Transportation Safety Board of Canada

Bureau de la sécurité des transports du Canada

RAILWAY INVESTIGATION REPORT

R00T0257

CROSSING ACCIDENT

VIA RAIL CANADA INC.
TRAIN NO. 85
MILE 33.54, GODERICH-EXETER RAILWAY COMPANY
GUELPH SUBDIVISION
LIMEHOUSE, ONTARIO
28 SEPTEMBER 2000

Canada

Railway Investigation Report

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Guelph Subdivision
Limehouse, Ontario
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Synopsis

On 28 September 2000, at approximately 0745 eastern daylight time, VIA Rail Canada Inc. passenger train No. 85, proceeding westward on the Goderich-Exeter Railway Company Guelph Subdivision, struck a motor vehicle at the public crossing at Mile 33 54, near Limehouse, Ontario. All three vehicle occupants were fatally injured. At the time, contractors were at the crossing preparing to lay a conduit for fibre-optic cable under the roadway near the tracks.

Ce rapport est également disponible en français.

1.0 Factual Information

1.1 The Accident

On 28 September 2000, 360networks of Mississauga, Ontario, was preparing to install fibre-optic cable under the north side of the public crossing on the Fourth Line Road, in the Town of Halton Hills, at Mile 33.54 of the Goderich-Exeter Railway Company (GEXR) Guelph Subdivision. Six construction vehicles and nine workers were in the vicinity of the crossing. One vehicle, a large truck, was parked to the northwest of the crossing approximately five metres from the rail. Because the shoulder of the road was narrow, the truck was parked part way onto the paved surface and protected by traffic cones. It blocked the view of the crossing warning devices located at the northwest corner of the crossing from southbound drivers, and forced southbound traffic into the opposing lane.

Rail traffic control was under the direction of a track occupancy permit (TOP)[1] foreman. At 0716 eastern daylight time[2], the crew of VIA Rail Canada Inc. (VIA) passenger train No. 85 (VIA 85), destined for Chicago, Illinois, United States, through Sarnia, Ontario, requested clearance to enter the TOP limits. As equipment and personnel had not yet arrived at the site, the TOP foreman authorized the crew of VIA 85 to pass through his limits at track speed with no restrictions.

At approximately 0745, as a vehicle slowly approached the crossing from the north, the crossing protection activated. As the vehicle passed the parked truck, the driver's attention appeared to have been focussed to the west on the south side of the crossing, where most of the vehicles and construction personnel were located. A construction employee, realizing that the vehicle was being driven into the path of the train, moved toward the tracks waving his arms as an indication to stop, but was apparently not noticed by the driver. The train approached the crossing from the east at 60 mph with the whistle sounding and the bell activated. Upon entering the crossing, the train struck the vehicle. The three vehicle occupants were fatally injured.

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1 The purpose of a Canadian Rail Operating Rules TOP is to ensure the protection of workers on a portion of track. No train may enter a section of demarcated track unless the TOP foreman stationed with those workers indicates verbally to the train crew that the track has been cleared of equipment and personnel. This verbal communication must be repeated and documented.

2 All times are eastern daylight time (Coordinated Universal Time minus four hours) unless otherwise stated.

1.2 Weather

The weather conditions were clear with light winds and a temperature of one degree Celsius.

1.3 Recorded Information

Event recorder information indicates that VIA 85 approached the crossing at a speed of 60 mph (96 km/h) with the throttle in the No. 8 position (maximum setting). Recorded information also shows that, as required by regulation, the locomotive whistle was activated 15 seconds and approximately 1320 feet (403 m) before the locomotive entered the crossing. (Canadian Rail Operating Rules [CROR] Rule 14 requires the whistle to be initiated 1320 feet (403 m) before occupying a crossing.) The ditch lights were on and the headlights were on bright.

1.4 Train Information

VIA 85 was a westward passenger train operating daily, seven days a week, between Toronto, Ontario, and Chicago, Illinois, United States, through the international border at Sarnia, Ontario. The train consisted of four Amtrak passenger cars and an Amtrak locomotive.

Sixty passengers, two on-train service crew and two operating crew were on board. No one on the train was injured.

1.5 Particulars of the Crossing

1.5.1 The Crossing

Fourth Line Road intersects the railway at a 78-degree angle, with a 9.8 m (32 foot) asphalt surface. The roadway speed limit is 60 km/h. Three advance railway crossing signs were posted on both approaches to the crossing. The crossing was equipped with flashing lights and bell. A four per cent ascending road grade was encountered approaching the crossing from the south, and a one per cent ascending grade approaching from the north. Approximately 7.6 m (25 feet) north and south of the crossing, the grade became level.

Average daily motor vehicle traffic volume was 900 vehicles. Six passenger trains and four freight trains were scheduled on this line daily.

1.5.2 The Track

GEXR has leased the running rights on the Guelph Subdivision from Canadian National (CN) for a period of 21 years. CN retains all other right-of-way land rights. The subdivision extends from Silver, Mile 30.0, to London, Mile 119.9, and consists of a single main track, with an authorized maximum speed of 70 mph for passenger trains and 55 mph for freight traffic. The track at the crossing location was tangent with an ascending grade (east to west) of one per cent.

1.5.3 Method of Train Control

Train movements on the GEXR Guelph Subdivision are governed by the Occupancy Control System authorized by the CROR and supervised by the rail traffic controller located in North Bay, Ontario.

1.5.4 Roadway and Sight Lines

The two-lane roadway consisted of 8.2 m (27 feet) of pavement with 0.6 m (2 feet) gravel shoulders.

In the northeast quadrant, various homes and trees intermittently obscured the sight lines. The northwest quadrant had a large earth berm approximately 1.8 m (6 feet) high, stretching westward for approximately 36.5 m (120 feet), where it met with a natural elevation of the terrain. This berm and natural rise in elevation obscured eastward train movements from southbound highway vehicles.

1.5.5 Automatic Warning Devices

The crossing was equipped with two automatic warning device signal masts, located across from each other on the northwest and southeast quadrants of the crossing. The northwest signal mast was equipped with four lights, approximately 2.4 m (8 feet) above the ground—two facing north and two facing south—providing four flashing red lights in each direction to warn traffic of approaching trains. The northwest mast was equipped with a bell. The southeast mast was similarly equipped, but also topped with two south-facing lights installed on a short cantilever arm. For approaching southbound motorists, the crossing signals to their right are aimed directly along the road with a distant focus (long lights). Those to the left of the road are aligned diagonally across the road, focused for maximum visibility for drivers who are at a distance of 15 to 30 metres (50 to100 feet) from the crossing. By regulation, flashing lights and bell must be activated at least 23 seconds before an approaching train enters a crossing. The automatic warning devices activated and worked as intended as VIA 85 approached and entered the crossing.

1.6 The Fibre-optic Project

1.6.1 Overall Project Description, History, and Planned Completion

360networks had undertaken to construct an underground network of fibre-optic communication lines along railway rights-of-way across Canada. This work required that the lines be placed under public roadways at railway crossings. A large proportion of this work had been carried out by September 2000.

1.6.2 History of Events and Agreements

360networks had entered into an agreement with CN to construct and operate a fibre-optic cable system on the Guelph Subdivision right-of-way. CN agreed to provide site supervision to protect 360networks equipment and crews from train movements. The agreement provided that 360networks would abide by all provincial traffic laws and regulations. When the project began on 03 May 2000, CN was providing personnel to give TOP protection (i.e., to protect 360networks crews from train traffic).

In agreements between the parties, there was no mention of responsibility for traffic control at crossings. The initial agreement had stipulated that CN would provide 360networks with protection against trains, at the expense of 360networks. CN's policy is that TOP foremen act to protect both trains from construction activity and construction crews from train movements. When notified by the crew of an approaching train, the foreman would clear all workers and machinery from the track before issuing permission for the train to pass through the work limits. TOP foremen were not instructed to protect vehicular traffic from trains.

An incident on 12 June 2000 (TSB Report No. R00T0302) involving a GEXR train and a 360networks work crew, protected by CN, and a passenger train accident on 09 July 2000 related to switch handling and involving 360networks equipment (TSB Report No. R00T0179) led to GEXR informing CN on 19 July 2000 that CN personnel would no longer be issued work clearances (TOP), effectively bringing the project to a stop.

Discussions regarding project resumption then took place between CN, GEXR, and 360networks. GEXR explained that, at that time, it was unable to provide the required protection with its current human resources. GEXR offered to provide that protection to 360networks if it were given funding for sufficient personnel and training. 360networks then indicated that it would take on the protection responsibilities itself.

360networks was supplied with a list of retired railway employees from which to hire personnel to carry out TOP responsibilities. The selected personnel were to be further instructed on GEXR operating practices. Based on the selected persons' CROR certification and experience and, after

further orientation regarding GEXR safety policies, GEXR rescinded the work stoppage. When work resumed on 19 September 2000, 360networks had assumed all train control and motor vehicle flagging duties to complete the installation of the fibre-optic cable.

1.7 Construction Conditions at the Crossing

Fibre-optic cables are installed at road crossings by boring horizontally under the road surface and inserting a cable conduit. To ensure that drilling does not damage other lines in that area, their location must be determined before drilling begins. A. van Egmond Construction Ltd. of Orangeville, Ontario, was subcontracted by 360networks to install the conduit under the Fourth Line Road. A. van Egmond Construction Ltd., in turn, hired Ontario Excavac Inc. of Milton, Ontario, to locate previously placed lines by a non-destructive, high water pressure excavation process.

On the day of the occurrence, a job and safety briefing had been planned for 0630 in Acton, Ontario (Mile 5.3), with the 360networks TOP foreman, a 360networks sub-foreman and another 360networks employee, three A. van Egmond Construction Ltd. employees, two Ontario Excavac Inc. employees, and a CN signal maintenance person. This briefing was rescheduled, however, and was then to be held at the work site. The nine workers travelled to the work site in six vehicles—five light trucks and the Ontario Excavac Inc. truck. The light trucks were parked to the south of the crossing—four on the west side of the roadway and one on the east side (see Appendix A). The Ontario Excavac Inc. truck was parked and left running just to the north of the crossing at the expected work location. As per company policy, the driver placed pylons on the roadway to direct vehicular traffic around the truck. The truck was 10.9 m (36 feet) long, 2.6 m (8 feet 4 inches) wide, and 4.1 m (13 feet 5 inches) high (see Figure 1). This situation meant that southbound highway drivers would have to use part of the northbound lane to pass the Ontario Excavac Inc. truck.

Figure 1. Location of Ontario Excavac Inc. truck, looking southward.

Shortly after their arrival, the A. van Egmond Construction Ltd. foreman instructed his two employees to place construction warning signs on the roadway. They immediately began to place signage to the south of the crossing, while the foreman and other workers began to gather at the south side of the crossing for the job briefing. No signage had yet been placed to the north of the crossing when the accident occurred. Because the on-site personnel believed that traffic control was only required after work had begun, no traffic control persons (TCP) were in position when the accident vehicle approached the crossing.

1.8 Accident Simulation

The circumstances of the accident were simulated on 29 September 2000, at 0745, the approximate time of the accident on the previous day. VIA 85 took part in the simulation. Vehicles and workers were placed at their measured locations. The Ontario Excavac Inc. truck was placed according to eyewitness estimates of its original location. The re-enactment determined that the Ontario Excavac Inc. truck obstructed the sight lines of the warning lights on the right side of the roadway when the truck was placed at the estimated position. When a vehicle was approaching from about 122 m (400 feet) from the crossing, the flashing lights appeared to be part of the truck's lighting system until approximately 6.1 m (20 feet) from the

crossing, where the lights were totally blocked by the truck. The conspicuity of the lights on the southeast mast was reduced by the rising sun and there was an indication that the conspicuity of the approaching train would also have been reduced at the last moment.

1.9 Vehicle Flagging

As a consequence of a fatal crossing accident at Bellamy, Ontario, on 05 June 1999 (TSB Report No. R99T0147), CN and Canadian Pacific Railway (CPR) were requested by 360networks[3] to adopt a TCP protocol to enhance vehicle safety at crossings under construction (see Appendix B). The new procedure required, in part, that two additional TCP be stationed within seven metres on either side of the track whenever a TOP foreman requested that the track be cleared for the expected arrival of a train.

In addition to adopting that protocol, CPR contracted with TCP experts to:

- provide vehicular protection;
- oversee site safety; e.g., work plans, vehicle placement, signage placement; and
- supply construction site expertise that is otherwise lacking

One of the procedures that the TCP experts established was that traffic control procedures must be in place to control the movement and placement of construction vehicles and personnel upon arrival at rail crossing construction sites. CPR agreed to implement a team concept whereby TOP foremen and on-site TCP experts communicated to ensure separation between vehicles and trains.

A similar protocol between 360networks and CN was not agreed upon. The 360networks' supervisors were responsible for implementing safety measures at this construction site. The accident occurred before the pre-work briefing and no TCP had been deployed.

1.10 Traffic Control Regulations, Standards, and Guidelines

1.10.1 Ministry of Transportation of Ontario

Requirements for traffic control on highways in Ontario are defined by the Ministry of Transportation of Ontario (MTO) and apply to traffic control by any persons or agencies performing construction, maintenance, or utility work on all provincial or municipal roadways. The MTO standards—the *Manual of Uniform Traffic Control Devices* and the *Traffic Control Manual for Roadway Work Operations*—specify that, on a low traffic volume highway with a speed limit of 60 km/h, such as Fourth Line Road, when a lane closure is in effect, TCP must be located

[3] At the time of the Bellamy occurrence, the company was called Ledcor Communications Ltd. In March 2000, it changed its name to 360networks.

between 10 m and 15 m from the start of a construction site, adjusting distances to suit road, weather and speed conditions so they can see and be seen by approaching traffic for at least 150 m.

The MTO standards contain no specific requirements and guidelines regarding TCP protection of vehicular traffic at construction sites that have a railway crossing. However, they do require that TCP instructions not conflict with other traffic control devices, such as stop signs or traffic signals, including train approach signals.[4]

1.10.2 Local Authority

Before commencing construction activity, 360networks obtained a permit from the local road authority (Town of Halton Hills). The safety of vehicular traffic at the railway crossing during construction was not made a condition for obtaining the permit. The governing municipal bylaw (92-199) deals with matters of liability insurance, timing and quality of work. Whereas the bylaw outlines that traffic safety matters are required to conform to the *Manual of Uniform Traffic Control Devices* and the *Traffic Control Manual for Roadway Work Operations*, as outlined in 1.10.1, these directions are practically mute on matters regarding railway crossings.

1.10.3 Manual of Uniform Traffic Control Devices for Canada

The *Manual of Uniform Traffic Control Devices for Canada*, developed in coordination with the Transportation Association of Canada, represents the views of all provinces and territories and their governments. It sets optimum standards for the use of traffic control devices and the provision of information to drivers and other road users. With respect to flagging activity, the manual outlines flag person equipment needs, desired flag person qualities, signage requirements, and traffic schemes. With the exception of descriptions of advance warning signs, matters related to railway crossings are not discussed.

1.10.4 Transport Canada

Transport Canada is currently engaged in two projects designed to improve safety at crossings. The first initiative is the *Grade Crossing Safety Regulations* pursuant to the *Railway Safety Act*. These regulations are in the draft stage and there is dialogue with the industry and provincial and municipal authorities. The regulations are believed to be nearing finalization. The regulations outline the responsibilities of the respective partners at crossings with respect to maintaining the safety defences to appropriate standards. The regulations will list the

[4] Government of Ontario, Ministry of Transportation, *Traffic Control Manual for Roadway Work Operations* and *Manual of Uniform Traffic Control Devices*, December 1989.

responsibilities of the partners during construction activity, as far as the blockage of traffic over the crossing, or obstruction of signal sight lines, is concerned. Highway vehicle flagging requirements at crossings are also outlined.

Concurrent with the regulations, Transport Canada has developed a draft manual entitled *Road/Railway Grade Crossing Safety Requirements, Technical Standards and Inspection, Testing and Maintenance Requirements*. The manual sets out best engineering practices and operating procedures for safety at crossings. The provisions of the manual will be referenced in the aforementioned *Grade Crossing Safety Regulations*.

The draft manual and regulations have been in the drafting/consulting stage for 14 years, due in part to Transport Canada's continued and extensive consultation with affected parties. Transport Canada intended to proceed with the regulatory proposal with publication in *The Canada Gazette Part I* by the spring of 2002, but that did not occur.

1.10.5 Railway Association of Canada Draft Recommended Practices for Manual Flagging at Railway/Road Grade Crossings

In January 2000, the Railway Association of Canada (RAC) began developing a circular entitled *Recommended Practices for Manual Flagging at Railway/Road Grade Crossings*. The scope of the circular is "to ensure that there are acceptable procedures and instructions in place to permit railway employees to safely perform the duties of flag-person at railway/road grade crossings when required to do so". A draft document is now being considered by the RAC member companies. The requirements in the circular focus on the responsibilities of railway employees, or contractor employees working on behalf of a railway company, who are required to direct traffic. The requirements are designed to provide for the safe passage of trains and motor vehicles when automatic warning devices are not operating as intended, and when construction is being carried out near a crossing. The circular outlines that employees will be properly equipped, trained and qualified, and that acceptable procedures and instructions will be established. The circular deals with construction work that is conducted over extended periods and involves lane closures, outlines that the railway supervisor must notify the road authority, and that a determination must be made as to who will perform the flagging duties (i.e., the railways, the road authority, or a contractor). The railway supervisor must also provide detailed instructions that conform to provincial requirements to the person(s) performing flagging duties and provide guidelines indicating standard practices and outlining provincial deviations from "national norms."

1.11 Action Taken in Response to the Bellamy Crossing Accident

In response to the rail crossing accident on 05 June 1999 at Bellamy, Ontario (TSB Report No. R99T0147), the TSB sent a Rail Safety Advisory (28 July 1999) to Transport Canada. The circumstances of that accident were described and it was outlined that the scenario encountered

by motorists at that crossing constituted a risk to their safety. It was indicated that Transport Canada might wish to consider remedial action relative to the current arrangements and philosophies concerning the protection of vehicular traffic during construction activity at or near crossings at grade.

Transport Canada replied, on 18 October 1999, that it concurred with TSB's concerns and advised that its proposed *Grade Crossing Safety Regulations* will cover safety issues regarding the safe passage of vehicles at such locations. To date, those regulations have not been finalized. Transport Canada continues to solicit information and positions on the issue from the railways.

1.12 Other Information

The three occupants of the vehicle were familiar with the crossing. Postmortem toxicology testing revealed that the driver's performance was not affected by drugs or alcohol. He was a licensed driver with no physical limitations affecting his ability to drive.

The forces of the impact completely destroyed the vehicle, making it impossible to determine if the audio system was in use. It was, however, determined that all the side windows were closed. No information surfaced to indicate that the vehicle had been in other than a safe operating condition before the accident.

2.0 Analysis

2.1 Introduction

The manner of operation of VIA Rail Canada Inc. passenger train No. 85 (VIA 85) as it approached the crossing was in compliance with regulatory requirements and company operating instructions and practices. The crew members were unaware of the exact location and nature of the construction activity and, having received a clearance to proceed without restriction, they expected to negotiate the crossing in the usual fashion. The actions of the train crew, therefore, played no role in the accident.

VIA 85 was cleared to pass through the track occupancy permit (TOP) area with no restriction. Although decisions respecting train speed through such locations are at the discretion of the TOP foreman, the design and intent of this rule is to provide for the safe and timely passage of trains while providing for the safety of personnel working on or near the track. In the absence of factors related to the physical condition of the track, and with no construction equipment or personnel on the track, the TOP foreman's decision to allow the train to proceed through the limits at track speed conformed to normal railway practice.

In this instance, the vehicle operator had no physical limitation or other impairment and did not react to the activated warning devices. The analysis will explore the circumstances that led to the apparent ineffectiveness of the automatic warning devices and discuss the conditions at the crossing that degraded safe vehicle passage. Regulatory action respecting construction activity at railway crossings will be addressed.

2.2 Information Available to the Driver

On the morning of the accident, the temperature was one degree Celsius and the vehicle's side windows were closed. The three young people driving to school may have had music playing or have been in conversation. As well, an idling truck was parked near the crossing. On the basis of this limited information, it could not be determined whether the train's whistle and bell, and the bell at the crossing, were audible to the vehicle's occupants.

The northwest crossing light signals were blocked by the truck and not visible to the driver. The rising sun obscured visibility of the southeast crossing light signals, and the driver's attention may have been distracted from these warning devices as he neared the crossing. The driver turned his head and looked to the right as he passed the front of the truck, indicating that his attention was directed away from the activated signal and the approaching train, both of which were to his left.

An NTSB study has shown that distraction is a common causal or contributing factor in many crossing accidents.[5] The many novel elements at a construction site are likely to direct a driver's attention away from crossing protection and the track itself, particularly at a crossing familiar to the driver. (Drivers familiar with a crossing underestimate train frequency, are less likely to look for trains, and are more likely to be struck by a train at that crossing.)

It is also possible that the driver saw that the crossing warning devices were activated and still proceeded, a scenario described in TSB Report No. R99T0147. Many drivers believe that construction at a crossing often causes spurious activation of crossing warning devices. At highway construction sites, drivers generally expect to be guided safely through the site by TCP when necessary, and be stopped if it is not safe to proceed. In this instance, one worker attempted to stop the vehicle in an *ad hoc* fashion but apparently was not noticed.

It is concluded, therefore, that the driver drove onto the crossing and into the path of the train because the activated warning devices were either obscured, degraded, or discounted.

2.3 *Vehicular Traffic Control Planning*

The accident occurred during pre-construction, when a vehicle had been parked to the northwest side of the crossing and workers were assembling on the south side for a briefing. The cues available to motorists at the crossing were diminished by this activity and no additional procedures were implemented to ensure the safe passage of motorists through the area.

Construction activity at crossings requires a comprehensive plan be in place, from the time equipment and personnel arrive at the crossing, to ensure the safe passage of motorists through the construction site.

2.4 *Guidance and Regulation*

The current guidance and regulation provided to those undertaking construction at or near railway crossings is very limited. Municipal authorities are concerned with issues regarding the quality of construction as it affects their infrastructure and matters of liability. Provincial and federal highway traffic safety agencies that deal with flagging issues have no specific provisions for safety at crossings. Although Transport Canada's proposed *Grade Crossing Safety Regulations* contain extensive standards for motor vehicle safety in areas of construction at or near crossings, they do not seem to be close to completion. Similarly, the Railway Association of Canada

[5] National Transportation Safety Board, "Safety at Passive Grade Crossings," Volume 1: Analysis, *Safety Study NTSB/SS-98/02*, Washington, D.C., 1998, 124 pages.

initiative, started in January 2000, has not yet been completed. The responsible government agencies and the industry may not have given sufficient priority to the risks posed to motorists at construction sites at or near railway crossings.

2.5 Vehicle Traffic Control Timing

While it is desirable to plan a day's activities and stress safety issues at an on-site briefing, the circumstances of this and other accidents have shown that construction at or near crossings requires a different approach. Any change to the normal crossing environment that arises from the presence of construction equipment or employees, regardless of the level of crossing protection, will increase the likelihood that a motorist will drive in front of a train. To maintain public safety at a railway crossing that experiences construction activity, there is a need for additional compensating traffic control measures immediately upon the arrival of construction equipment and personnel.

2.6 Flagging Procedures

Although this accident occurred before motor vehicle flagging had been initiated, it was not the intention of the A. van Egmond Construction Ltd. supervisor to stop motor vehicles from proceeding onto the tracks if signal activation occurred after the vehicle had passed the TCP positions. As outlined in Section 2.2 and based on the facts presented in the previously mentioned Bellamy report, the presence of construction equipment and employees in the vicinity of a crossing may distract a vehicle operator away from the warning devices or provide conflicting cues as to what is expected. Therefore, it is apparent that, to ensure the safety of motorists in such circumstances, additional traffic control systems are needed to prevent vehicles from continuing to advance towards a crossing upon or after signal activation.

3.0 Conclusions

3.1 Findings as to Causes and Contributing Factors

1. The driver drove onto the crossing and into the path of the train because the activated warning devices were either obscured, degraded, or discounted.

3.2 Findings as to Risk

1. Responsible government agencies and the industry may not have given sufficient priority to the risks posed to motorists at construction sites at or near railway crossings.

2. To maintain public safety at railway crossings that experience construction activity, there is a need for additional compensating measures immediately upon the arrival of construction equipment and personnel.

3. Matters relating to the safe passage of motorists at crossings experiencing construction activity require comprehensive overview and direction to ensure safety is being considered and included in the planning process.

4.0 Safety Action

4.1 Action Taken

On 25 April 2001, the crossing signal protection was enhanced by the addition of automatic gates and constant warning time track circuitry.

Transport Canada's forthcoming regulations which, as stated earlier, were not published as scheduled in 2002, are intended to address the issues of safety standards for crossings and to define clearly the responsibilities of railway companies, public road authorities and private road owners. These will include temporary protection requirements that are to be followed when construction work is underway at crossings or when visibility of crossing signals is impeded.

4.2 Action Required

The Board issued the following recommendation in 2001.

> The Department of Transport expedite the promulgation of new grade crossing regulations.
>
> (R01-05, issued 11 September 2001)

TSB Report No. R99T0147 included the following comments on the adequacy of procedures to ensure the safety of the travelling public where there is construction under way at railway crossings at grade.

> The particularly dangerous and unforgiving nature of collisions between motor vehicles and trains has long been recognized. To lessen this risk, reliance has traditionally been placed on the protection provided by automatic warning devices. However, when there is construction activity at a crossing, drivers may be confused by contradictory stimuli and may not view the automatic warning devices as a clear instruction to stop. Neither the Transportation Association of Canada's Manual of Uniform Traffic Control Devices, the Railway Association of Canada (RAC) circular nor Transport Canada's (TC) current regulations address this risk.
>
> TC's proposed Grade Crossing Safety Regulations and associated manual will require the responsible authority to ensure that adequate traffic controls are in place so that the work does not adversely affect safety at crossings. However, the Board is concerned that these regulations are not yet in force and, to this end, it very recently made recommendation R01-05 regarding the need to expedite the promulgation of these regulations. Moreover, the Board is concerned that, once the regulations come into force, a variety of procedures will likely be established on a site-by-site basis and

a piecemeal approach may not ensure that a secondary defence to automatic warning devices is provided at all crossings under construction. The absence of an effective secondary defence has the potential to place Canadian motorists at risk.

The introduction of secondary defences is not a complicated matter but it will require a concerted effort on the part of government and industry. The Board is of the opinion that this effort could come from Direction 2006. This program, sponsored by TC and the RAC, is described as ". . . a partnership between all levels of government, railway companies, public safety organizations, police, unions and community groups whose objective is to reduce grade crossing collisions and trespassing incidents by 50 per cent by the year 2006."

As such, Direction 2006 is in an excellent position to work to reduce crossing collisions at crossings at which construction activity is occurring.

Because of the potential for government/industry initiatives through Direction 2006 and in anticipation of Safety Recommendation R01-05, the Board felt that an additional recommendation, at this time, was not necessary. However, the Board believes that there is an opportunity for TC and the RAC, through Direction 2006, to develop a uniform set of standard procedures which will ensure the safety of motorists approaching all grade crossings undergoing construction activity. These standards could ensure that motor vehicles are given advance warning of oncoming trains and a clear and unequivocal instruction to stop. Once developed, Direction 2006 would be able to distribute these to all railways in Canada and encourage their implementation.

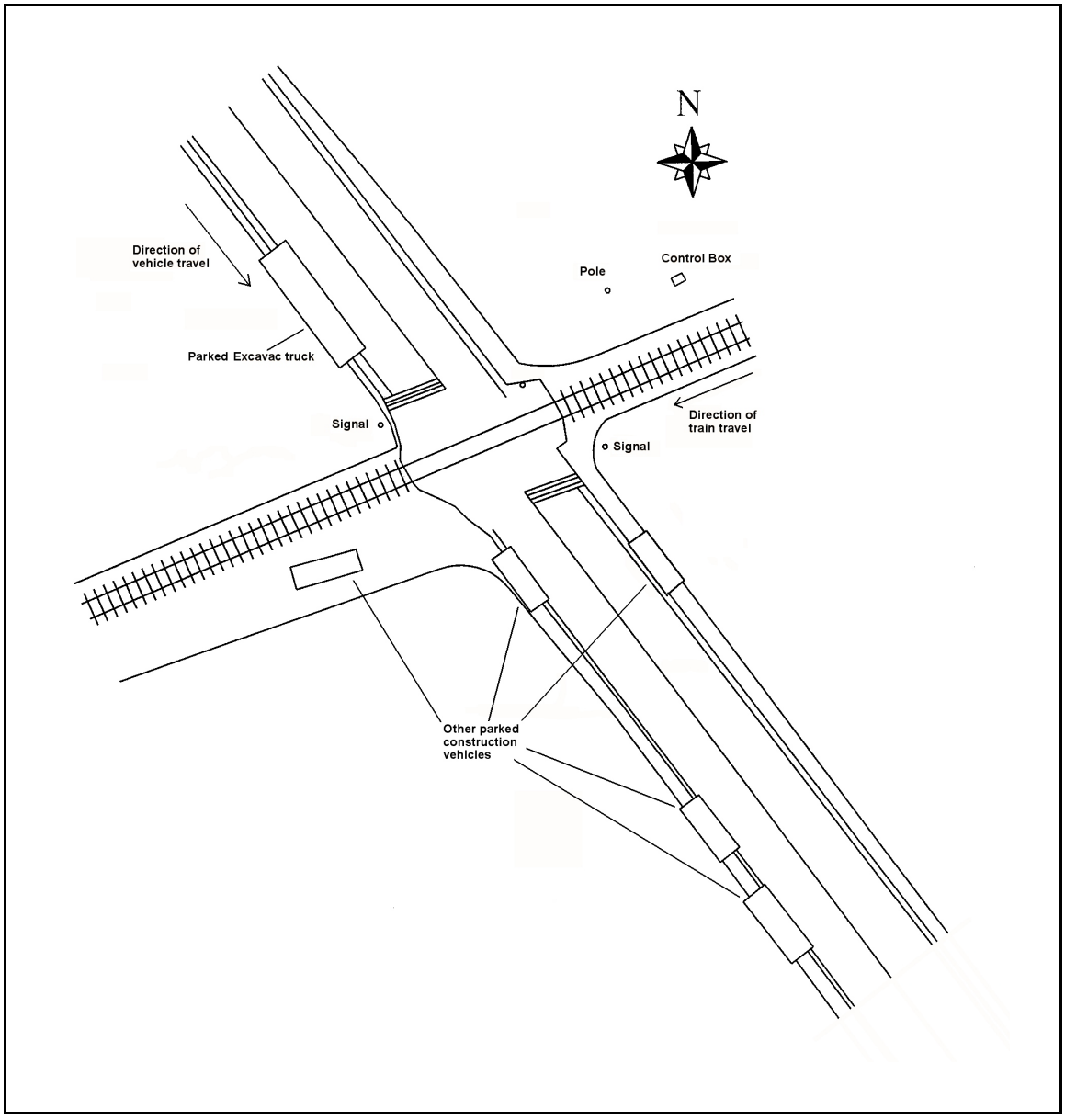
The very slow pace of regulatory process towards addressing this issue means that motorists continue to be placed at risk. While there is already a Board recommendation (R01-05) on expediting the issuance of the Grade Crossing Regulations, it is clear that delays continue. Consequently, the Board recommends that:

The Department of Transport implement new grade crossing procedures without delay irrespective of the status of the proposed regulations.

R03-03

This report concludes the Transportation Safety Board's investigation into this occurrence. Consequently, the Board authorized the release of this report on 22 January 2003.

Appendix A - Site Diagram



Appendix B - 360networks National Project Procedure

Traffic Control at CP Rail Crossings:

1. In situations that require traffic control flag persons at railroad crossings;

    a) The traffic sign indicated as "360 RR" (on attached diagram) must be placed a minimum of 100 feet (30 metres) from the track, on both sides of the crossing,

    b) The traffic control flag person must be positioned a minimum of 30 feet (10 metres) beyond the traffic sign, on both sides of the crossing, and;

    c) As per normal traffic control procedures, and when safe to do so (no oncoming traffic), allow the vehicle to pass by displaying the slow sign on the flagging paddle.

2. In addition to the foregoing, in situations that require traffic control flag persons at railroad crossings, **AND** our crews have been advised by the Railway Protecting Foreman (or Railway Flag Person) to begin clearing operations due to the expected arrival of a train;

    a) The Railway Protecting Foreman (or Railway Flag Person) will be present at the railroad crossing when he/she authorizes a train through the work limits.

    b) Two additional traffic control flag persons ("Crossing Guards") supplied by 360 will be positioned a minimum of 21 feet (7 metres) from the track, on both sides of the crossing.

    c) Once the crossing signals are activated or when visual contact of the approaching train is made by the Railway Protecting Foreman (or Railway Flag Person), he/she will direct the Crossing Guards to display the stop sign to traffic approaching the crossing from either direction.

    d) Once the train has passed by the crossing and when safe to do so, the Railway Protecting Foreman (or Flag Person) will direct the Crossing Guards to allow any detained traffic to proceed through the crossing.

    e) Once the detained traffic has proceeded through the crossing and when safe to do so, the Railway Protecting Foreman (or Flag Person) will advise the Crossing Guards that their services are no longer required.

f) Upon release of their duties at the crossing, the Crossing Guards will resume their regular duties on the crew.

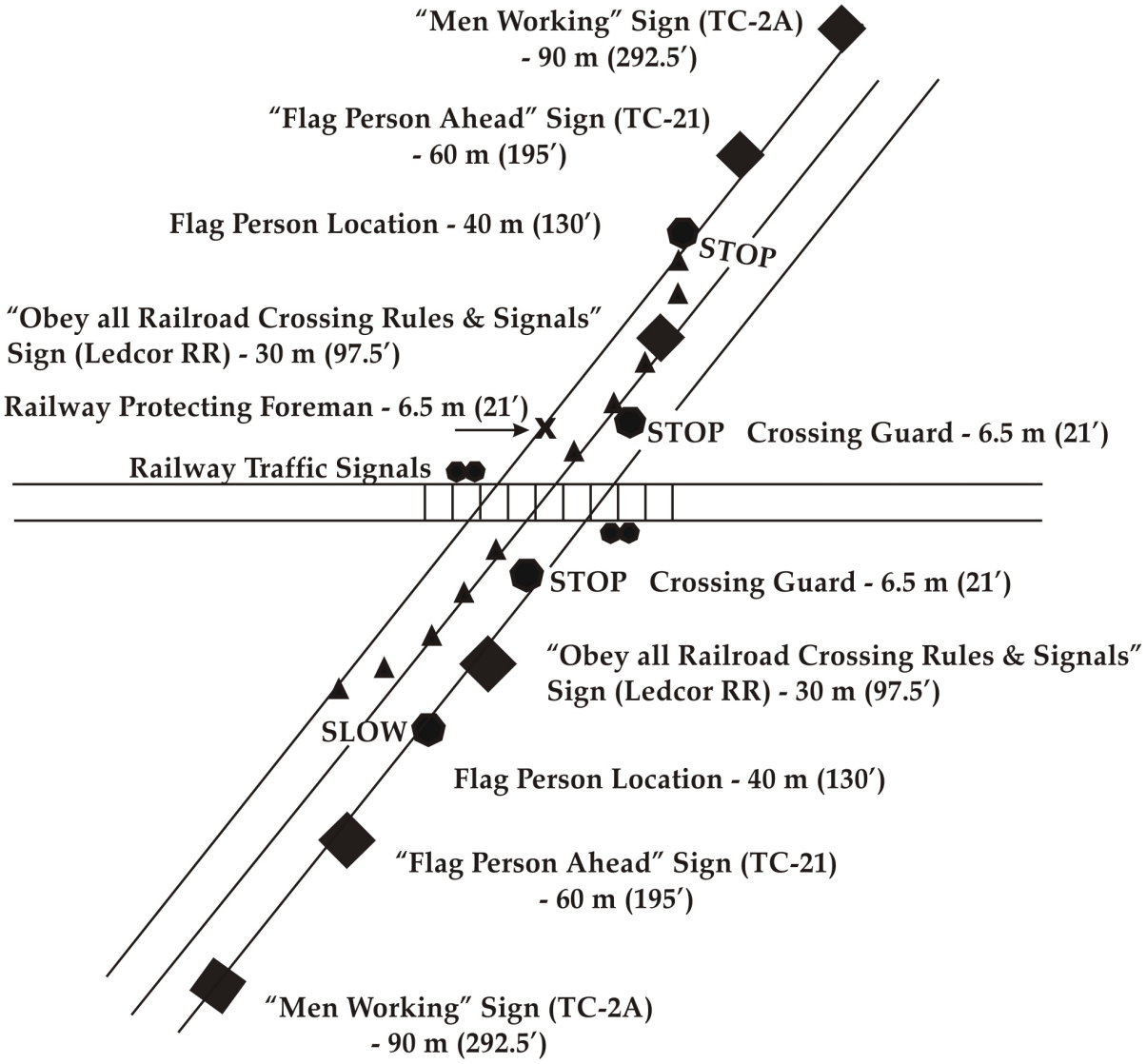
g) As per normal operations, the Traffic Control Flag persons will resume their regular duties controlling vehicular traffic.

Note: The Crossing Guards must maintain communication with each other and with the Railway Protecting Foreman (or Railway Flag Person) at all times prior to and during the passage of a train through the work limits.

Note: All other procedures/regulations governing traffic control and signage must be in compliance with Local Ministry of Transportation guidelines.

Note: In most situations where the railway crossing is equipped with gates as well as lights and bells, Crossing Guards **will not** be required. The only exception to this rule is in situations where a highway lane closure is in effect.

Diagram - Typical Lane Closure (scenario)



Appendix C - Glossary

CN	Canadian National
CPR	Canadian Pacific Railway
CROR	Canadian Rail Operating Rules
GEXR	Goderich-Exeter Railway Company
km/h	kilometres per hour
m	metre
mph	mile per hour
MTO	Ministry of Transportation of Ontario
RAC	Railway Association of Canada
TCP	traffic control person
TOP	track occupancy permit
TSB	Transportation Safety Board of Canada
VIA	VIA Rail Canada Inc.