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CITY OF CAMBRIDGE

489 BROADWAY, CAMBRIDGE, MA. 02138
TEL. (617) 349-6911 FAX 349-6918

EMERGENCY COMMUNICATIONS DEPARTMENT
George L. Fosque, Emergency Communications and 911 Director (gfosque@ps.ci.cambridge.ma.us)
Paula M. Snow, Chief of Emergency Operations
Kenneth T. Pitts, Public Safety Computer Systems Manager
Pat Macher, Administrative Assistant

Memorandum

To: Robert Healy, City Manager
From: George Fosque
Re: Council Order #3 dated 5/21/01
Report on the failure of the E911 system due to problems with Verizon
Date: 6/25/01

We have received the attached letter from Verizon, the telephone company that operates the statewide 911 phone system. In this letter, they describe the reasons for the 911 system failure on May 16, 2001 and, more importantly, the specific steps they have taken to insure that such a failure does not reoccur. We have also asked them to consider rearranging the way automated messaging occurs during a similar outage so that callers who fail to reach 911 get helpful instructions on alternate dialing. They are considering how they might institute these alternate dialing instructions.

The 911 Outage

After investigation, Verizon now reports that the 911 phone system outage lasted from 8:46 AM through 10:08 AM on May 16, 2001 - a period of 1 hour and 22 minutes. The outage involved over 15 communities and was first detected after 9:30 AM by Somerville, Belmont, and ourselves.

Callers to 911 during this outage got a recorded message (the 'vacant code message') saying "we're sorry, your call cannot be completed as dialed, please check the number and call again or call your operator to help you". In Cambridge, we appear to have had only one major emergency call to 911 in this period, a woman with chest pains. She called 911, got the above message, called the operator as instructed, got the operator's voice message, and was redirected back to the same "we're sorry ..." message again. Fortunately, she gave up on this approach and contacted someone in her building who reached

us on our 10-digit, non-emergency line. The Cambridge Fire Rescue responded and she was transported to a hospital where she recovered.

Other callers to 911 in Cambridge during this interval called either the police or fire non-emergency numbers, 617-349-3300 or 617-349-4900, both of which were operational. We made 15 dispatches in this interval of which many were related to callers using our 10-digit numbers. None were to emergencies except the woman caller with chest pains.

The 911 system failed "quietly" due to an error in a software update being made on our regional 911 phone switch in Wakefield. No alarms were set off and no one at Verizon or their 911 Service Response Center knew there was a problem. The problem was first discovered by Somerville 911 who received a call on their police business line from a citizen saying he had called 911 and the call did not go through. Within a 15-minute period before 10:00 AM most of the 911 centers in the effected areas were notified by regional fire and police radio networks that 911 was inoperative. Shortly thereafter, at 10:08 AM, the 911 system became operative again.

Verizon Has Instituted Procedures to Prevent a Reoccurrence

The outage was caused by a software change to a 911 switch that accidentally removed a critical set of routing numbers. Verizon has taken steps to insure that software maintenance updates that impact 911-related phone switches are properly tested and verified upon installation. Further, they will make test calls to 911 to insure that the system works properly. Finally, technicians are being retrained to insure they are more alert to any sign of trouble with 911-related software.

We believe these steps are prudent and expect they will catch any such future programming errors from disrupting 911 phone service.

It should be noted that Cambridge's last experience with a 911 outage was in 1995 when Boston was starting up their E911 service. We experienced an outage of less than 20 minutes during which time callers also used our 7-digit business lines to get emergency help.

Verizon Is Reviewing Automated Instructions Given to 911 Callers

We are still working with Verizon to organize automated messages so they are able to direct callers during a similar 911 outage. Currently, the automated messaging sequence received by callers during a similar outage would not be helpful. We will report in the future on our progress to change this to a helpful message.

Peter T. Bowman
Regional Director
Public Affairs

Verizon Communications
451 Main Street
Wakefield, MA 01880

Phone 781.224.2005
Fax 781.246.2268
peter.t.bowman@verizon.com

June 22, 2001

Mr. George L. Fosque
Emergency Communications and 911 Director
City of Cambridge
489 Broadway
Cambridge, MA 02138

Dear Mr. Fosque:

I am responding to your letter of May 30, 2001. On Wednesday, May 16, at 08:46 a.m., Verizon experienced a service outage impacting the E911 system in Cambridge and surrounding communities. The problem was isolated to a software change in the Wakefield Central Office.

The Wakfield office provides local dial tone to both Wakefield and Stoneham and also serves as a tandem office for the Enhanced 9-1-1 (E911) network. In accordance with standard operational procedures, a Verizon technician downloaded a software change in the Wakefield Central Office related to new area codes. Due to an error in the software code, the exchange that governs all 9-1-1 routing was removed, delivering 9-1-1 calls to a vacant code. As a result, callers did not reach the City's Public Safety Answering Point ("PSAP") and instead received the standard vacant code announcement directing them to verify the number they were calling and/or contact an operator for further assistance. At 10:08 a.m., the problem was rectified and calls were once again routed to the appropriate PSAPs.

Verizon is taking the following steps to prevent a recurrence of this incident:

- Software Provisioning will verify all changes made to E911 routes for accuracy in the Code database and will continue to develop a mechanized method to verify software changes for accuracy.

- All software orders affecting E911 will be treated as "safe time" critical orders (generally early morning hours) to be implemented in compliance with Verizon's practice governing such orders.

- After implementation of software affecting E911, test calls will be made in the Network Operations Center to verify that E911 and the emergency network continue to function properly.

- Technician training has been reinforced to highlight that if a routing problem is suspected after a software order has been implemented, the translation technicians must remove the software changes immediately and the Software Provisioning group will work directly with the technicians to rectify the problem.

As you know, the E911 network provides alternate and diverse routing as well as redundant 9-1-1 tandems. Unfortunately due to the software error described above, 9-1-1 calls were routed to a code that was eliminated, thereby rendering any alternate routing unusable. During this outage callers dialing 9-1-1 never reached the E911 system. Therefore, there is not a technical solution that would allow us to design a unique announcement directing callers on how to alternatively reach emergency personnel, during an outage of this kind. However, we are working with Operator Services to determine if the automated instructions that were encountered by callers who dialed the operator, can be tailored to direct callers on how to immediately reach a live operator.

Since the inception of Enhanced 9-1-1 service in Massachusetts the availability and completion rate of 9-1-1 calls to a PSAP has exceeded 99.99%. Although Verizon strives for a 100% completion and availability rate there are rare occasions where either network or human error can interrupt service for a brief period of time. Let me assure you that Verizon recognizes the serious nature of outages to the E911 system and is doing everything within its power to assure that a situation like this does not occur in the future. If I can provide further assistance please contact me.

Sincerely,

Peter T. Baum

cc: Jamie Karp, SETB

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May 30, 2001

Peter Bowman
Regional Director - Public Affairs
451 Main Street
Wakefield, MA 01880

Dear Mr. Bowman

On May 16, 2001 the Verizon-operated 911 telephone system serving the City of Cambridge failed for at least 30 minutes. During this interval, persons with emergencies were not able to reach our Emergency Communications Center in a timely manner.

In one case, a woman alone in her apartment with chest pains was delayed in reaching us, a delay that could have had very tragic consequences. Fortunately, she finally reached us through the help of a person in her building and was transported to Mass. General Hospital where she recovered.

The Cambridge City Council, the City Manager, concerned citizens, and myself are quite concerned by an outage to a "fault-tolerant", redundant system that must always be available. I have been directed to seek specific assurances from Verizon that such an outage will not reoccur.

1. What was the specific cause of the failure and for how many minutes was Cambridge actually without 911 telephone service?

2. What steps are being taken to insure that this failure does not reoccur and when will these steps be taken?

3. In the case of a future reoccurrence, what steps are being taken to insure that the recorded message received by 911 callers provides correct alternate emergency help dialing instructions?

It appears that the recorded message given in the recent outage caused callers to dial 0, then 9 to reach emergency help, at which point they were routed back to the failed 911 message and caught in a time-consuming "loop".

Please contact me at (617) 349-6911 and I can provide further details.

Sincerely,

George L. Fosque

cc. Jamie Karp, SETB

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CITY OF CAMBRIDGE • EXECUTIVE DEPARTMENT

Robert W. Healy, City Manager *Richard C. Rossi, Deputy City Manager*

July 30, 2001

To the Honorable, the City Council:

Please find attached a response to Awaiting Report Item No. 01-198, regarding a report on the failure of the E911 system due to problems with Verizon, received from Emergency Communications and 911 Director George Fosque.

Very truly yours,

Robert W. Healy
City Manager

RWH/mec
Attachment

795 Massachusetts Avenue, Cambridge, Massachusetts 02139 Voice: 617.349.4300 Fax: 617.349.4307 TTY: 617.349.4242 Web: www.ci.cambridge.ma.us

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Consent Agenda #3

Awaiting Report Item Number 01-198, regarding a report on the failure of the E911 system due to problems with Verizon.

In City Council July 30, 2001

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