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16. Abstract
Although occurrences of life-threatening kidnappings are rare in the United States, each year the media reports on missing children who are later found brutally murdered. Law enforcement officials have learned that one effective tool for preventing injury to missing children has been the America's Missing: Broadcast Emergency Response, more commonly referred to as an AMBER Alert. AMBER Alerts have become a vital instrument for law enforcement agencies to quickly and widely disseminate information about missing children and their abductors to the general public. State Departments of Transportation (DOTs) frequently contribute to this effort by posting descriptions of suspected abductors' vehicles, along with their license plate information, on Dynamic Message Signs (DMSs) along highways. This study explores the feasibility of using emergency notification software to accelerate communication between TxDOT's AMBER Alert command center in Fort Worth and the individual district personnel who are responsible for activating its DMSs. The research tested two modestly priced notification software programs to determine whether they could be used to improve AMBER Alert communication between TxDOT personnel, using commonly carried communication devices (e.g. cellular phones, pagers, etc.). The research project concluded that emergency notification software does create opportunities to decrease intra-agency communication time during AMBER Alert events, but the application of notification software should be introduced slowly and appropriate protocols should be developed to avoid confusion between TxDOT personnel.

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USING EMERGENCY NOTIFICATION SOFTWARE TO IMPROVE TXDOT'S AMBER ALERT RESPONSE

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Products

This report document contains two products. Product 1 (P1) consists of the main report body; Product 2 (P2) consists of Appendix A.

Table of Contents

List of Tables

List of Figures

Introduction

One of the most frightening and heinous crimes in our society is the kidnapping and injury of a child. Although occurrences of life-threatening kidnappings are rare in the United States, each year the media reports on missing children who are later found brutally murdered. Law enforcement officials have learned that one effective tool for preventing injury to missing children has been the America's Missing: Broadcast Emergency Response, more commonly referred to as an AMBER Alert. AMBER Alerts have become a vital instrument for law enforcement agencies to quickly and widely disseminate information about missing children and their abductors. The idea was originally born following the tragic kidnapping and murder of nine-year-old Amber Hagerman in Arlington, Texas. After family members, friends, and concerned citizens learned of the inefficient communication techniques used by law enforcement agencies, they began a grassroots effort to improve public notification. Their first step was to contact Dallas-area radio stations and request that child abduction information be broadcast over airwaves, similar to the broadcasts made during severe weather (*1*). They were later joined by law enforcement agencies to implement the first AMBER Alert system in 1996. Since then, the concept has been replicated in 41 states, and AMBER Alerts have been credited with saving the lives of 31 children. These accomplishments led President George W. Bush to sign a federal law in 2003 that required every state to institute its own AMBER Alert system (*2*).

The key to the AMBER Alert's success is the wide and rapid dissemination of information to the public, which in turn multiplies the search capabilities of law enforcement agencies. Minimizing the period of time between the abduction of a child and notification of potential witnesses is absolutely critical to increasing the odds of safely recovering the child. The U.S. Department of Justice has estimated that children abducted by strangers are three times as likely to be murdered within six hours after abduction and that 74 percent of children who were abducted and later found murdered were killed within the first three hours of their kidnapping (*3*). Without question, time is of the essence during abduction. Texas's AMBER Alert network now operates at the statewide level and includes the use of Dynamic Message Signs (DMSs) along the state's highways. DMSs provide motorists with a description of the suspected abductor's vehicle and its license plate information. The responsibility for activating these highway DMSs during a Texas AMBER Alert resides with the Texas Department of Transportation (TxDOT).

The State of Texas AMBER Alert Network

The State of Texas's AMBER Alert Network is managed by the Division of Emergency Management (DEM) located within the Governor's Office (see Figure 1). Because the vast majority of child abductions are not life-threatening, and to avoid public fatigue, the DEM requires that specific criteria be met before an AMBER Alert is issued:

- "The abducted child must be 17 years or younger;
- The local law enforcement agency must believe that the child has been abducted, that is, unwillingly taken from their environment without permission from the child's parent or legal guardian;
- The local law enforcement agency must believe that the missing child is in immediate danger of serious bodily harm or death;

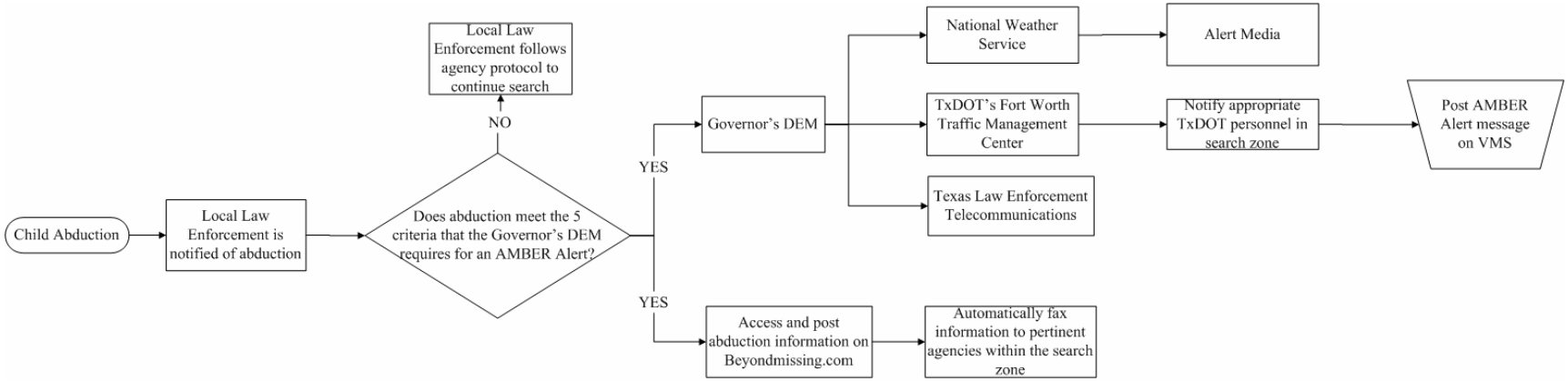

Figure 1: Operation Protocol of the State of Texas AMBER Alert Network

- The local law enforcement agency must confirm that an investigation has taken place that verifies the abduction and has eliminated alternative explanations for the missing child; and
- Sufficient information is available to disseminate to the public that could assist in locating the child, the suspect, or the vehicle used in the abduction" (*5*).

After the responding local law enforcement agency determines that all criteria have been met, it undertakes two tasks that formally begin the process of issuing an AMBER Alert. First, the responding law enforcement agency contacts the Governor's DEM. Second, after notifying the Governor's DEM, the responding law enforcement agency creates a file on the www.beyondmissing.com Internet Web site, which provides descriptive information of the abducted child (e.g., last known whereabouts, pictures, and other critical information) as well as descriptions of the suspected abductor. Beyondmissing.com then automatically faxes and e-mails the newly created file to other law enforcement agencies, media, and certain private sector businesses located within a specified search zone (e.g., 200 miles from the point of the abduction). After the Governor's DEM receives the alert from the responding law enforcement agency, it notifies the National Weather Service (which issues an alert to the media), the Texas Law Enforcement Telecommunications System (TLETS), and TxDOT's Fort Worth Traffic Management Center (TMC) (*5*).

Because TxDOT has decentralized control of the state's DMSs, its Fort Worth TMC serves as the clearinghouse for notifying all appropriate TxDOT personnel at the district level if an AMBER Alert is issued. After receiving an AMBER Alert message from the Governor's DEM, the Fort Worth TMC contacts the appropriate personnel at each TxDOT district office located within a 200-mile radius of the abduction site, who ensure the posting of the AMBER Alert message on their DMSs (*5*). At present, personnel at the Fort Worth TMC manually contact the appropriate TxDOT district personnel (who volunteer each month to be a point of contact) by telephone, a process that typically requires five to six minutes. The Fort Worth TMC does not notify the District Public Information Officer (PIO) or District Engineer during an AMBER Alert, leaving that responsibility to the volunteer. Thus, although it does not require an extensive amount of time to contact the district personnel, the process could be accelerated and the information more widely distributed if technological improvements were made to the system. An automated notification system would also add a beneficial layer of redundancy, increase the accuracy of the message received, and be less labor intensive.

The crucial role that DMSs play during an AMBER Alert cannot be overstated. Consider the August 2002 abduction of two teenage girls in southern California. Parked with a group of friends at a secluded location, the two girls were forced out of their cars at gunpoint and abducted; the abductor used their friend's car. Upon receiving notification of the kidnapping, law enforcement officials immediately issued an AMBER Alert containing precise information about the stolen car. Within two hours, police received a tip from a motorist, who saw the AMBER Alert on a highway DMS. Police helicopters and airplanes were able to spot the stolen vehicle off a dirt road, and when law enforcement arrived on the ground, they confronted the abductor. The suspect was shot and killed as he was searching for a secluded area to murder and bury the two girls. Interestingly, this AMBER Alert was the first-ever public alert issued by the California Child Safety AMBER Network (*4*).

TxDOT's activities during an AMBER Alert are straightforward, but the agency has a keen interest in improving its response. In 2003, TxDOT provided support to the Center for Transportation Research (CTR) at the University of Texas at Austin to explore opportunities for using emergency notification software to more efficiently notify TxDOT district personnel when an AMBER Alert is issued. The basic idea is that the time elapsed from the point at which a call is received at the Fort Worth TMC to the point at which a DMS operator is notified to post an AMBER Alert message represents the most inefficient step in the current process. If this single step could be accelerated, then additional time could be spent searching for a missing child, since the minutes after abduction are the most important to increasing the odds of saving the child. It is also important to note that CTR's role has been to determine the feasibility of using notification software and, as of August 31, 2004, TxDOT had not yet decided whether to implement the notification software in its AMBER Alert activities.

Improving Emergency Notification during an AMBER Alert

A brief search of the Internet quickly reveals that the marketplace offers a wide variety of notification software programs or services that can cost as little as $80 to more than $75,000, depending upon the functions and services that the program provides and the user demands. However, requirements set forth by TxDOT narrowed the range of candidates considerably. Specifically, TxDOT desired a modestly priced software program capable of transmitting alphanumeric messages to communications devices that TxDOT personnel already carry or have access to, such as cellular phones, pagers, e-mail, instant messaging, etc. The need to contact staff outside of the workplace on landline and cellular telephones meant that a system also needed to generate voice messages that could be transmitted over phones without text messaging capabilities.

After considering the capabilities and costs of a number of commercially available emergency notification programs, as well as TxDOT's specific needs, CTR researchers purchased a license for Emergin Wireless Office 5.0. CTR researchers also purchased a license for InfoRad Wireless Pro, which is currently in use within TxDOT's Austin district. The usefulness and practicality of both software packages were examined through a series of exercises specifically related to their ability to enhance TxDOT's role in the AMBER Alert process.

In terms of overall capabilities, the researchers found the Emergin Wireless Office software to possess fairly sophisticated options, with the capability of instantly transmitting text and voice notification messages through a variety of communications media. The program can send text messages to cellular phones, pagers, two-way pagers, BlackBerries®, and e-mailboxes. The same text messages can also be converted to a computerized voice and transmitted to cellular and landline phones using a feature called "text-to-speech." Other Emergin software features permit the transmission of instant message alerts via local area networks (intranets) and alert recipients to check a Web site where emergency notification messages can be posted (*7*). Emergin's ability to transmit messages to multiple communications media increases the likelihood of successfully notifying the recipient—regardless of location and moment in time—by simply bombarding them with messages. Other relevant Emergin capabilities include creating and grouping contact lists, maintaining a tracking log of messages sent and problems encountered, and providing various security elements.

The cost of Emergin Wireless Office software is modest when compared to other systems, although the cost of a single-user one-year license depends on the maximum number of

recipients. For example, a single-user one-year license for 25 recipients costs $1,500, increasing to $4,500 for 250 recipients, $6,500 for 500 recipients, and $15,000 for 100,000 users (*7*). For subsequent years, the software-user license can be renewed on a yearly basis to maintain technical support and upgrades, although the program will continue to function after the one-year period expires. Emergin's text-to-speech voice messaging option costs an additional $5,000, which activates the text-to-speech option using an external voice modem with one phone-line port. Additional phone-line ports can be added to a maximum of 96 at an additional cost of $1,500 per port (*7*).

InfoRad Wireless Pro is a notification program that is limited to sending alphanumeric text messages and is capable of sending them to cellular phones, pagers, two-way pagers, BlackBerries®, and as e-mail messages (*8*). InfoRad does not have the capability of transmitting text-to-speech voice messages, sending instant message alerts via local area networks, or posting Web page notification alerts. It also has fewer functions than Emergin, specifically in terms of security features and ability to manage group contact information. However, InfoRad's most attractive feature is its inexpensive price. While there are different versions of the program available, InfoRad's Wireless Pro software provides the basic functions necessary for wireless text message transmission and is available for the price of $80.

Practicalities of Using Emergency Notification Software Programs

While no communication system is completely flawless, the testing of the two notification programs revealed several issues: 1) some recipients had difficulty understanding text-to-speech messages; 2) the software could not consistently deliver audio messages to voicemail systems; 3) the transmission of lengthy text messages via Simple Mail Transfer Protocol (SMTP) fragmented the messages and sent them in no particular order; and 4) configuring the software can be difficult.

Although TxDOT personnel had requested the ability to receive messages by telephone while away from the office, its staff had difficulties understanding Emergin's text-to-speech voice generator. Adjusting the speed of the voice generator improved the listener's comprehension, but the messages were still considered too "mechanical." Additionally, it was discovered that the voice generator's understanding of the text message did not necessarily coincide with its intended meaning. More specifically, the text-to-voice feature must transmit messages with numbers and letters, which describe a suspect's license plate number and the phone number of the TxDOT employee coordinating the AMBER Alert. However, the Emergin software was unable to interpret license plate numbers, DMS abbreviations, or phone numbers. In the case of phone numbers, the software relays them as a single numeral (e.g., reads 5127732118 as five billion, one hundred and twelve million, etc.). To correct this problem, each number or letter of a license plate or phone number must be written as a separate word, which requires additional time and a second message. Further, the modified message is still transmitted without sufficient pauses and is difficult to understand.

One method that the researchers explored for getting around this problem was to use a third software program that could dial phone numbers and play a prerecorded audio file in a WAV format. However, this program was rarely capable of leaving complete messages on voicemail systems, a problem frequently experienced by the text-to-speech generator in the Emergin program. One explanation for why this occurs is that voicemail options vary between providers, and the silence time (the time required to play the voicemail's introduction and instructions) causes the software to begin playing the message early or to disconnect the call.

Because voicemail options vary between carriers, it is all but impossible to specify appropriate, all-encompassing software settings. One attempted solution was to set the program settings to repeat the message three times, which enabled the recording of at least one full message on some voicemail systems, but this fix did not work with all providers. A more advanced notification system might be able to address this problem, but lower-cost software programs do not appear to have the capacity to handle it.

The third problem encountered with both programs was their inability to transmit a single, complete text message to cellular phones. When a text message over 100 characters in length is sent to cellular phones via SMTP protocol, the message is broken into several fragments. This is not necessarily a problem, but the SMTP protocol does not always deliver the messages in the proper order. For instance, a message divided into three fragments should be received in the proper and logical order (i.e., 1-2-3), but during the testing stage, it often arrived in a completely different order (e.g., 1-3-2). This is a problem associated with the way SMTP functions and is not a limitation of the software programs. The problem can be avoided by limiting the original message length to fewer than three fragments (200 characters maximum) or by using SNPP or TAP to transmit messages, although some cellular phone carriers do not provide SNPP or TAP transmission capabilities. The InfoRad program does stamp the order of the messages (e.g., 1 of 3) so that if they are not delivered in the proper order, the recipient is able to piece them together. The Emergin software does not offer this capability.

Purchasing technical support for any notification software is recommended because the user manuals can be difficult to understand and may not address certain problems. In fact, unless the software installer and administrator have a working knowledge and experience with Internet communications technology and network configurations, they may encounter difficulty with the complex nuances of operating the software, which can be frustrating and time consuming.

As the researchers and TxDOT compared the two software programs using the evaluation criteria found in Table 1, it became apparent that the text-to-voice option was the primary feature that distinguished InfoRad from the Emergin software. Considering that Emergin's Wireless Office costs a total of $6,875 for the baseline software with 25 recipients, technical support, and text-to-voice capability, compared to InfoRad Wireless Pro's total cost of $98 for unlimited recipients and technical support, TxDOT and the researchers concluded that InfoRad Wireless Pro was the most cost-effective and efficient solution. Furthermore, because TxDOT possesses licensing rights to InfoRad Wireless Pro in their Austin district, it is already incorporated into the agency's information technology architecture.

Table 1: Evaluation Matrix of InfoRad Wireless Pro and Emergin Wireless Office Notification Programs

	Evaluation Matrix	
Emergency Notification Software Criteria	**InfoRad Wireless Pro**	**Emergin Wireless Office**
Instant text messaging to recipients via multiple common communication media (i.e., pager, cell phone, email)	Yes—can specify only 1 device per recipient (no device sequencing), but can specify same recipient again with different device	Yes, can specify 10 devices for each recipient with device sequencing
Web-based and instant messaging capabilities	No	Yes
The ability to group database contacts	Yes	Yes
Track and log message transmission information	Yes	Yes
Text-to-voice messaging	No	Yes
Leave text-to-voice messages on voicemail	N/A	Yes, but inconsistently
Additional communication device hardware required of recipients?	No	No
Software security features	No	Yes
Scalable to existing network systems	Yes, very easy configuration with few features	Yes, complex configuration with more features
Notification Software Baseline Version		
Inexpensive software cost	$80	$1,500
Technical support/year	$18	$375
Message recipients	Unlimited	25
Voice messaging price	N/A	$5,000, which includes voice modem with one phone line port; for additional ports the cost increases

Notification Message Protocol

Although limiting the AMBER Alert notifications to text messages greatly diminishes the opportunities for misinterpretation, it does not eliminate them. A misunderstood symbol or instruction could result in an inaccurate message being posted to a DMS and, subsequently, missed opportunities to recover a missing child. To counter this possibility, the researchers developed a standardized protocol for AMBER Alert text notifications so that the DMS postings could be quickly and accurately composed and transmitted between TxDOT personnel using the InfoRad Wireless Pro software. The message protocol was developed to include both phases of the DMS, which allow for a total of six message lines. The notification message protocol uses a specific syntax to distinguish between the personnel contact information, the message lines, the DMS phases, and the end of the transmission. The protocol is as follows:

1. The message begins with the first initial and full last name of the TxDOT official who is sending the message. The recipient must contact the TxDOT official who sent the message to verify that the message has been posted on the DMS.

2. Insert one space, type the ten-digit phone number of the official without hyphens, insert one space and type *AMBER ALERT PHASE 1*. This signifies that the following message lines are to be displayed on phase 1 of the DMS.
3. To separate and distinguish the three message lines in each DMS phase, the protocol requires inserting one space, typing a double backslash (\\ ), and inserting another space between message lines. At this point the message should appear as: J. Doe 1112223333 AMBER ALERT PHASE 1 \\ (insert message for phase 1 line 1) \\ (insert message for phase 1 line 2) \\ (insert message for phase 1 line 3) \\.
4. To signify the message lines to post on phase 2 of the DMS, type *AMBER ALERT PHASE 2* after the last phase 1 double backslash and continue with the same protocol used in phase 1 to separate DMS message lines.
5. After the final message line of phase two, insert one space, a double backslash, and type *end*. This signifies the termination of the AMBER Alert notification message. The second half of the message protocol should appear as: AMBER ALERT PHASE 2 \\ (insert message for phase 2 line 1) \\ (insert message for phase 2 line 2) \\ (insert message for phase 2 line 3) \\ end.

The following text shows the message lines from an actual AMBER Alert posted on DMSs in the Dallas area, utilizing the protocol for message composition described above:

J. Doe 111222333 AMBER ALERT PHASE 1 \\ Kidnapped Child \\ Dallas TX \\ Call Police \\ AMBER ALERT PHASE 2 \\ Kidnapped Child \\ White Chevy P/U \\ Lic TX 2JV L61 \\end

As an example, the phase 2 message would be interpreted and displayed by the district personnel as shown in the Figure 2 photo of a Dallas-area DMS.

Figure 2: AMBER Alert Message Posted on a Dynamic Message Sign in Dallas TX

Conclusions and Further Recommendations

Integrating emergency notification software into TxDOT's AMBER Alert activities presents opportunities to decrease notification time to district personnel. However, given the gravity of the mission, the application of notification software should be introduced slowly and parallel to a continued human participation, so that technical difficulties in the system can be observed and corrected without jeopardizing public safety. Based on the researchers' experience, text messages appear to create the fewest opportunities for the misinterpretation during transmission. However, establishing a standardized protocol for composing and interpreting the text-based AMBER Alert messages is an absolutely essential step to ensuring accurate comprehension. TxDOT should also anticipate some technical difficulties when configuring and operating the software, but these problems can typically be resolved by rigorous testing and vendor technical support. In addition to its use with the AMBER alert system, feedback from district personnel suggests that there could also be benefits to using emergency notification software during other extraordinary events, such as hazardous cargo spills, train derailments, major traffic accidents, weather phenomena, natural disasters, and terrorist attacks. TxDOT leadership should consider these opportunities as it works towards improving public safety on Texas roadways.

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(5) Office of the Governor. *Texas AMBER Alert Network.* 7-8 September 2002.

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(7) InfoRad Wireless Pro Demo Version 9.6.4. www.inforad.com. Accessed 21 July 2004.

Appendix A: Quick Start Tutorial Guide

This appendix is intended as a quick reference to install, configure, and operate the InfoRad Wireless Pro software. More detailed information is available by clicking *Help* on the program's task bar, by accessing the InfoRad Web site at http://www.inforad.com/techsupport.html, or by calling InfoRad at 216-531-1369 (reference the InfoRad Web site for technical support service hours).

Installation of InfoRad Wireless Pro Software

1. **Installing the InfoRad Wireless Pro software.** The InfoRad software can be installed by either downloading it from the Internet or from a CD-ROM. If the user is downloading the software package from the Internet, open the following Web site in an Internet browser and follow the onscreen directions: http://www.inforad.com/iwpro.html. Please note that if you choose to download a licensed copy of the software, you will be required to purchase it using a credit card before you will be allowed to proceed to the download. If the software is being installed from a CD-ROM, place the disk into the CD-ROM drive. The installation software may not start automatically, in which case, click on the *Windows Start* button at the bottom of the screen. Go to *Run* and then press the *Browse* button. Select the appropriate drive for the CD-ROM. After it displays the contents of the drive, click once on the *IW_PRO_v964* icon, then *Open*, and then press *OK* (the exact name of the icon may change, depending on the version being used, but it should be distinguishable). After pressing *OK*, the software installation will begin. Note that if you are installing the software from a CD-ROM, you will likely need the seven-digit serial code from your online order to proceed with the installation. Follow the onscreen instructions to install Wireless Pro.
2. **Getting ready to configuring the software.** After installing Wireless Pro, a dialog box will appear to help you configure the software for a dial-up modem, Local Area Network (LAN), or DSL Internet connection. If you will be using a dial-up modem on your computer, go to Step 1 in the next section to configure Wireless Pro. If you will be using a LAN or a DSL account, then skip to Step 2.

Setup and Configuration of InfoRad Wireless Pro

1. **Establishing a dial-up modem connection.** From the main InfoRad software interface toolbar click *Setup*, then *Communications*. You will see the dialog box shown in Figure A.1. Select the modem shown (typically there is only one, unless your computer has two modems). If no modem is shown, make sure your computer has a modem, as some do not. If your computer does have a modem, but one is not shown in the dialog box, contact TxDOT IT or InfoRad technical support. Also on this dialog box, it is recommended that users select *Use the system's modem configuration*, unless they have a specific reason for doing otherwise. During the testing stage, the *Flow Control* setting *RTS/CTS (hardware) flow control* was selected.

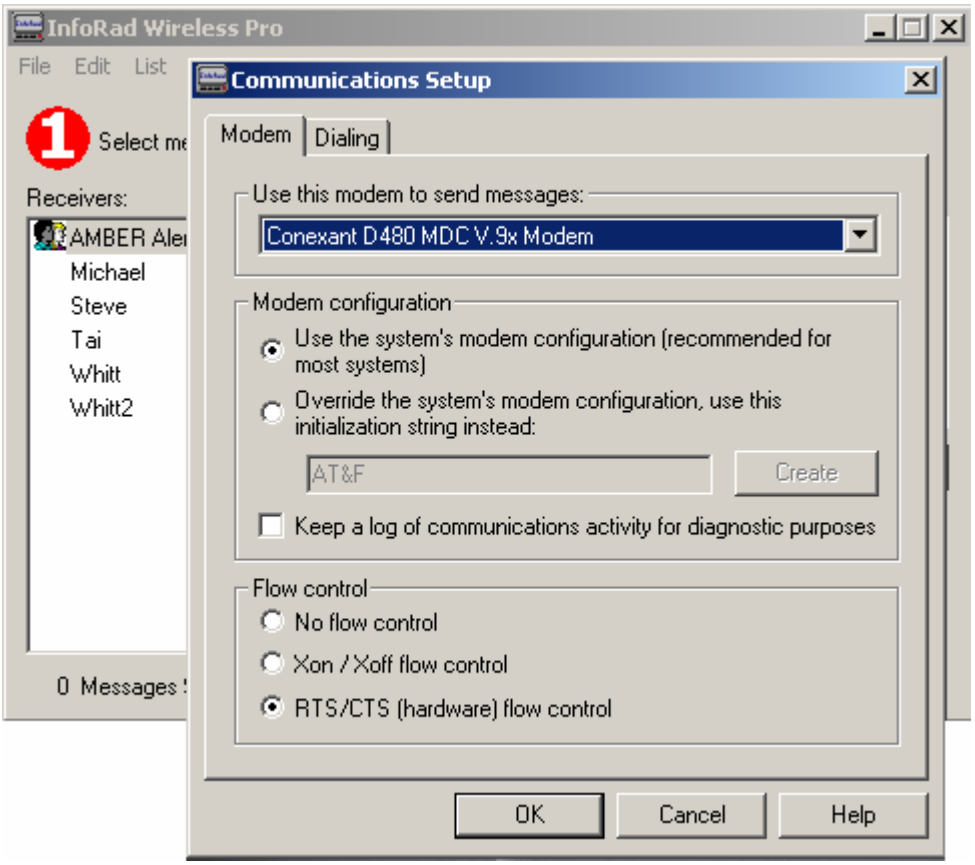

Figure A.1: Establishing the Modem Setup

Your modem's dialing properties must be configured to your Internet Service Provider (ISP). To configure Wireless Pro, press the *Dialing* tab and then press the *Dialing Properties* button. This will open a new dialog box called *Phone and Modem Options*. Under the *Dialing Rules* tab, press the *New* button, which will open the *New Location* dialog box shown in Figure A.2. Enter a name for the ISP and the area code of the dial-up number. If the user is calling from a phone system that requires dialing a number to make an outside call, then this number must be placed in the *To access an outside line* box and followed by a comma. For example, if the user must dial a "9" before making a local call from their location, then they should enter *9* in the box. Failure to include the comma will increase the chance that the computer will begin dialing before an outside line is accessed, and the call will not go through. The comma signals the modem to pause, before attempting to place the call. If you will be making a long-distance call, you may also need to provide other relevant codes, which will be specific to your location. Click the *Disable Call Waiting* box, if you will be calling from a line that has the call waiting feature. This will prevent interruptions from other incoming calls that could prematurely disconnect you from your ISP. After clicking this box, you must also enter the code that your local telephone provider requires to disable the call waiting feature. This information is usually located in your local phone book, or you can call the local telephone provider's customer service. Finally, unless you know that the telephone line

you will be using has pulse service, leave the setting on *Tone*. When you have finished, click *OK* three times. Refer to the InfoRad help resources or TxDOT IT if you need additional assistance setting up your modem connections.

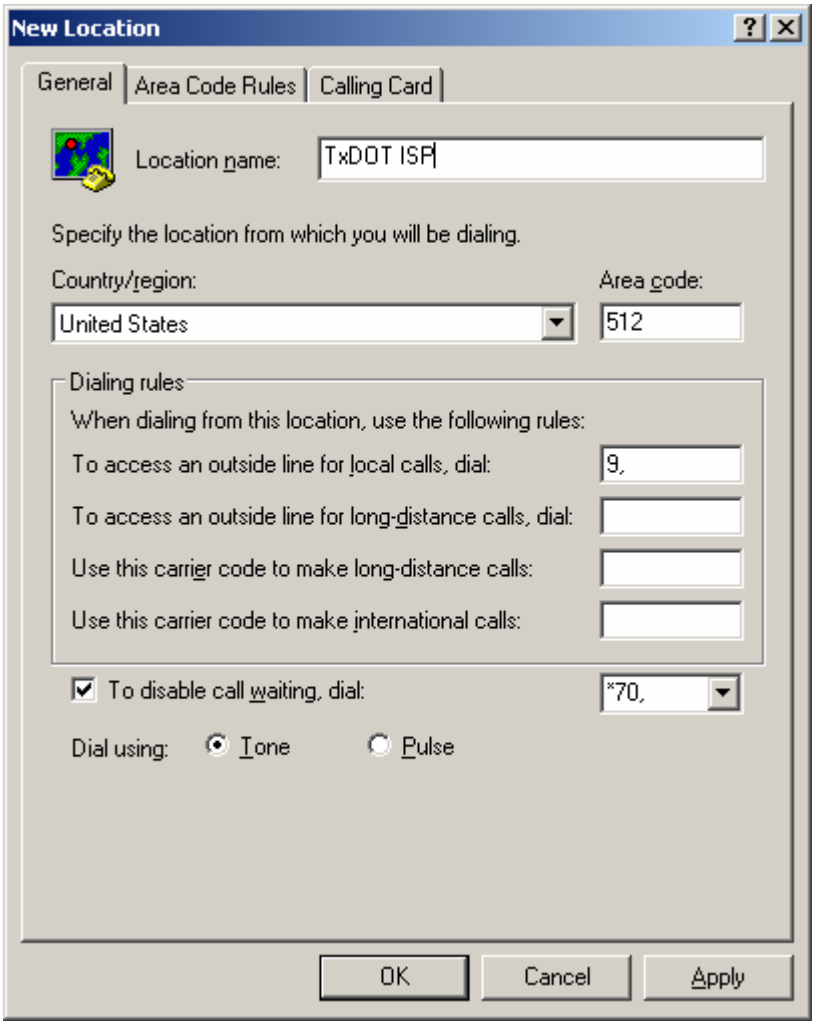

Figure A.2: Setting Up the Modem Properties

2. **Configuring the Internet connection.** From the main software interface toolbar click *Setup*, then *Internet Settings* (see Figure A.3). Choose the method by which you will be accessing the Internet. If you are using a computer that is connected to a LAN (i.e., the network in your TxDOT office) then click on the *LAN* box. If your computer is not at TxDOT and you are using a dial-up connection, then click on the *Dial-Up* box. If you click the *Dial-Up* box, you will need to specify the dial-up connection you will be calling. If there is not a connection listed in the box, go to *Start Windows*, then *Settings*, and then *Control Panel*. Double click on the *Phone and Modem Options* or the *Network and Dial-up Connections* icon. Double click on the *Make New Connection* icon and follow the directions of the *Network Connection Wizard*. If you have difficulty setting up

the dialing properties for your Internet connection, or if these directions do not look familiar, contact TxDOT IT.

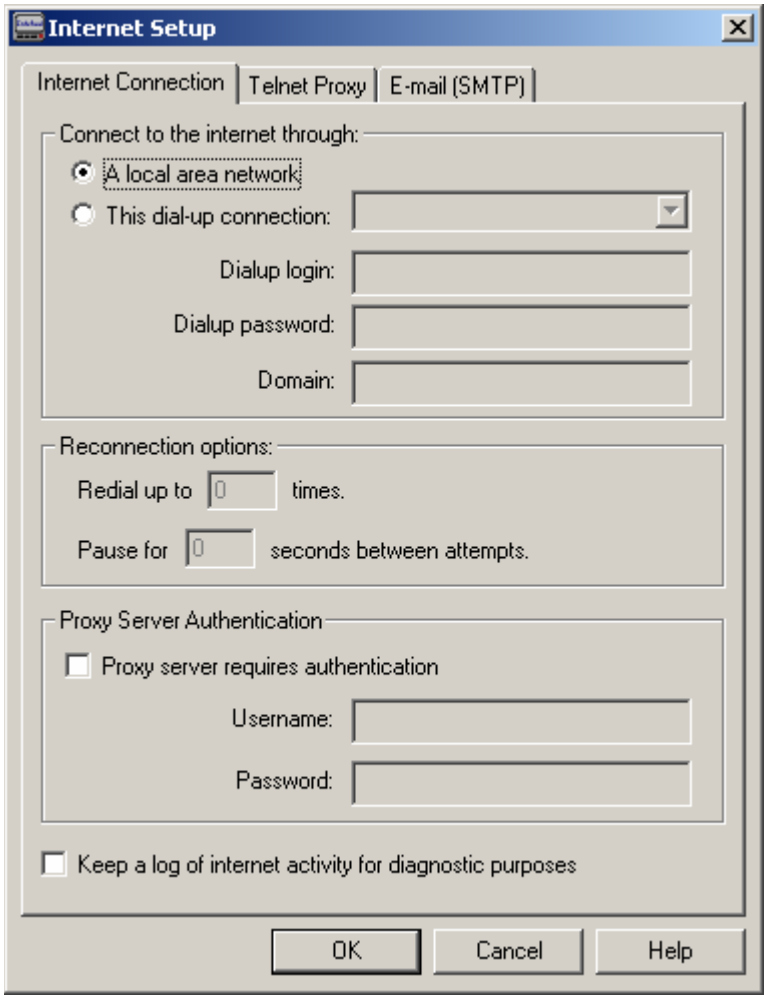

Figure A.3: Configuring the Internet Connection

Finally, click on the *E-mail (SMTP)* tab and enter your e-mail address in the appropriate box, then click *OK* (see Figure A.4). If you later find that your computer is unable to access your ISP or you are unable to successfully send a message because of a communications problem, consult InfoRad's online *Help* information. If you are still unable to resolve the problem, contact TxDOT IT personnel to ensure that the correct Internet settings have been established.

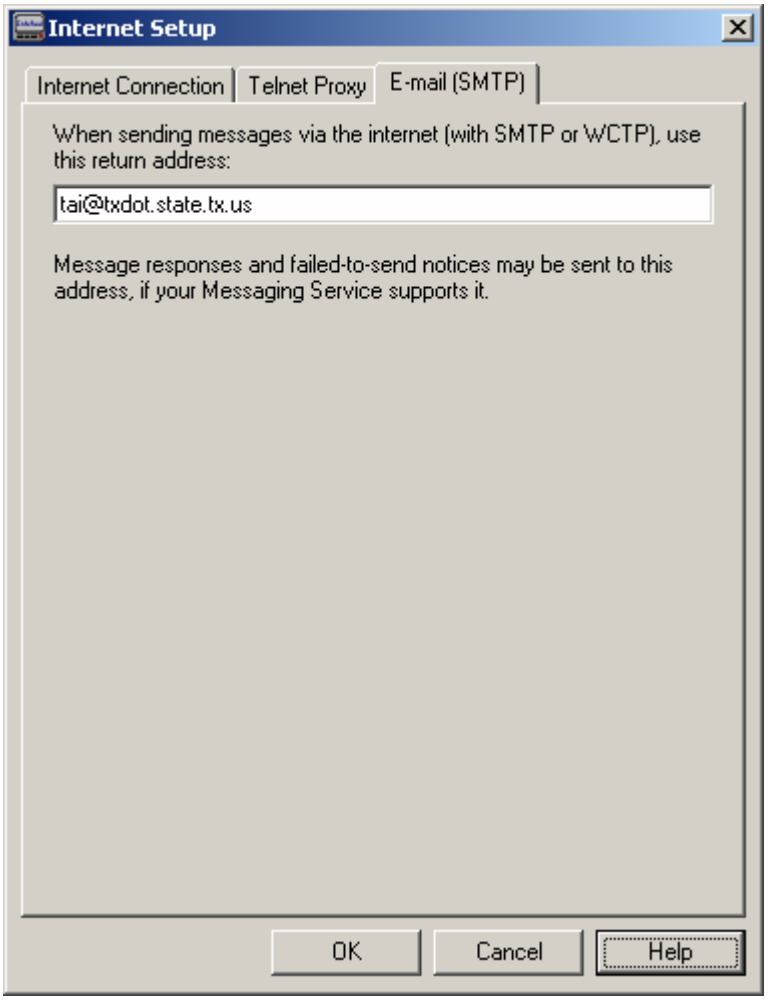

Figure A.4: Entering the Return E-mail Address

3. **Establishing software preferences.** From the main software interface toolbar click *Setup* and *Preferences* (see Figure A.5). A signature can be entered into the *Message Signature* box that will automatically appear at the end of each transmitted message, if you so desire. If you click on the *Password* box, a log-on password can be entered for security control measures. It is recommended that all boxes be checked in the *General* section of the *Preferences* dialog box. One of these important features enables all lengthy messages to be split into multiple message fragments. This is a necessary function, due to the inability of cellular phones to receive messages over a certain length as one complete message fragment. Also, select all options in the box titled *Failed Message Retries*. It is recommended that users retry all failed message attempts no less than three times. Click *OK* when you have finished selecting your preferences.

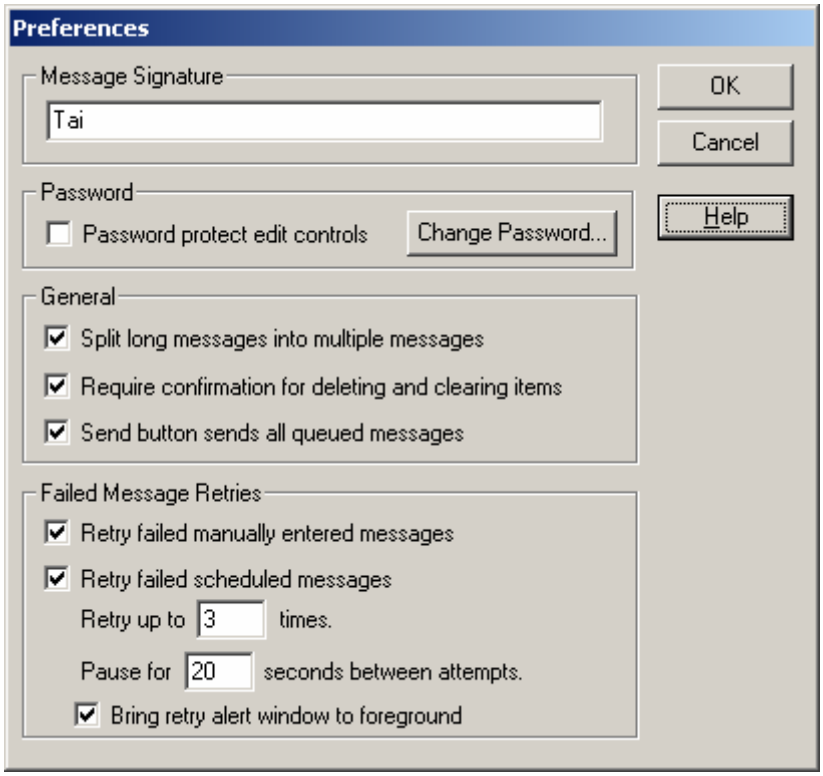

Figure A.5: Establishing User Preferences

Designating Recipients, Groups, and Carriers

1a. **Adding a recipient.** From the main software interface toolbar click *Edit*, *Receivers*, and, within the *Listing of Receivers* dialog box, select *New* (see Figure A.6). Type the name of the recipient in the box titled *Name of person carrying this receiver*. In the boxes below, called *Receiver's ID number or E-mail address*, enter the ten-digit phone number of the recipient, if it is a pager or cellular phone number. Immediately following the ten-digit phone number type @ followed with the SMTP (or SNPP) address of the receiver's carrier, which varies depending upon the cellular phone carrier. Protocol addresses can change, but a list of current (August 2004) protocol addresses for popular carriers is located in Table A.1. Because the protocol addresses are subject to change, it is critical that TxDOT maintain an updated database of them. To transmit a message to a receiver's e-mail address, simply enter the complete e-mail address of the recipient in the box labeled *Receiver's ID number or E-mail address*.

Table A.1: Protocol Addresses for Major Cellular Phone and Pager Service Providers

Carrier	SMTP Address	SNPP Address	TAP Address
Arch	--	--	18009464644
AT&T Wireless	mobile.att.net	--	--
Cingular Wireless (Blackberry)	bellsouthips.com	--	--
Cingular Wireless SMS	mobile.mycingular.com	--	--
Metrocall	page.metrocall.com	snpp.metrocall.com	18002450004
Nextel	messaging.nextel.com	snpp.nextel.com	3177106683
Sprint PCS	messaging.sprintpcs.com	--	--
Verizon	vtext.com	--	18007934595

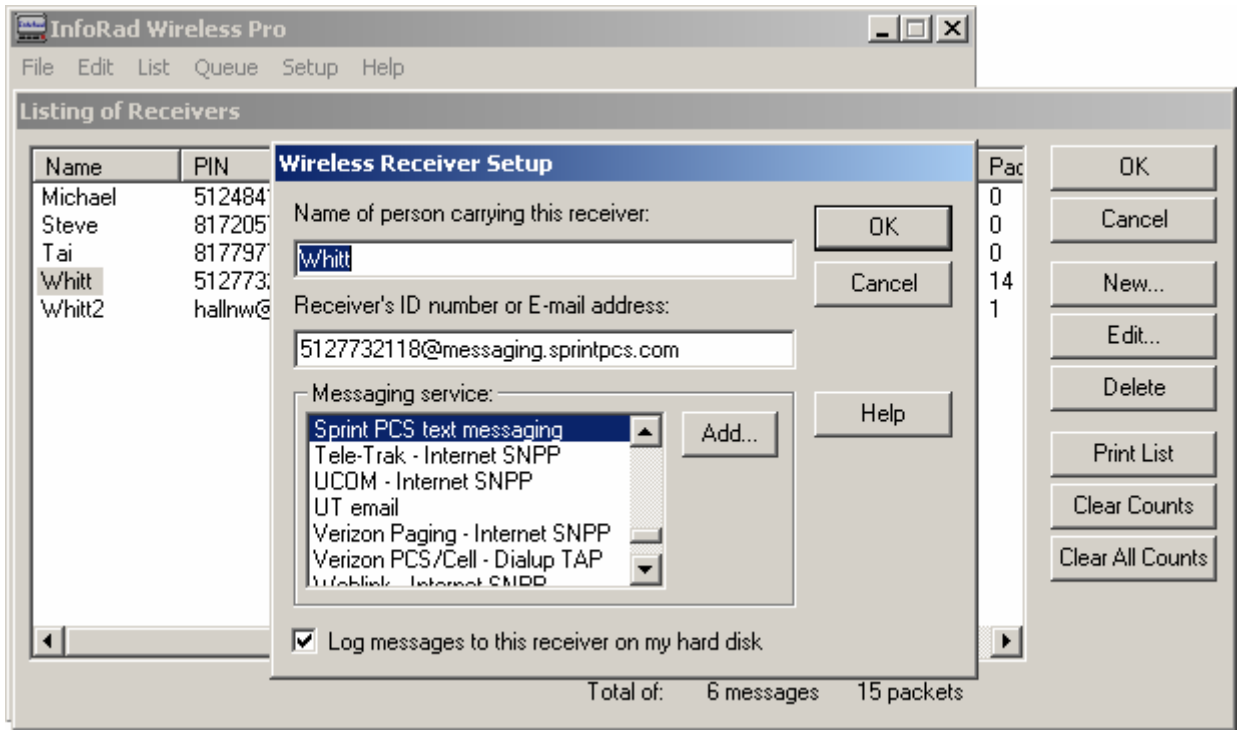

Figure A.6: Adding a Message Recipient

1b. **Specifying the message service**. In the box titled *Messaging service*, highlight the carrier and specific server protocol used to transmit the message and click the *OK* button. If the carrier or protocol for the carrier does not exist in this box, click the *Add* button, type the name of the carrier in the box titled *Name*, and select the proper transmission protocol in the box titled *Send messages via* (e.g., SMTP) (see Figure A.7). In the next box, the name of which will vary depending upon the protocol used, enter the address of the server used at the specific TxDOT location or dial-up phone number. This is your ISP's SMTP, SNPP, or TAP address. **It is strongly recommended that all receivers be configured using the SNPP protocol, since the SMTP protocol can experience message delivery delays.** After these steps are completed, click the *OK* button two times to return to the

main software interface. These instructions for adding new carriers remain the same whether you are using the SNPP, TAP, or SMTP protocol. Recipient information can be amended or deleted by clicking on the *Edit* or *Delete* buttons, respectively. If you want to contact a recipient on two or more devices (e.g., cell phone, pager, and work e-mail), you must create a new recipient (with a different name) for each device. After you have added all the appropriate receivers of an AMBER Alert message, click *OK* to return to the InfoRad Wireless Pro main software interface.

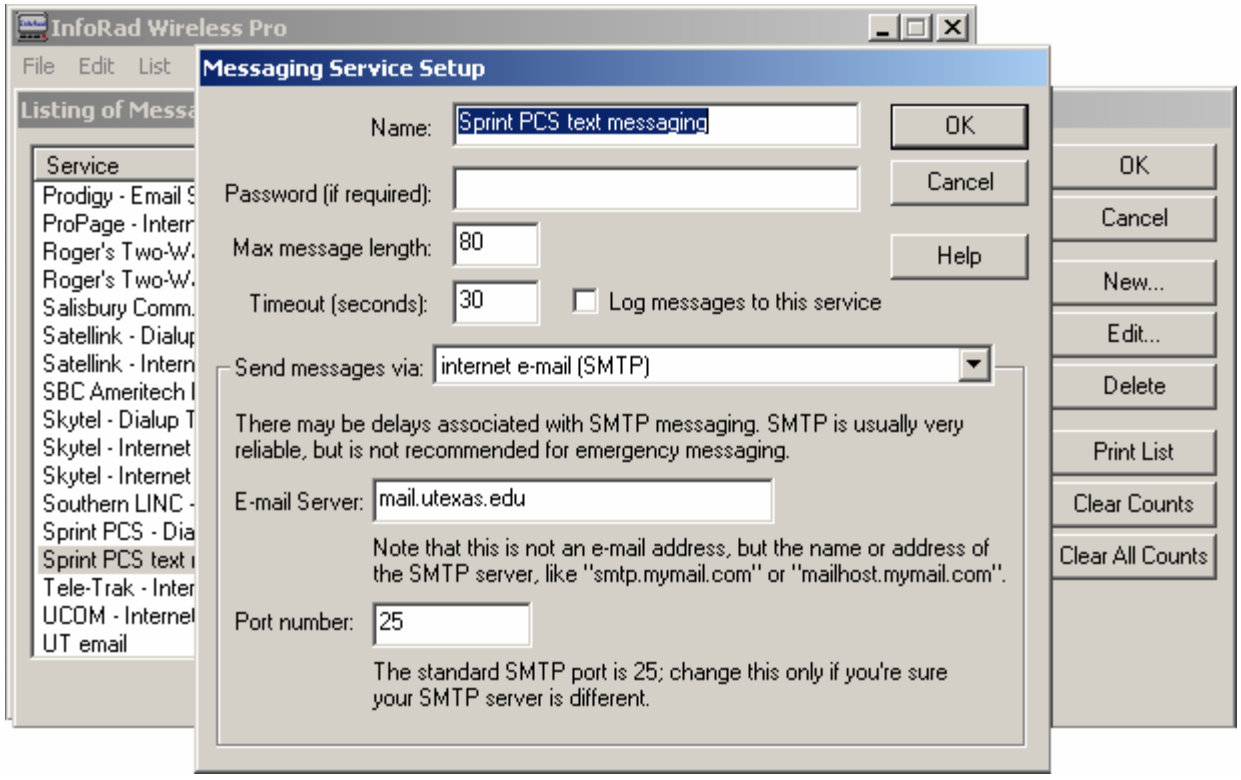

Figure A.7: Adding New Messaging Services

2. **Creating a recipient group.** The recipient group function allows the user to place a number of recipients into a single listing, which makes it easier to contact a large group of individuals. From the main software interface toolbar click *Edit*, *Groups*, and *New*. Type the name of the recipient group in the box titled *Group Name* (see Figure A.8). All of the possible receivers for this group will appear in the *Available Receivers* box. To select the receivers that you want to add to this group, highlight the name of the receiver and click the *Add* button on the bottom of the interface screen. The selected receivers will become a *Group member*. Receivers can also be deleted from the group by highlighting the receiver in the *Group members* box and clicking the *Remove* button. Once finished, click the *OK* button to save the group. The group information can later be altered or deleted by clicking the *Edit* or *Delete* buttons, respectively. Once you have finished, click *OK* twice to return to the main software interface.

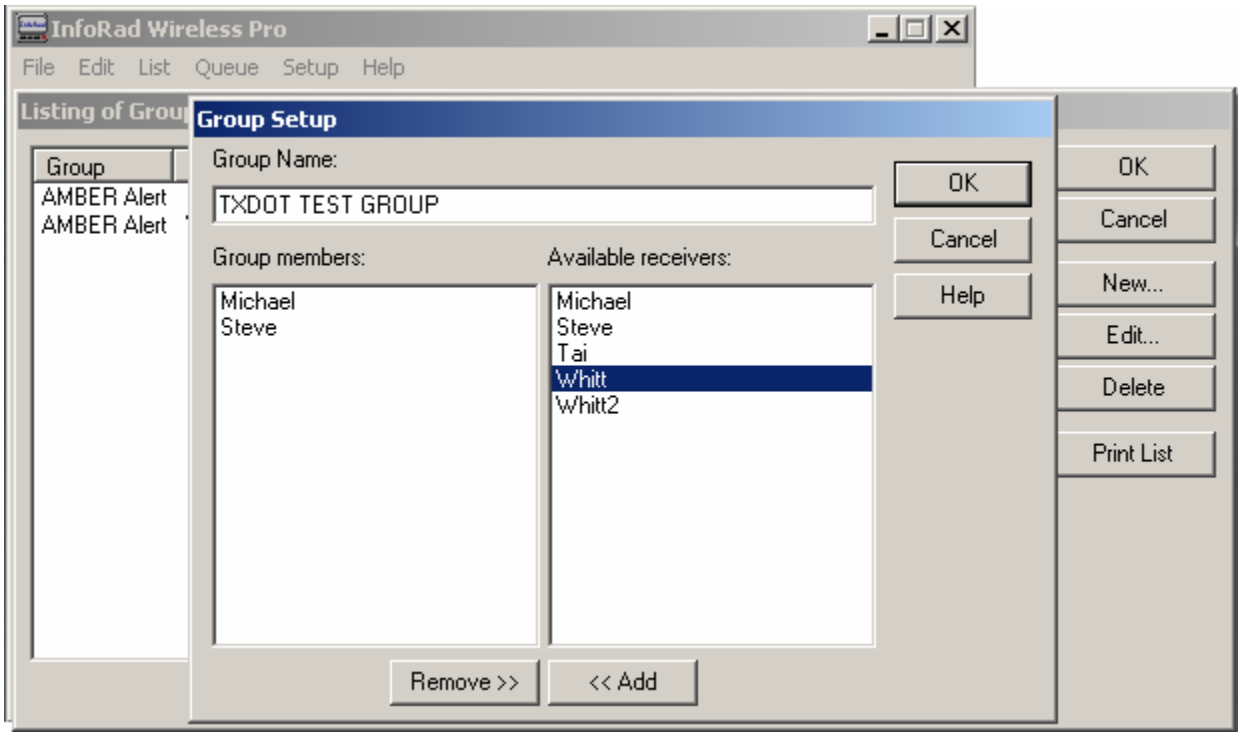

Figure A.8: Creating Recipient Groups

3. **To create a carrier and routing protocol.** From the main software interface toolbar click *Edit*, *Messaging Services*, and *New*. Enter the name of the carrier in the *Name* box and the protocol to be followed in the box labeled *Send messages via*. For the remainder of the process, refer to the procedures previously described in **Step 1b** in the section titled **Designating Recipients, Groups, and Carriers**. From this interface, existing carriers can also be edited or deleted. After adding the appropriate carriers, click *OK* to return to the InfoRad Wireless Pro main software interface.

Sending an AMBER Alert Message Using InfoRad Wireless Pro.

1. From the main software interface, highlight the pertinent receivers or groups in the box titled *Receivers* (under Step 1) (see Figure A.9). To send the message to more than one receiver or group, hold down the *Control (CTRL)* key on the computer keyboard while highlighting the desired receivers using a point-and-click-mouse.
2. Type the AMBER Alert notification message in the box under Step 2 labeled *Type message*. Remember that you **MUST** use the AMBER Alert message protocol described on pages 7 and 8 of this report.
3. After verifying the receivers and the message, click on the *Send* button located under Step 3 of the main interface.
4. Insure that all AMBER alert messages were sent properly by monitoring the software for error messages.
5. Manually contact any receivers who have not placed a return call within the allotted response time.

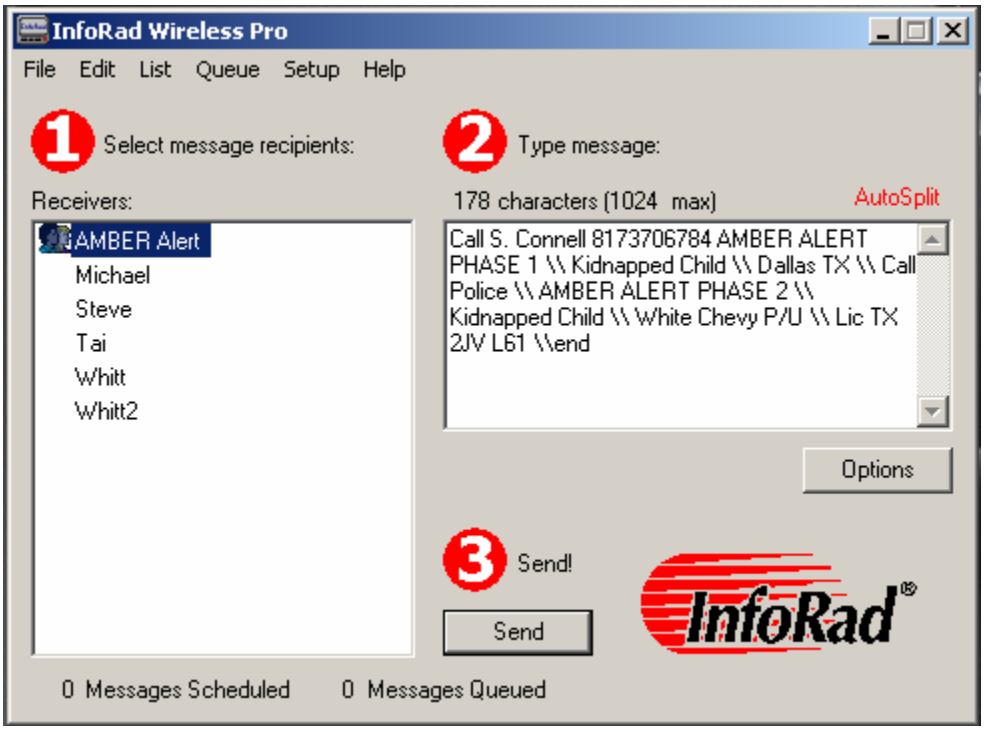

Figure A.9 Sending a TxDOT AMBER Alert Message Using InfoRad Wireless Pro