



Geography, the physical aspect of cyber

Wojtek Gawecki, Esri

PSCE Meeting, Paris, Nov 25 – 26, 2014

Cyberspace Re-Considered

It's Mappable

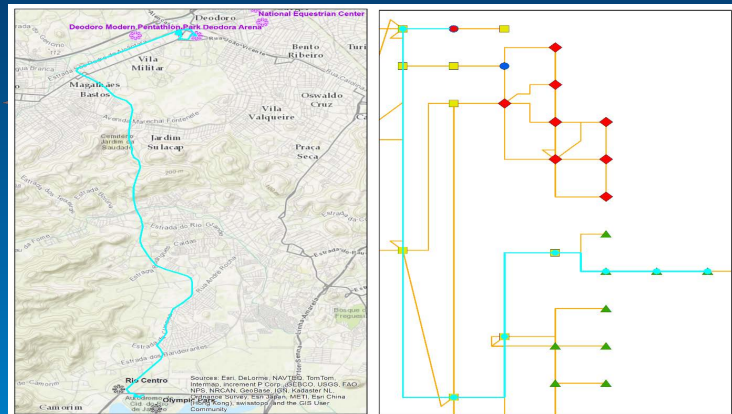
Social / Persona Layer

Device Layer

Logical Network Layer

Physical Network Layer

Geographic Layer

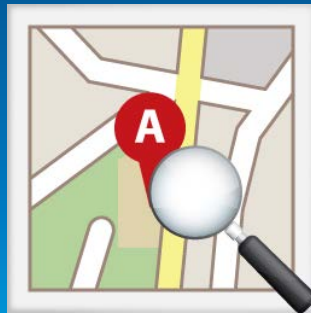


- Each device in cyberspace is owned by someone
- Electro-mechanical devices exist in space-time and interact with physical events
- Geography is required to integrate and align cyberspace with other data

Critical Infrastructure

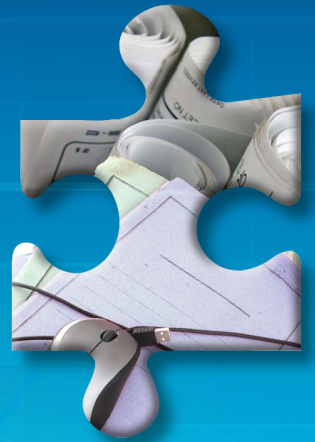


Frequently Failing To Connect The Dots





What's going on
right now?



CI Protection

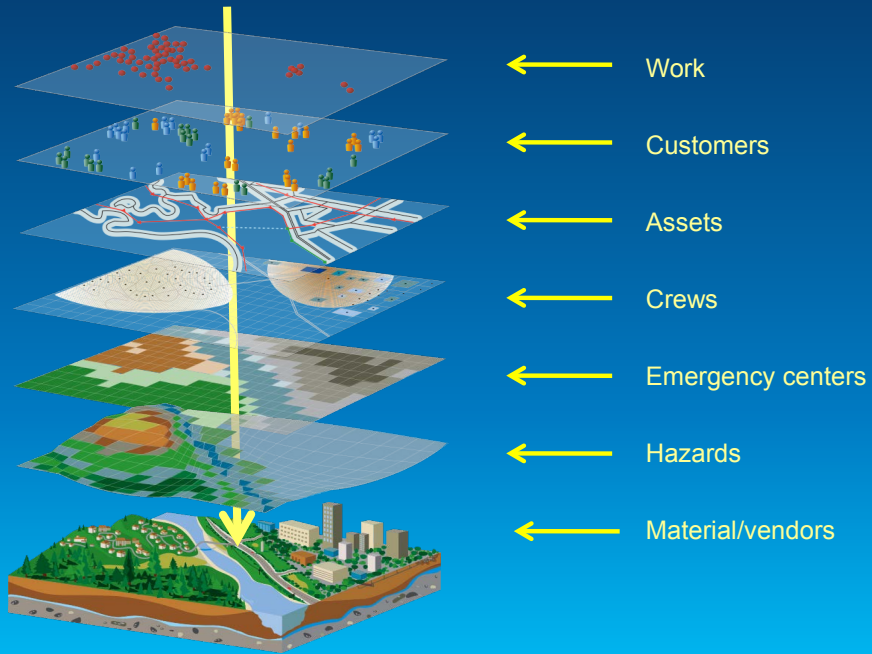


Challenges

- What?
- Where?
- When?
- How?
- What does it mean?
-

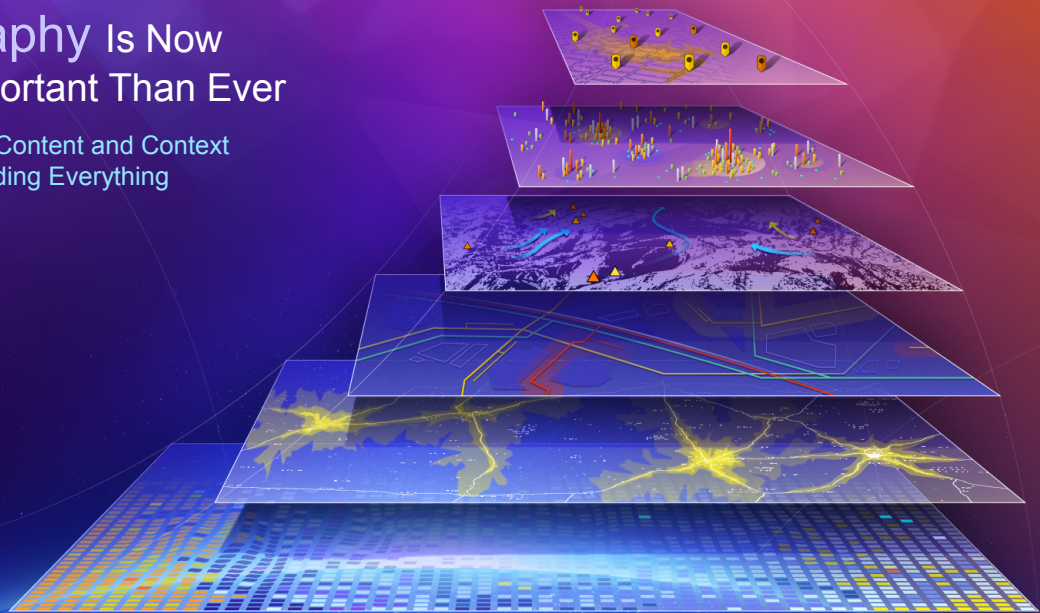


Location – the Common Denominator



Geography Is Now More Important Than Ever

Providing the Content and Context
for Understanding Everything



Web GIS Leverages Advancing Technology

In Measurement, Computing, and Networks

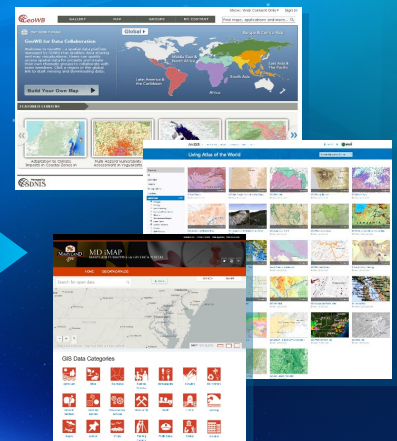


Web GIS Integrates All Types of Information

Web Maps
and Services

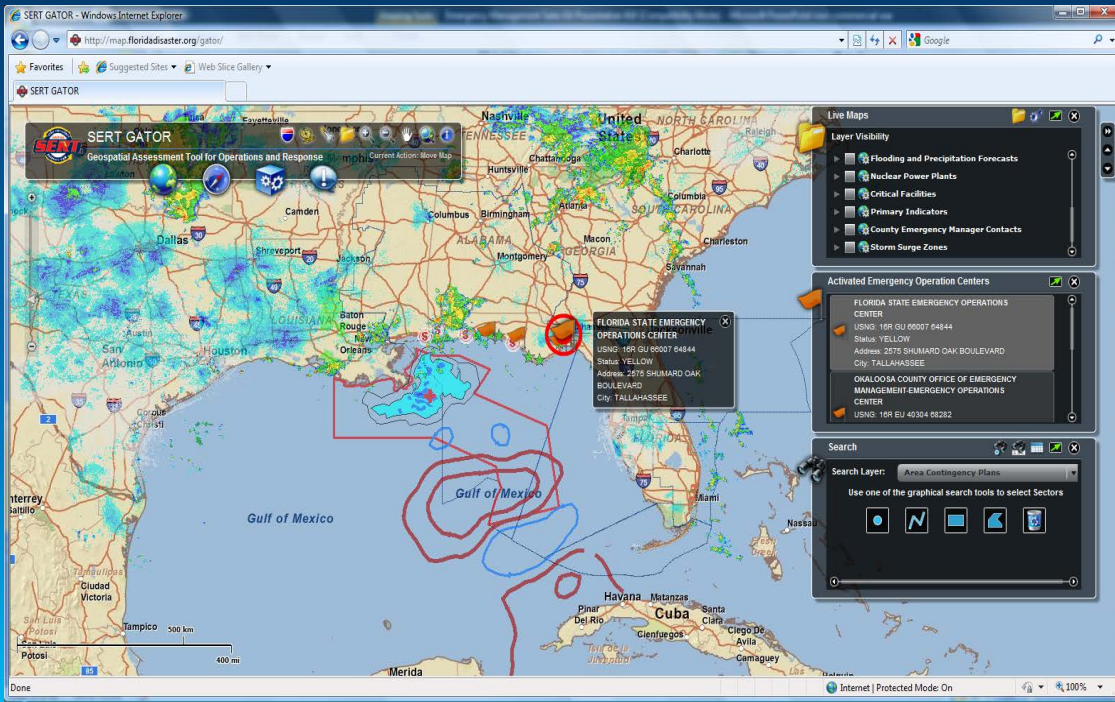


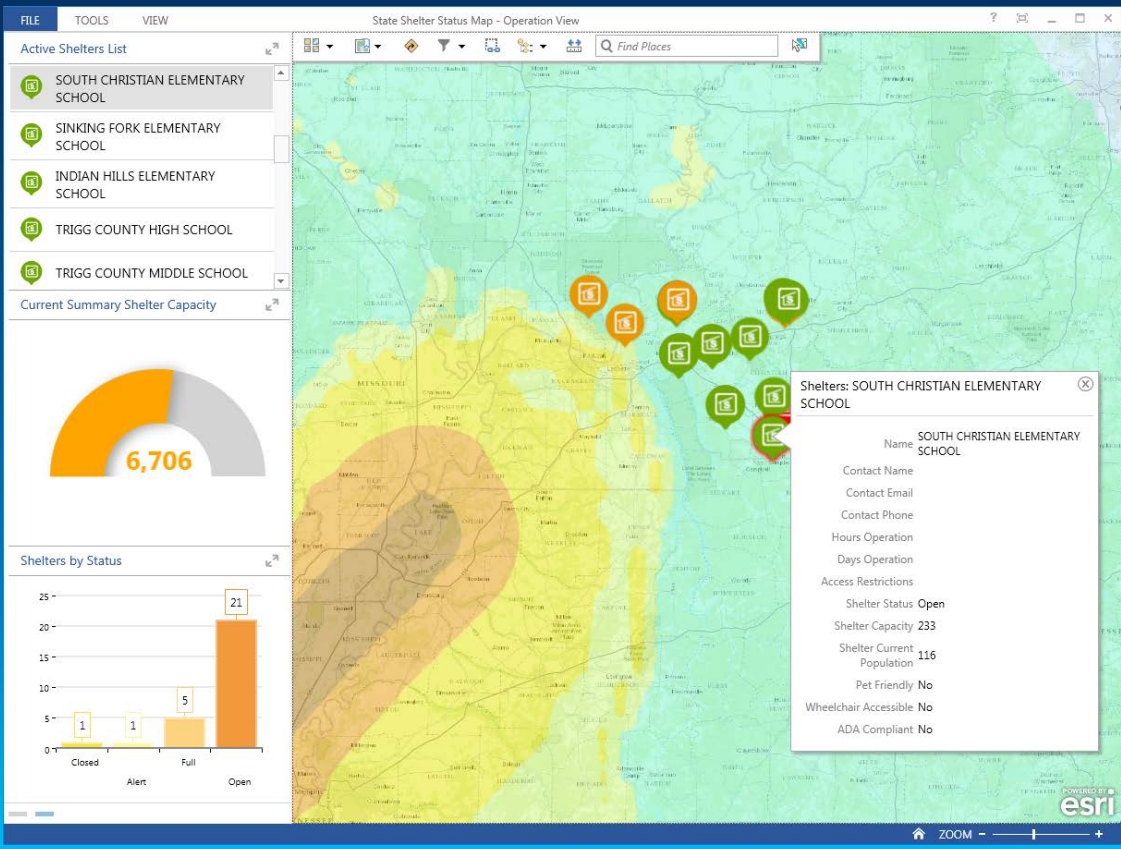
Portal



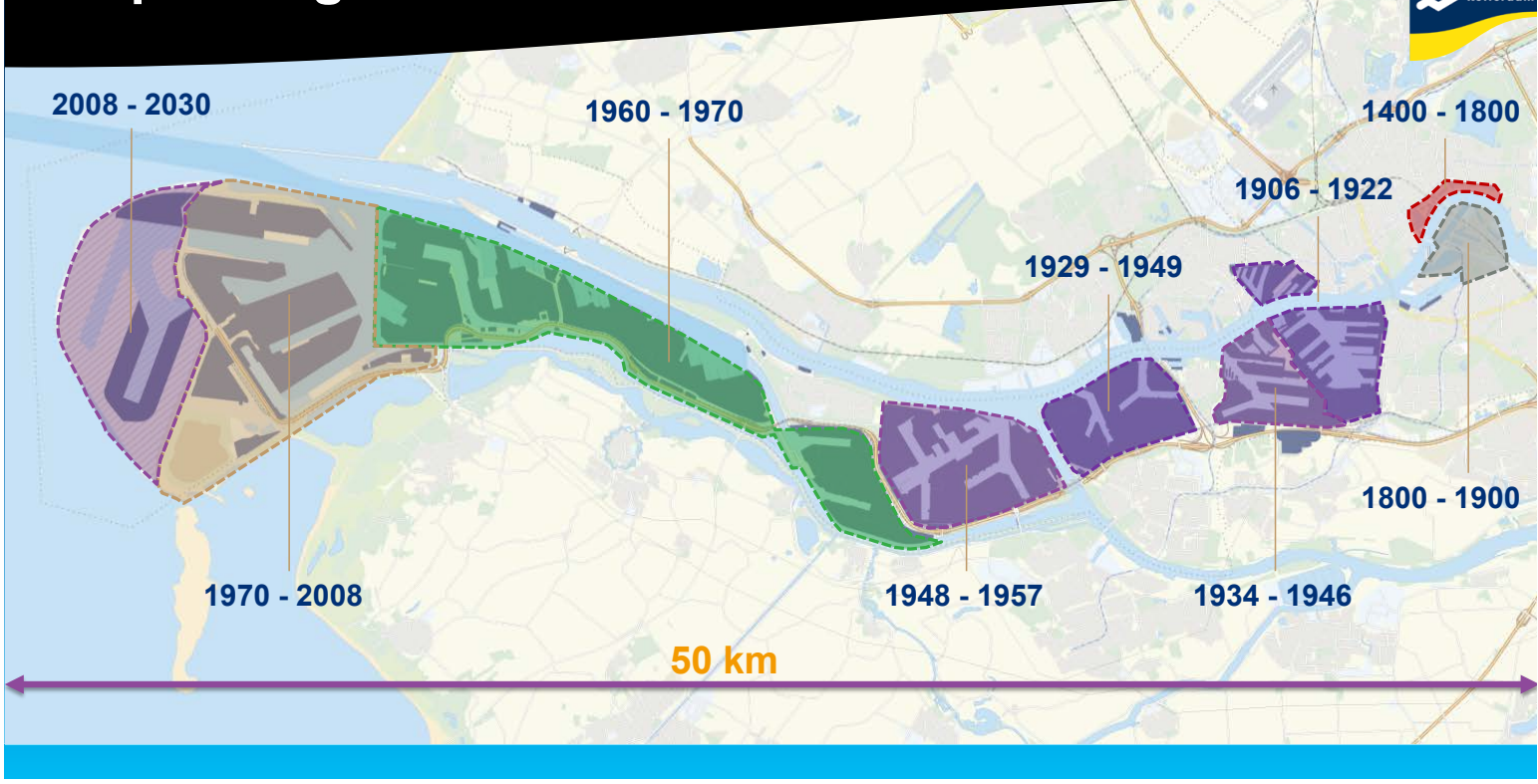
Both Internally and on the Open Web

Common Operating Picture

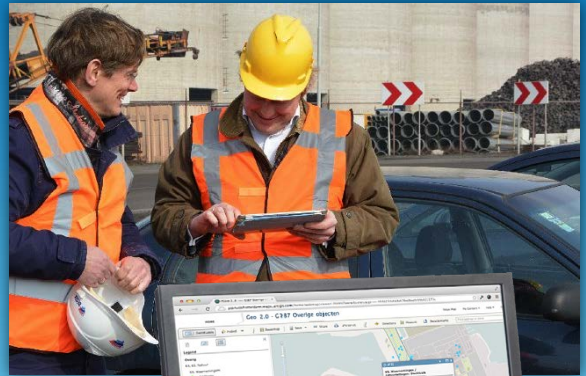
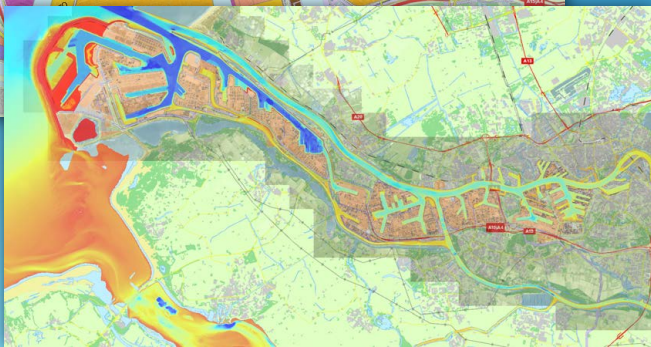




Expanding the Port



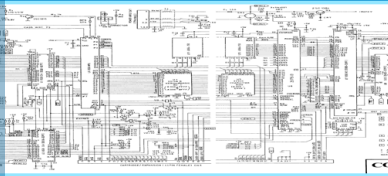
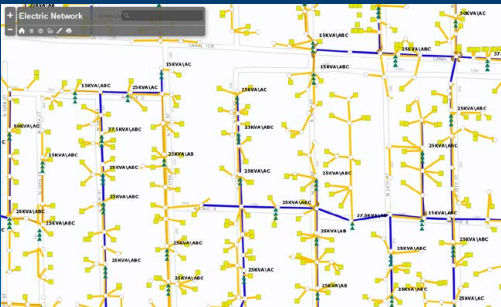
PortMaps in action



The Geographic Approach



Preparation – Know Your System

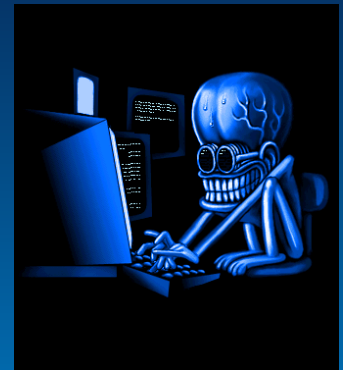
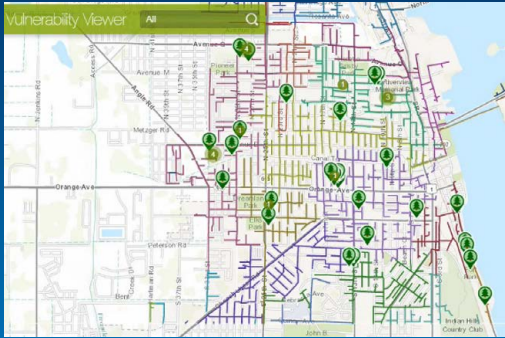


Data Management – Operationalize Plans

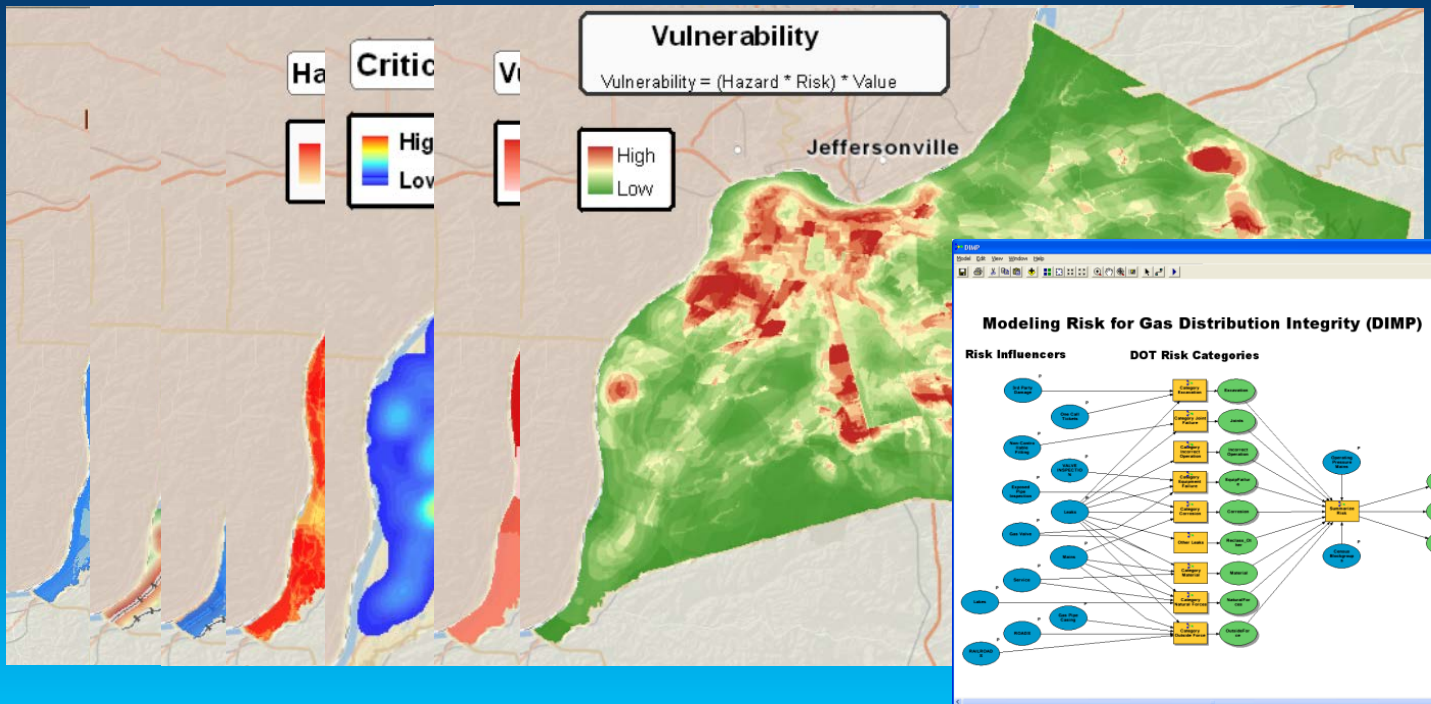
The screenshot displays a web-based interface for managing operational plans. The main window is a Microsoft Internet Explorer browser showing a Google Maps view of a city grid. Overlaid on the map are several key components:

- Common Operational Picture:** A header bar at the top of the map area.
- Map Content:** A sidebar on the right containing a 'Local Map Layers' list with checkboxes for 'Incidents', 'Hospitals', 'Operations', 'Road Blocks', and 'Traffic Cam's'.
- Operations:** A sidebar on the right listing tasks such as 'Staging Area 2', 'TEST TEST TEST', 'Test for Hydrants and Self', and 'test from agg mobile 4 - staging area'.
- Manual Entry:** A window in the bottom left corner with a 'File' menu and a list of entries, each with a 'Migration message' and a 'Page ID'.
- City Security:** A red poster with the text 'CITY SECURITY' and an image of a city building.
- Thumbnail Gallery:** A grid of small images in the top left corner, with a 'Click Thumbnail to Display the Full Sized Image' instruction.
- Floor Plan:** A detailed architectural drawing on the right side of the interface.
- Document:** A document titled 'MAJOR EMERGENCY PLAN OF OPERATION' by 'AnyTown Energy', with the subtitle 'Procedures for Restoration following Emergency Declaration'.

Preparation – Identify Threats



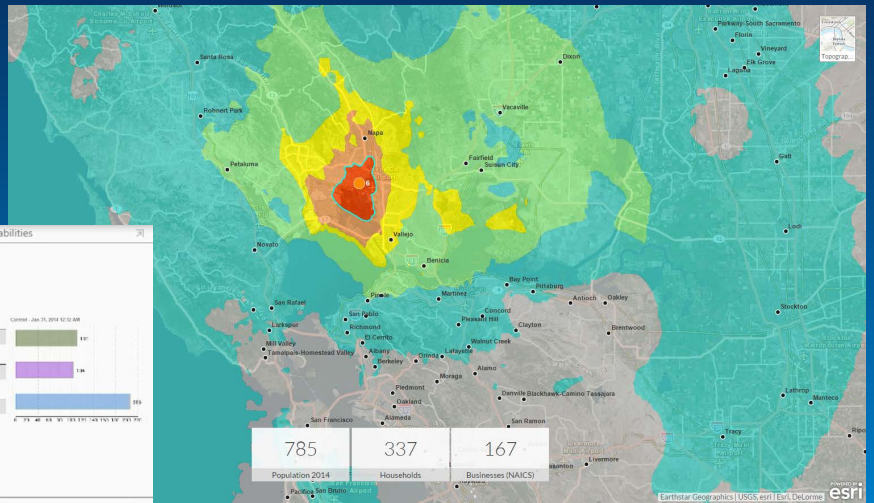
Preparation – Vulnerability assessment



Response



Response



Incoming Attacks by Country

China	287
Croatia	16
Czech Republic	15
France	54
Greece	16
Italy	19
Japan	45
North Korea	96
Syria	15
Turkey	14
UK	34
Unknown	198
USA	159

Rio - Cyber Operational View

Device Vulnerabilities

Microsoft	110
Oracle	104
IBM	208

Attack Surface

Known Attack Surface	211
Potential Attack Surface	5,918

Intrusion Detection System (Scanning...)

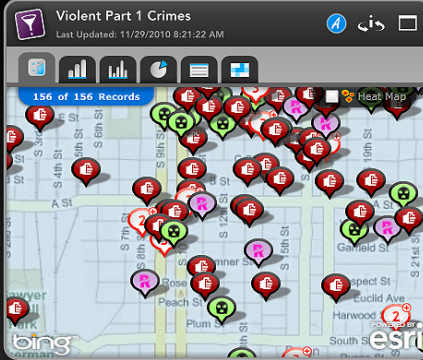
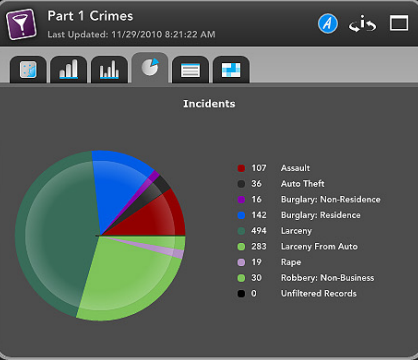
***Alert* - Endpoint Security**
Alert: XYZ malware detected on host 192.168.124.168

Cyber Query Widget
 Search for Vulnerability
 Search for Building (by name)

Vulnerability Type

Microsoft	197
Oracle	182
IBM	197
Other	19

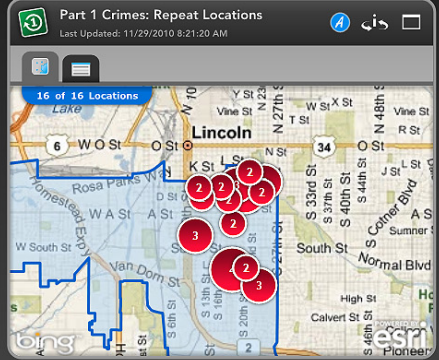
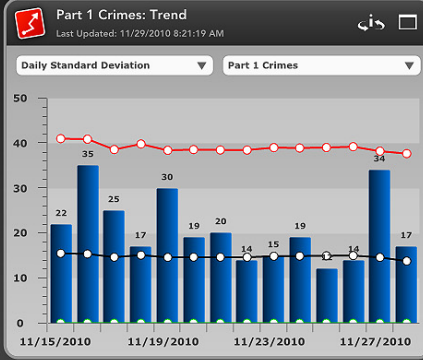
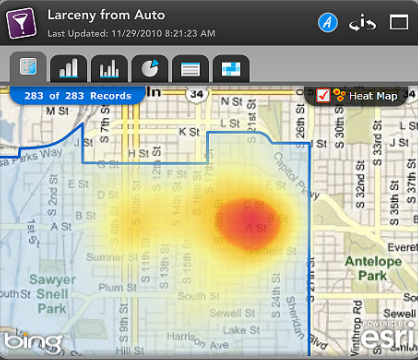
785 Population 2014
 337 Households
 167 Businesses (NAICS)



Burglary

Last Updated: 11/29/2010 8:21:22 AM

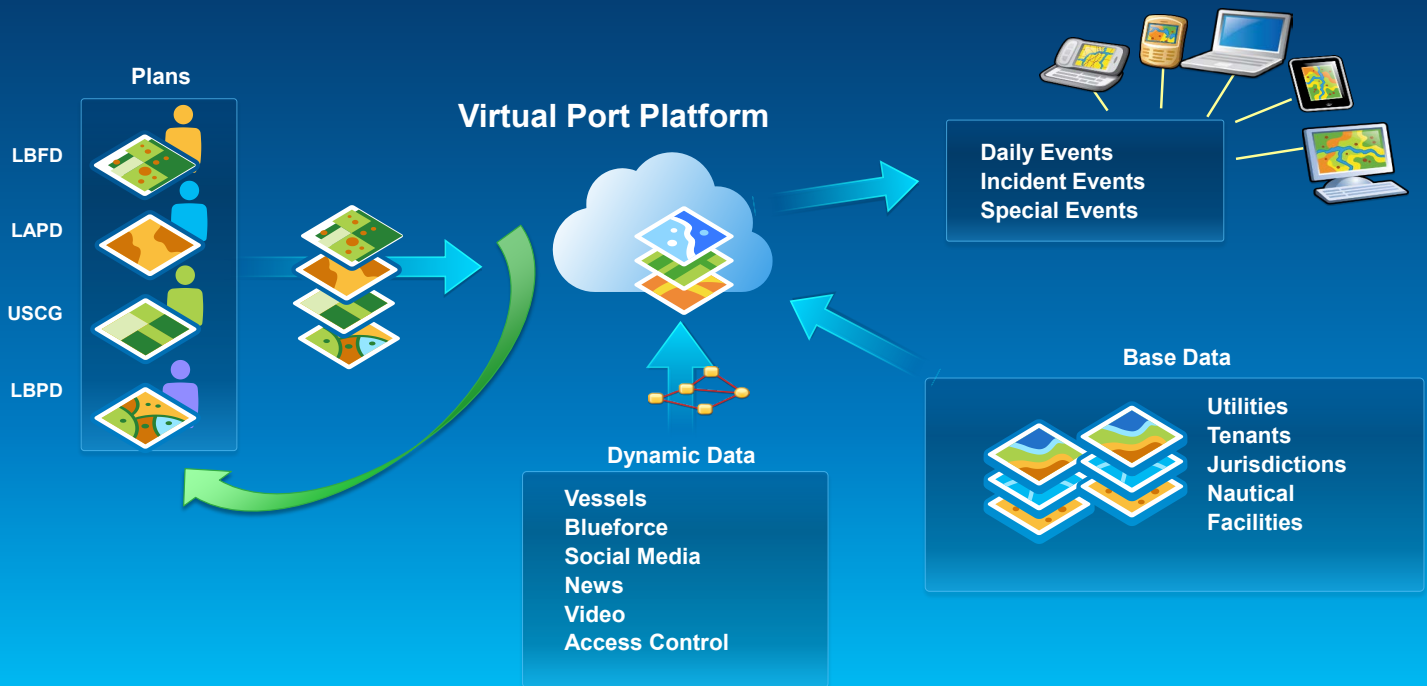
Case Number	Address	Comments
B0-117178	1801 J ST	NO SIGNS OF FE/V SAID HE LOCKED DR BUT I
B0-071818	2035 J ST	ENT APT BROKEN WINDOW E SIDE /OFC SEAR
B0-075762	2229 J ST	PICKED LOCK TO OFFICE DOOR AT SCHOOL PL
B0-076737	644 S 19TH ST	ENT: ALREADY UNLOCKED WINDOW AND TOOP
B0-071271	701 S 21ST ST	UNK PR CUT WNDW SCREEN/NO ENTRY/NO LO
B0-110817	640 S 17TH ST	GLASS WINDOW OF RES BROKEN RINGS,WALLE
B0-063850	660 S 20TH ST	ENT UNL DOOR W/O PERMISSION TOOK ITEMS
B0-066848	705 S 18TH ST	HEARD & OBS UNK PR TEARING WINDOW SCR
B0-067463	705 S 18TH ST	APT POSS ENTERED W/KEY UNK MEANS LOCK I
B0-117617	705 S 18TH ST	WINDOW BRKN NO ENTRY NO LOSS



EDITIONS
LIBRARY
QUERIES ON DEMAND
ALERTS

Port of Long Beach – GIS Platform for Dynamic Planning

Filter, Focus and Coordinate

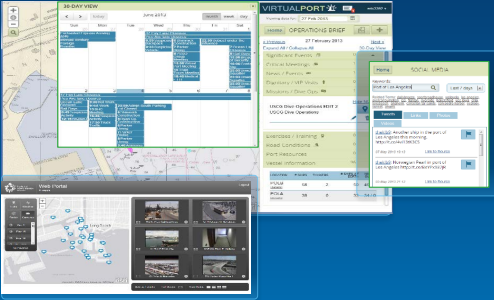


Enterprise integration

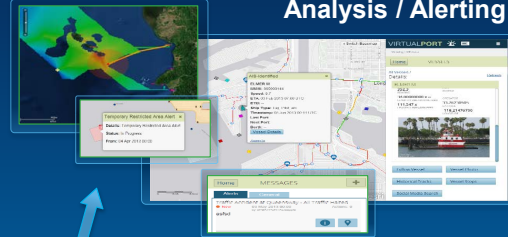


Platform-Enabled Apps

Monitoring / Scheduling



Analysis / Alerting



Visualizing



Planning



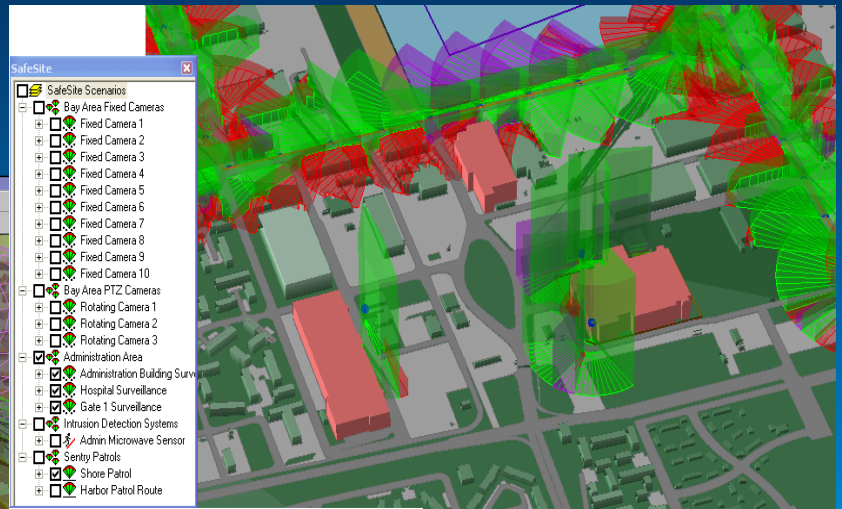
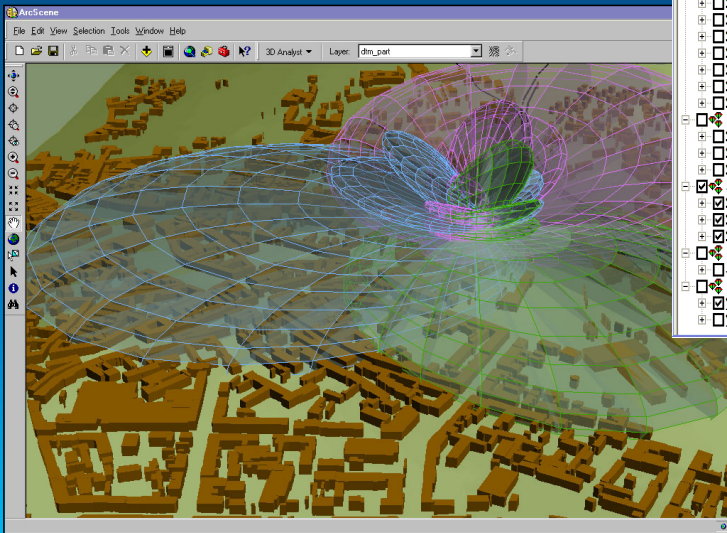
Enterprise Integration



Mobile Ops



Sensors





Answering Today's Intelligence Questions



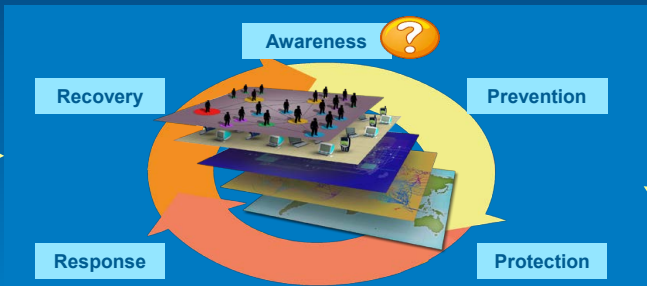
One source informs another source to create the Question Focused set of Data and Methods

Actors

Executives/Commanders
Enterprise-Focused



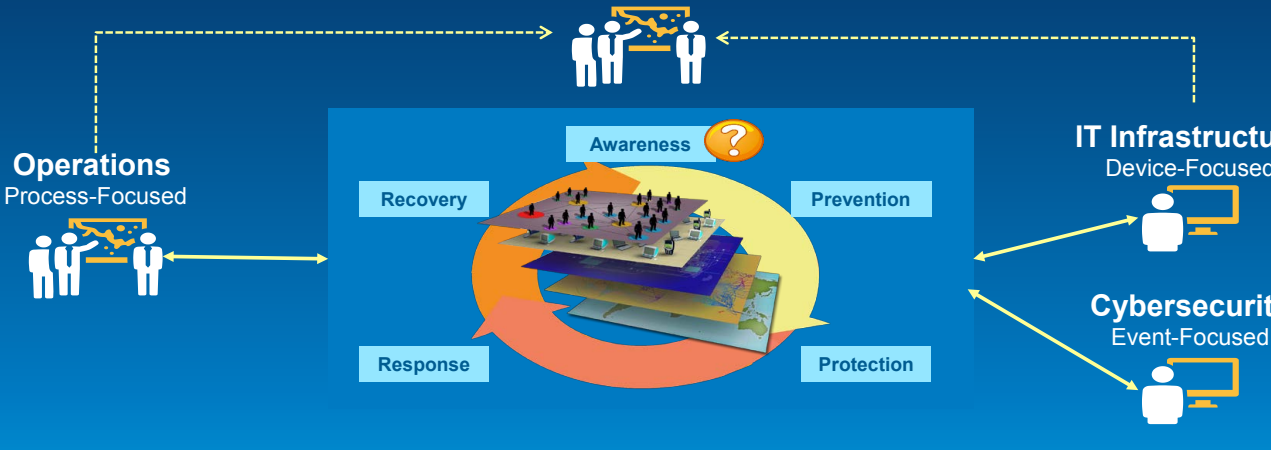
Operations
Process-Focused



IT Infrastructure
Device-Focused

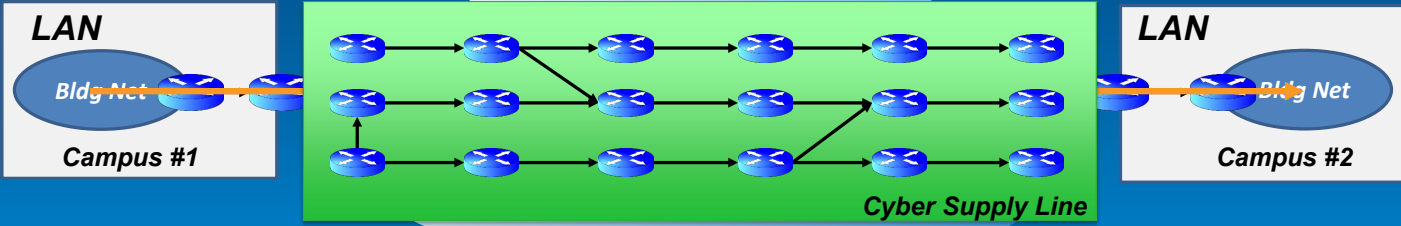


Cybersecurity
Event-Focused



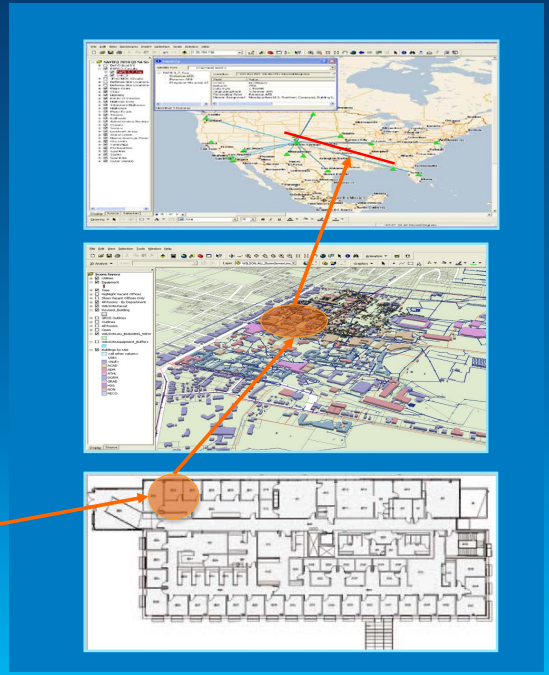
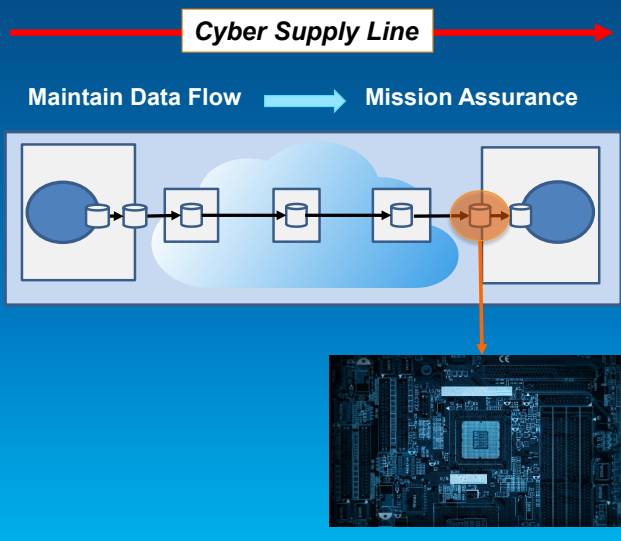
The Cyber Supply Line

Mission Data Flow



Effect Propagation

Multi-level Model of Data Flow



Summary

- **Geography matters**
- **Existing GIS capabilities can be used to integrate all mission data**
- **'Whole of Organization' response required to effectively combat threats**
- **Shared Situational Awareness is required for efficient cross-domain collaboration**



Thank You



Understanding our world.