

Integrated Multimedia GIS

for

Increased Situational Awareness

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Multimedia GIS Concept

Geographic Information Systems (GIS)

- Vector (points, lines, polygons) and associated tabular information
- Overhead imagery (satellite and airborne)
- Spatial analyses and visualization

Photo/Video Documentation

- Rich, vivid imagery (still and video)
- Myriad details captured quickly and efficiently

“Multimedia GIS” - Integrating GIS with Photo/Video

- iPix and RedHen technologies
- GeoCoding digital imagery...visualizing map features with imagery
- Increased situational awareness for field and HQ decision makers

iPix Technology Overview

**Create and interactively view 360° field-of-view
immersive images**



iPix Technology Overview

- Originally developed by DOE & the National Aeronautics & Space Administration (NASA)
- Tripod-mounted digital camera
 - Fish-eye lens
 - Attached Global Positioning System (GPS) unit
- Digital images acquired at various compass azimuths
- “Stitched” into a single, contiguous image



iPix Technology Overview



Integrate Imagery with GIS

- Imagery viewed within the context of other geospatial information
- Accessed via “hyperlinks”
- Navigate within the iPix image (zoom in/out, pan up/down, link to other iPix images)

iPix Concept of Operations

Pre-event documentation of assets and infrastructure

- Outside buildings
 - Strategic vantage points (ground and rooftop)
 - Emergency evacuation routes and assembly areas
- Inside buildings
 - Shelter-in-place areas
 - Hazardous chemical storage areas
 - Radioactive material storage areas
 - Key assets



iPix Demonstration

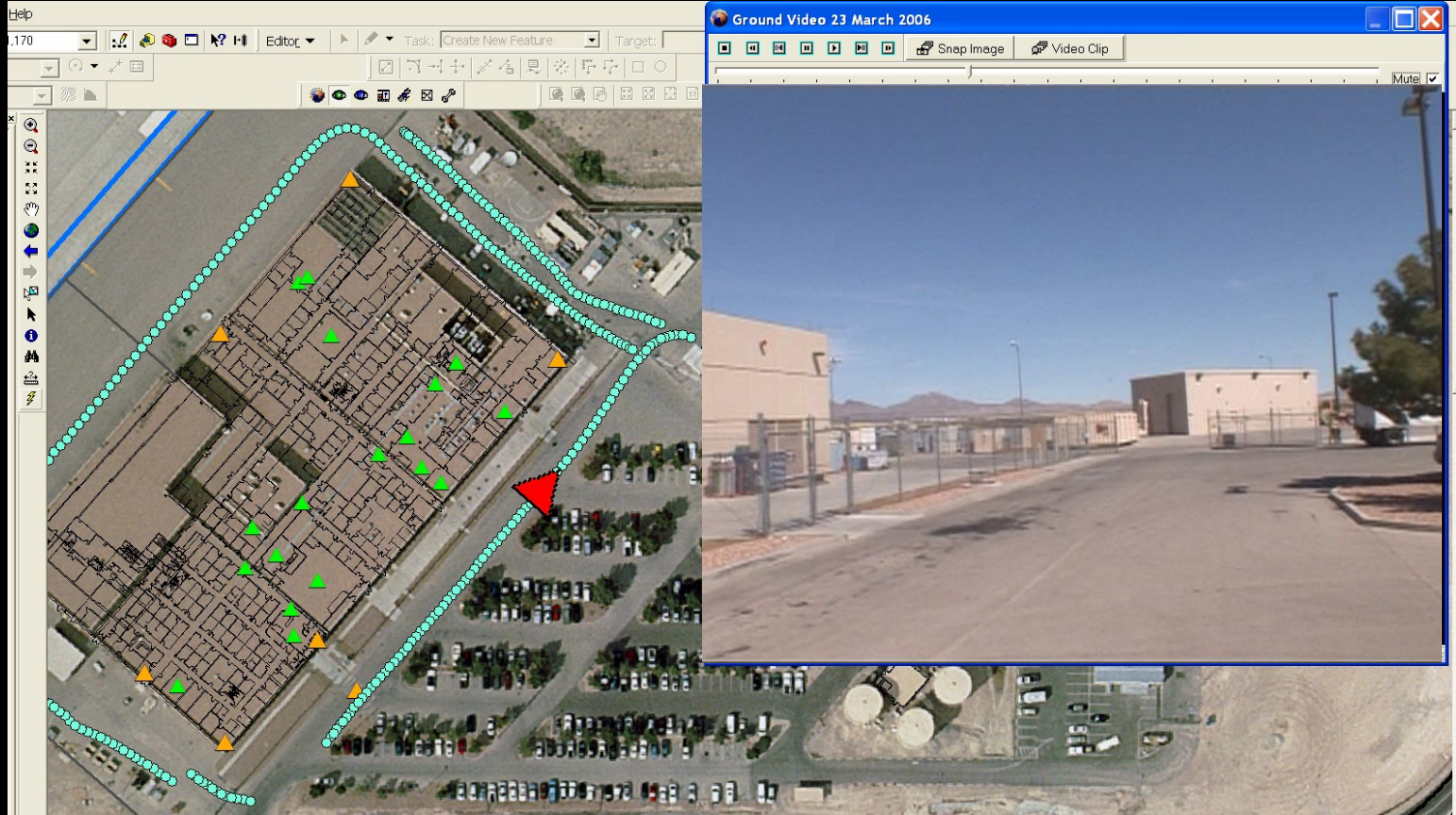
RedHen Technology Overview

Geospatially Encode Video

- Streams time, date, and GPS location data to corresponding video frames
- GPS data captured on one of the audio tracks
- Traditional audio (narration, etc.) can be captured on the other audio track
- Recorded onto DVD



RedHen Technology Overview



Integrate and view within GIS (ArcMap)

- Location extracted from audio track
- Written to shapefile (ESRI® GIS layer)
- Video location viewed within the context of other geospatial information
- Interactively play video associated with individual camera locations

RedHen Concept of Operations

Pre-event infrastructure documentation

- Facility/Complex perimeter, buildings, key assets/infrastructure, etc.
- Aerial
- Ground

Post-event documentation

- Aerial
- Ground
- Damage Assessments



RedHen Demonstration

Current Users

U.S. Department of Defense

- Defense Intelligence Agency
- Southern Command
- Central Command
- Special Operations Command
- Army Intelligence
- United States Marine Corps
- United States Air Force
- National Geospatial Intelligence Agency

U.S. Department of Homeland Security

U.S. Capital Police

Central Intelligence Agency

U.S. Geological Survey

Benefits of Multimedia GIS

Multimedia capabilities enhance GIS as a support tool for field and HQ decision makers

- Increased situational awareness and understanding
- Quicker and better informed decisions

Potential Applications

Emergency management & consequence assessment

- Pre- and post-event surveys
- Planning & preparedness
- Damage Assessments

Facility/Infrastructure documentation

Security (inspection & analysis)

Presentations/briefings

Public awareness

Orientation/training