting a phone line. Most said they eventually got through; they just kept calling.)

The survey data, by the way, suggest that people had a great many reactions to the storm — reactions which de-

pended on the severity of their own personal experience. Most people agreed with the opinion statements put to them (example: the police did a good job, the schools acted correctly, they were not ready for such a storm), but on one statement they disagreed:

"Looking back, the whole experience had turned out to be fun:"

Agree strongly	6.8 per cent	- 27.2 %
Agree	20.4 per cent	
Disagree	45.6 per cent	- 63.1%
Disagree strongly	17.5 per cent	

Clearly, those who thought it wasn't fun were in the majority. (Slightly fewer than 10 per cent had no opinion or remained neutral.)

But perhaps the most revealing survey finding (and one that tends to confirm the validity of the other data) is one based on an analysis of responses to statements concerning the seriousness of the storm. People were asked whether they agreed or disagreed with the statement that "this is the worst storm I can ever recall in this area".

Eighty-six point nine per cent agreed with that statement,

54.2 per cent agreeing strongly. Only a relative handful (11.2 per cent) disagreed, while one lone individual disagreed strongly.

But cross-tabulation of those answers with the length of time lived in the county suggests the most recent previous storm which occurred in 1947 had also left its impact on those who could remember it. The chart below compares answers to the statement about the storm to length of residence in the county.

"This is the worst storm I can ever recall in this area:"

	Lived in County less than years		
	5	5-20	20 -
Agree	10	21	26
Neutral	7	10	18
Disagree	1	3	11

One respondent's remarks:

"This is the worst blizzard but not the worst storm, more snow fell in '47. Talked to my grandfather and he said it wasn't as bad '47 when you could walk on the telephone wires..."

