
# Toward the Next Level of GIS for Emergency Management (EMMA)

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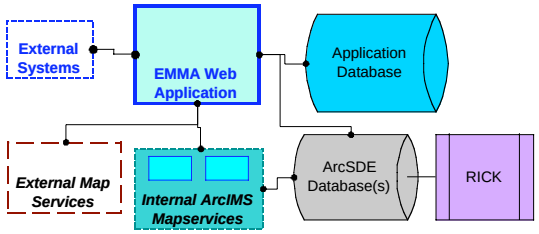
# Presentation Overview

- Emergency Management Needs
  - Data and tool interoperability needs
- Quick System Overview
  - Functionality
  - Integration
  - Architecture
- Enterprise System Strategies
  - Application Development Strategies
  - Real-time Data Strategies
  - Configuration Strategies
  - Expandability Strategies

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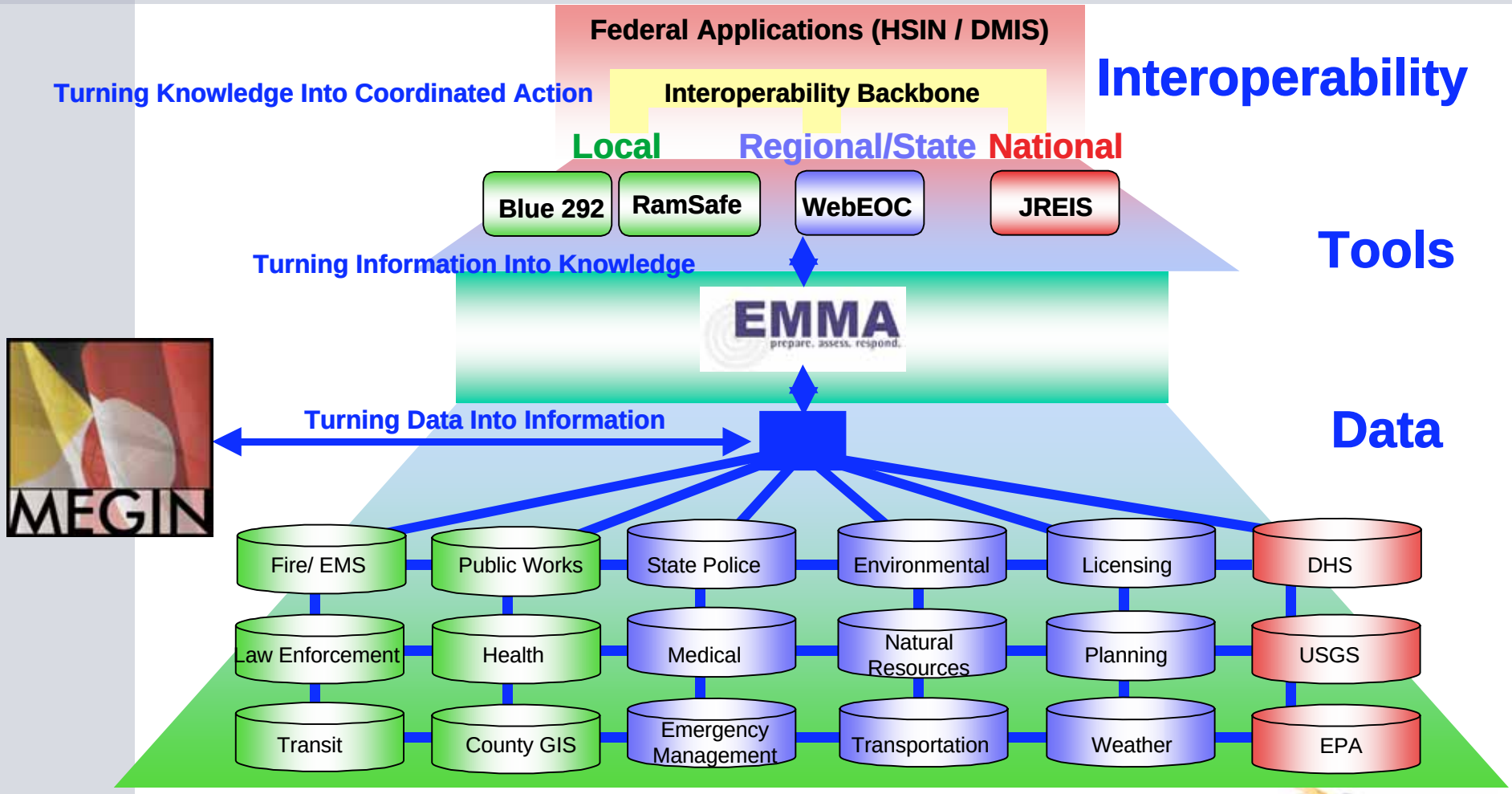
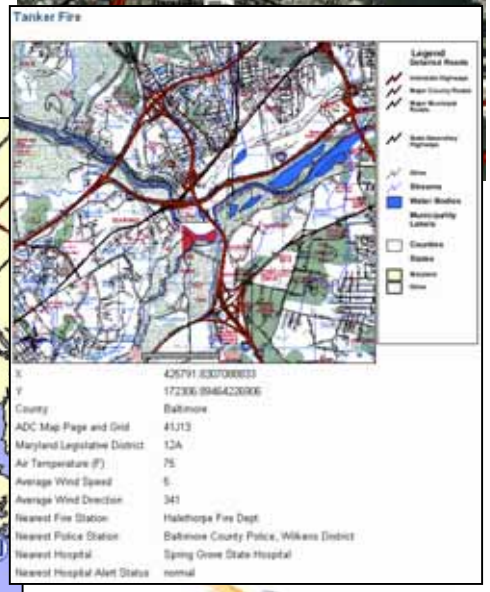
# Maryland's Model for Emergency Management Data Interoperability



# High Level Look at 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 data
  - Resource tracking

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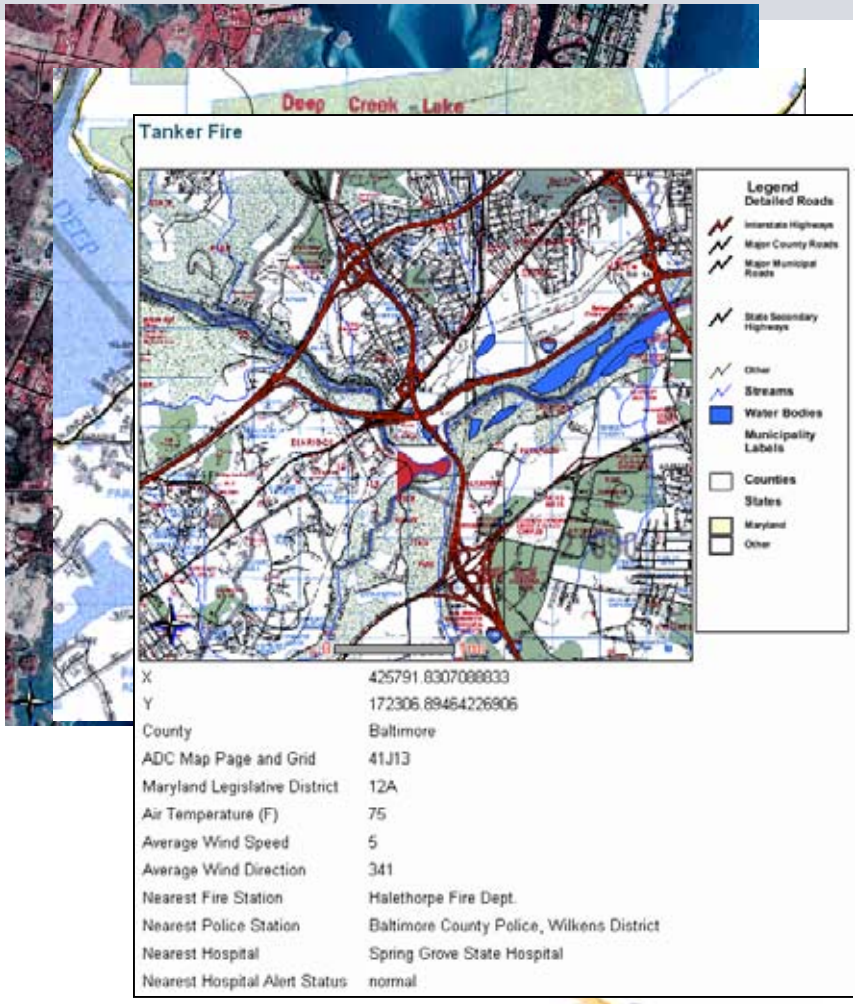
# How does EMMA Relate to Incident Management Software?

- Acts as the spatial component of the decision making process
- Common Operating Picture
  - A picture is worth a thousand words…
- Turns data into information
  - Map visualization
  - Location analysis
  - Report generation

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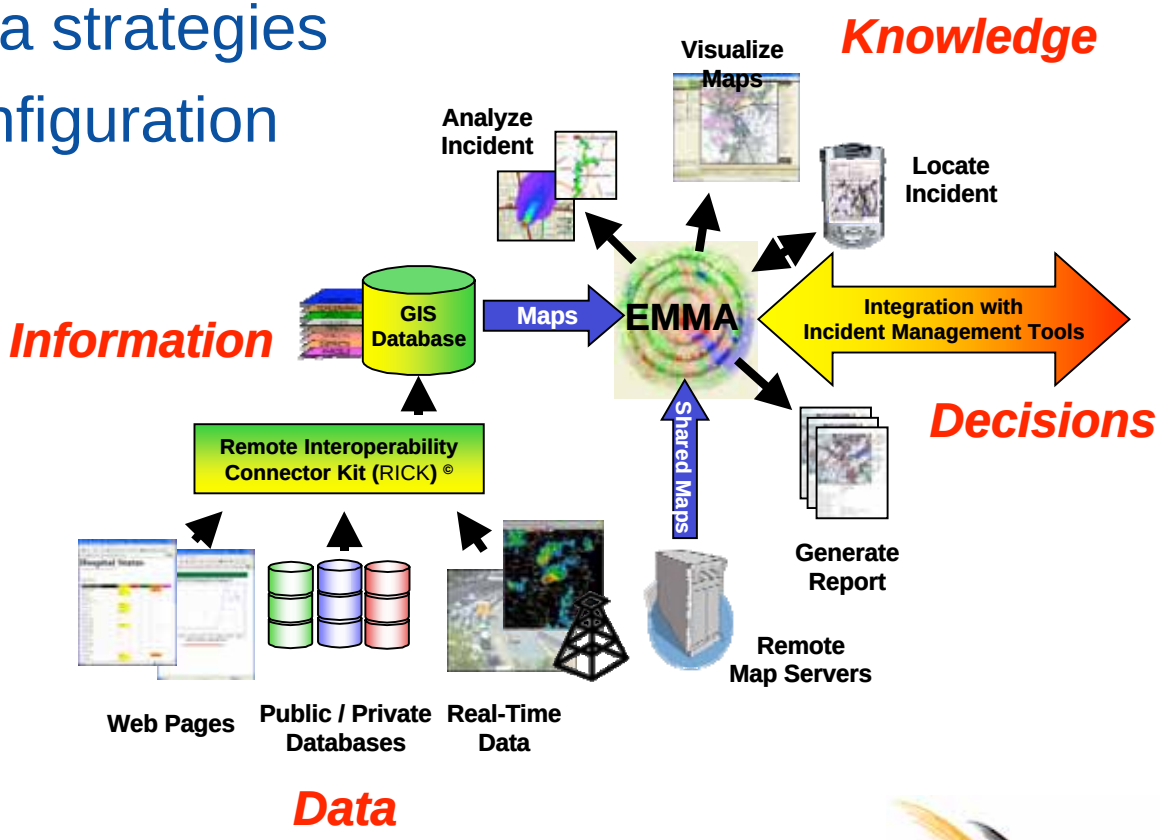
# Enterprise Architecture Optimized for Emergency Management

- Server-side processing
- Real-time data strategies
- Simplified configuration
- Expandability

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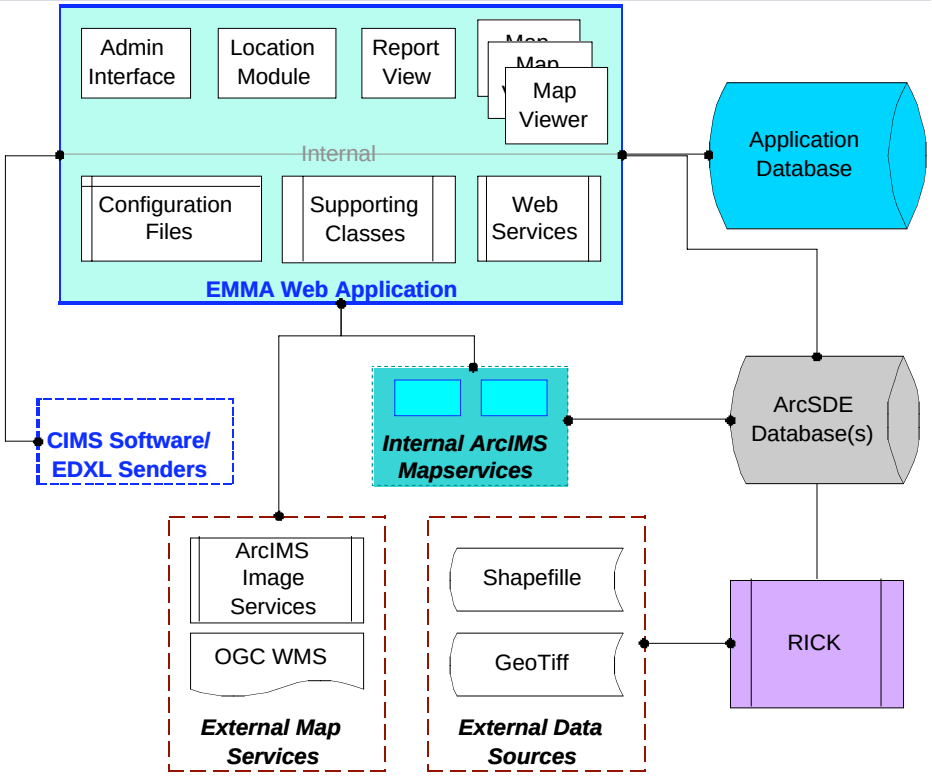
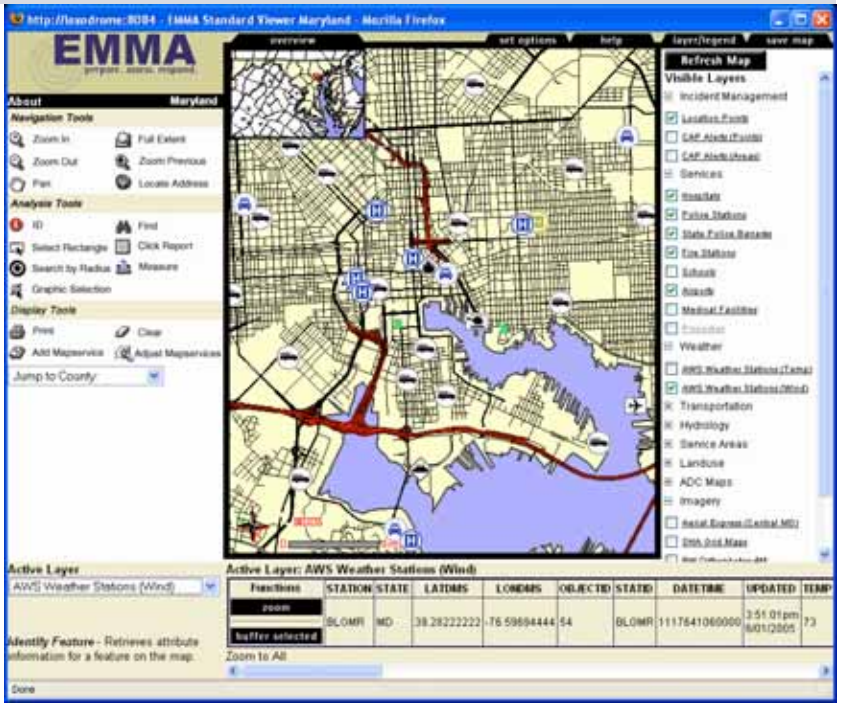
# High Level Architecture of the Enterprise System

- Application
  - Admin interface
  - Location Module
  - Viewers
  - Report View
  - Supporting Classes
  - Web Services
  - Configuration Files
- Map services (internal and external)
- Application database
- ArcSDE Databases and other GIS data
- Remote Interoperability Connector Kit (RICK)



# EMMA Core Web Application (User Interaction)

- Map Viewer(s)
  - Navigation tools
  - Analysis tools
  - Display tools
    - (set refresh rate)
    - (add map services)
- Location Module
  - Create features through form into ArcSDE
- Admin Interface
  - Viewer resources
  - Update incident data
- Reporting Mechanism

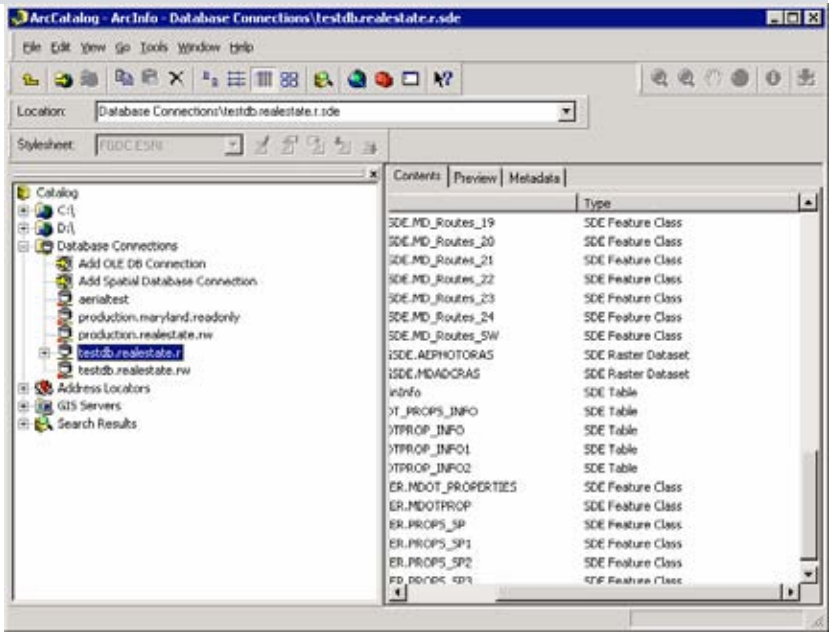



# Application Development Strategy (Java Web Application)

- Server-Side Processing
  - Lightweight
    - Code is compiled on a server and HTML is sent to browser, keeping the page lightweight on the client-side
  - Secure
    - Clients can't see code or connection information
  - "Easy" to customize (if you know what you're doing!)
- Many Java libraries are available for a multitude of useful functions.
- Possible to integrate many types of functions
  - Web services
  - Context Listeners and Section Filters
  - Direct integration of custom libraries
  - Ability to build custom security in several ways
  - Ability to securely contain configuration files

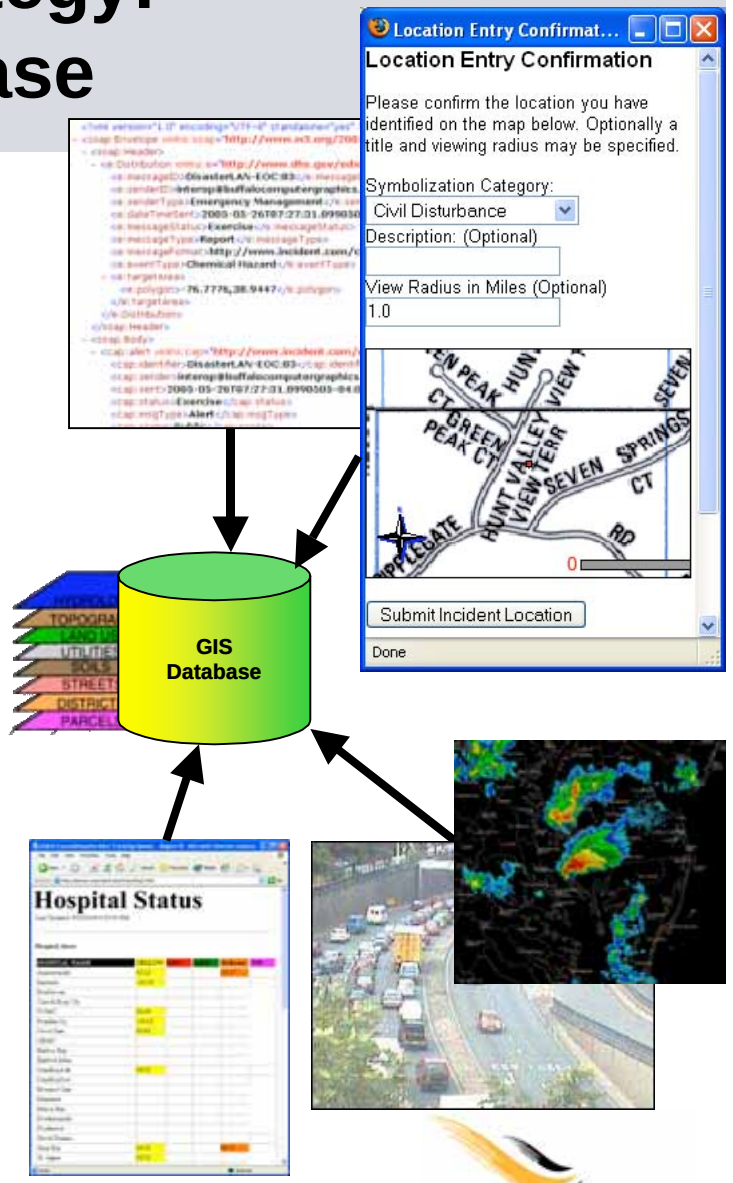
# Real-time Data Strategy: ArcSDE as Database Engine

- Dynamic updates of data
  - Attribute level data updates
  - Spatial data updates
- Related data table options
- Indexing flexibility
- Robust security options
- Performance advantages (Tuning Required)
- Consistent with RDBMS management techniques
- Flexibility for backups



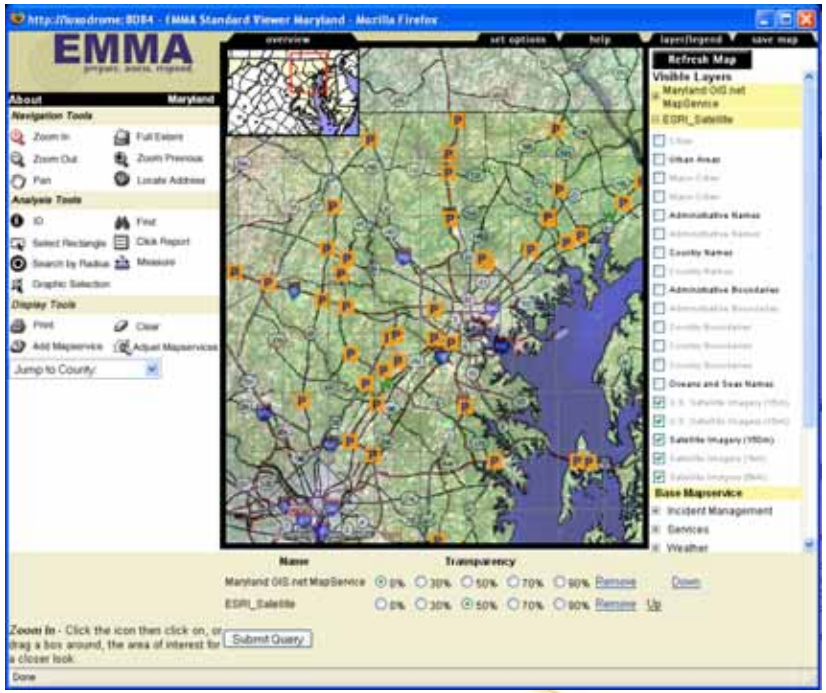
# Real-time Data Strategy: Populating Database

- Dynamic creation of emergency management spatial data
  - Identify incident locations
  - Receive CAP alerts (via EDXL)
  - Specify emergency resources (i.e. shelters)
- Scheduled updates of diverse data via RICK (Remote Interoperability Connector Kit)
  - Complete layer harvesting
  - Scraping data from existing sources (HTML, Text, XML)



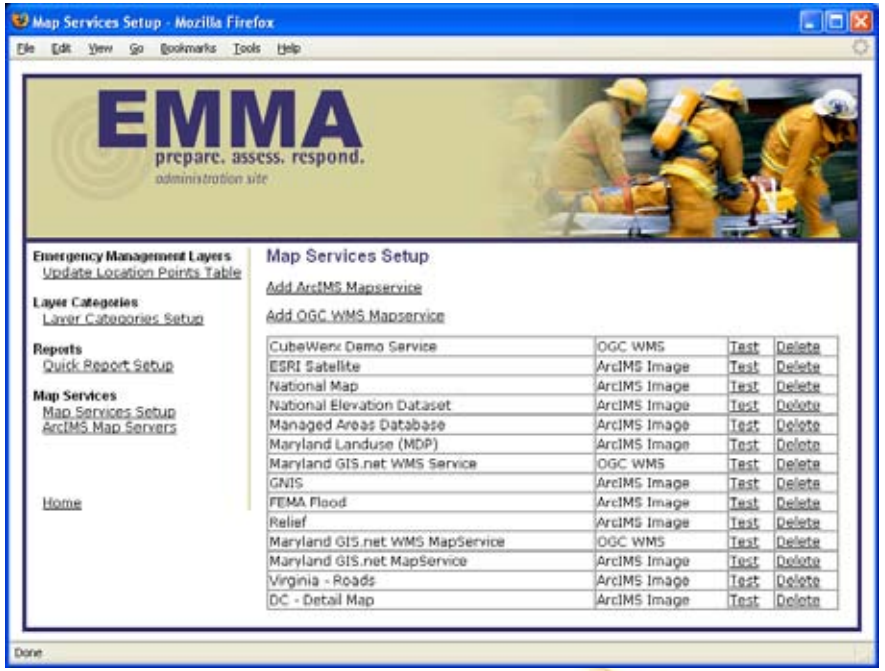
# Real-time Data Strategy: On the Fly Access to External Data

- Current Map service integration
  - ArcIMS services
    - Image services
  - Open Geospatial Consortium, Inc. (OGC) Services
    - Web Map Services (WMS) standard
- Future Map service integration possibilities
  - ArcGIS services
    - ArcGIS SOAP image services
  - ArcIMS services
    - Feature services
  - OGC Services
    - Web Feature Services (WFS) standard



# Configuration Strategy

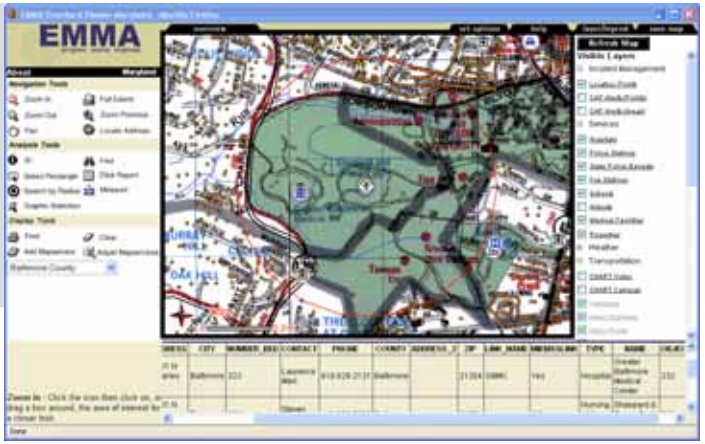
- Property files
  - Streamlined installation / configuration
  - No need to modify code
- Application database manages:
  - Reports
  - Layer categories
  - Map service connection information
  - Admin System for database modification
- Style sheets
  - Flexible design



# Expandability Strategy

- Built for multiple viewers
  - Standard Viewer(s)
  - Basic Viewers
  - Mobile Viewers
- Modular approach
  - Uses a flexible collection of core libraries
  - Utilizes XML Web Services (Service oriented architecture)
    - To perform regular functions
    - To allow access from other applications
- Incorporates layer metadata (FGDC)
  - Abstract view
  - Full document view
- Incorporates data layers that have a database relation to Incident Management software
  - Incident locations, shelter status, etc.
  - These layers can be administered via Web interface

# Questions?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