Leveraging Geospatial Technologies for Analysis, Decision Support, and Information Dissemination for Natural Disasters and Hazards

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Ninth United Nations Regional Cartographic Conference for the Americas
New York, 10-14 August

Why Web-based Geospatial Technologies?

Integration of disparate databases that cannot normally “talk” to each other
- Flexible
- Fast
- Easily expandable
- Open

Data Dissemination
Modeling
Collaboration

Analytical
- Proximity Analysis
- Performance Monitoring
- Metrics Analysis

Enhanced Management by Exception
- Automated alerts

Real-time information
- Weather
- Traffic
- Sensors
- Asset location
Fixed and Mobile Asset Management -- Web-based Geospatial Technologies

- Allows analysis beyond simply showing "dots on a map"
- Relate shipments/vehicles with other shipments (GPS, RFID), fixed assets, infrastructure
- Relate shipments with high risk features/zones, weather, traffic, construction
- Optimize routing of shipment movements

Example Geospatial Application - IRRIS

- Developed as a data integration, data sharing tool to help deal with variety of disparate datasets in an agency and across agencies.
- Focus is on Asset Tracking and Asset Intelligence
- IRRIS tracks assets globally on road, rail, and ocean. IRRIS also reports on asset utilization.
- Went into production in 1999
- Includes variety of real-time feeds including weather, camera feeds, traffic conditions.
- Has over 400 layers of infrastructure, environmental data, real time feeds, etc.
- Default logistics geospatial portal for US DOD, FEMA
IRRIS - Capability

Role based, secure access  
Highly secure  
Robust mapping  
Map markup and annotation  
Map and query saving, sharing  
Cargo & Vehicle tracking  
Fixed Asset Status tracking/reporting  
Integrated Charting and data analysis  
PDA support for mapping, alerting, and query

IRRIS - Capability

Dynamic Geofencing  
Alert/Notification  
Point-to-Point routing for emergency personnel or evacuation  
Incident generation, reporting, alerting  
Shipment performance monitoring  
HAZMAT Plume modeling  
Advanced geospatial query  
Integrated PowerPoint builder  
Export to PDF, Excel, PowerPoint and other common formats
Multiple Stakeholder Integration Tool

- Local...
  - Environmental
  - Energy
  - Agricultural
  - Emergency Response
  - Infrastructure
  - Hospital

- International, Federal and State, Local Agencies...
  - Disaster Management
  - Transportation
  - Military
  - Cities
  - Regions

- Commercial/Private
  - Utilities
  - Supply Chain
  - Risk Management

Mobile and Fixed Asset Intelligence
ISO has grouped supply chain goods into logistic unit hierarchy. Objects in each layer are handled differently and have different requirements for each part of the supply chain. Necessitates different requirements for each layer.

Layer 0: Item
- Barcode
  - Passive
    - Very short range (1ft)
    - Ultra Low cost
    - Read only
  - Active
    - Long range (300+ft)
    - High metal environment
    - Omni directional
    - Real Time Assured Data
    - Sensor / Security enabled
    - Affordable
- Passive RFID
  - Short range (3-15ft)
  - Lower cost tags
  - Read/write
  - Non line of sight
- Layer 1: Packaging
- Layer 2: Transport Unit
- Layer 3: Unit Load
- Layer 4: Container
- Layer 5: Movement Vehicle
  - Satcom/GPS
    - Line of sight
    - Global location
  - Active RFID
    - Long range (300+ft)
    - High metal environment
    - Omni directional
    - Real Time Assured Data
    - Sensor / Security enabled
    - Affordable

**The Right Tracking Tools**
Management By Exception

- Profile Sensors for “Normal” operation
- Tracking not “ALL” sensors, but only the ones that are not performing as profiled.
- Sensor data in relation to operational awareness and impact on “Total Asset Visibility and Performance”

What impacts business processes

- Slow traffic
- Temperature, Humidity
- Unauthorized stops
- Leaving an area/route
- Entering an area
- Height
- Weight
- Pressure
- Capacity
- Performance
- Predictive performance - notification of non performing assets
Summary

Geospatial Logistics technologies allow decision support beyond “dots on a map”
- Integrate data from different sources, different modes, different formats
- Integrate shipment data with sensitive areas, high risk areas, populations, urban areas, infrastructure

Management by exception approach allows the important information to be brought to attention.

Provides multi-use return including security, incident management, and environmental monitoring.
Questions