

# Building a Disaster Resistant Douglas County



# Partnerships

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- Douglas County
  - Board of Commissioners
  - Fire Department
  - Sheriff's Office
  - E911
  - Emergency Management
  - Board of Health
  - GIS Department
- Georgia Tech Research Institute
  - Center for Emergency Response Technology, Instruction and Policy
- U.S. Marine Corps Systems Command
- U.S. National Guard Bureau



# Outline

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- Project overview & preplanning tools
  - Chief Scott Spencer
  - Douglas County Fire Department
- Information Systems for Emergency Response
  - Christina Baxter, PhD
  - Georgia Tech Research Institute
  - Douglas County Fire Department
- Handheld Computer Tools
  - Lt. Jim Mykytyn
  - Georgia Tech Research Institute
  - Cobb County Fire and Emergency Services



# Project

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- The objective of the project is to *develop an emergency response information system thereby allowing emergency managers to make educated decisions by providing the necessary data on-scene in a digital format*
- Enable emergency responders to quickly and efficiently access information
- The applications include GIS systems for enhanced public safety and community preparedness resulting in disaster resistance



# Project Elements

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- Preplanning Tools
  - Risk Assessment – RHAVE
  - Hazardous materials
  - Building diagrams / photographs
- Community information
  - Emergency response history
  - Handicapped citizens
  - Water supplies
  - Utilities information
  - Others
- Incorporate all of the above into a geographically linked system



# Risk Assessment

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- Risk Assessment Elements:
  - Fire flow
  - Probability
  - Consequences
    - Life safety
    - Economic impact
- Risk Assessment Measures:
  - Occupancy risk
  - Demand zone
  - Community
- Utilizing Risk Hazard and Value Evaluation (RHAVE) Process



# RHAVE

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- Developed by:
  - International Association of Fire Chiefs
    - Accreditation Task Force
  - FEMA
    - United States Fire Administration
  - Commission on Fire Accreditation International
- Cost = FREE
- Means of demonstrating the specific risks and hazards in any given community



# RHAVE Forms

DOUGLAS COUNTY FIRE DEPARTMENT	
<b>Occupancy Vulnerability Profile</b>	
Date _____	
<b>Premise</b>	
Description	
Address	
1st Due Station	
Property Use	*See table 1
Map page	
Occupancy Type	*See table 2
Number of units	
Area	
Special concerns	<input type="checkbox"/> Non-owner occupied
	<input type="checkbox"/> Wildland interface
Employer impact	<input type="checkbox"/> Major employer
	# of employees _____
<b>Building</b>	
Exposure Separation	Type of Construction *See table 5
<input type="checkbox"/> 101'+	<input type="checkbox"/> I-A <input type="checkbox"/> III-B
<input type="checkbox"/> 61' to 100'	<input type="checkbox"/> I-B <input type="checkbox"/> IV/HT
<input type="checkbox"/> 31' to 60'	<input type="checkbox"/> II-A <input type="checkbox"/> V-A
<input type="checkbox"/> 11' - 30'	<input type="checkbox"/> II-B <input type="checkbox"/> V-B
<input type="checkbox"/> 0 to 10'	<input type="checkbox"/> III-A
Height	Access
<input type="checkbox"/> 1 - 2 stories	<input type="checkbox"/> All sides
<input type="checkbox"/> 3 - 4 stories	<input type="checkbox"/> 3 sides
<input type="checkbox"/> 5 - 6 stories	<input type="checkbox"/> 2 sides
<input type="checkbox"/> 7 - 9 stories	<input type="checkbox"/> 1 side
<input type="checkbox"/> 10 + stories	<input type="checkbox"/> Extra ordinary #flr
Square footage	
<input type="checkbox"/> 0 - 7,500	
<input type="checkbox"/> 7,501 - 15,000	
<input type="checkbox"/> 15,001 - 25,000	
<input type="checkbox"/> 25,001 - 40,000	
<input type="checkbox"/> > 40,000	
<b>Life Safety</b>	
Occupant Load	Occupant Mobility
<input type="checkbox"/> 0 - 10	<input type="checkbox"/> Awake/ambulatory, one - two stories
<input type="checkbox"/> 11 - 50	<input type="checkbox"/> Asleep/ambulatory, one - two stories
<input type="checkbox"/> 51 - 100	<input type="checkbox"/> Awake/ambulatory, 3+ stories
<input type="checkbox"/> 101 - 300	<input type="checkbox"/> Asleep/ambulatory, 3+ stories
<input type="checkbox"/> > 300	<input type="checkbox"/> Non-ambulatory or unrestrained
	<input type="checkbox"/> Not a factor

Life Safety		Continued
Warning Alarm	<input type="checkbox"/> Automatic - central <input type="checkbox"/> Automatic - local <input type="checkbox"/> Manual - central <input type="checkbox"/> Manual - local <input type="checkbox"/> No alarm system <input type="checkbox"/> Not a factor	Exiting System <input type="checkbox"/> Conforming <input type="checkbox"/> Non-conforming
<b>Risk - Frequency / Likelihood</b>		
Regulatory Oversight	<input type="checkbox"/> Highly regulated, mandatory compliance <input type="checkbox"/> Highly regulated, inspections scheduled <input type="checkbox"/> Regulated, inspections schedules random <input type="checkbox"/> Regulated, voluntary compliance <input type="checkbox"/> Unregulated, uninspected <input type="checkbox"/> Not a factor	Human Activity <input type="checkbox"/> No access to unauthorized persons <input type="checkbox"/> Controlled access to unauthorized persons <input type="checkbox"/> Business activity, sales and retail <input type="checkbox"/> Group activity, transient population <input type="checkbox"/> Domestic activity, No occupant control <input type="checkbox"/> Not a factor
Experience	<input type="checkbox"/> Daily events <input type="checkbox"/> Weekly events <input type="checkbox"/> Monthly events <input type="checkbox"/> Annually events <input type="checkbox"/> Rare occurrence	
<b>Risk - Consequence</b>		
Capacity to Control	*See table 3 <input type="checkbox"/> Control within building of origin <input type="checkbox"/> Exposure to complex of building <input type="checkbox"/> Major deployment <input type="checkbox"/> Extreme resistance to control <input type="checkbox"/> Hazardous to firefighting activities	Hazard Index <input type="checkbox"/> Limited hazards <input type="checkbox"/> Common hazards (residential type) <input type="checkbox"/> Mixed hazards (business type) <input type="checkbox"/> Industrial hazards, F, L, F, G, explosives <input type="checkbox"/> Multiple and complex hazards
Fire Load	*See table 4 <input type="checkbox"/> Light <input type="checkbox"/> Ordinary hazard group 1 <input type="checkbox"/> Ordinary hazard group 2 <input type="checkbox"/> Extra hazard group 1 <input type="checkbox"/> Extra hazard group 2	<b>Water Demand</b> Fire Sprinklers <input type="checkbox"/> Yes (NFPA Compliant) <input type="checkbox"/> No
<b>Value</b>		
Property Value	<input type="checkbox"/> Personal / family loss <input type="checkbox"/> Business loss, minor casualty exposure <input type="checkbox"/> Moderate economic impact to community, severe casualty exposure <input type="checkbox"/> Severe economic impact to community, tax base or jobs lost <input type="checkbox"/> Irreplaceable major loss to community (non-monetary), infrastructure, cultural, historical	

- Prepared two page forms for initial data collection
- Keep it simple!





# Preplanning

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- Link information geographically
  - MSDS Sheets
  - Pre-plans
  - Building diagrams
  - Medical information
- Training
  - Utilize pre-plans in training exercises
- CAMEO / ALOHA
  - Cost = FREE!
  - US EPA



# Preplanning

Business-Building Information.doc - Microsoft Word

File Edit View Insert Format Tools Table Window Help

Title Times New Roman 14 B I U

37%

1 2 3 4 5 6 7 8 9 10

**DOUGLAS COUNTY FIRE DEPARTMENT**  
2700 Hospital Drive  
Douglasville, GA 30145  
770-442-2626

General Information

Building/Business Name: \_\_\_\_\_

Building Address: \_\_\_\_\_

Phone Number: \_\_\_\_\_

Emergency Contact: **PLEASE LIST AT LEAST 2**

Name	Title	Phone Number

Total number of employees: \_\_\_\_\_ Total per shift: \_\_\_\_\_

Building Information

Number of floors/levels: \_\_\_\_\_ Number of basements: \_\_\_\_\_

Is there a basement? **Y/N** Is there more work space? **Y/N**

Is there access to the roof without ladders? **Y/N**

Utilities

Electric Company: \_\_\_\_\_

Gas Company: \_\_\_\_\_

Alarm Company: \_\_\_\_\_ Phone: \_\_\_\_\_

Utilities Show/FLE location:

Show: \_\_\_\_\_

Gas: \_\_\_\_\_

HVAC: \_\_\_\_\_

Alarm: \_\_\_\_\_

Sprinkler: \_\_\_\_\_

Waste: \_\_\_\_\_

Detection/Warning/Alarm System:

Fire Department Connection **Y/N** Location: \_\_\_\_\_

Sprinkler system type: \_\_\_\_\_ Zone **Y/N**

Location of Alarm/Smoke/gas: \_\_\_\_\_

Is there a fire pump? **Y/N** Location: \_\_\_\_\_

Emergency generator **Y/N** Location: \_\_\_\_\_

How many Smoke Detectors? \_\_\_\_\_ Extinguishers: \_\_\_\_\_

Know about Mass risk:

Hazardous materials: \_\_\_\_\_

Location of HazMat: \_\_\_\_\_

**ATTACH LIST OF CHEMICALS IF YOUR FACILITY**

Are there any special hazards or processes that we may need to ask? \_\_\_\_\_

\*\*\*Please attach an 8" X 10" drawing of the layout of your business (hand drawn will be fine). This is probably the most important aspect of the information gathering process. It will provide a clear view of what is the same discussed above. Strategic and tactical will be implemented quicker when a drawing is available.

Prepared by: \_\_\_\_\_ Date: \_\_\_\_\_

Draw AutoShapes

Page 1 Sec 1 1/2 At 0.7" Ln 1 Col 1 REC TRK EXT OVR

Start Micros... C:\D... Micros... C:\D... Busin... 5:24 PM



Business owner information

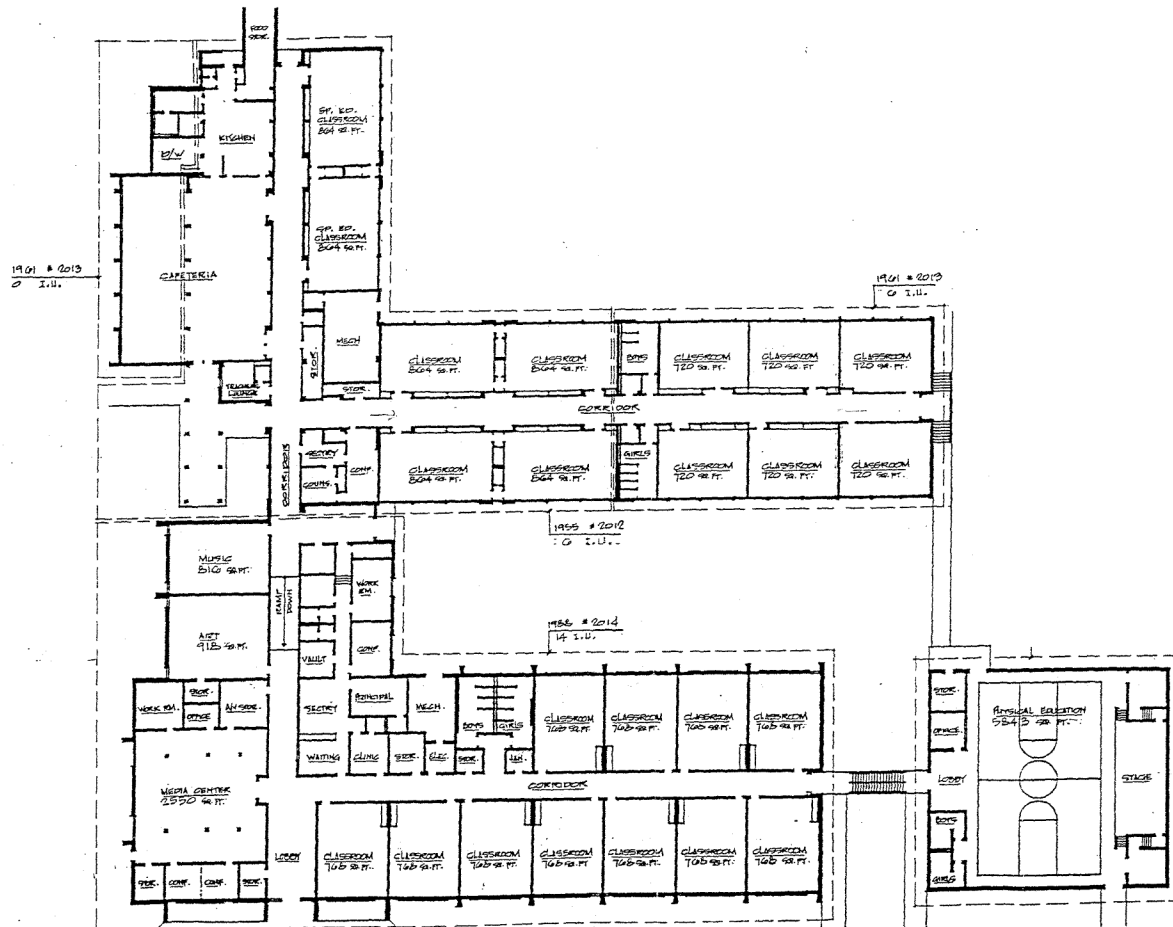
# Preplanning

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- RHAVE forms
- Building owner forms
- Follow-up visit forms



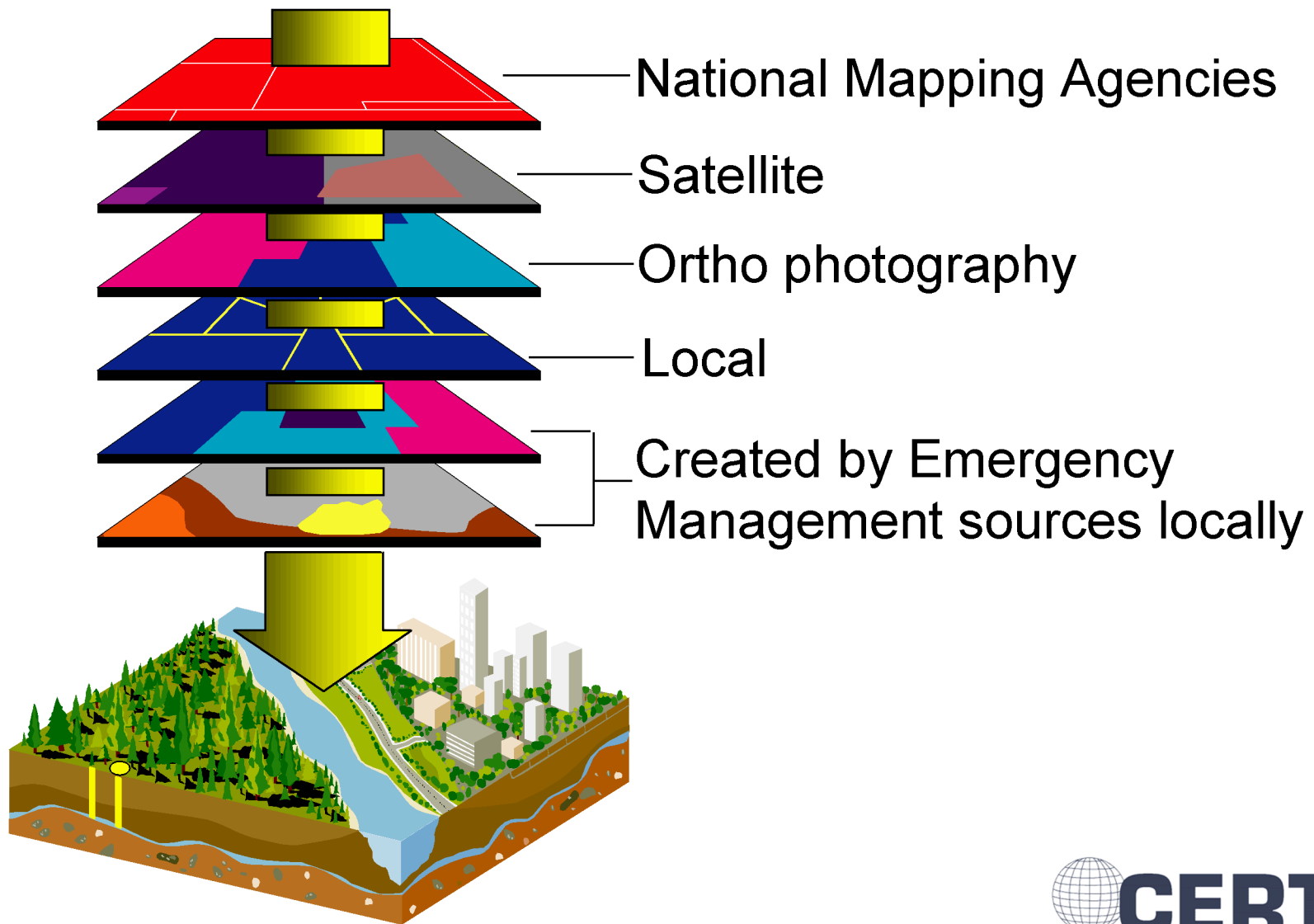
# Preplanning



- Link information directly to building diagrams

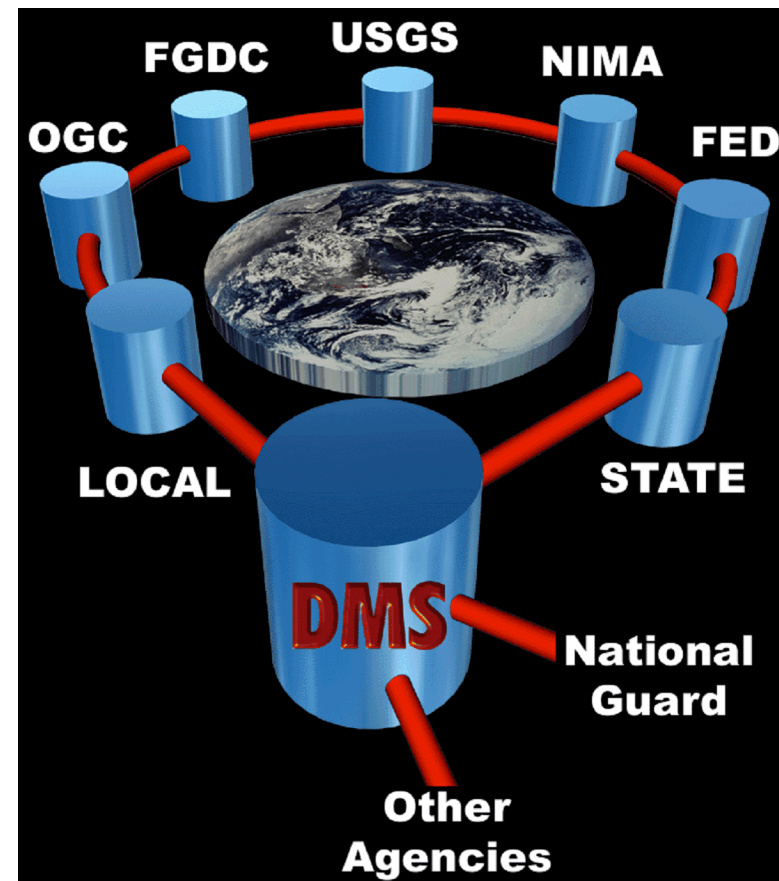


# GIS – Data Sources



# Digital Mapping Server

- “Server” indicates access to GIS data from many sources (Federal, State, Local, etc.) NOT storage of data.
- Standard data sources (e.g. NSDI) and server protocols are key.
- Leverage from FGDC clearinghouse and framework, Open GIS Consortium programs, Digital Earth, and other GIS data sharing efforts (e.g. Geography Network).

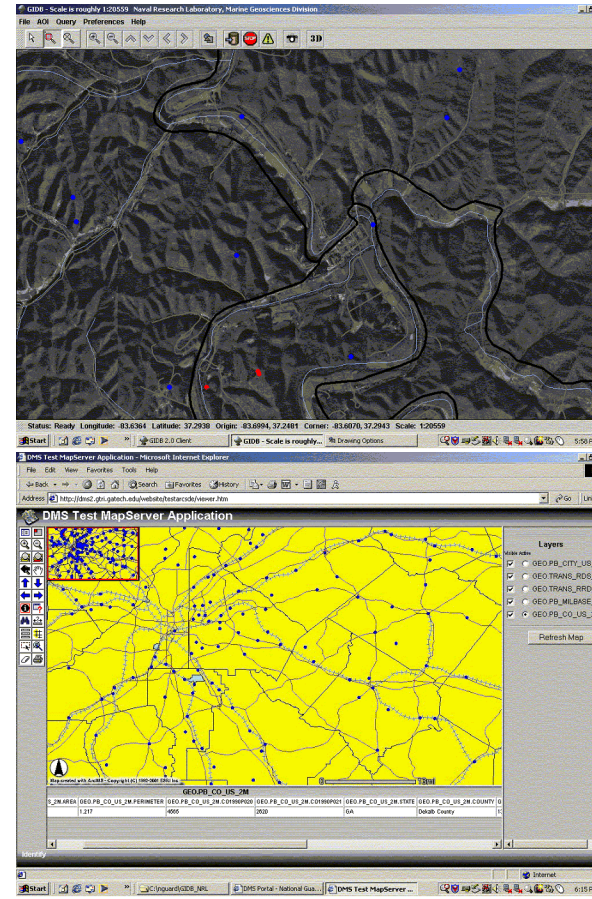
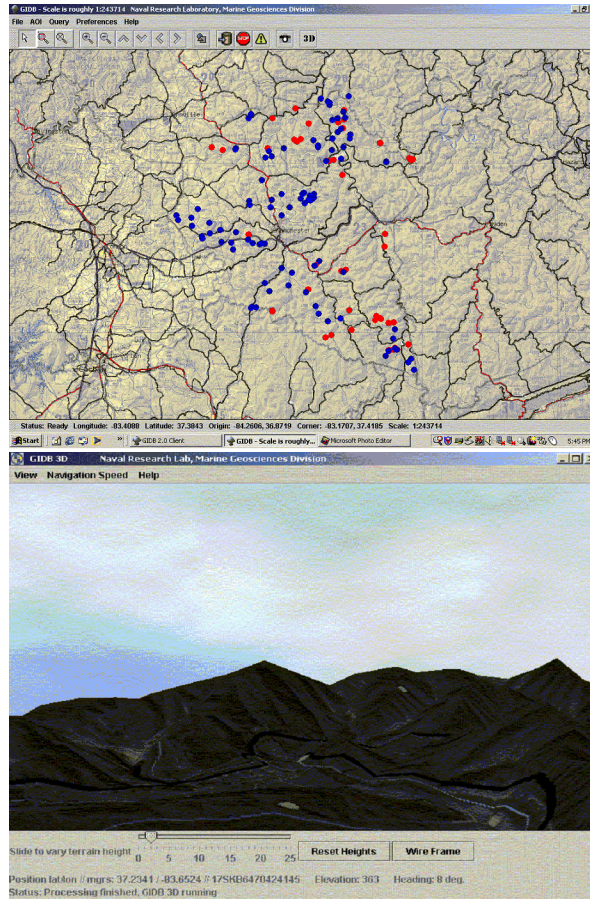


<http://dms2.gtri.gatech.edu/dms/index.html>

# System Integration

Topos,  
Street Lines,  
And Local  
Points of  
Significance

3D Maps

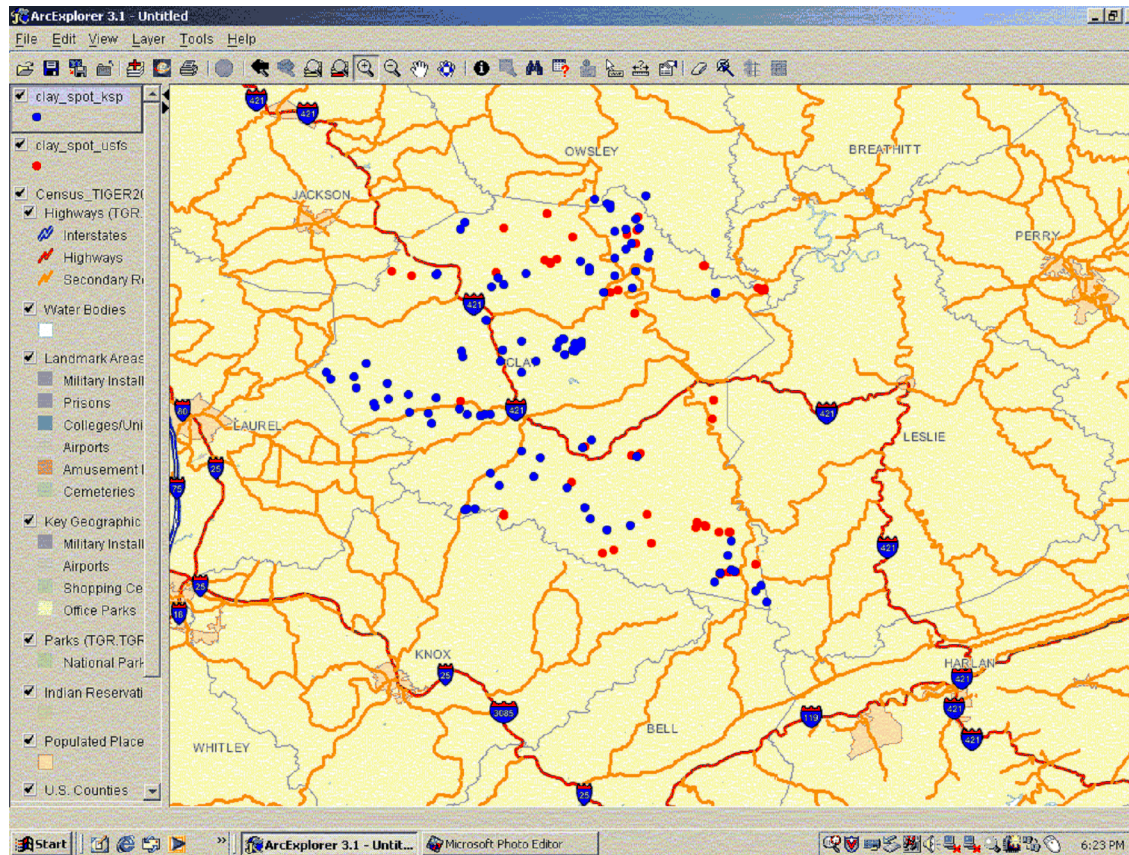


1m Imagery

ArcIMS  
Interface



# ArcExplorer



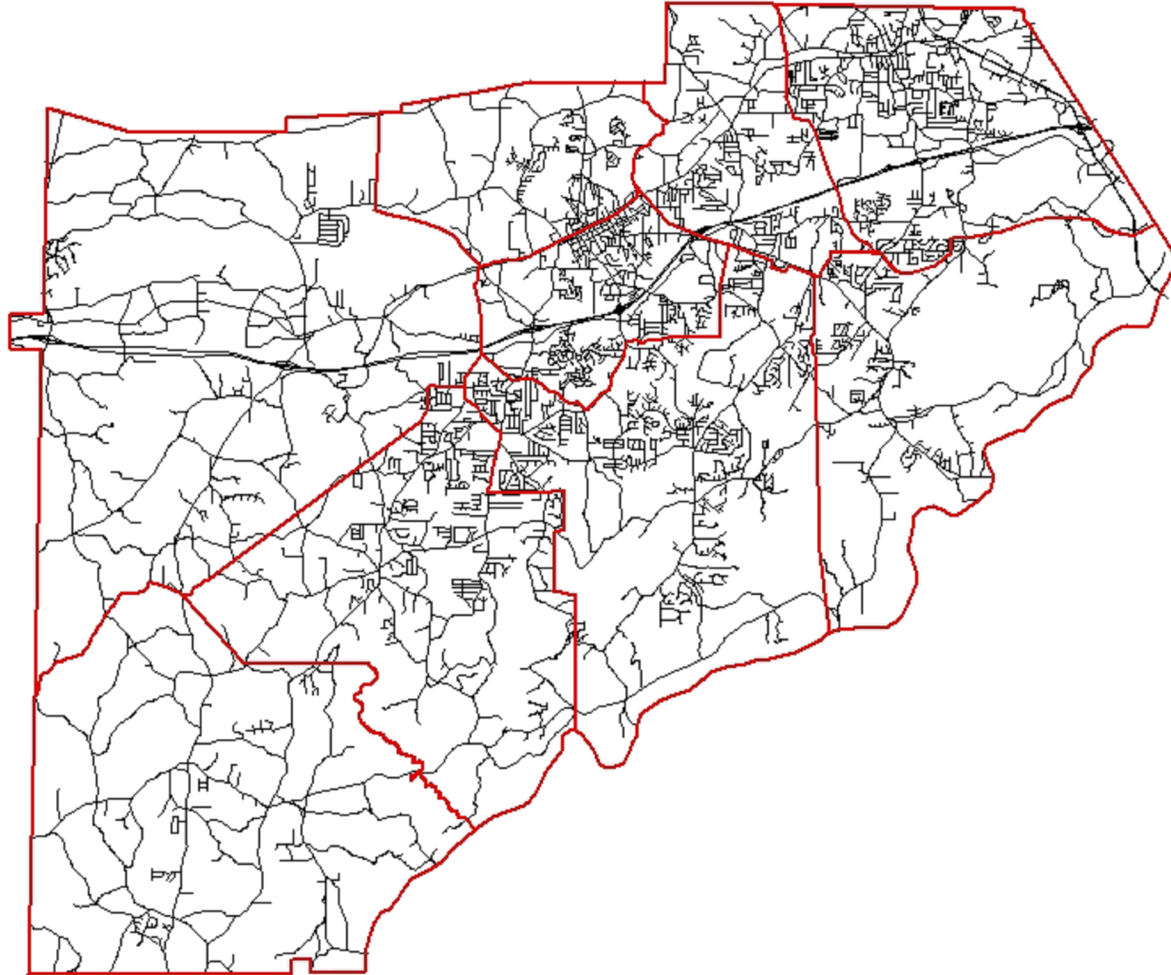
*Create maps on the fly with local or remote data (FREE!)*





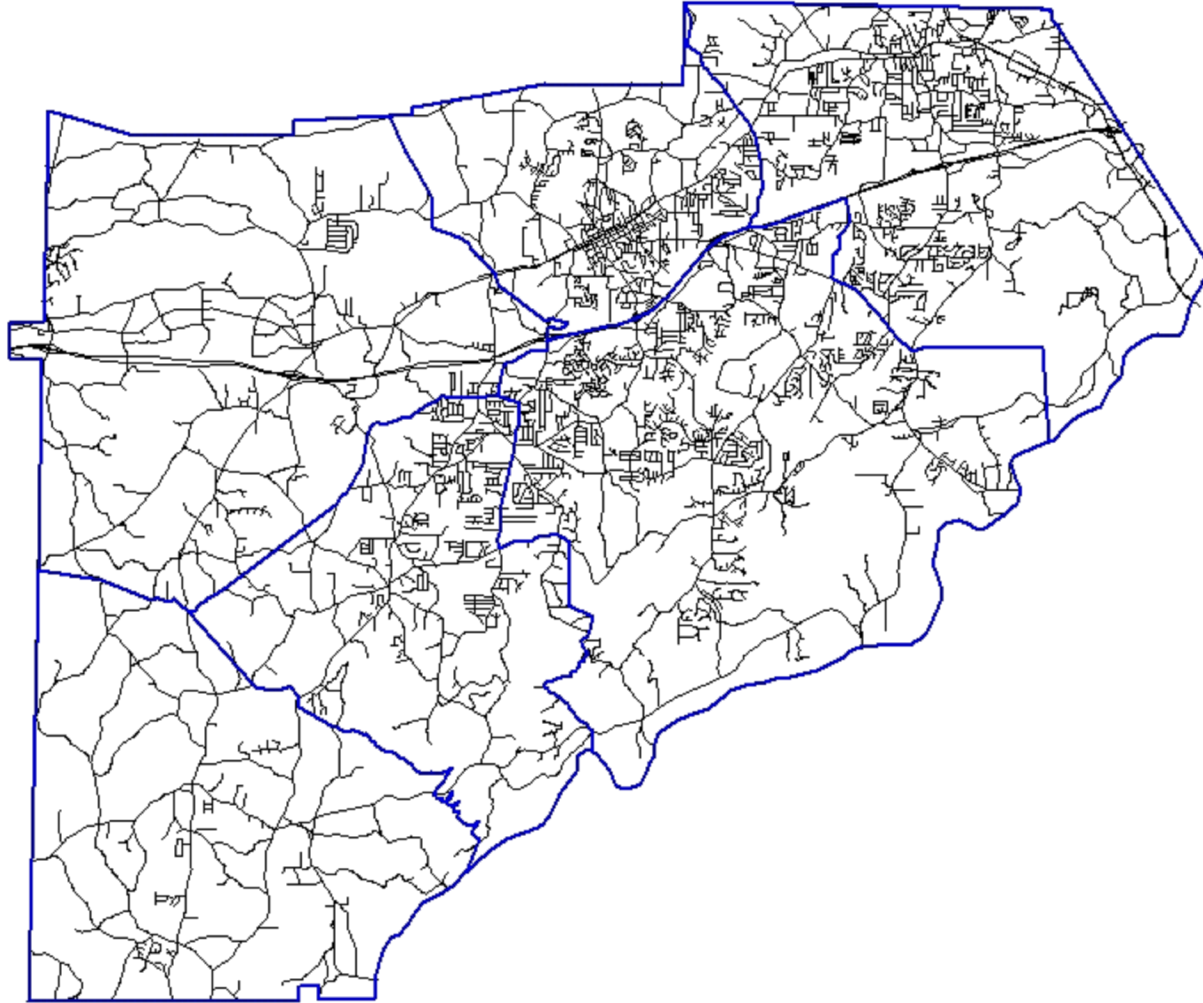
# Fire Zones

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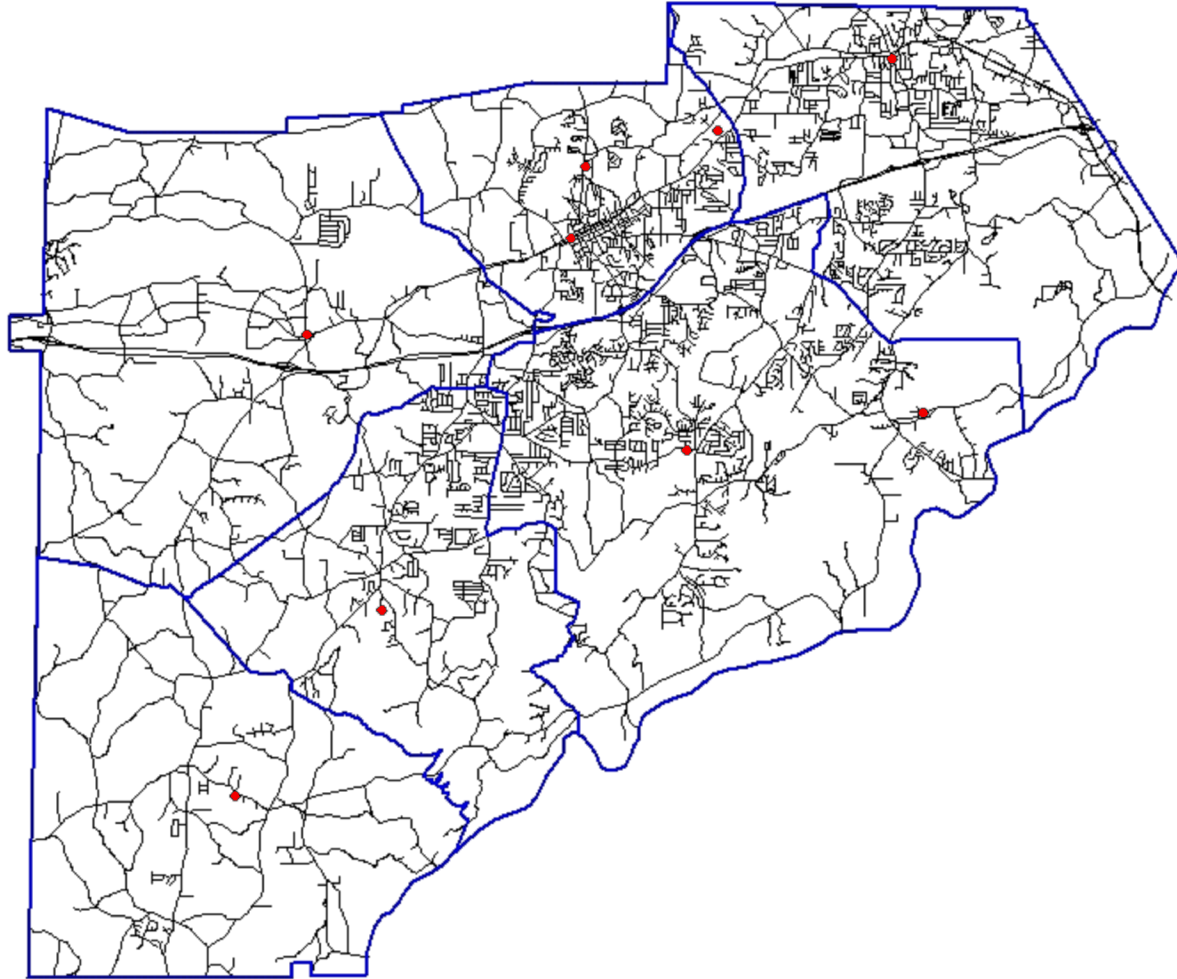
# EMS Zones

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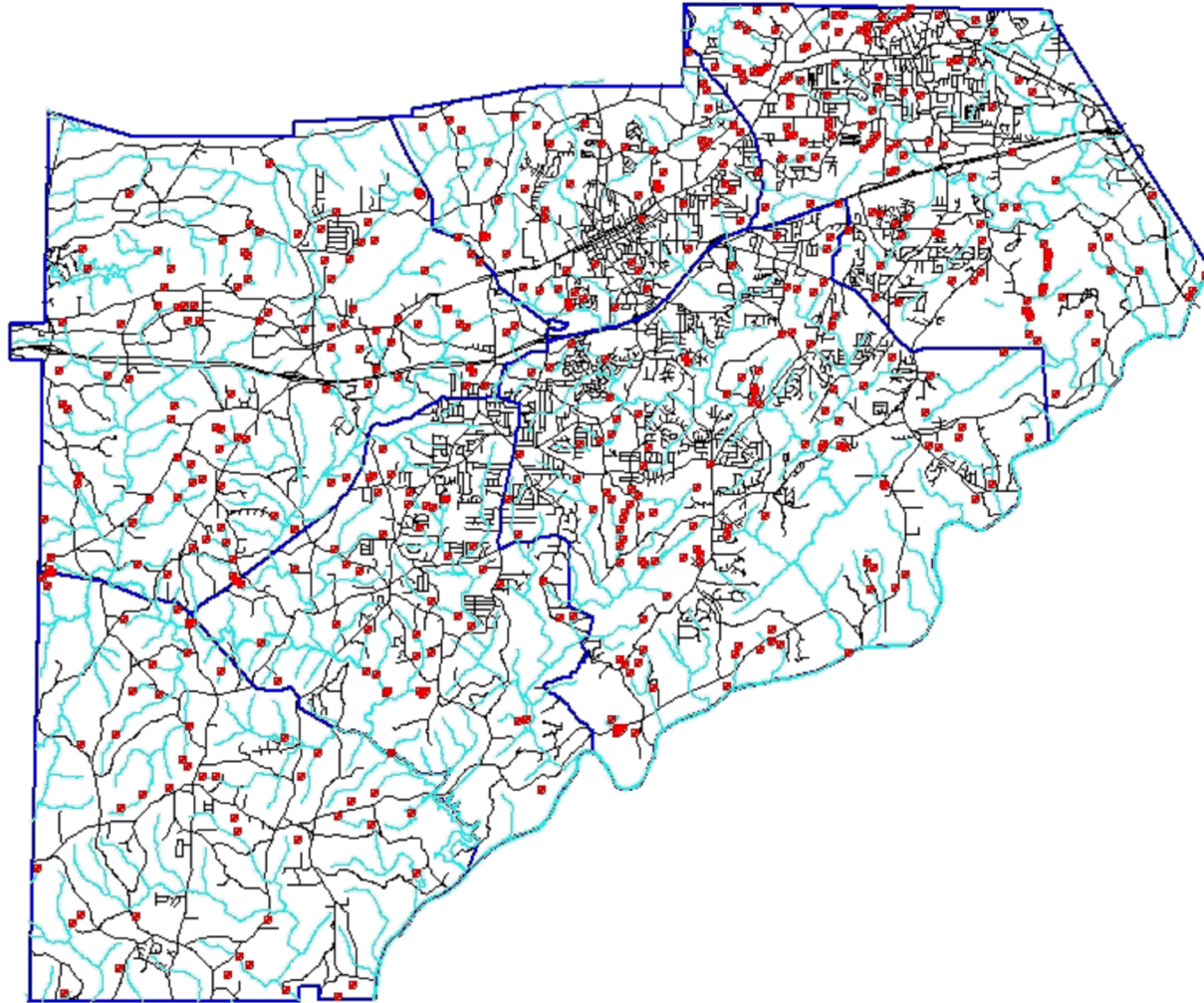
# Fire Stations

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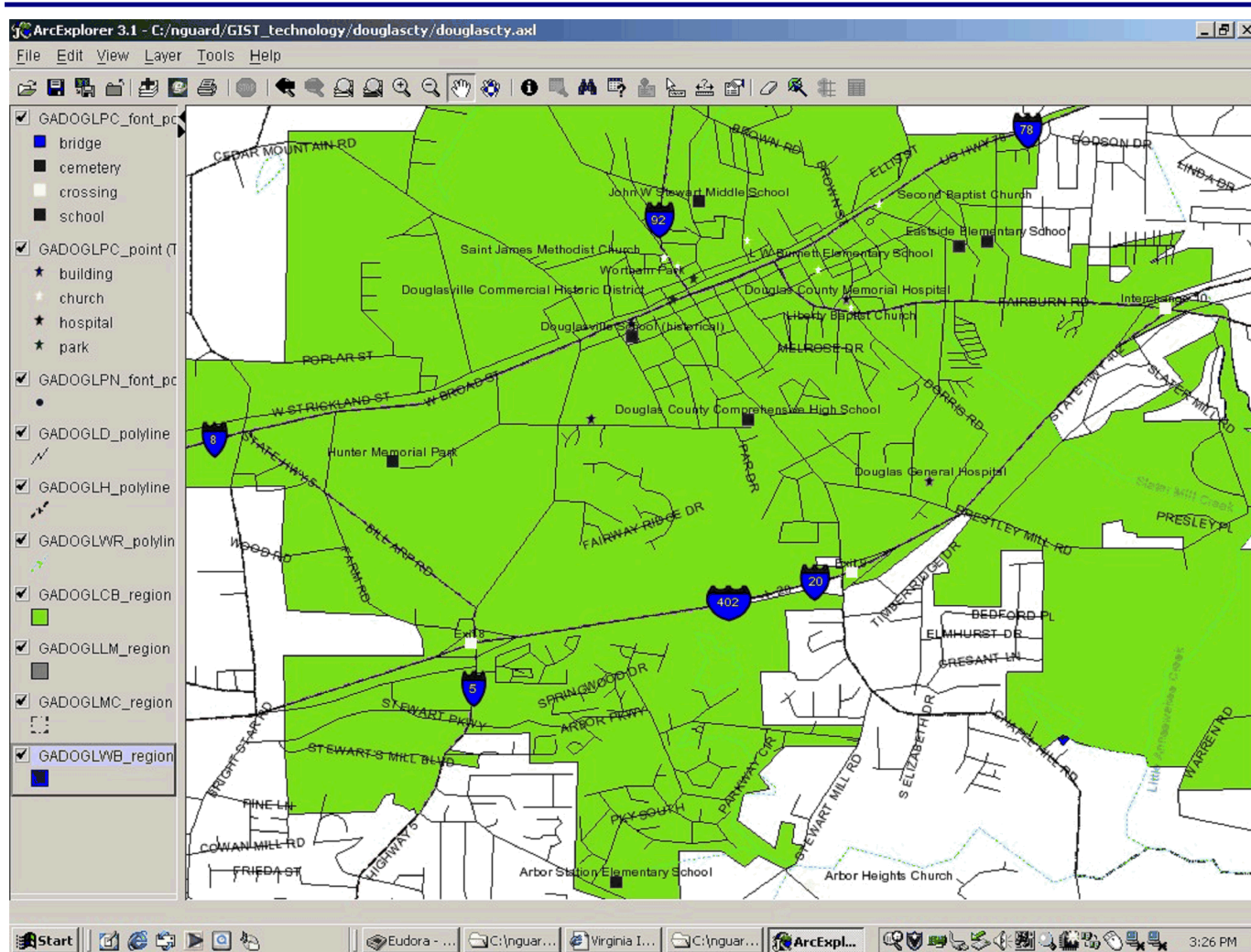


# Hydrants

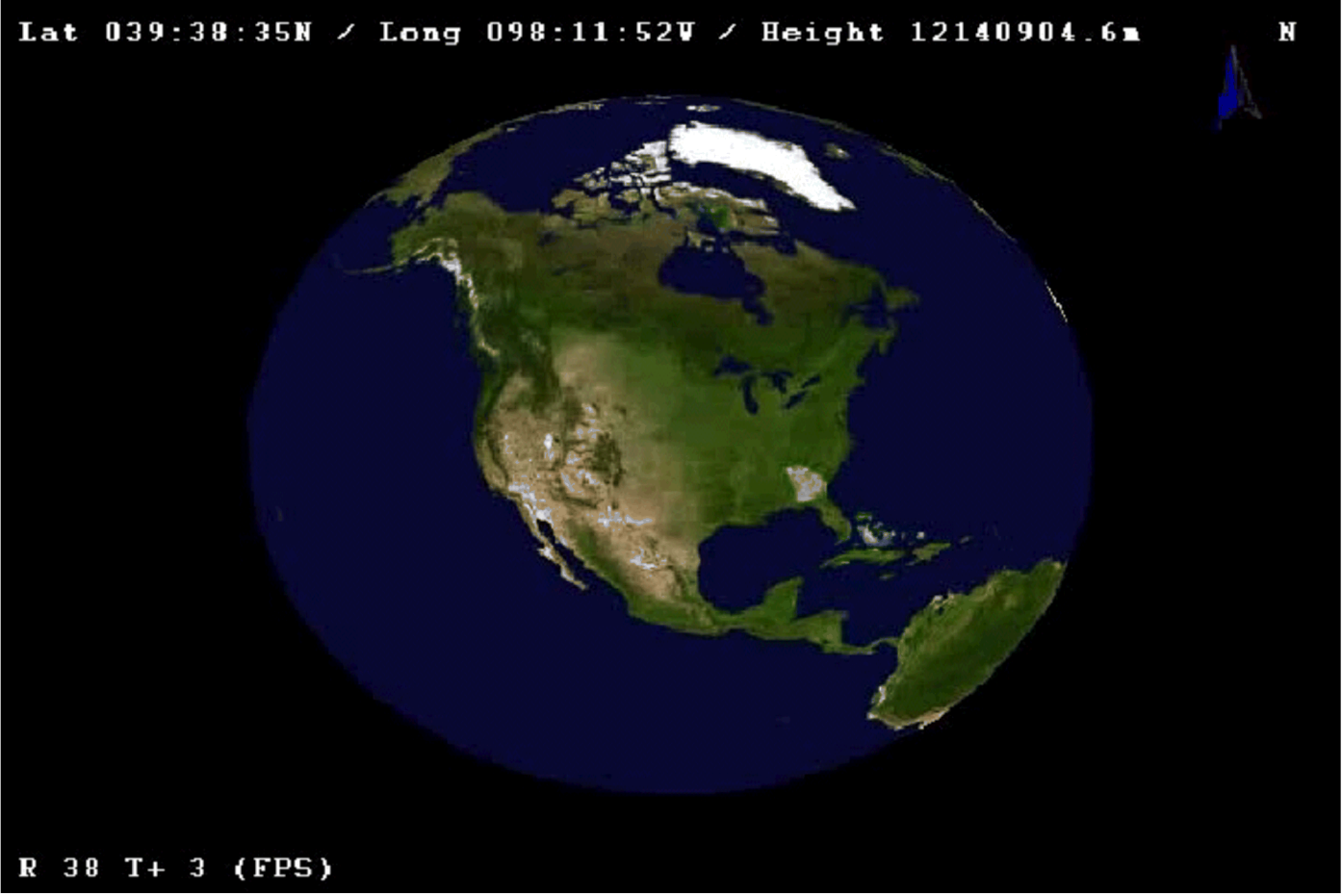
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# Key Assets

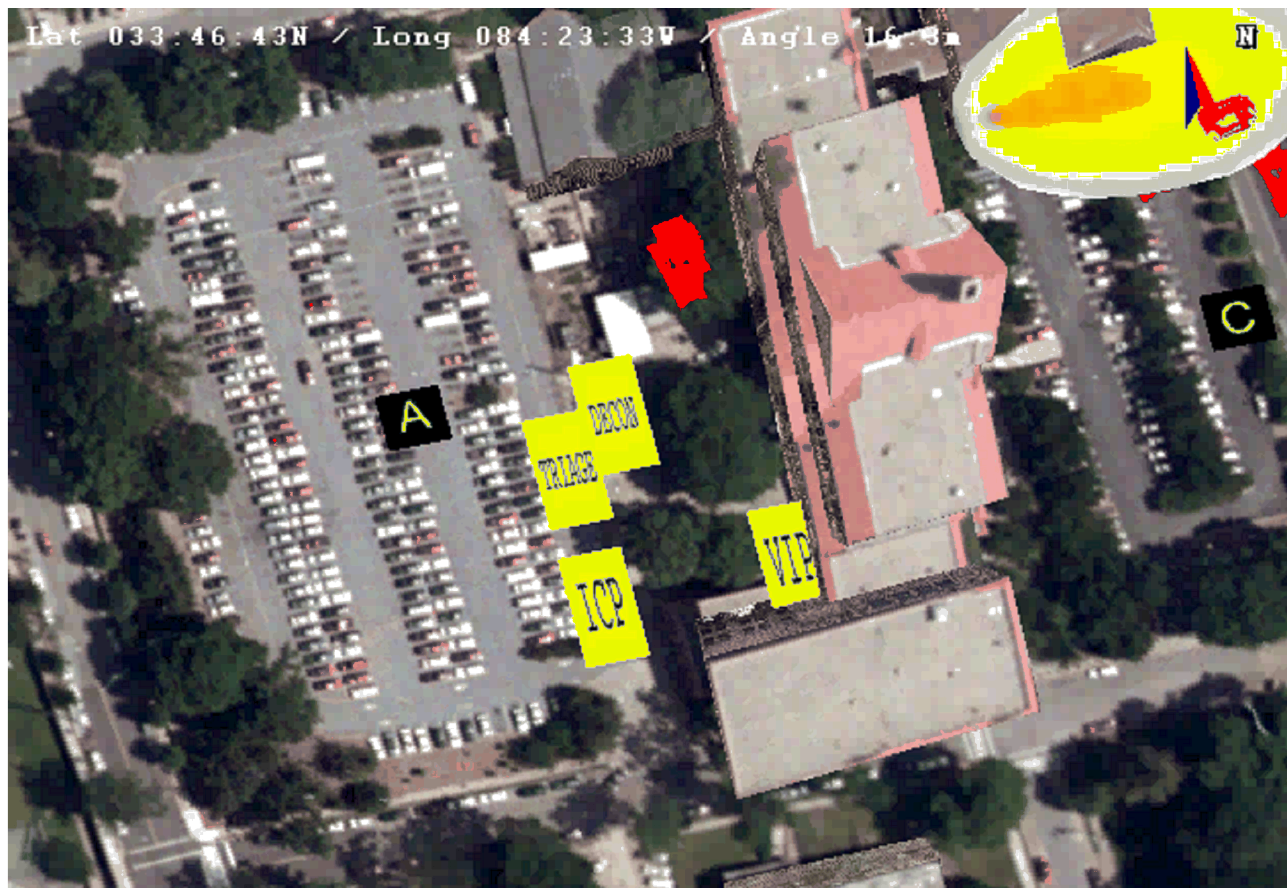


# Virtual GIS



# Virtual GIS and Plume Models

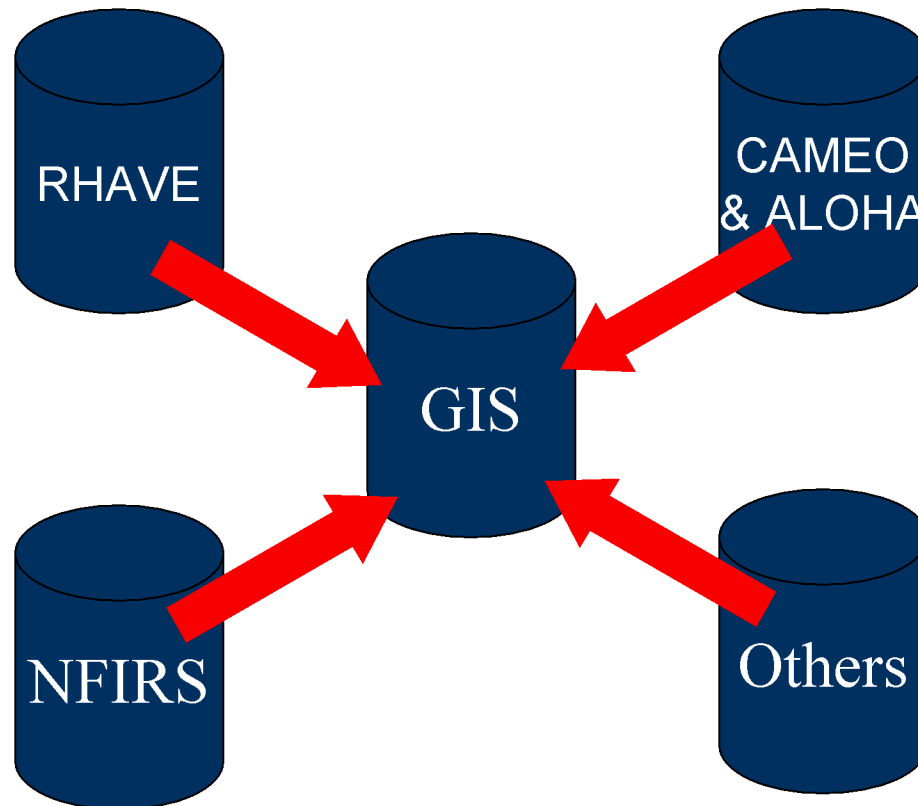
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# Conclusions

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Better Preparedness Through Technology Insertion,  
Planning & Training!!!





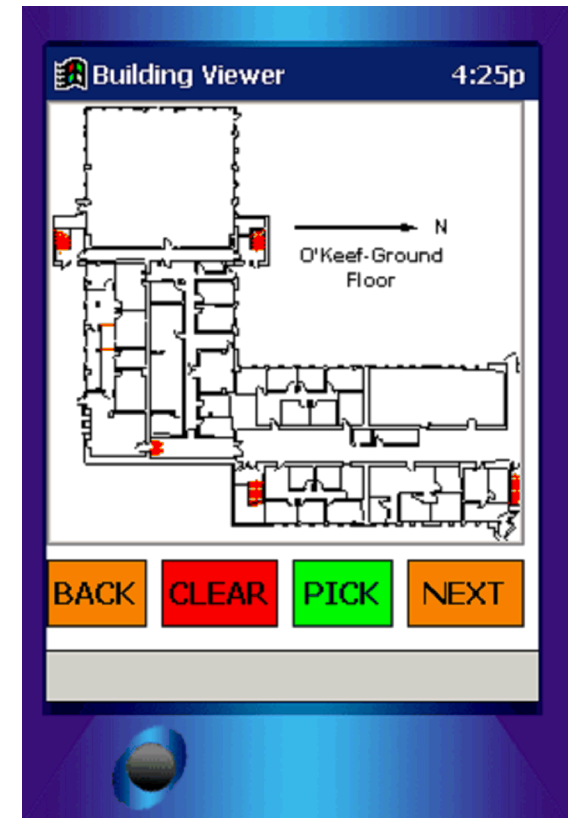
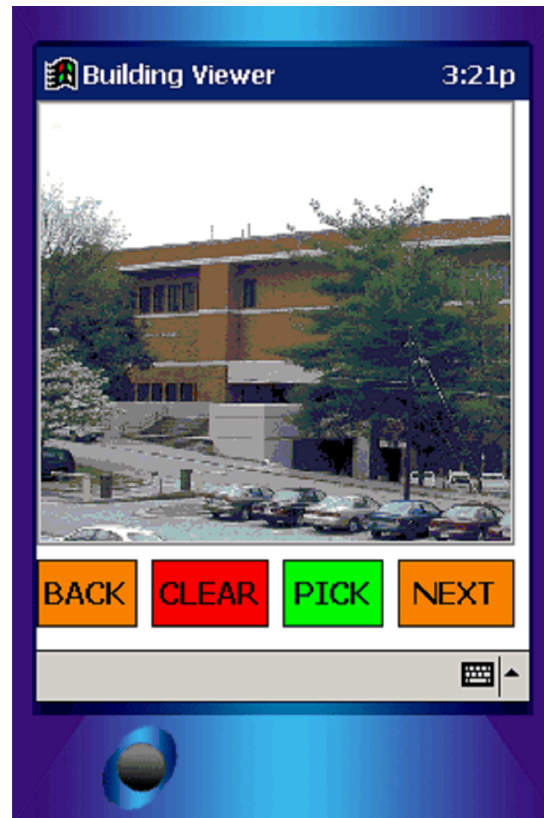
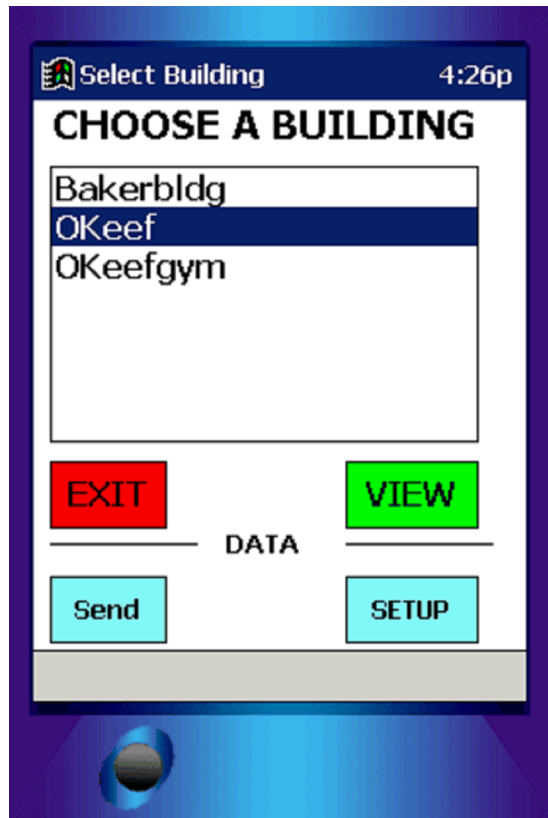
# Windows CE Programs – Building Viewer

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- *Pre-planning tool*
- Display building graphics
  - Photos, floor plans, location maps
- Collects and stores data on-site
- Initial image (.bmp) is user definable by file name (photo, descriptive image, etc.)
- Step through images via Next / Back buttons
- Data point entry
  - Add data by holding for 1 sec, then releasing
  - Entry via drop-down lists (user configurable)



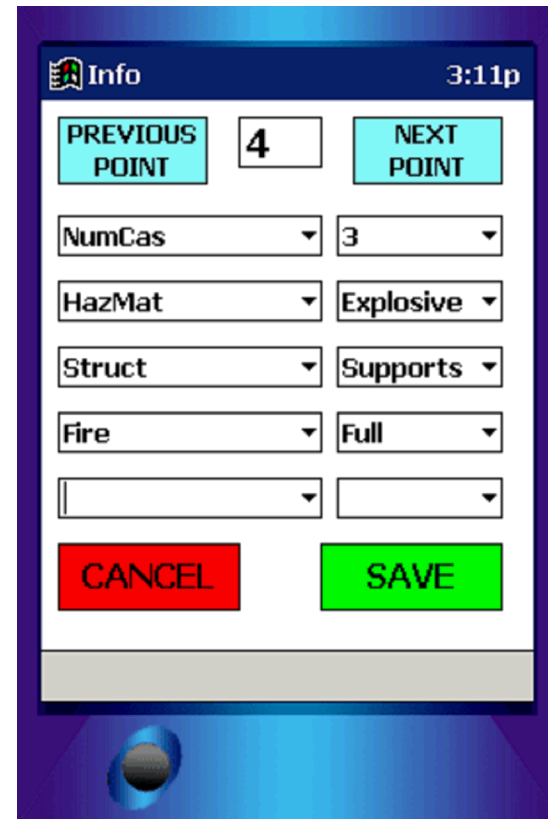
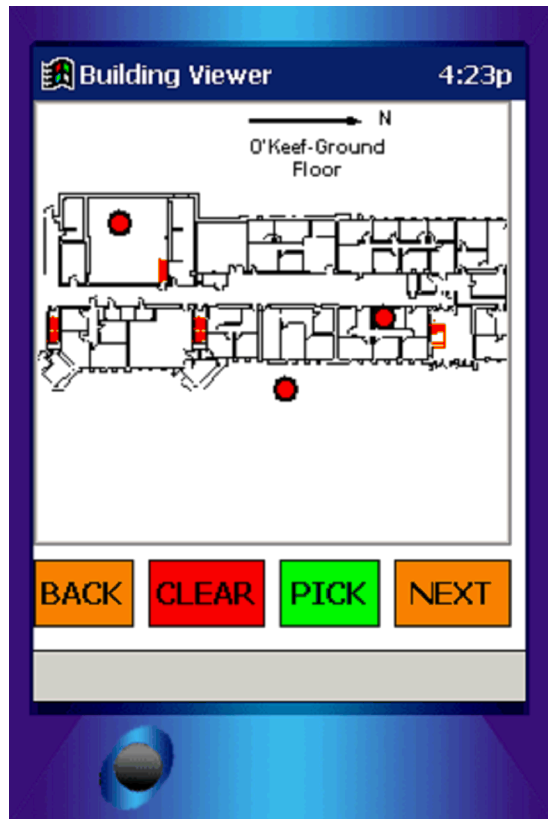
# Windows CE Programs – Building Viewer



Display Building Graphics



# Windows CE Programs – Building Viewer



Data Point Entry



# Windows CE Programs – Decision Aid

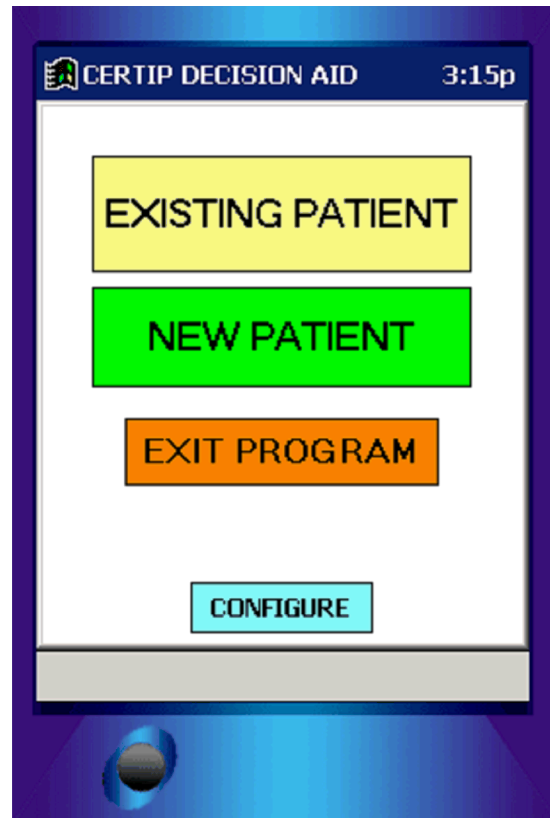
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- *Decision support tool*
- Menu driven
- PDA based
- Collect basic patient information
- Prompt for patient symptoms (observable)
- Provide candidate agents or class of agents based on symptoms
- Provide additional operational information



# Windows CE Programs – Decision Aid

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Add or Change Patient Information



# Windows CE Programs – Decision Aid

**PATIENT DESCRIPTION** 3:16p

3  FEMALE  
 MALE

RACE **Caucasian** ▾

AGE **13-18 Yr** ▾

HEIGHT **5-6 Ft** ▾

WEIGHT **100-150 Lbs** ▾

BACK END NEXT

**OTHER INFORMATION** 3:17p

3

Conscious  
 SemiCons/Disoriented  
 Unconscious

Bleeding  
 Broken Bones  
 Other Major Injuries  
 Pregnant

BACK END NEXT

Collect Basic Patient Information



# Windows CE Programs – Decision Aid

PUPIL INFORMATION 3:17p

3

## PUPIL SIZE

**CONSTRICTED**

**NORMAL**

**DILATED**

BACK END NEXT

DECISION 3:18p

3  UPLOAD

## DECISION

	AGENT	U%	W%
1	Blood	77	75
2	Blister	71	67
3	Normal	71	71

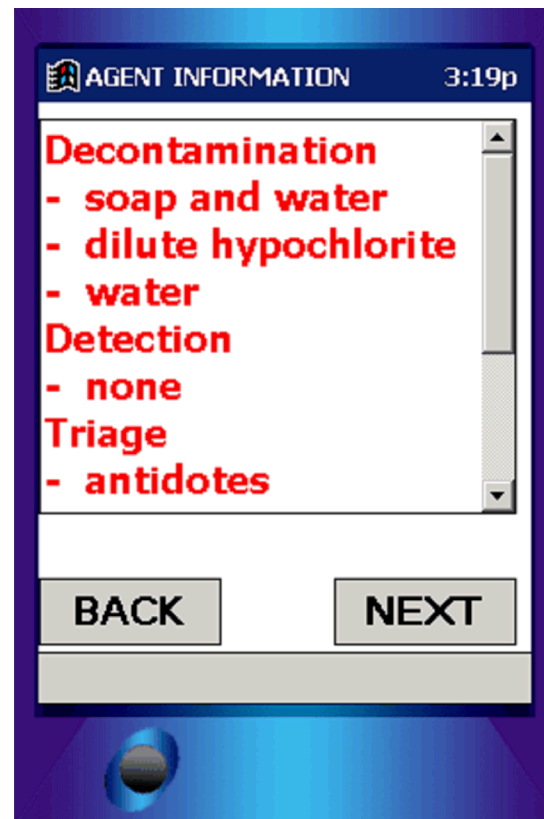
BACK NEXT

Prompt for observable symptoms  
Provide candidate class of agents



# Windows CE Programs – Decision Aid

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Provide additional operational information





# Windows CE Programs – Decision Aid

The screenshot shows a Windows CE desktop environment with a Microsoft Internet Explorer browser window open. The browser displays the "CERTIP Reachback Home Page" with a sidebar menu containing links for "Blood Oxygen", "EKG Strip", "Blood Pressur", "EEG (Demos)", and "Webcam". The main content area is titled "Patient Information Collected On Hand-Held Decision Aid(s) By Responders" and lists data from a device named "DECAID2".

**CERTIP Reachback Home Page**

**Patient Information from Decision Aid**

- [Blood Oxygen](#)
- [EKG Strip](#)
- [Blood Pressur](#)
- [EEG \(Demos\)](#)
- [Webcam](#)

**Patient Information Collected On Hand-Held Decision Aid(s) By Responders**

From Device DECAID2\_Patient #1 Updated at: 11/15/00 7:34:16 AM

From Device D

From Device D

From Device D

Address: https://comserver.gtri.gatech.edu/certip/certip/PDEGAID21.htm

From Device DECAID2  
Patient #1  
Date and Time Info Last Updated: 11/15/00 7:34:16 AM  
Patient Sex: Female  
Patient Race: Caucasian  
Patient Approximate Age: 19-40 Yr  
Patient Approximate Height: 5-6 Ft  
Patient Approximate Weight: 100-150 Lbs  
Patient Consciousness: SemiConscious

Decision Aid Symptoms:  
Pupil Size: Constricted  
Eye Photosensitivity: Normal  
Skin Color: Normal  
Sweating: Extreme  
Twitching: Yes  
Coughing: Major  
Choking: No  
Skin Painful To Touch: None/Normal



Send information to a website – ICP data collection

# Authors Contact Information

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## Presenting Authors

Scott Spencer	(770) 942-8626	<a href="mailto:sspencer@co.douglas.ga.us">sspencer@co.douglas.ga.us</a>
Christina Baxter	(404) 894-5362	<a href="mailto:christina.baxter@gtri.gatech.edu">christina.baxter@gtri.gatech.edu</a>
Jim Mykytyn	(770) 528-3937	<a href="mailto:jm169@aol.com">jm169@aol.com</a>

## Non-Presenting Authors

Nick Faust	(404) 894-0021	<a href="mailto:nick.faust@gtri.gatech.edu">nick.faust@gtri.gatech.edu</a>
Melinda Higgins	(404) 894-4971	<a href="mailto:melinda.higgins@gtri.gatech.edu">melinda.higgins@gtri.gatech.edu</a>
Mike Witten	(404) 894-7636	<a href="mailto:mike.witten@gtri.gatech.edu">mike.witten@gtri.gatech.edu</a>
Tony Wasilewski	(404) 894-0133	<a href="mailto:tony.wasilewski@gtri.gatech.edu">tony.wasilewski@gtri.gatech.edu</a>
Kim Ransom	(770) 942-8626	<a href="mailto:kransom@co.douglas.ga.us">kransom@co.douglas.ga.us</a>
Chad Arnold	(770) 942-8626	<a href="mailto:carnold@co.douglas.ga.us">carnold@co.douglas.ga.us</a>
Stacy Gear	(770) 920-7235	<a href="mailto:sgear@co.douglas.ga.us">sgear@co.douglas.ga.us</a>

