The Challenge

Classifications

- LOCAL
- REGIONAL
- STATE
- NATIONAL

Public Preparedness

Coordination Complexity
State & Federal Involvement

Examples

- Minor Traffic Incidents
- Traffic Crashes
- Minor Load Spills
- Vehicle Fires
- Minor Train/Bus Accidents
- Accidents w/ Injuries

- Train Derailment
- Major Bus/Rail Transit Accidents
- Major Truck Accidents
- Multi-vehicle Crashes
- Hazmat Spills
- Some Casualties & Fatalities

- Train Crashes
- Airplane Crashes
- Hazmat Incidents
- Multi-vehicle Accidents
- Tunnel Fires
- Major Casualties & Fatalities
- Tornadoes

- Port/Airport Incidents
- Large Building Fire or Explosion
- Industrial Incidents
- Major Tunnel or Bridge Closure
- Terrorist Attack/WMD
- Floods, blizzards
- Transportation Infrastructure Collapses
- Extended power/water outage
- Large Riots
- Mass Casualties

Expected Event Duration

- 0 - 2 HOURS
- 2 - 24 HOURS
- DAYS
- DAYS
- WEEKS

Used with permission of the Maryland Department of Transportation

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TOWSON UNIVERSITY
Incident Scale and Complexity

- As emergencies “spin up” there is a need for more information and multi-agency coordination
- To effectively respond to incidents, first responders and decision-makers need …
  - **Data** – Information about the incident
  - **Tools** – A way to manage and interpret that data
  - **Interoperability** – A way to share knowledge
Maryland Model For Data Sharing

Turning Data Into Information

Turning Information Into Knowledge

Turning Knowledge Into Coordinated Action

Federal Applications (HSIN / DMIS)

Interoperability Backbone

Interoperability

Tools

Data

EMMA

Fire/EMS
Public Works
State Police
Environmental
Licensing
DHS
USGS
EPA

Law Enforcement
Health
Medical
Natural Resources
Planning

Transit
County GIS
Emergency Management
Transportation
Weather

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Value of Geospatial Data During Incident Management

- Adds a spatial component to the decision making process
- “Common Operating Picture”
  - A picture is worth a thousand words…
- Turns data into information
  - Map visualization
  - Location analysis
  - Report generation
EMMA © Functionality

- Identify an incident location
  - Field to EOC communication
- Generate a location report
  - EOC to field communication
- Visualize an incident location
  - Integrate multiple data sets into one view
- Analyze an incident location
  - Analyze an impacted area
- Coordinate resources
  - Real time, resource tracking
The Need for More Data

- Successful implementation of Incident Management Suite of Tools (September 2004)
  - EMMA Version 1.0 installed at MEMA
    - Accessed by local county EOCs
    - Available to State EOC representatives and MEMA staff
  - WebEOC installed with EMMA linkages for
    - Locating incidents by address or map click
    - Viewing all incidents statewide
    - Saving location reports and briefing maps for collaboration
  - Incorporation of over 40 map layers from publicly available sources
  - Leverage existing efforts underway in Maryland
  - Interoperable architecture
  - Non-intrusive
  - Finding, sharing, and integrating maps into the decision making process
  - Before, during, and after incidents
Addressing Barriers to Information Sharing and Integration

- **Information dispersal:** Best data is kept where it is used in daily business process
  - MEGIN documents the location, use-constraints, and accuracy of data

- **Pride of ownership:** Data owners fear that costly data may be leaked, misused, or modified
  - MEGIN provides a secure, non-intrusive structure for gradual, controlled sharing

- **Access to secure databases:** May be blocked, unknown, inaccessible, or destroyed
  - MEGIN provides tools to facilitate visualization and sharing of data to illustrate critical information

- **Timely and accurate integration of disparate data:** Multiple languages and cultures exist across the EM community
  - MEGIN provides a framework for documenting policies before an incident occurs, sharing a common operating picture during an incident, and creating a data backup after an emergency
Approach for Resolution

- Delivering the right **data**, at the right **time**, to the right **person**
- A new kind of GIS clearinghouse
  - Access to relevant information during emergencies
  - Automatic, controlled access to data
  - Allows backup to a secure off-site location
- Secure, intranet environment
  - Multiple tiers of security
  - Controlled access
- Optimized for first responders
  - Easy to use
  - Familiar language / terminology
  - Support collaborative decision-making and conversation across communities
# Project Timeline

<table>
<thead>
<tr>
<th>2003</th>
<th>2004</th>
<th>2005</th>
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<tbody>
<tr>
<td>AUG</td>
<td>SEP</td>
<td>OCT</td>
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<td></td>
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<tr>
<td><strong>Conception of Data Interoperability Model</strong></td>
<td><strong>EMMA Version 1.0 Development</strong></td>
<td><strong>WebEOC &amp; EMMA Deployed at State EOC</strong></td>
</tr>
<tr>
<td><strong>First EMMA Demo at Towson University</strong></td>
<td><strong>Emergency Access to EMMA during Isabel</strong></td>
<td><strong>EMMA Version 1.1</strong></td>
</tr>
<tr>
<td><strong>Public Safety Communications Interoperability Workgroup</strong></td>
<td><strong>Letter from Governor’s Office</strong></td>
<td><strong>DHS ITEP Grant Awarded</strong></td>
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**EMMA Version 1.2**

**MEGIN Development**

**MEGIN Operational**
Leveraging Existing Technologies

Lessons learned from MEGIN effort will be incorporated into MMRG

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Software Components

• Metadata repository with publisher and explorer
  – Modification of Maryland Mapping Resource Guide (MMRG) application
  – GIS Portal Toolkit (ESRI)

• Map Services
  – Identification and documentation of existing web services
  – Creation of selected new web services

• Map Viewer and Data Integrator
  – Emergency Management Mapping Application (EMMA)

• Rights Management
Technologies

• Data directory
  – Maryland Mapping Resource Guide catalog
    • Previously ESRI ArcIMS Metadata Explorer 4.0.2 / ArcSDE 8.3
    • Upgraded to ESRI Portal Toolkit / ArcSDE 9.0
  – MEGIN catalog
    • Built using same technology as upgraded MMRG

• User directory
  – Oblix CoreID
    • Authentication
    • Authorization
  – Oblix CoreSV
    • Map service security
    • Reporting / auditing
Maryland Emergency Geographic Information Network Conceptual Architecture

Client Domain

Web Client

User

Web Service Security

Remote Data Provider Domain

User Name
Password
Digital Certificate
Connection Information

SSL

IPSEC

Map Service

User Directory

IPSEC

Audit Logs

Data Sharing Policies

Metadata

Tables

Security

Tables

Web Service

Security

IPSEC

Audit Logs

Data Sharing Policies

Version 1.0.1
March 15, 2004

MEGIN Domain

Portal Home

Authenticated

Authorize
d

Publish Data

Search for Data

Search Results

Metadata

Security

Tables

IPSEC

SSL

IPSEC

User Name
Password
Digital Certificate

User Name
Password
Digital Certificate

User Name
Password
Digital Certificate

User Name
Password
Digital Certificate

Login Screen

User Name
Password
Digital Certificate

User Name
Password
Digital Certificate

Session Token

Search Results
Finding Data for MEGIN

• Communication
  - MSGIC outreach
  - Governor’s Letter - Survey Agencies (Oct – Nov 04)
  - Partnerships to raise awareness (MML / MACO)
  - TUGIS (MEGIN Data Sharing Booth)

• Information needed about
  - Map services
  - Data
  - People, websites, other

• Tools
  - MMRG Survey - for less sensitive information
  - MEGIN Survey - for more sensitive information

• Pilot connections
  - Existing web services (secure and non-secure)
  - Assistance with implementation of technology
Sharing Data is Key to Success

http://www.MarylandGIS.net

Stop by the MEGIN Data Sharing Center

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Benefits of MEGIN

Improving the decision making process before, during, and after emergencies

- **Access**
  - Providing emergency personnel with the information they need, when they need it most

- **Coordination**
  - Bridging multiple disciplines across jurisdictional boundaries at all levels of government

- **Security**
  - Protecting sensitive information for those who need to know
Questions & Feedback

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Please participate!
http://www.MarylandGIS.net