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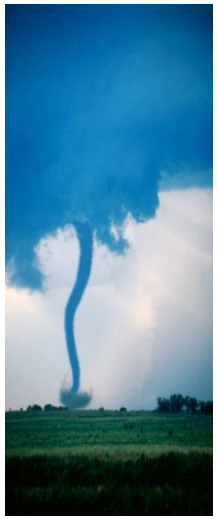
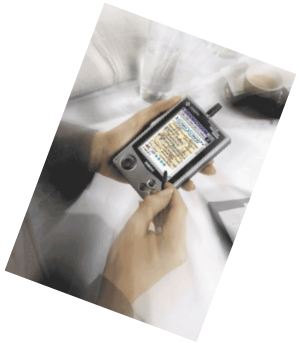
Wireless Emergency Communications:

Accessible Alerts for People with Disabilities





Helena Mitchell

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CACP

Why Wireless?

- Mobile wireless applications can increase independence and quality of life for people with disabilities.
- Applications that serve people with disabilities will also be attractive to the general population.
- Lower cost of new models of wireless devices is enabling diffusion to all users, including people with disabilities.
- **Federal Communications Commission 2005**
  - Amends rules to ensure that people with disabilities have access to public warnings.
  - Substantive filings push access to Emergency Alert System notifications

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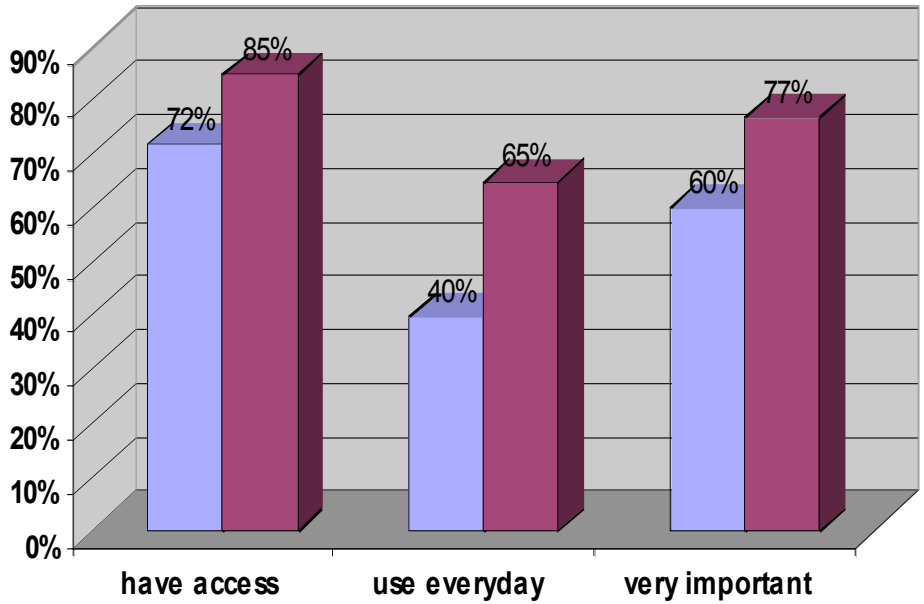
Wireless Use Among People with Disabilities

Survey of User Needs -- RERC Consumer Advisory Network

1200 plus people with disabilities



Between 2001-07:

- Access to wireless technology increased from **72% to 85%**
- Everyday use increased from **40% to 65%**
- Importance to individual increased from **60% to 77%**

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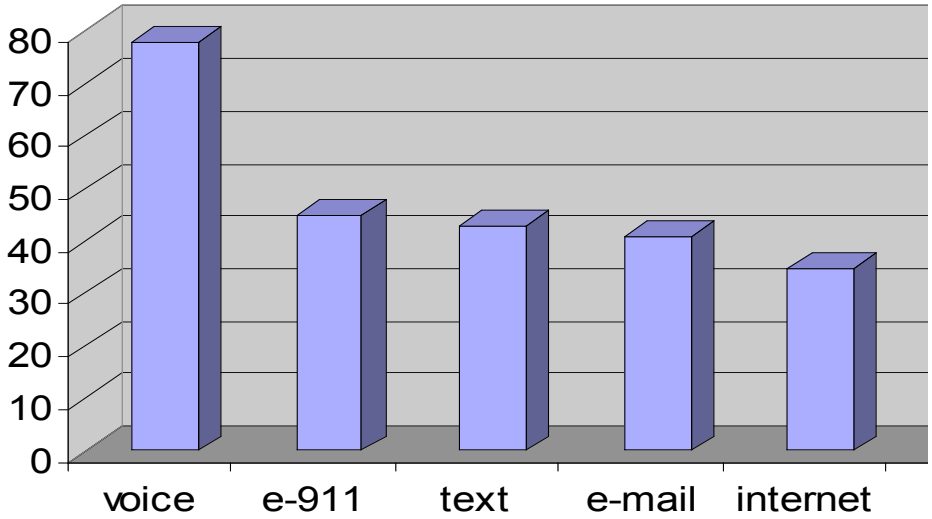
Wireless Produce Use

"84% use wireless products"



- **Most important features**
  - voice: 78%
  - e-911: 45%
  - text: 43%
  - email: 41%
  - Internet: 35%
- **70%** use everyday
- **24%** have difficulty

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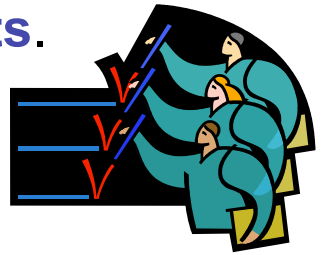
Wireless Emergency Communications Objectives

- Ensure critical, specific and accessible emergency alerts are reaching people with disabilities, utilizing the most optimal means and methods.
  - Examine technology approaches to transmit specific alerts and warnings to wireless devices.
  - Develop prototypes of promising technology approaches to deliver alerts in **accessible formats**.
  - Field test **working prototypes**.
  - Generate **recommendations to the FCC** on feasible approaches to ensure accessible alerts.



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Methodology

- Administer 4 field tests to examine accessibility and effectiveness of alerts to wireless devices.
  - Administer pre-test and post-test questionnaire to users.
  - Wrap-up with focus group session to discuss user experience during the test.
  - Tabulate quantitative and qualitative data for reports, presentations and filings before the FCC.
- Final field test 5 will be based on recommended refinements by users.

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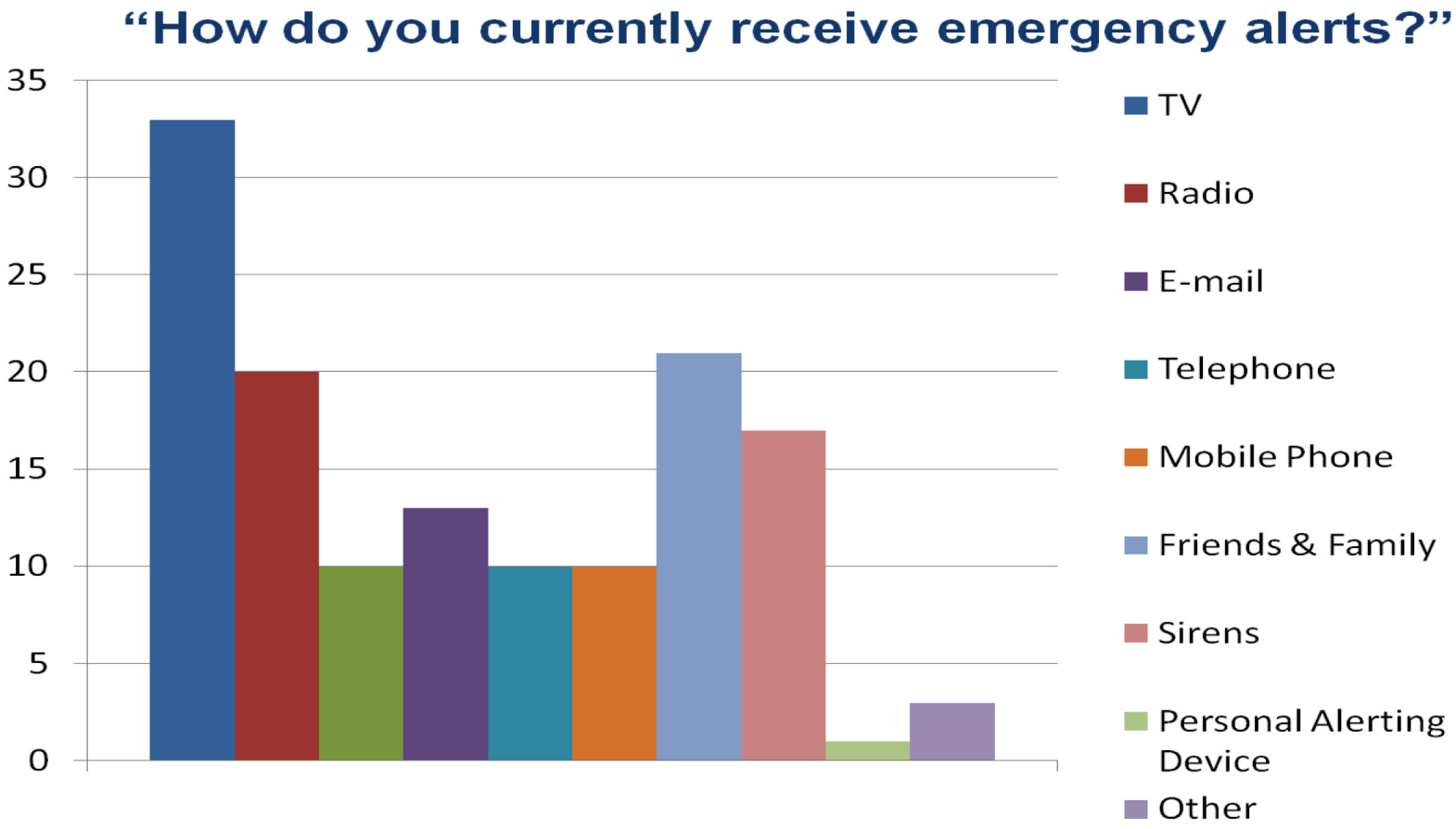
A Pre-test Question



Majority of participants receive emergency alerts through traditional media outlets and/or low tech systems

Field Test 1 & 2

- Field Test one:
  - 3 groups of blind/visually impaired users: technical savvy, mixed ability, infrequent users.
  - Supplied mobile phones with custom software featuring an audio-oriented interface and text-to-speech reading of emergency alerts for the visually impaired.
  - Series of 3 text messages (SMS) with increasing audio intensity sent to each device.
- Field Test two:
  - Replicated field test one: users were visually *and* hearing impaired.
  - Included, a vibrating cadence attention signal to differentiate incoming alerts from regular text messages for the Deaf and hard-of-hearing.

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Field Test One: Post test Findings

Post-field test revealed that **94%** of participants found the WEC emergency alert software an improvement.

Specific comments -- Pro:

- Very convenient way to receive alerts.
- Would be able to react to the alert quicker.
- I'm not always around TV, friends or family.
- Hard to get emergency information when you are blind and outside.

Specific comments – Constructive:

- Provide cues for blind or visually impaired to replay the message.
- Have the ability to speed-up or slow down the voice/message.
- Allow speech output to be adjustable by volume and/or pitch.
- Continued or "looped" alert message until phone is answered/alert receive.

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Field Test Two: Post test Findings

Post-field test revealed that **81%** of test participants found the WEC emergency alert software an improvement.

Specific comments -- Pro:

- Liked the "override" feature that interrupts current phone activity.
- This format [would] reach and protect more people with disabilities.
- I am alerted if I am not at home or in front of the TV.
- I live alone and this would be very helpful to me.

Specific comments – Constructive:

- Provide a prompt to repeat the message.
- Create an interface with a lamp or bed to awaken people who are Deaf/HoH while they are sleeping and/or signal service animals.
- Allow multiple zip code subscriptions through one account.
- Emergency message should be a blinking text message in a distinctive color.

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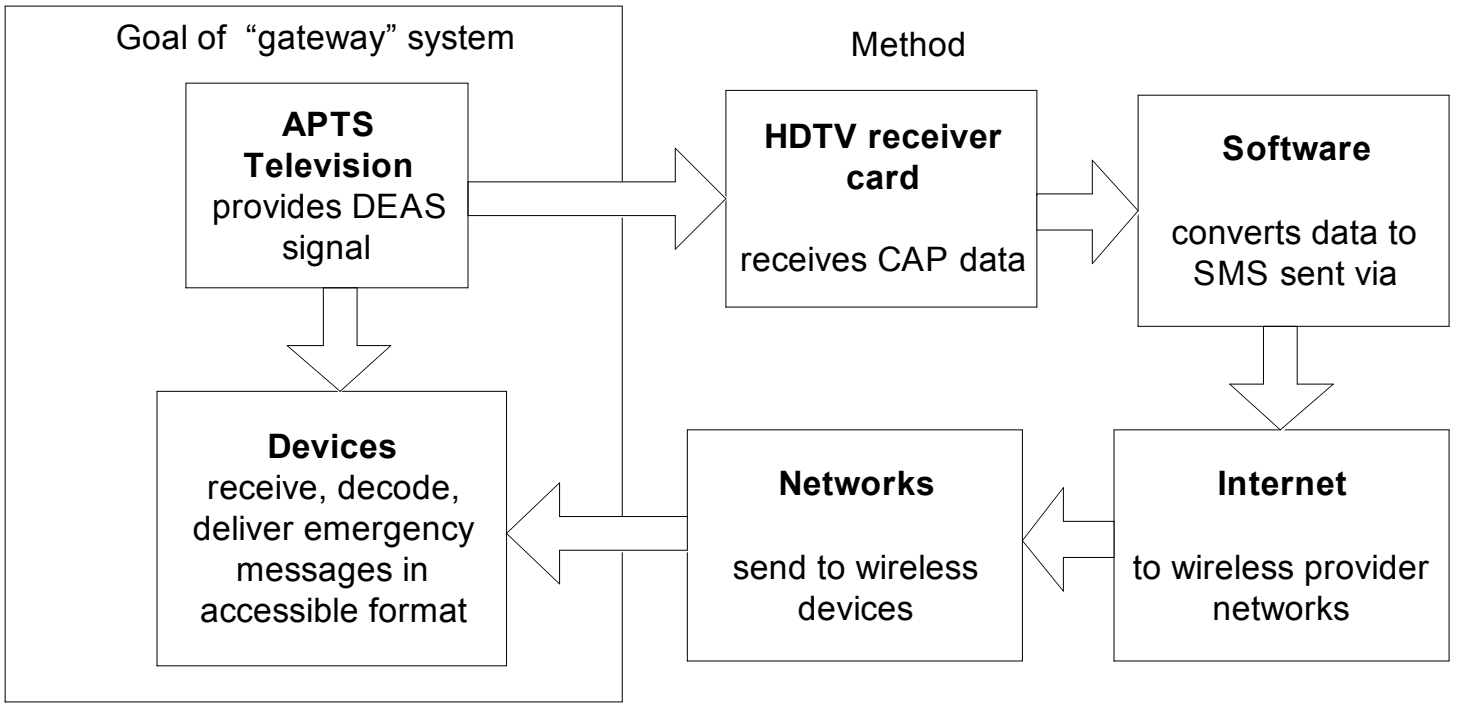
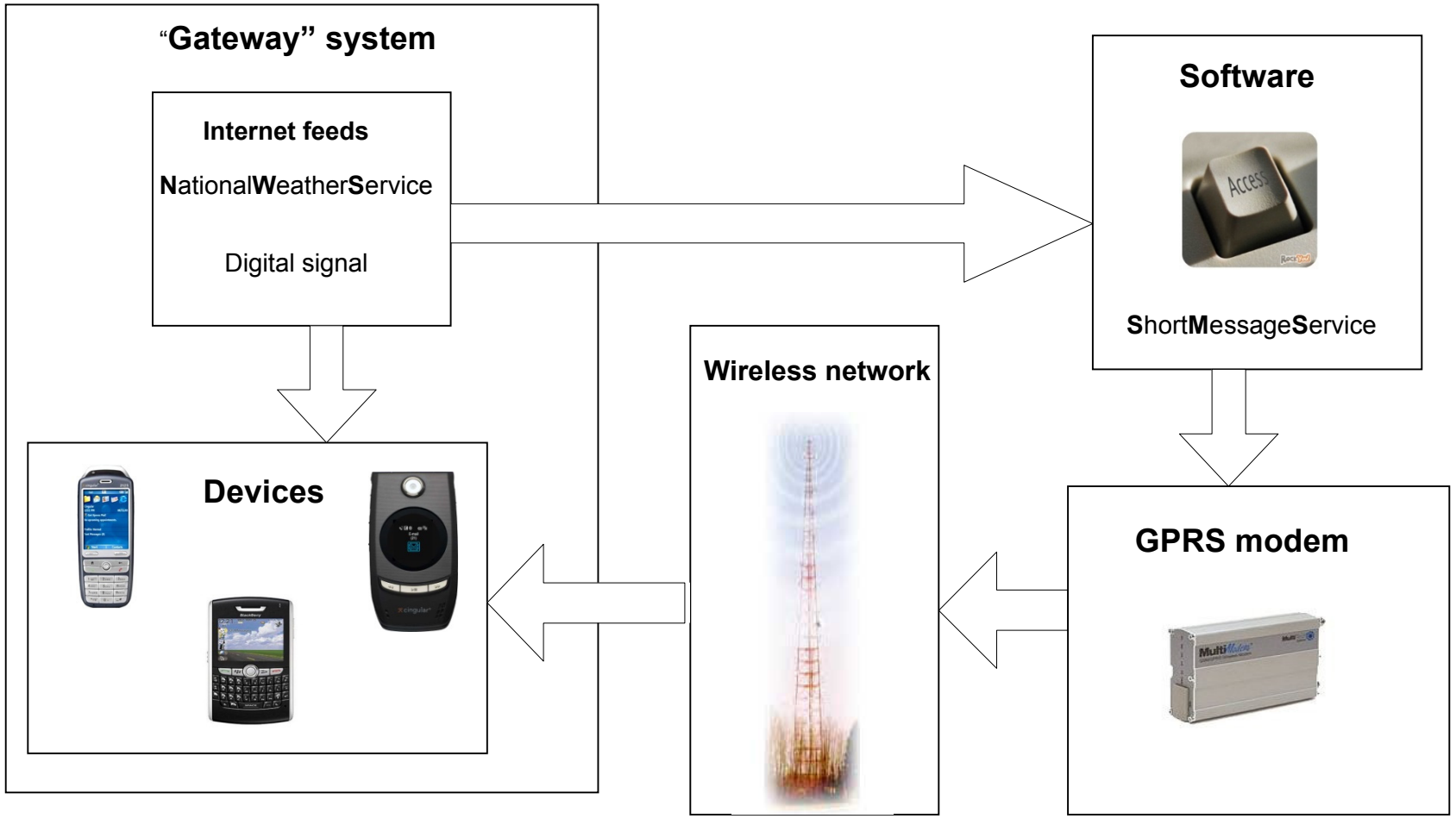
Proposed Technical Approach

Development of a "gateway" to convert emergency alerts and warnings to SMS messages and audio feeds in accessible formats deliverable to mobile devices



Actual Technical Model



Moving Toward Solutions

- Present findings to the FCC regarding results of field tests to support equal access to critical information via appropriate wireless warning systems

  - How to provide accessible emergency alerts
  - How to ensure next-generation digitally-based alerts are developed to give equal access to alerts
  - EAS improvements that incorporate existing FCC disability access rules and ensure timely accessible notifications

More FCC Rulemakings

- Commercial Mobile Alert System (CMAS)

  - First Report and Order adopted April 9th 2008
    - Adoption of a common audio attention signal
    - Adoption of existing 8-second EAS signal
    - Adoption of common vibration cadence
    - Clear instructions including labels identifying mobile devices suitable for persons with audio and visual disabilities
    - 90 character text limit of CMAS alert
    - Adding trailer to alerts

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PROJECT COLLABORATORS

- Staff: Frank Lucia, Salimah Major, Ed Price, Jeremy Johnson, Laurel Yancey, Ben Lippincott, GRAs
- Panel of Experts: Broadcasters; universities; Blind and low vision; deaf and hard-of-hearing; emergency public safety personnel and trainers
- Other Rehabilitation Engineering Research Centers

  Technology related

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Rehabilitation Engineering Research Center for Wireless Technologies
Wireless Emergency Communications

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