



EMMA: The Emergency Management Mapping Application

The Emergency Management Mapping Application (EMMA) developed by the Towson University Center for Geographic Information Sciences (CGIS) is a secure, Web-based mapping application that enables the emergency management community to display relevant information before, during, and after an incident occurs. Built upon ESRI's ArcIMS software, the platform has an open architecture and includes features that enable the emergency responders to identify incident locations from the field, generate location-specific reports, visualize incident locations via a map, perform site-specific analysis, and coordinate response efforts. Using a simple Web browser, such as Internet Explorer, EMMA provides basic and advanced tools for map visualization, location analysis, and report generation.

EMMA'S PRIMARY FEATURES

Here's a more detailed look at the important tools EMMA offers.

- **Identification of Incident Location**

The Incident Location Identification data entry tool provides responders with the ability to enter an incident location using GPS data (latitude, longitude), a street address, or a point identified on a map. Descriptive information can then be associated with the location and submitted to a database. This tool can be accessed from any Web accessible device, including small, wireless devices with limited screen resolution (240 X 320).



- **Creation of Location Report**

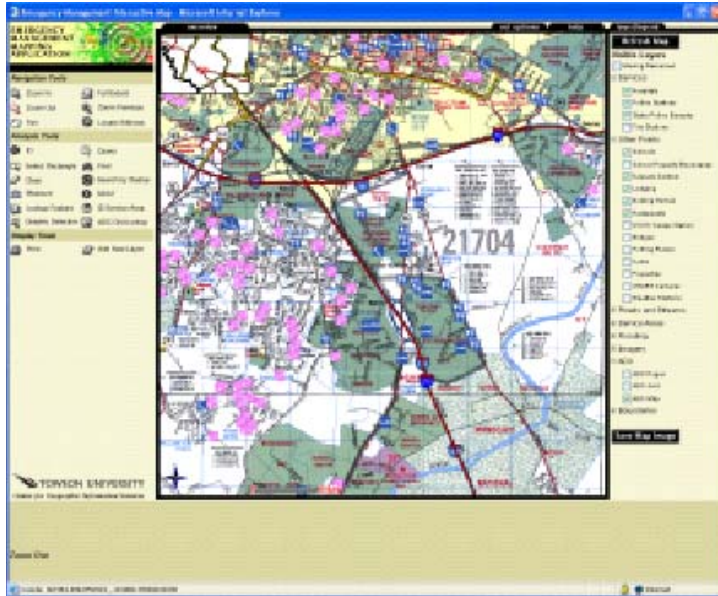


Once an incident location has been identified, the Location Report function provides the ability to generate a summary of key geographic features of the location. In addition to a map, the report can be customized to include nearest features (e.g., police stations, schools, hospital, fire departments), location reference (ADC map grid, congressional district), and real-time data (weather conditions). Contents of this report can be archived to a database and sent to predefined e-mail addresses or location-specific e-mail addresses (such as fire stations within two miles of the incident).

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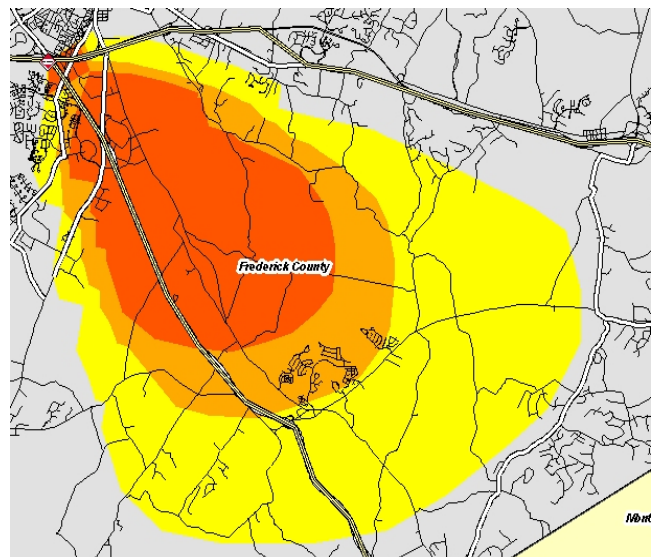
- **Visualization of Incident Location**

EMMA provides a full suite of online GIS tools that enable users to understand the geographic context of an incident. Map layers within EMMA can include publicly available data (e.g., political boundaries), state agency data (roads), local government data (aerial photography), and licensed data (ADC digital maps). EMMA can also provide links to external data that are provided in real-time (stream flow, traffic cameras, weather) as well as map layers that are based on external databases (County Hospital Alert Tracking System, NEXRAD weather). Each of these data layers is accessed using a variety of map navigation tools (pan, zoom in/out), analysis tools (buffering), and display tools (map layer visibility).



- **Spatial Analysis of Affected Area**

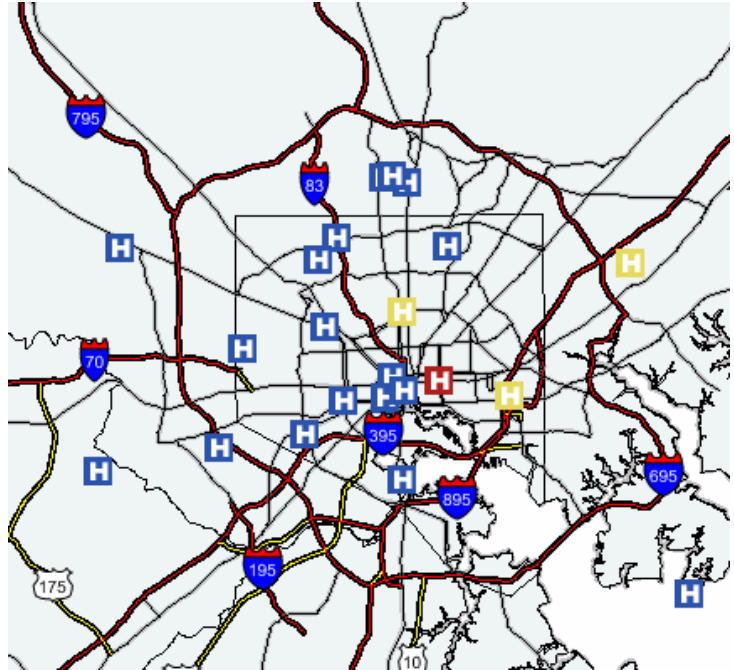
Using EMMA's analysis tools, users can answer key spatial question about an incident location. Using a combination of buffering and selection tools, questions such as "What areas are at risk?", "Which roads are affected?", and "Whose properties are affected?" can be answered in minutes.



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- **Coordination of Response**

Real-time location data can be viewed on a map using EMMA. This may include mapping the location of people or vehicles as they move, or the availability of hospital beds as hospital status changes. Among the many controls within the EMMA interface are tools that control how frequently the map is refreshed and new location data are shown.



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EMMA'S TECHNICAL FEATURES

- **Open Architecture**

EMMA's modular system architecture, developed with JavaServer Pages (JSP), upon ESRI's ArcIMS software (<http://www.esri.com/arcims>), allows for flexibility and expandability. As the demand for maps increase, multiple servers can be utilized for both database and application scalability. EMMA incorporates the Open GIS Consortium (OGC) Web Map Services (WMS) standard, which is an XML- and URL-based schema for providing and retrieving map services across multiple platforms.

- **Connection to other Systems, and Tools for Data Exchange**

1) EMMA offers multiple ways of accessing spatial data.

- On-demand access to remote map services, based upon the Web Map Services standard
- Capabilities to import and display real-time data for dynamic map display using EMMA import tools.
- Open architecture that supports secure access to remote ArcIMS map services
- Ability to link to externally maintained Web pages (HTML) containing real-time content

2) Currently, EMMA offers a location identification tool that enables users to identify incident locations on a map. Once identified, this information can be passed to any applications utilizing the Disaster Management Interoperability Services (DMIS) backbone. For more information about DMIS, visit <http://www.cmi-services.org>. Future versions will offer a location tool that can plot an area of impact for view and analysis.

3) By selecting a specific incident, location-specific maps can be launched that show relevant geospatial information. Incident-specific maps can also be created by receiving incident information passed through the DMIS backbone

4) EMMA can export geospatial information about an incident via the DMIS backbone, including maps and spatial reports generated using EMMA reporting tools, for consumption in external applications.

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