



# Portland's Emergency Notification System (PENS)

## FINAL REPORT

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**City of Portland , Oregon**  
Vera Katz, Mayor  
Mark A. Kroeker, Chief of Police

Portland Police Bureau  
Planning and Support Division  
1111 SW 2<sup>nd</sup> Ave. Room 1552  
Portland, Oregon 97204  
(503) 823-0283  
(503) 823-0289 Fax

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# **Portland's Emergency Notification System (PENS) FINAL REPORT**

## **Summary**

With funding from a U.S. Department of Justice, Office of Community Oriented Policing Services, Advancing Community Policing grant, the Portland Police Bureau established an emergency notification system. This system delivers a pre-recorded telephone message to citizens in a selected area of the city, and can be deployed when there are threats to life or property.

Working with the community crime prevention personnel, Portland neighborhood associations, and the City of Portland's bid process, a company was selected to provide an emergency notification system. The company selected was FirstCall Interactive Network, Inc., Baton Rouge, Louisiana. The Portland Emergency Notification System (PENS) became operational in August 2000.

In 1996 the Portland Police Bureau received funding from a U.S. Department of Justice, Office of Community Oriented Policing Services, COPS More96 grant to establish a mapping based crime analysis network. This Advancing Community Policing grant built upon the mapping technology developed with the COPS More96 grant. The Police Bureau also has other programs that use mapping and this Advancing Community Policing grant allowed the coordination of the various programs. Both a process and outcomes evaluation were conducted.

## **Introduction and Project Overview**

The Portland Police Bureau had by the late 1990's over 10 years in computerized desktop mapping. Much of this work was concentrated in a centralized unit. With the Crime Analysis Management Information Network (CAMIN) developed through the COPS More96 grant, police officers throughout the Portland Police Bureau began using computerized mapping as a tool in visualizing crime and crime problems. The vision for citizens to perform similar mapping functions via the Internet was recognized during this CAMIN project development.

As mapping developed in the Portland Police Bureau it became clear that mapping was a key tool to display crimes or any spatial information such as telephone numbers at residential and business addresses. Desktop mapping can effectively make selections on an electronic map and create electronic files for sharing information. Combining the power of desktop mapping with telephone communications would create a system that would deliver a message to the telephones in selected areas in order to save lives and property. During an 18 month time period several situations highlighted the need for an emergency notification system:

*January 1996:* Armed gunman holds hostages in a downtown high-rise office building. While the television and radio media were able to notify the people outside the building that a hostage situation was occurring in the building, there was no way to notify the residential and commercial tenants inside. An emergency notification system would have allowed police to give instructions to tenants of this building and surrounding buildings to stay inside until it was safe for them to evacuate.

*February 1996:* Portland was faced with torrential rains and strong winds causing severe flooding in many areas around the city. The City of Portland is situated at the conjunction of the Willamette and Columbia Rivers and is home to over half a million people. Low-lying areas around the rivers and streams were on alert for many days. As waters rose the need to evacuate specific geographical areas was critical. An emergency notification system would have assisted evacuation of specific areas much faster and more efficiently.

*September 1996:* An armed gunman shoots three people and sets fire to the Church of Scientology building. Claiming that the Church of Scientology took control of his mind and body, an irate former member shot three people and took one hostage before attempting to burn the building with an accelerant. An emergency notification system would have allowed for the evacuation of tenants in surrounding buildings.

*March 1997:* An armed robbery suspect barricades himself in an apartment complex. The Special Emergency Reaction Team (SERT) was activated to evacuate and resolve an incident involving an armed robbery suspect with a high caliber weapon held up in an apartment complex. Officers in camouflage went door to door to evacuate residents in a nine-block area. An emergency notification system would have allowed instructions to citizens to stay in their homes and out of the line of fire until they were notified or evacuated by officers. This would limit the exposure of the officers and citizens as much as possible.

Flooding, dealing with armed gunmen, locating missing children or Alzheimer patients reinforced the need for an emergency notification system to protect citizens, officers, life and property. Often the system can notify citizens and businesses more efficiently than officers going door to door, which avoids placing officers and citizens in harms way. Given this goal of protecting life and property, the Portland Police Bureau applied for and received an Advancing Community Policing grant to create such an emergency notification system.

The goals of the project stated in the grant were:

1. Set in place a “Dial and Deliver Notification System” that could notify citizens of an emergency via telephone. Provide training and upgrades to current systems of computerized mapping.
2. Conduct mapping training and coordinate the training of the various mapping programs in use in the Police Bureau.
3. Produce an evaluation of the program at the conclusion of the grant.

## **PROCESS EVALUATION**

### **Grant Implementation**

In August 1998 the Portland City Council voted to accept the U.S. Department of Justice, Office of Community Oriented Policing Services, Advancing Community Policing Grant award. The City Council directed that the emergency notification system be used only for threats to life and property. With the emphasis on “emergency situations” the Portland system would not be used for meeting notifications and similar uses, unless on a subscriber list.

The Police Bureau assigned an officer to be the project manager of the grant. Before the implementation of the project however, research was needed on the various types of systems and equipment available. Several companies had been in touch with the Police Bureau to demonstrate and explain their programs. A Request For Information (RFI) was released and was sent to all companies that were known to provide products or services in the emergency notification industry. The information was also posted on the Police Bureau and City of Portland web sites in cooperation with the Bureau of Purchases. See Appendix A. This RFI resulted in three responses.

The references listed in the RFI responses were then mailed a survey to gather information about the systems their agencies were using, amount of use, networking capabilities and satisfaction (Appendix B). Approximately 20 survey forms were returned and the responses identified uses that ranged from fraud alert to daily senior citizen contact programs. The location of the equipment for the systems and support personnel for these systems varied from agency to agency. Most agencies located the systems in their records divisions or 911 dispatch centers. Survey results may be found in Appendix C.

Companies responding to the RFI were invited to provide a demonstration of their systems to members of a Police Bureau selection committee. This committee was comprised of representatives from the Data Processing Division, Planning and Support Division, Detective Division, and the Police Information Line. Three companies chose to provide demonstrations. This process identified two types of emergency notification

systems: equipment based and service based. Please see Appendix D for a detailed discussion of these systems.

Based on the demonstration and survey results the selection committee chose the service based system. However the original Advancing Community Policing grant award was for an equipment based system. The Portland Police Bureau next requested and received a grant adjustment to pursue a service based system. Working with the City of Portland Purchasing Bureau a formal bid process was then begun. FirstCall Interactive Network, Inc. was awarded the bid to provide Portland's emergency notification system.

### Portland Emergency Notification System (PENS)

The process to establish Portland's emergency notification system involved eight major components: policy; command involvement; procedure; location of equipment; support; citizen involvement; media involvement; and possible future enhancements. Many of these components occurred concurrently.

#### Policy

As previously mentioned the City Council directed that the system be used only for notification involving threats to life and property. The Police Bureau had been concerned that PENS calls would become common place or even ignored if the messages were too numerous. A PENS phone call must be considered an emergency.

#### Command Involvement

Precinct Commanders and command staff were involved in creating policy and procedure as outlined in a training bulletin. See Appendix E. Training bulletins are distributed to all police divisions and precincts and contain policy and procedures on new programs, special events, and legal updates. Because PENS was a new program the precinct commanders wanted to be the only authorized activators of PENS. They realized that they ultimately would have to address complaints and concerns from citizens within their precincts about activations or non-activations.

#### Procedure

Portland is divided into 5 precincts with a commander assigned to each. Commanders are responsible for all police operations within their precinct. Police officers, specialty units (e.g., Special Emergency Response Team) or outside bureaus including the Fire Bureau requesting activation of PENS must obtain approval from the precinct commander for the involved area. Procedures and operations of the system were outlined in a manual that was supplied to all precinct commanders. See Appendix F. Activation requires an account number and personal identification number.

One advantage of a service based system is that it can either be activated on local equipment or with assistance from a 24/7 service provider operator. Thus precinct commanders have the option to contact the Police Information Line Unit for local activation or call the service provider directly. The recommended procedure is to call the Police Information Line Unit to assist with activation. The Police Information Line Unit

is a telephone support unit taking citizen non-emergency calls and providing information and referrals.

Precinct Commanders are directed to begin all emergency activations with the Police Information Line unless there is a tactical advantage not to do so. Emergency situations are often hectic scenes, and the Police Information Line can assist the commander with the mechanical process of activation: computerized map selection and recording outgoing and closure messages. This allows the precinct commander to focus on the emergency.

For tactical advantage PENS allows a remote system in the field for emergency notification. The Police Bureau has one operational mobile precinct with a second one planned. A laptop computer can be taken to the mobile precinct or any remote command center and emergency notifications can be done from those locations.

A significant element of the PENS system is the Closure Routine (Appendix E contains a discussion of the routine). When the danger or threat has passed or concluded, a closure message can be sent to assure the citizens that the incident has concluded. The Police Bureau termed this closure message the Closure Routine. Historically, sending officers door to door in search of a lost child is often done. However, sending those same officers door to door after the child is found would most likely be deemed an inappropriate use of officers' time. PENS and the Closure Routine facilitate both processes. The Closure Routine calls back the same residents and businesses that were called during the emergency. During the closure message the precinct commander can deliver the outcome of the emergency and most of all thank them for their help.

During the development of this project an officer stated he had during emergency situations told many people over the years to stay inside or follow specific instructions. He said he was not able most times to go back to those people and thank them. The officer said: "This is our opportunity to ask for citizens assistance and cooperation and then thank them for that help. Now that's community policing."

#### Location of Equipment

PENS equipment at the local level consists of one desktop computer, a data phone line and a voice phone line. The computer allows police personnel to select a geographical area on a computer map in order to create a list of phone numbers that are transmitted to the service provider for message delivery.

Within the Police Bureau several locations were considered. The Police Information Line Unit was selected for a number of reasons. As mentioned above, the Police Information Line serves as the contact point for citizens that need information about police related matters. They can answer questions and refer citizens to the appropriate police or other resource.

During activations of PENS citizens might call the Police Information Line with questions about the emergency. Because the Police Information Line personnel would be involved in the activation they would have the information needed to appropriately direct

citizens. In critical situations this would assist the precincts by handling these types of calls thus allowing precinct personnel to focus on the actual emergencies.

The Police Information Line is a unit of 6 persons and a supervisor. This unit was willing to take ownership of the PENS support functions and was enthusiastic about the potential life-saving benefits of this program. The unit's size also permitted training on the system to be accomplished in one day with two two-hour sessions.

The Police Information Line was also able to serve as the data entry point for citizens with unlisted phone numbers who wanted to participate in the program. The City of Portland and the Police Bureau have no statutory authority to the telephone companies' records of unlisted phone numbers. Therefore the Police Bureau established a process so that unlisted phone numbers could be added to the system: by mail, phone, or Internet. See Appendix G for examples.

Another reason for selecting the Police Information Line Unit was that its functions could be backed-up by Detective Division support personnel. The Police Information Line Unit has limited business hours. When the Police Information Line is not available the Detective Division reception desk is the backup. The Detective desk is available until 2300 hours daily and is trained to receive calls for activation. If there is a need to activate the system after 2300 hours the commander can call the service provider directly.

The other major location considered was the Bureau of Emergency Communication, (BOEC), which is the dispatch center for the City of Portland and all police, fire and medical services within Multnomah County, a region of 660,486 citizens. BOEC is not part of the Police Bureau thus agreements necessary to operate a joint system were not practical for the grant period.

### Support for Program

In 1996 the Portland Police Bureau received funding from a U.S. Department of Justice, Office of Community Oriented Policing Services, COPS More96 grant to establish a mapping based crime analysis network. The Portland Police Bureau had been involved in desktop mapping for several years prior to this 1996 grant. The PENS system intentionally utilized the mapping knowledge and experience gained from these other projects, maximizing return on prior investments in programming and training. The Planning and Support Division is a Portland Police Bureau support division and the grant manager was assigned to this division. This division has been a major innovator for mapping applications in the Police Bureau and has extensive experience in grant management.

PENS primary technical support is supplied by the service provider. Data file and map layer maintenance as well as other system updates are the responsibility of the service provider. Updates to the unlisted phone number file are made by the service provider. These unlisted numbers are originally obtained by the Police Bureau as described earlier.

### Citizen Involvement

The City of Portland is a strong neighborhood based city and has 96 neighborhood associations. The Police Bureau worked with the Office of Neighborhood Involvement (ONI) to find neighborhoods willing to be involved in PENS testing. The Piedmont and Woodstock neighborhoods volunteered and were given presentations about the system at their monthly meetings. The neighborhood associations published articles in their newsletters and information was released to the local neighborhood newspapers to inform citizens that testing would occur.

During the Piedmont and Woodstock neighborhood PENS tests, a phone number was included in the message for citizens to call if they had questions. During the four separate tests approximately 12 calls were received from citizens. The number of telephone inquiries was surprisingly low considering almost 400 messages were delivered in the two neighborhoods.

In August, 2000 the City of Portland Mayor's Office held a series of neighborhood meetings dealing with crime and other livability issues. This program is called NeighborSafe. To inform citizens about the meetings information was mailed to each household in the City of Portland. PENS information was also included in the mailings. See Appendix H for a copy of this insert.

In addition to the NeighborSafe mailing, PENS brochures were also made available at public libraries, neighborhood association offices, fire stations and other agencies having public contact. In total more than 200,000 PENS brochures and inserts were distributed.

The Police Bureau recognized the communication value of making information available on the Internet. The Police Bureau has had a web site for several years ([www.portlandpolicebureau.com](http://www.portlandpolicebureau.com)) and PENS information was included on this site. Citizens could obtain general information on the program, answers to most commonly asked questions, and register unlisted phone numbers online. See Appendices G and I.

### Media Involvement

Media involvement was also important to the project as a way to distribute information and introduce citizens to the PENS system. The press was kept informed of PENS progress throughout the grant period via news releases, radio, television and print interviews, local talk shows and a news conference.

### Possible Future Enhancements

#### Other Uses:

The future of law enforcement will emphasize using technology wisely to work more efficiently. An emergency notification system is an example of such technology. Other notification system uses could include subscriber lists: elderly contact, suspect alerts, fraud alerts and employee callbacks. A subscriber list for the purposes of this document is a list of people or businesses requesting to be called by the system for the purpose of

delivering requested information. Citizens or employers who have not requested to be added to a subscriber list would not be added automatically.

PENS is capable of more than delivering emergency messages. The system could be used to inform citizens of upcoming events, neighborhood meetings, crime prevention tips, warnings and other information. One law enforcement agency surveyed used their system to contact elderly citizens on a daily basis. When called, the citizen needed to enter a code. If there was no response to the call, an operator dispatched a car to check the welfare of the person.

Another use would be to notify banks and check cashing businesses of counterfeit checks, money orders or other potential frauds. Jewelry stores, pawnshops, pharmacies, and other businesses having the potential to deal with criminal activity could also benefit from a subscriber list notification system. The release of press information, contacting neighborhood leaders and neighbors and call back lists for employees are other examples of enhanced uses.

#### System Enhancements:

In an Enhanced 911 dispatch system the operator has access to address and phone information, both listed and unlisted numbers. During this grant period there was no statutory authority to access unlisted phone company information. A fully functioning emergency notification system must have access to this information and work has begun at a federal level to make this possible.

An emergency notification system should be available statewide as emergencies can cross local jurisdictional boundaries. The state could serve as the agent ensuring data availability to all emergency notification systems.

## **OUTCOMES EVALUATION**

### Neighborhood Survey

Prior to PENS becoming operational the Piedmont and Woodstock neighborhoods received a test message from the system. Calls were made to 388 phone numbers in the test areas with 287 messages delivered. The phone numbers dialed were from those supplied as part of the FirstCall database.

This database was the best available list of telephone numbers, but the provider recognized that such lists are incomplete. For example, unlisted telephone numbers are not in the database. To obtain a measure of how complete this list might be, a mail-out survey was then sent to residents of that area. See Table 1. In total survey letters were sent to 947 property addresses selected from the Multnomah County Department of Assessment and Taxation records.

A total of 357 surveys (38%) were returned. This return rate represents a sampling error of plus or minus 4.1%. That is, responses could be expected to vary by plus or minus 4.1 percent 95% of the time. Table 1 contains the survey questions and responses.

Table 1

**1 - Did you receive the test message on (Date & Time the Message was Sent)?**

Yes – 24%                      No – 55%                      Don't know – 19%

**2 - If you did not get the message was it because your phone number is Unlisted?**

Yes – 15%                      No – 47%                      Don't know – 4%

**3 - Do you have an Answering/Message Machine or Service?**

Yes – 69%                      No – 13%                      Don't know – 4%

**4 - Does your phone number have a dot by it in the phone book?**

Yes – 10%                      No – 71%                      Don't know – 12%

**5 - Do you have a TTY/TDD machine?**

Yes – 2%                      No – 85%                      Don't know – 6%

**6 - What is the primary language in your household?**

English – 94%                      English + Another - 1%                      Other – 2%

This survey was not intended to answer all possible questions about the community and this type of system but to answer some concerns that were raised in development. The local telephone company had been contacted and either didn't have or refused to supply information about the number of unlisted phone numbers, TTY/TDD machines and any other related data they may have.

This limited survey showed that only 24% of the responders received the message. Unlisted phone numbers are at about 15%. Most of the homes would have an answering machine or service to receive the emergency call if they didn't get to the phone to answer the call. When a dot appears by the telephone number in the telephone directory it indicates to telemarketers not to call that number. Only about 10% of the responders indicated they had a dot by their number in the phone book. There were concerns about transmitting the message in different languages and to the hearing impaired during development of PENS. Although messages to TTY/TDD machine and multi-lingual messages were not addressed by this grant they remain a priority for solution.

Summary of Activations

There were three activations during the approximate grant period. These activations are summarized below.

## 1. North Precinct Sexual Predator

On September 2, 2000 at about 6:00 pm the North Precinct Commander activated the PENS system for the first time regarding a vicious sexual predator. The system called 2314 phone numbers and delivered 1932 messages in about 32 minutes. The involved area was rather difficult to map because of the terrain and size. Several other issues were identified during this activation. The following list of concerns noted in the afteraction report of the incident were:

- Custom Message could not be recorded because Sprint lines were down nationwide.
- FirstCall's customer service representative seemed unaware that the Police Bureau had a mapping workstation and could do the mapping locally. The Representative seemed to think the only way he could help was by doing the mapping himself.
- Procedures for the Police Information Line operator were not clear enough on dialing and activation.
- Mapped area was very large and there was no paper map for reference.
- Commander wanted to notify two neighborhoods but neighborhoods are not selectable items in the program.

### Responses to concerns:

- It was unknown why Sprint phone lines were down. The contingency plan for this problem is to call FirstCall directly. This is one of the reasons to use a service based system, local mapping and a 24/7 service provider. If the system fails at the local level the activation could be made with a call to FirstCall.
- It appeared that the FirstCall staff was unaware that the Police Bureau had a mapping workstation and was attempting to transmit the data. Because the phone lines were down the system was failing. The area to be notified was an exceptionally difficult area to map because of its size and irregular shape. Bordered on a bluff on one side and industrial area on the other the operator had to create the area manually. This was the type of area that would be extremely difficult to explain over the phone and was best mapped at the local level. After the activation, FirstCall dealt with training of their operators.
- Apparently the operator manual was not clear enough at the local level. The Police Information Line operator had difficulty understanding the dialing and connection instructions. The manual was redesigned after this activation to include better instructions.

- The local operator requested that a paper map be available as an overview device when mapping large areas. The map available on a computer monitor doesn't include much area when the view is large enough to see detail. A wall map or book map next to the mapping station would allow the operator to have a paper reference.
- In this particular activation the commander made the request to notify the entire area of the two neighborhoods. There was no layer created to allow the selection of an entire neighborhood during development. This was a unique situation and it is not anticipated that an entire neighborhood would be used again. There are no plans to include neighborhoods at this time but it is possible.

## 2. Southeast Precinct Missing Child/Children

On October 9, 2000, at about 8:00 pm the PENS system was activated by the Southeast Precinct Commander to locate two lost children with disabilities. During the first of the two activations, 1800 phone numbers were dialed with 1436 messages delivered. This activation had complications unique to the situation. The call in summary is as follows:

The initial 911 call was for one missing girl and the PENS system was activated to deliver an emergency message to the neighborhood. Shortly after activation of the PENS system the commander changed the parameters of the activation to include an additional missing child, the fact that two children are together and the area to be notified is larger. The following issues occurred:

- Once the emergency notification begins the system attempts to call all telephone numbers in the selection. If there is no answer or there is a busy signal the system calls again after a short delay. The number of attempts is set at five. The activation was progressing normally during the first activation.
- Prior to the completion of the first activation another activation was started. This activation was the addition of the second missing child and the expansion of the area. When the second activation began the computer system failed and needed to be restarted before any other notifications could be made.
- The final issue with this activation was the way files were saved when two or more activations are made in close time proximity.

### Responses to Concerns:

- Programming changes need to be made to the computer at FirstCall to make it possible for an activation to begin before the previous one completes. It appears no client had ever done this before. Changes were made to allow this.
- Files created on the system need to be saved so they may be accessed later and for archival purposes. FirstCall made changes to the system to allow the voice message wave file to be archived for each activation.

### 3. Northeast Precinct Barricaded Man with Rifle.

On February 8, 2001 at about 2:30 pm the Northeast Precinct Commander activated the PENS system for a man armed with a rifle barricaded in a house. This activation included a five block radius from the location. During this activation there was the following issue:

- Police Information Line Operator made the selection and attempted to complete the activation but received an error message on the computer.

Response to Concern:

- When the operator had the error on the local computer she followed procedure and dialed service provider to make the activation. FirstCall responded and the activation and closure routine went well. It was later determined that the modem on the local machine had locked in the MS Windows operating system. After the computer was rebooted, testing was done and all tests were successful. This is another illustration of having a service based system.

#### What Worked and Lessons Learned

What Worked: The PENS system can deliver messages to any segment of the community much faster than traditional means. During actual events within the city, as many as 2000 messages were delivered in about 30 minutes, which included up to 5 attempts on no-answer calls.

What Worked: The PENS system can deliver a closure message to the same segment of the community at the completion of an incident. The responders to the RFI were not aware of a Closure Routine being used by any other agency to tell citizens that the incident is closed and thank them for their cooperation.

What Worked: There was strong community support for an emergency notification system based on neighborhood meetings, surveys, and phone conversations. More than 500 citizens with unlisted phone numbers wanted to participate in the program and supplied their unlisted numbers to the Police Bureau during the grant period.

What Worked: Training is ongoing and continues to be supported by the Police Bureau. The Planning and Support Division personnel are doing coordination of PENS, mapping and other program training.

Lesson Learned: Lack of access to unlisted phone numbers is the single biggest problem to implementation of the program. **A recent change in federal law appears to have given authority to local agencies to obtain the information for programs like this**

**one.** Related legal issues may need to be settled in the courts before cities have access to the information.

Lesson Learned: Cellular phones are slowly replacing wired phones for many citizens. Because cellular phones are transitory and not stationary, the citizen can receive the call when not at home or even in the target calling area. The Police Bureau was aware of the cellular phone issue and decided not to ask citizens if the number they were supplying was a wired phone. How cell phone usage will impact emergency notification systems will need to be addressed in the future.

Lesson Learned: Technology has progressed greatly over the last few years but has not solved at least two problems. First, the hearing impaired TTY/TDD machines cannot be contacted at the same time the hearing telephone calls are being made. TTY/TDD calls must be made separately and the phone number list must be known. The ideal system would identify a TTY/TDD machine and leave a message. The technology is not available at this time.

Second, fax machine messages cannot be sent automatically when the calling computer gets a fax machine tone. As in the TTY/TDD equipment the technology is not sophisticated enough to auto-detect the fax and deliver a paper copy of the call. Both Faxes and TTY/TDD may be detectable automatically in the future. Until that time, faxes and TTY/TDD will be very mechanical processes.

Lesson Learned: In many communities there is a need to deliver the emergency message in more than one language and Portland is one of these communities. The PENS system is capable of delivering multiple language messages like most notification systems. During this grant period messages were delivered only in English but this issue will be addressed as Portland continues to rely on PENS.

## **Training**

Coordination of all mapping training in use by the Police Bureau was a goal in the grant. The Portland Police Bureau viewed the PENS system as building on a foundation of mapping technology that had been started a number of years earlier.

In the spring of 1998 the Portland Police Bureau established a computer training lab to permit training on a number of software applications. Mapping software was one of these applications. The computer lab was available to all bureau personnel on a 24 hour, seven days a week basis. Funding for the computer lab was obtained through a Bureau of Justice Assistance (BJA) Local Law Enforcement Block Grant.

The mapping operations in the Portland Police Bureau were reviewed, a training curriculum was developed (see Appendix J), and classes were offered. The Police Bureau recognizes that training will be ongoing and is committed to providing support for its members.

## **Conclusion**

As previously mentioned the goals were:

1. Set in place a “Dial and Deliver Notification System” that could notify citizens of an emergency via telephone.

The PENS system is ongoing and fully functional to date. The Police Bureau continues to maintain the program.

2. Conduct mapping training and coordinate the training of the various mapping programs in use in the Police Bureau.

The PENS system was built on a foundation of mapping technology that had been started a number of years earlier. As mentioned above, all of the mapping operations in the Portland Police Bureau were reviewed, a training curriculum was developed, and classes were offered.

3. Produce an evaluation of the program.

The evaluation of the program had two components: a process evaluation and an outcomes evaluation.