Geographically Targeted Messaging

SquareLoop Technology Overview

May 26, 2006

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SquareLoop Team

- **Thomas A. Stroup**, President
  - CEO of PCIA, Columbia Spectrum Management, P-Com Network Services, and GroupServe
  - Co-Founder CSM, NuRide, Capital Broadcasting Company
- **Rich Biby**, P.E., Technology
  - CTO Crown Castle International
  - Founder SiteSafe; Biby Engineering Services
- **Joe Walsh**, Business Development & Operations
  - Director of Investments VA Center for Innovative Technology;
  - VP Corporate Development Outbounder; Director Corporate Development kinkos.com

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SquareLoop In Action

First Responder Messages

Potentially heavy traffic on Route 66. Divert traffic to Route 29 where possible

Citizen Messages

Memorial bridge blocked, alternate route Routes 66 or 29

Memorial bridge blocked, alternate route 395

SquareLoop provides the ability to deliver different messages based on location and recipient

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SquareLoop Overview

- Approach originally developed for DoD
- SquareLoop's patents licensed from MITRE provide the only method for geographically targeted messaging that:
  - Maintains user location privacy
  - Delivers messages based on current or past locations
  - Does not require new infrastructure
  - Works on existing handsets
  - Can deliver rich-media messages such as ringtones, MP3's, video clips, etc.

This system incorporates elements of the Geographic Alerting Method that was developed by The MITRE Corporation, and which is covered by U.S. Patent Nos. 5,636,245 and 6,522,250

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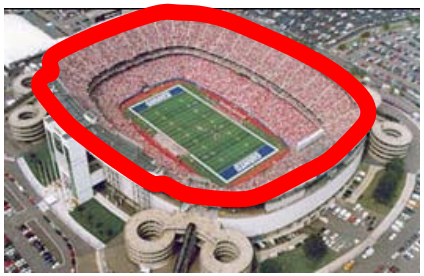
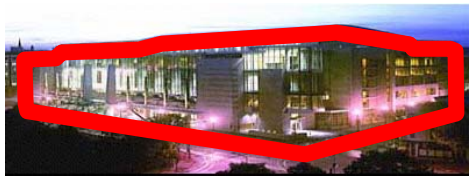
SquareLoop Overview (Continued)

- Subscriber configurable, opt-in model
- Can deliver messages where people are, and where they have been
- Can filter by velocity or direction of travel
- Messages can be sent to everyone:



in a stadium



at a convention

at a festival

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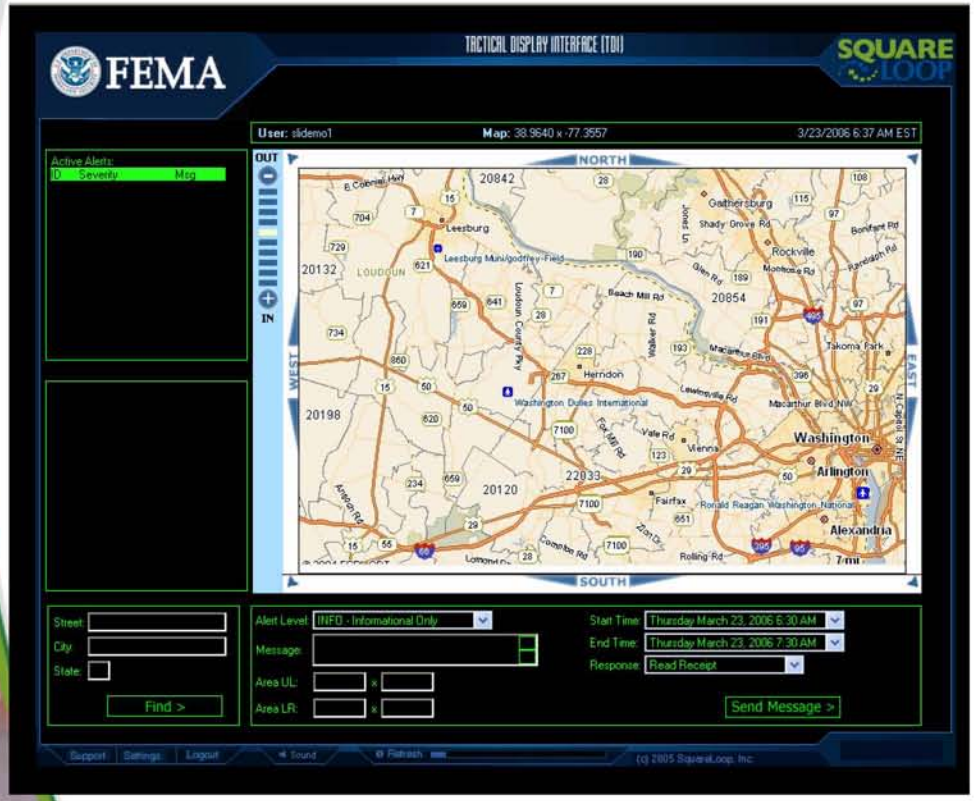
Launching Messages



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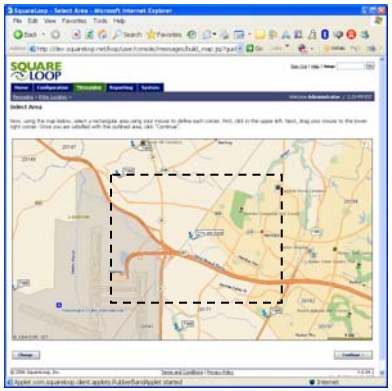
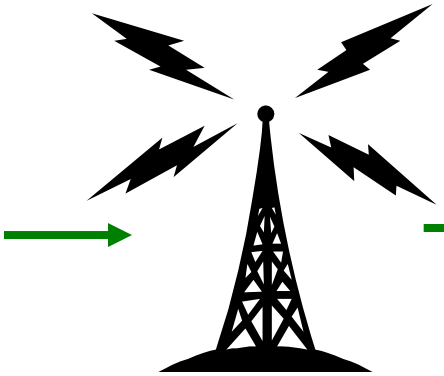
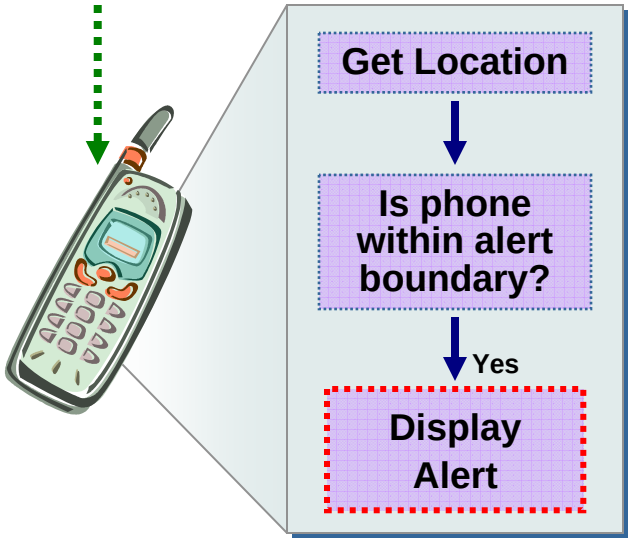
How It Works





Location via GPS, network, etc.



Web Interface

Wireless Carrier

Application On Phone

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Location

- Location determination
  - Derived from base station
    - Indicates if within area
    - Further refinement possible with assistance from carrier
  - GPS when available / necessary
  - Network based location can also be used
- Location history stored on phone to display messages based on past location

Location via
GPS or cell tower

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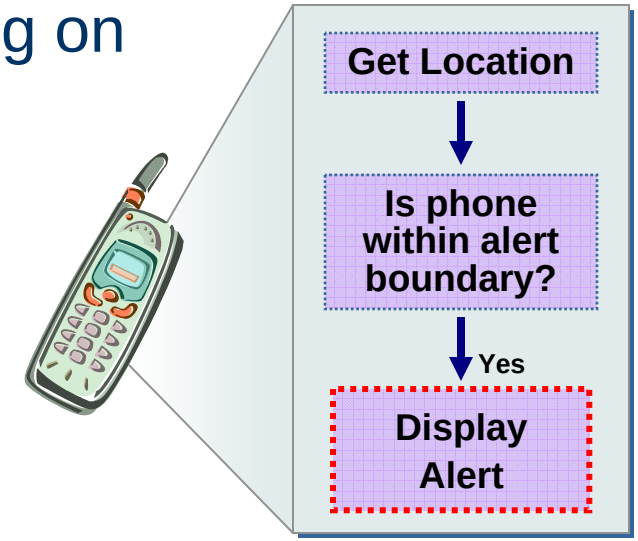
Application

- Developed in J2ME / BREW / Symbian / Windows Mobile / Palm, etc.
  - Potential for OS level integration for enhanced functionality
  - Runs in background
  - Can play special tones to differentiate from normal SMS / Voicemail messages
- Version 1 currently working on iDEN Motorola phones and Blackberries



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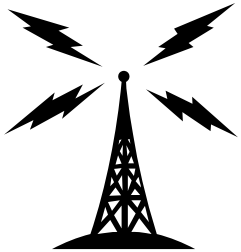
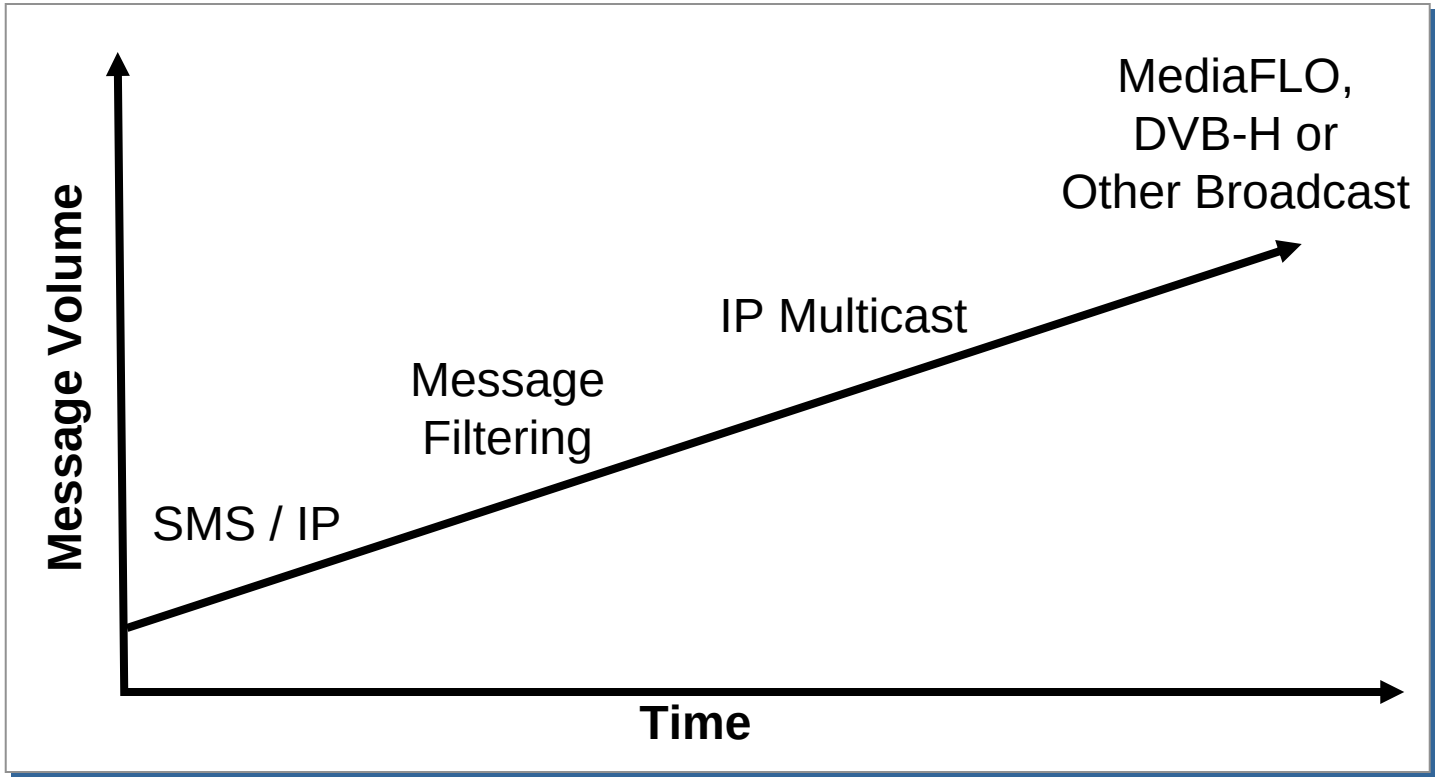
Message Transmission

- Either TCP / IP or SMS
- Initial message contains location and authentication
- Subscribers nearby download remainder of message via IP





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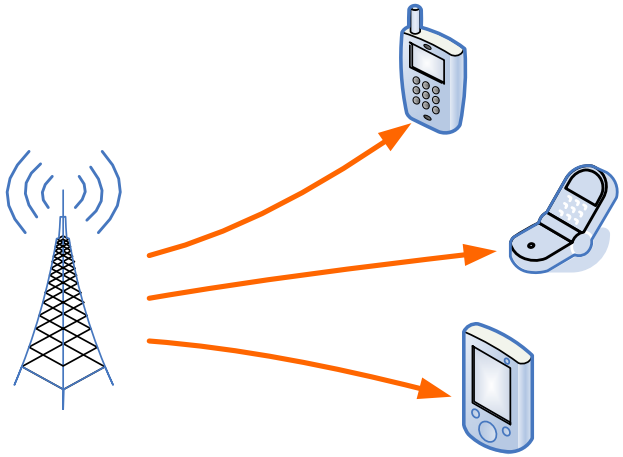
Application (Continued)

- Current Deployment
  - Over-The-Air (OTA) download
- Future Deployment
  - Pre-provisioned handsets



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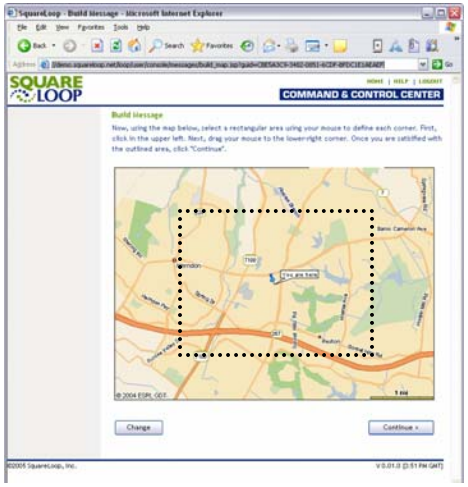
Easy Implementation

Method 1: Web Interface



Fast implementation, easy to use

Method 2: Integrate into existing CAD/incident management systems

Integrates with most systems via XML using Common Alerting Protocol (CAP)

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Benefits

✓	Network independent
✓	Fast deployment - no change to base station / towers or hardware changes to phones
✓	Cost effective
✓	Valid timeframe
✓	Historical messaging
✓	Response capabilities
✓	Rich media – alert tones, message size, message priority, graphics, etc.
✓	Built-in retry mechanism
✓	Selective message delivery based on subscriber profile
✓	No noticeable battery drain

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Enhanced AMBER Alerts

- Geographically targeted
  - Deliver localized messages to entice best response
  - Expand message delivery based on projected / expected travel
- Specialized alert tones
- Multi-media alerts possible

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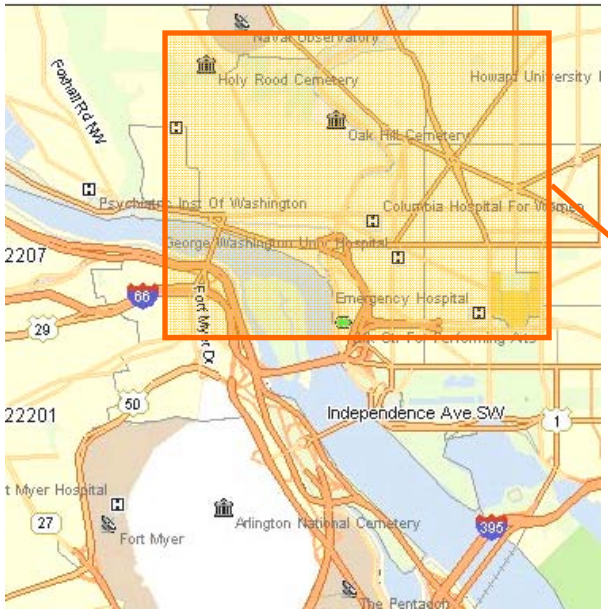
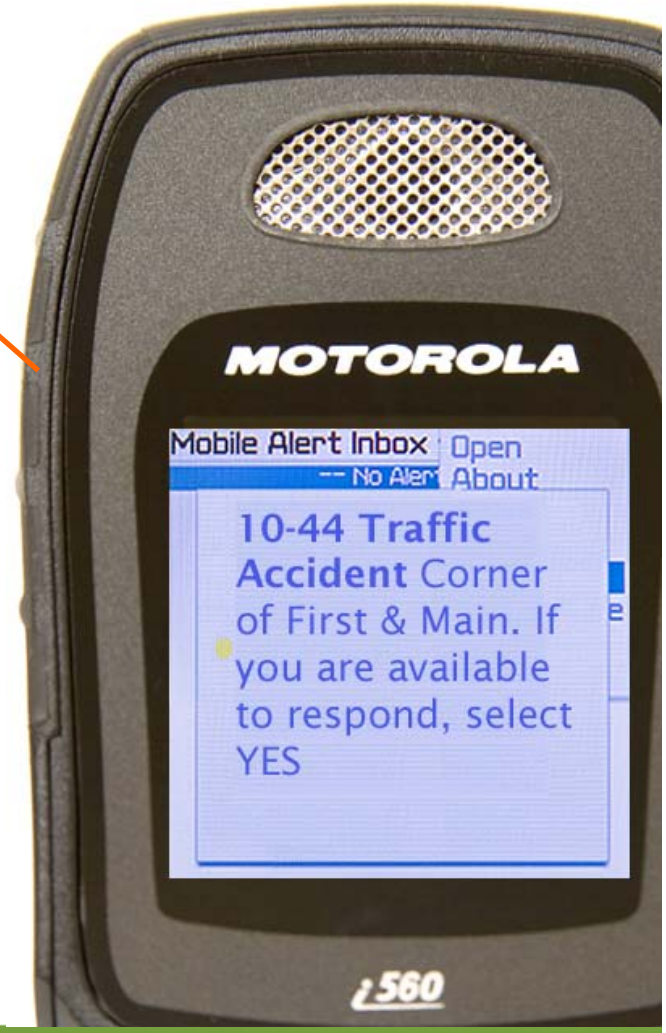
First Responder Dispatch / Recall





- Dispatch or recall officers based on location
- Responses can be YES / NO or Text

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Fugitive Alert In Action

- Geographically targeted
- Specialized alert tones
- Includes text, graphics and callback number

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Manassas Beta Trial

- Beta trial February – April 2006
  - Internal trial of 20 – 30 users
  - Test user interface and uses for system
- Using TCP/IP with public IP addresses for communication
- Combination of pre-defined and ad hoc messages
- On Motorola and RIM devices

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