

Welcome to the National Geospatial Preparedness Summit

August 4-5, 2015
Washington, DC



Classroom B



Challenges, Solutions, and Policy Considerations in Integrating Location- Enabled Tools into Situational Awareness and Mutual aid

- Carla Boyce, FEMA
- Kim Zagaris, California Office of Emergency Services
- Brian Collins, Intterra Group
- Jim Dineen, HERE

Facilitated by: Rand Napoli, Chairman, NAPSG Board

Implementing the US National

August 4, 2015



FEMA

Problem Statement

Situational Awareness without context and common location language **limits or prevents** ability to anticipate, identify, or adjudicate resources needed to meet the needs of survivors and their communities

- Situational Awareness must be established, maintained and communicated across platforms to a wide range of audiences with
 - Access to state of the art technology (hi-tech)
 - Small footprint and mobile technology (lo-tech)
 - Paper & Pen (no-tech)
- Decision makers need location-enabled situational awareness to identify and adjudicate resource needs
- Technology are not always reliable and can be especially challenging after a cyber-attack or geo-magnetic storm

Assumptions

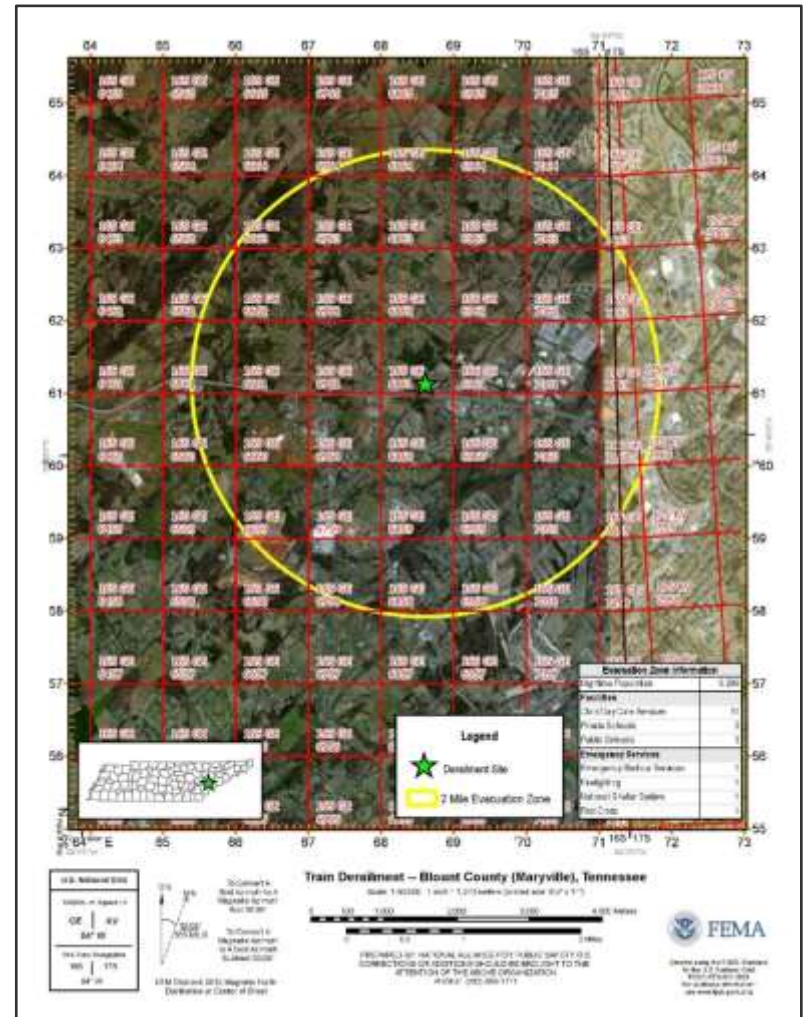
Implementing a standard grid/geo-referencing system for day-to-day AND disaster operations will increase proficiency and probability a common location language will be used when needed most

- The USNG is both an **area and point** reference system that can make data actionable at tactical, strategic, and executive levels with or without technology using USNG enabled maps
- The USNG **compliments** other location references and persists without roads, or recognizable landmarks



Solution – US National Grid

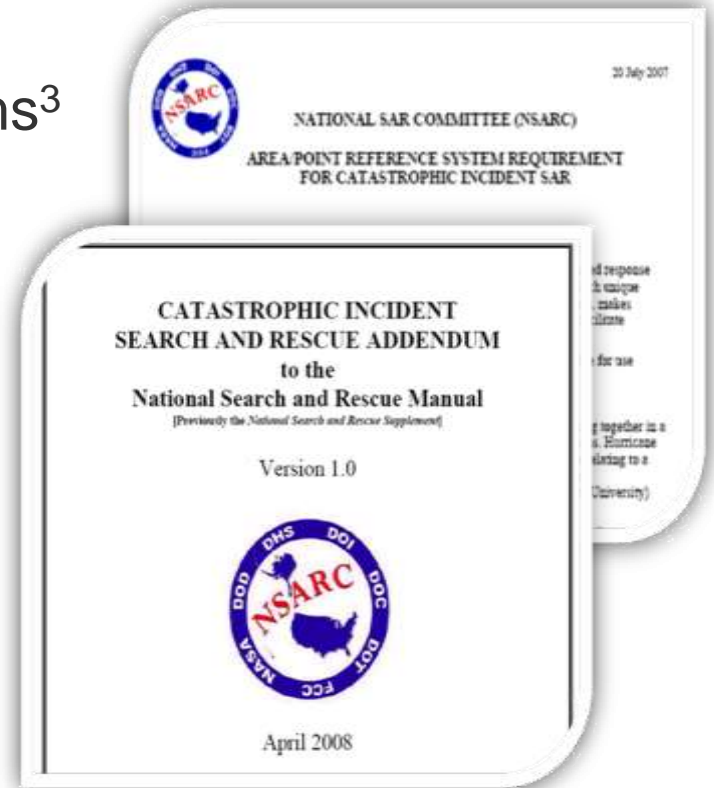
- **POINT & AREA** reference system
- **UNIFIED language** for defining AOI/AOR, planning & reporting, and navigation
- Increases capability to **COMMUNICATE mission critical information** in austere conditions
- Transforms data to **ACTIONABLE** information in a **UNIFORM** format
- Supports **CONSISTENT situational awareness**, especially across multiple areas of operation



Functionally equivalent to Military Grid Reference System

Who's Using the USNG

- The Federal Emergency Management Agency (FEMA)¹
- Department of Defense²
- National Search and Rescue Teams³
- Florida Fire Chiefs Association⁴
- Local & State Public Safety
 - California
 - Iowa
 - Florida
 - Minnesota
 - Missouri
 - New York City
 - Texas
 - North Carolina



¹ Near Term Priorities for Disaster Operations Directorate (May 28, 2009)

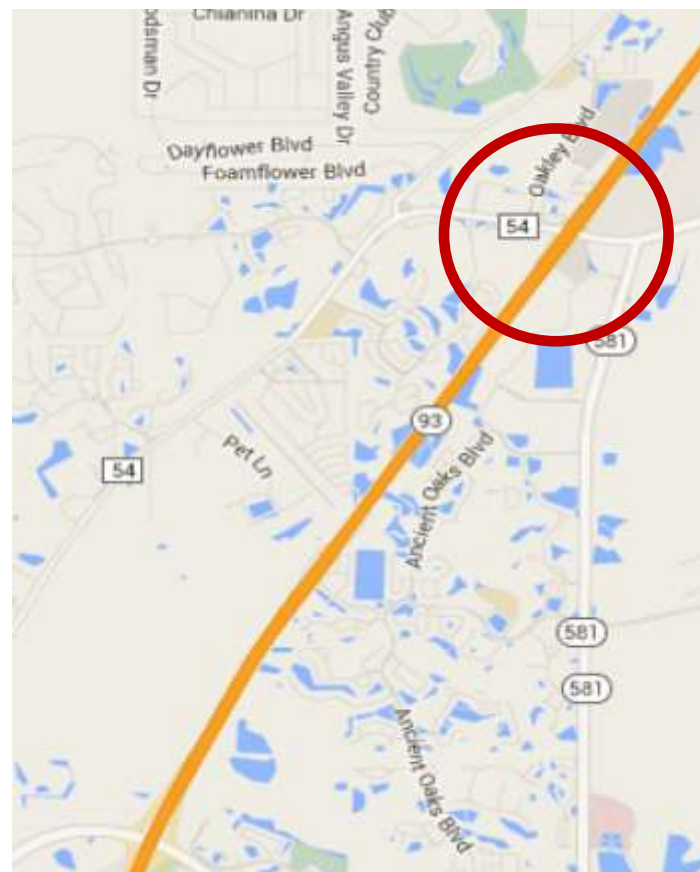
² Chairman of the Joint Chiefs of Staff Instruction 3900.01C (June 12, 2011)

³ Catastrophic Incident Search And Rescue Addendum (August 2008)

⁴ FFCA's Statewide Emergency Response Plan (SERP) (January 2010)

When Seconds Count & Where Matters

- Just past the Hillsborough River State Park exit on I75 **off the road to the right** around MM 218
 - **Just past**
 - north OR south??
 - feet or miles??
 - Off the road **to the right**
 - east or west??
 - feet or miles??



FEMA

When Seconds Count & Where Matters

- Helicopter crash while responding to an EMS mission
- Last position before the crash was accurately known and provided quickly
- Coordinates were improperly communicated as a string of undesignated numbers in DD-MM-SS
- Error was compounded when the string of numbers was entered into a web-based map application



Latitude/Longitude can correctly be reported in multiple formats including:

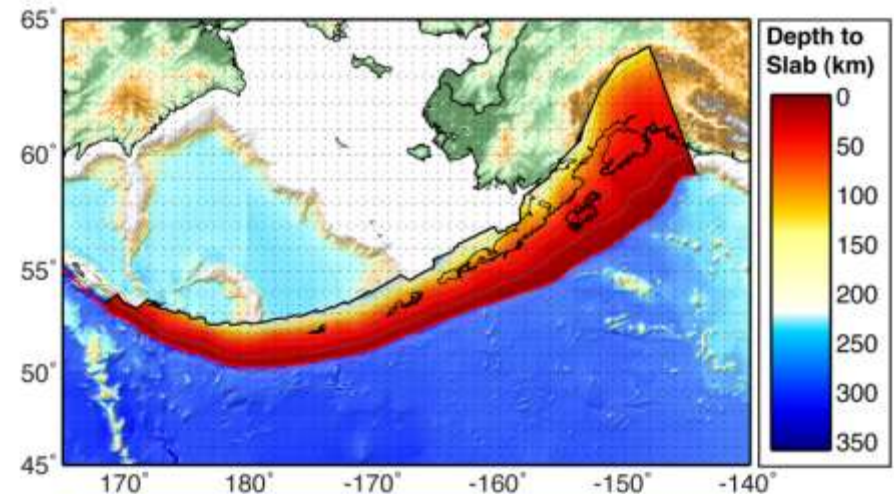
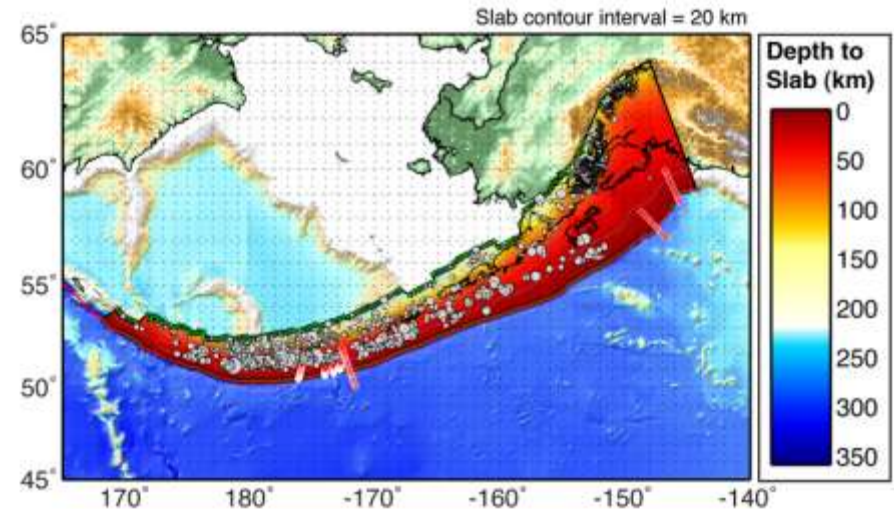
- Decimal Degrees (DD.MMMM)
- Degrees Minutes (DD-MM.MMMM)
- Degrees Minutes Seconds (DD-MM-SS)



Common Location Language is Essential

Cascadia Subduction Zone

- Several states directly affected
- Multi-national
- Millions of people
- Mutual aid will be needed from across the country



USNG: Features & Benefits

- US National grid (USNG) is **both** a **point** and **AREA** grid reference system
- **Flexible** precision (100K, 10K, 1K, 100m)
- **Functionally equivalent** to the MGRS which is in use by all branches of the military
- Allows for a **universal location language**
- Established as **NATIONAL** standard

Scalable to Strategic & Tactical Needs

- Coordinates below 100,000 meter are **represented in pairs**
 - Eastings & Northings
RIGHT then **UP**
- **Number of digits determine precision**
- **16R GU = 100,000m (strategic AOI/AOR - 62 sq miles)**
- **16R GU 6 4 = 10,000m (operational AOR - 6.2 sq miles)**
- **16R GU 61 07 – 4 digits = 1,000m (tactical AOR - .62 miles)**
 - 16R GU 610 704 – 6 digits = 100m (football field)
 - 16R GU 6103 7043 – 8 digits = 10m (modest sized home)
 - 16R GU 61031 70436 – 10 digits = 1m (parking space)

USNG: Primary Components

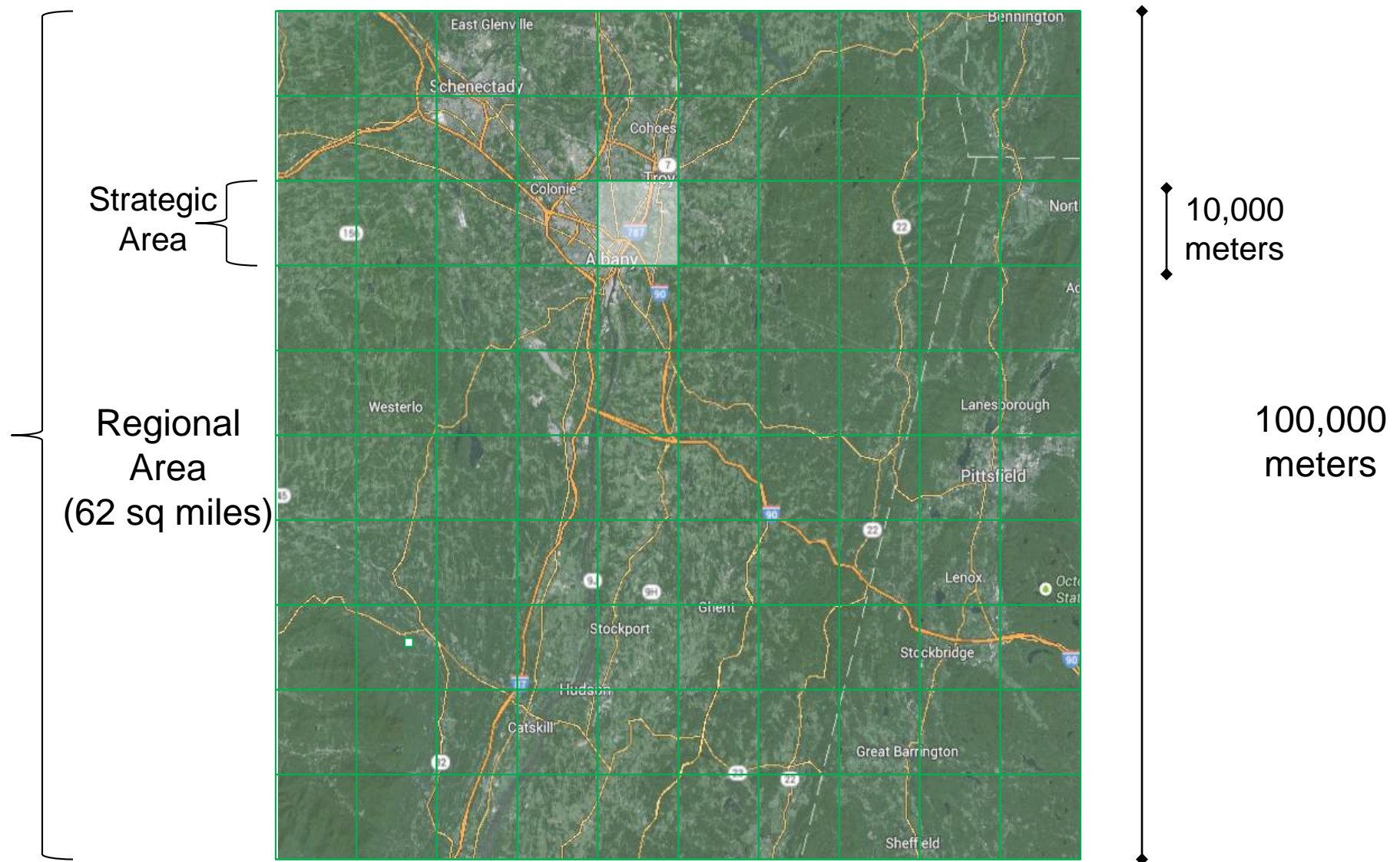
16R GU 66000 64820

Grid Zone Designation – for a world-wide unique address, identifies the longitude zone number and the latitude band letter

100,000 Meter Grid – identification for regional areas

Grid Coordinates – Easting and Northing position

USNG Areas: Perspective



USNG Areas: Perspective



USNG Areas: Strike Team Perspective



Super Bowl XLI
Search and
Rescue Branch

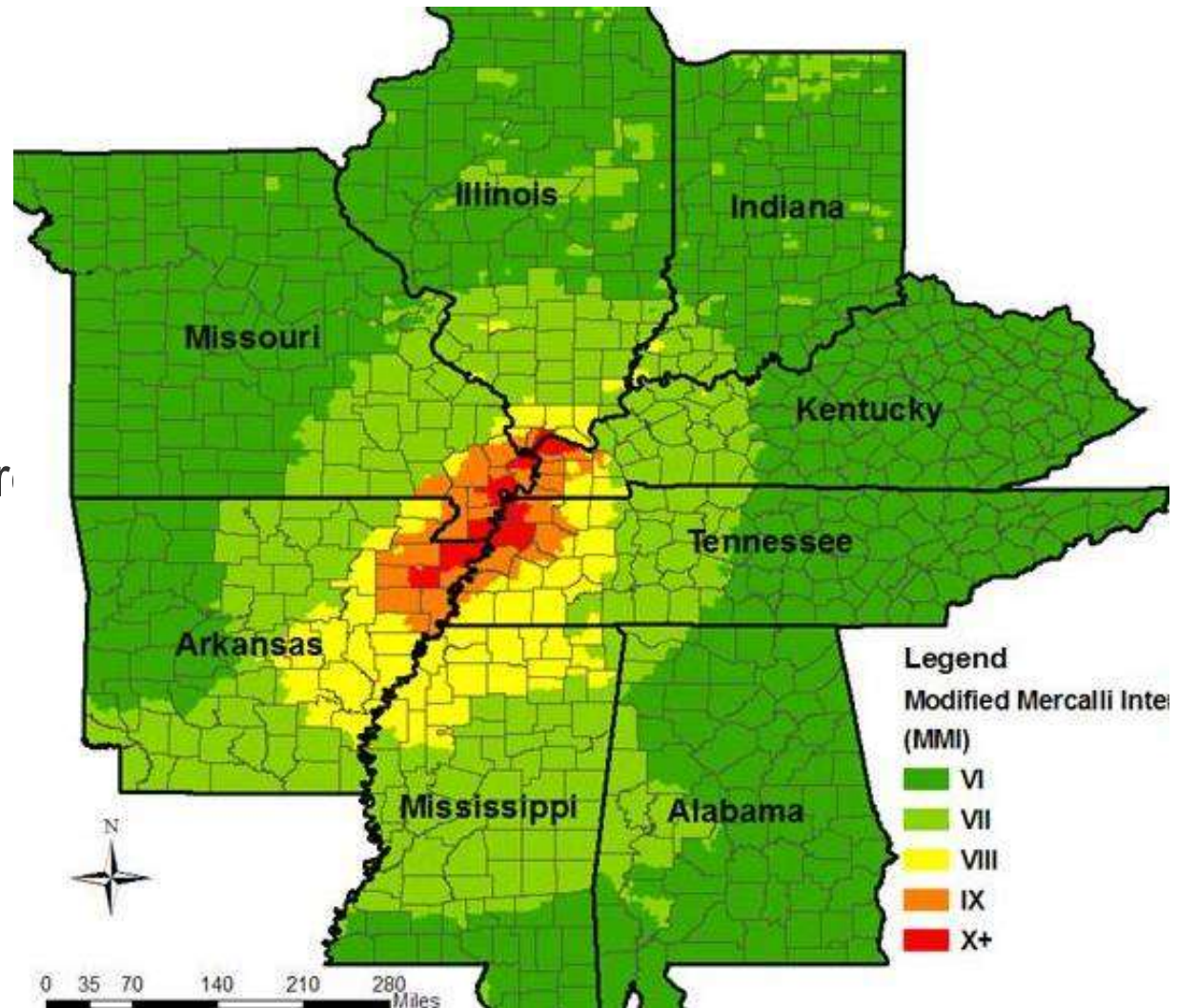


Preparedness, Planning, Coordination, and Command

- Preparedness
 - Threat Hazard Risk Identification Assessment (THIRA)
 - Revisions to Emergency Operations Plans
 - Catastrophic Planning
 - Mission-based Required Resource Planning
- Incident Support/Coordination & Command/Control
 - Situational Awareness
 - Pre-scripted Mission Development
 - Organizing & managing operations

Example: New Madrid Seismic Zone

- 8 States directly impacted
- 4 FEMA Regions
- ~12 Million people
- Mutual aid will be necessary from across the country



FEMA

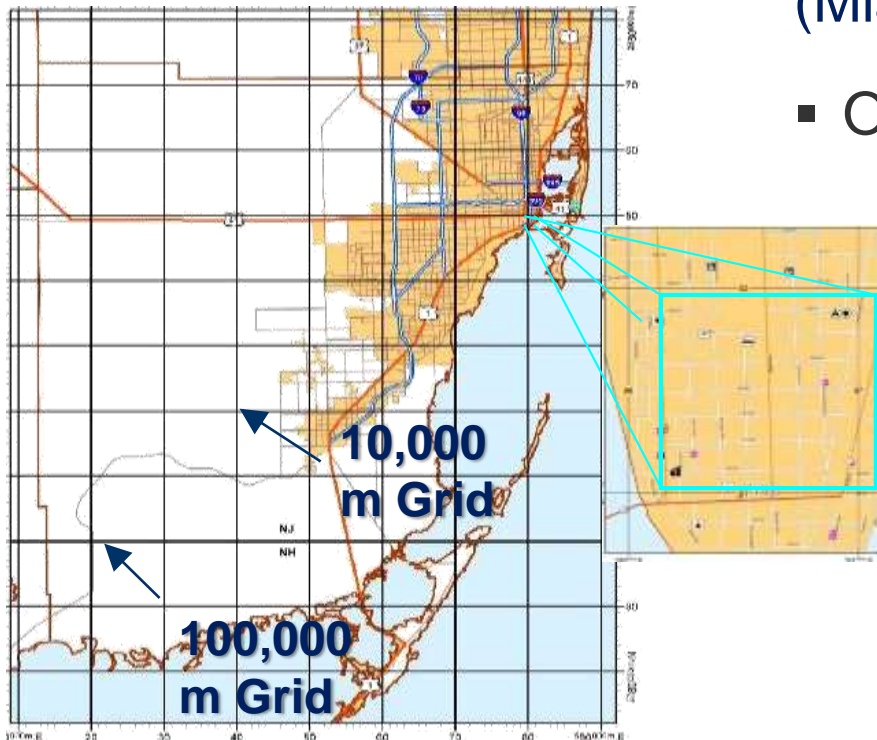
Mission Planning (Preparedness/Operational)

- Identify potential missions within an area of operations (assigned grid cell)
 - Demographics, infrastructure, hazards
 - Multi-disciplinary missions
- Establish resource requirements
 - Based on scenario and consequence analysis
 - Based on pre-incident forecasts
 - Revise based on post incident damage intelligence
- Facilitates pre-arrival planning by command and staged or deployed resources

Pre-Scripted Mission: Data Analysis

Goal: Determine mission based required resources and pre-script missions based on USNG analysis of **17S NJ** (Miami Beach)

Catastrophic Planning



- Overlay basic data layers with USNG
 - Incident data/forecasts (Hurricane track, path of tornado, tsunami inundation)
 - Demographics
 - Community lifelines (transportation, communications, energy)
 - Critical Facilities (Police, Fire, Medical, Schools)

Demographics & Community Resources

Population for USNG 17S NJ 8651

Number of Census Blocks	Total Population	Male Under 5	Male Over 65	Female Under 5	Female Over 65	HH Income Under 20,000	HH Non-auto Owning	Non-English Speaking	Number of HH in Grid	Avg HH Size in Grid
88	14440	618	933	590	1452	3240	3782	13251	8956	1.33

Community Resources for USNG 17S NJ 8651

Facility Type	Emer_Funct	Name	Address1	City	County	Zip	USNG
FAITH-BASED FACILITY	CR	SAINT FRANCIS DE SALES CHURCH		MIAMI	086		17R NJ 86203 51109

Education for USNG 17S NJ 8651

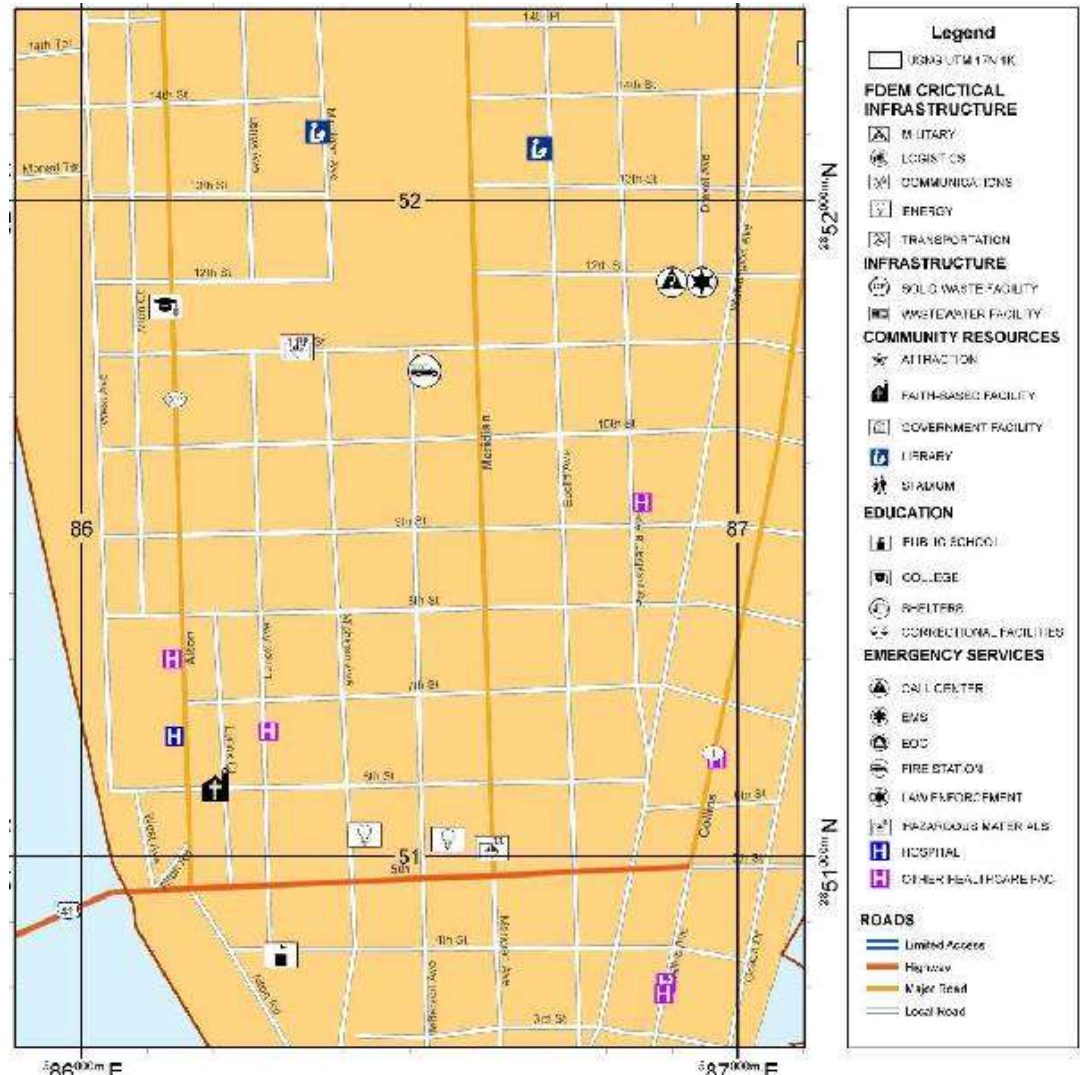
Facility Type	Emer_Funct	Name	Address1	City	County	Zip	USNG
COLLEGE	ED	YESHIVA GEDOLAH RABBINICAL COLLEGE	1140 ALTON RD	MIAMI BEACH	086	33139	17R NJ 86128 51838

Energy for USNG 17S NJ 8651

Facility Type	Emer_Funct	Name	Address1	City	County	Zip	USNG
FUEL FACILITIES -ALONG EVACUATION ROUTES	ENR	8506091		MIAMI BEACH	86		17R NJ 86558 51024
FUEL FACILITIES -ALONG EVACUATION ROUTES	ENR	8504579		MIAMI BEACH	86		17R NJ 86430 51032

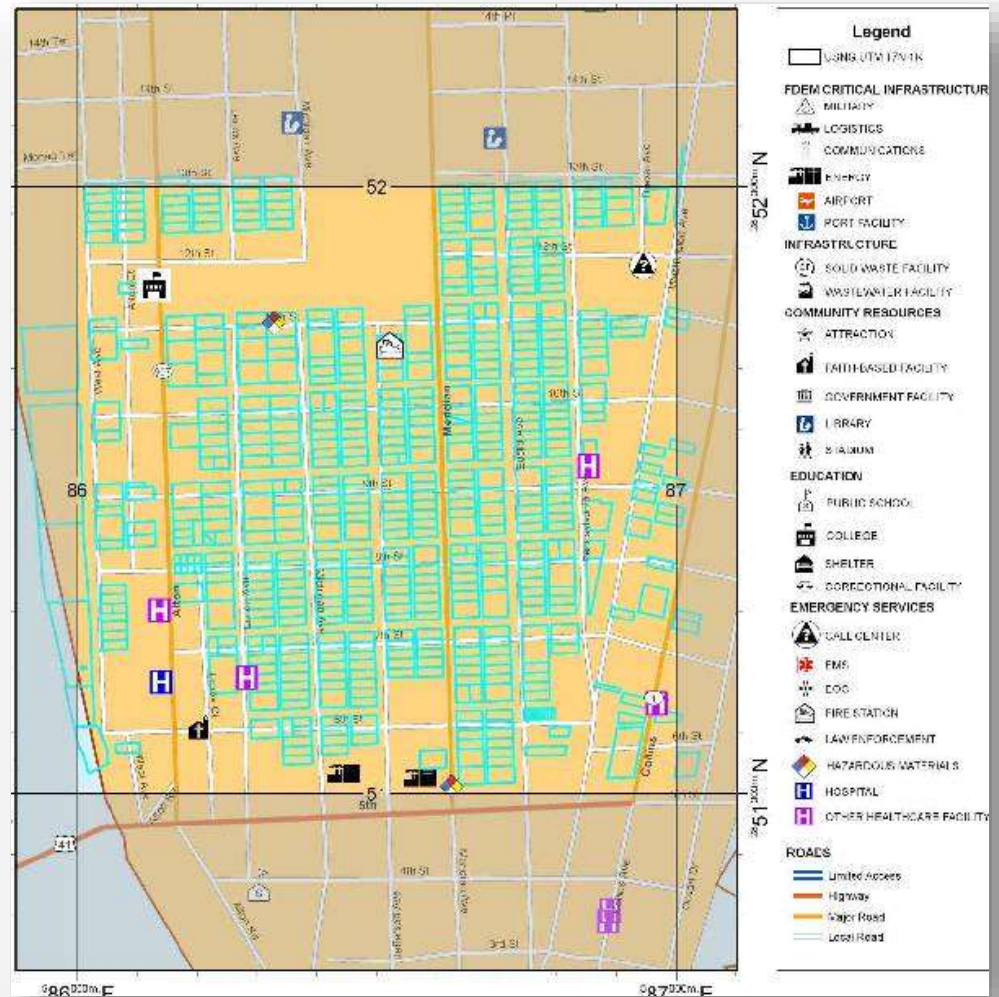
Example: 1,000m (~1/2 sq mile)

- Situational Awareness
 - Critical Facilities (**What's there?**)
 - Demographics (**Who's there?**)
- Planning
 - Pre-Incident
- Operations
 - Incident driven



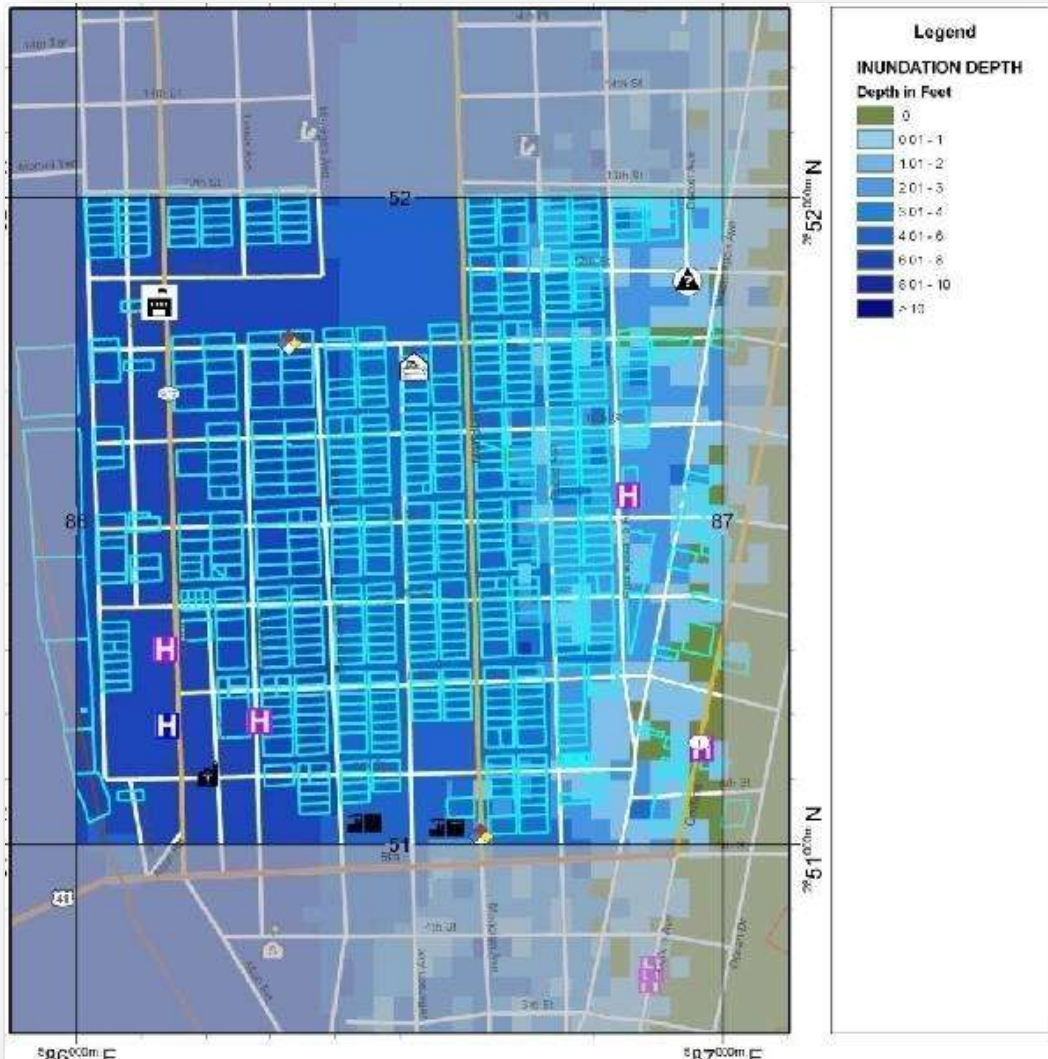
Example: Parcel Analysis

- Situational Awareness
 - **Perspective**
- Focus/Prioritize
 - Residential or commercial
- Resource Requirements
 - Anticipate needs



1,000 m grid square overlaid with selected features

Example: Flood Analysis



- Situational Awareness
 - Perspective & **Context**
- Focus/Prioritize
 - Severity of consequence
- Resource Requirements
 - Anticipate & adjudicate

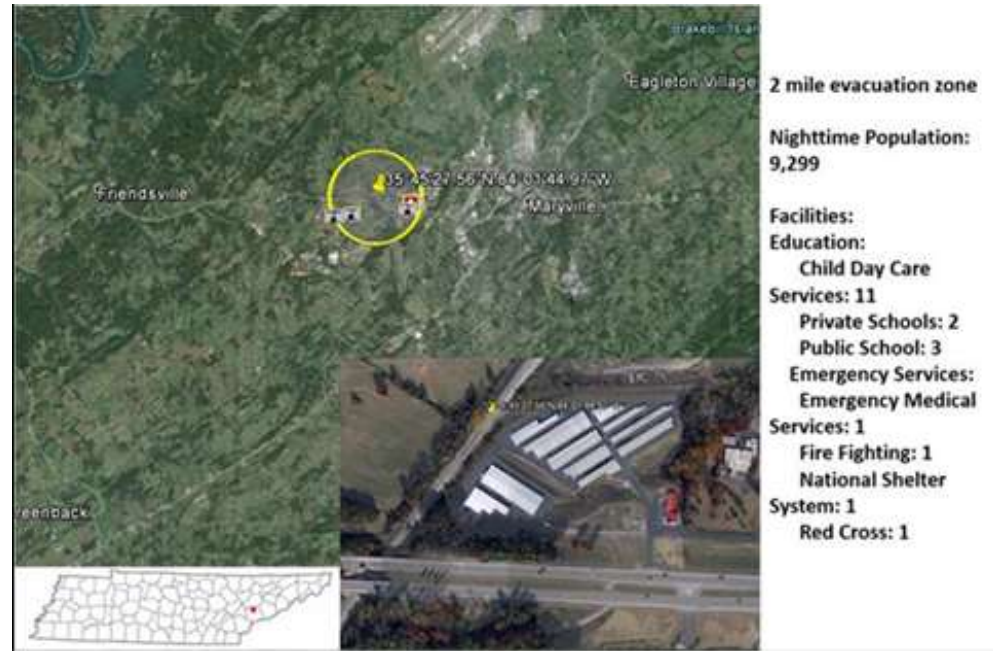
Train Derailment: Blount County, TN

- **Type & Location of Incident:** Train Derailment – Blount County (Maryville), Tennessee
- **Situation:** At approximately 1:00 a.m. ET on July 2, 2015, a CSX cargo train derailed near the town of Maryville (est. pop. 28k) in Blount County, TN. One of the cars derailed and its contents—the chemical acrylonitrile—caught fire.
- Evacuations and shelter-in-place orders have been issued for residents within a 2-mile radius
 - One shelter is open with 100 occupants
 - TN EMA reports an additional 2,500 residents may need to be evacuated
 - It is estimated up to 9,300 residents are within the evacuation zone

Derailment: Blount County, TN (Cont.)

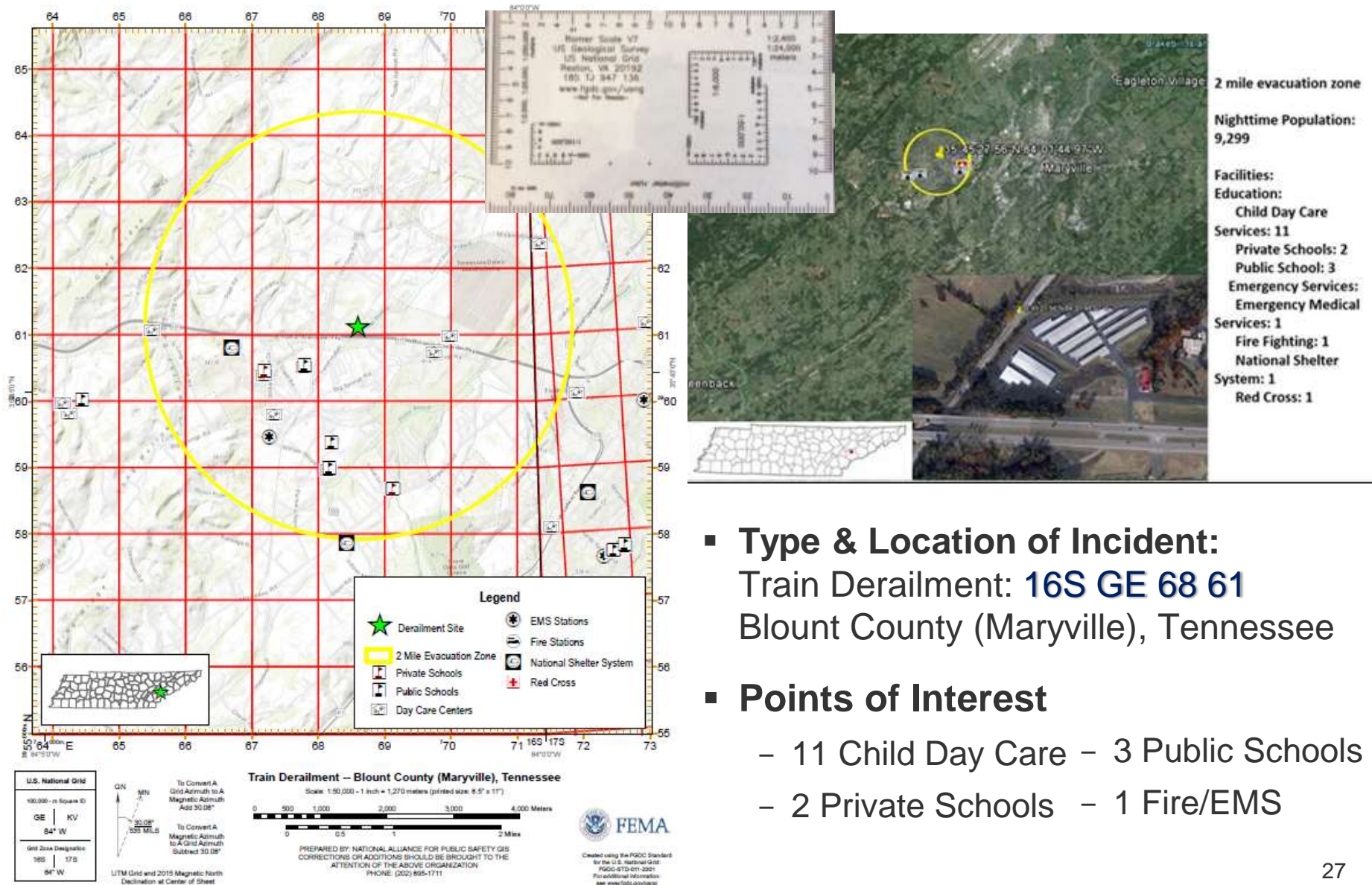
■ Response

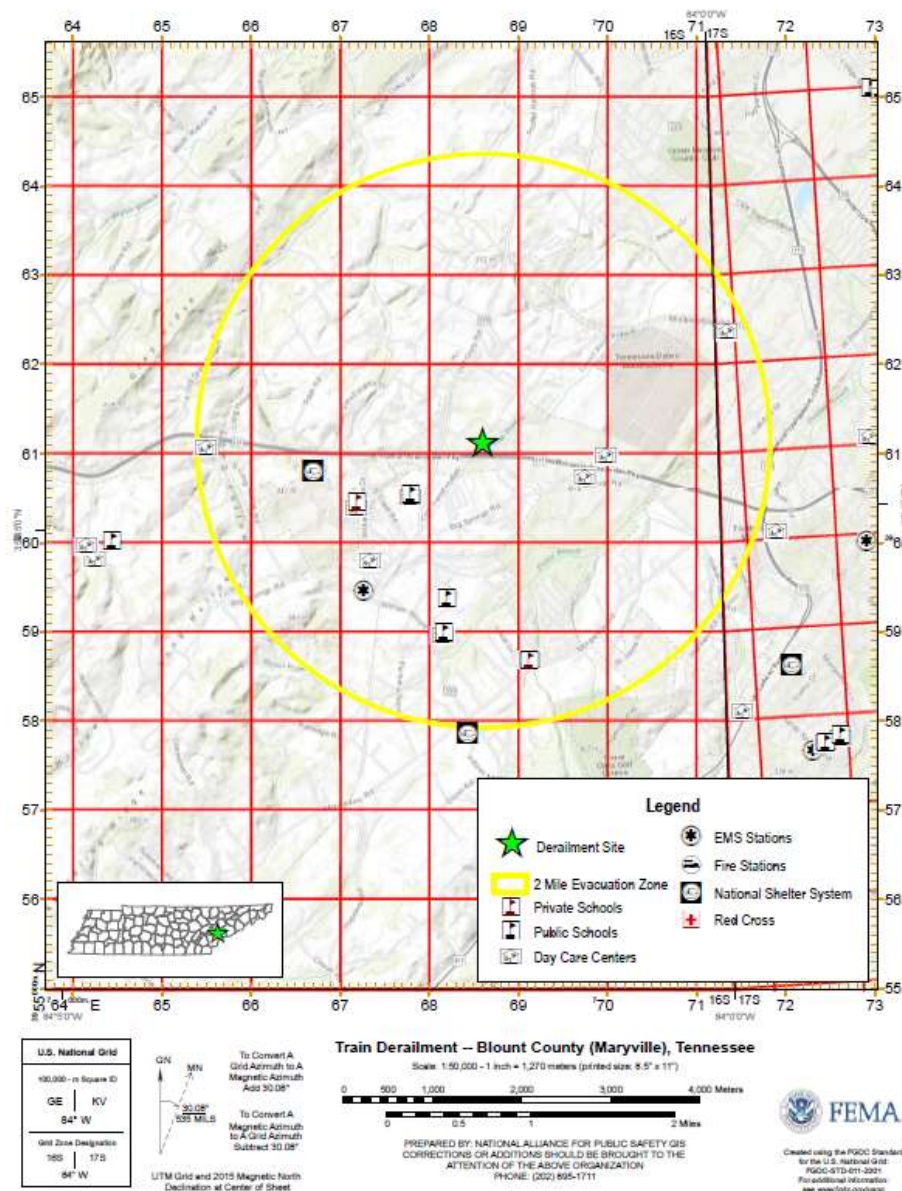
- CSX HazMat and local first responders are on scene
- IMAAC charter activated on behalf of TN EMA
- TN State EOC remains at Normal Operations



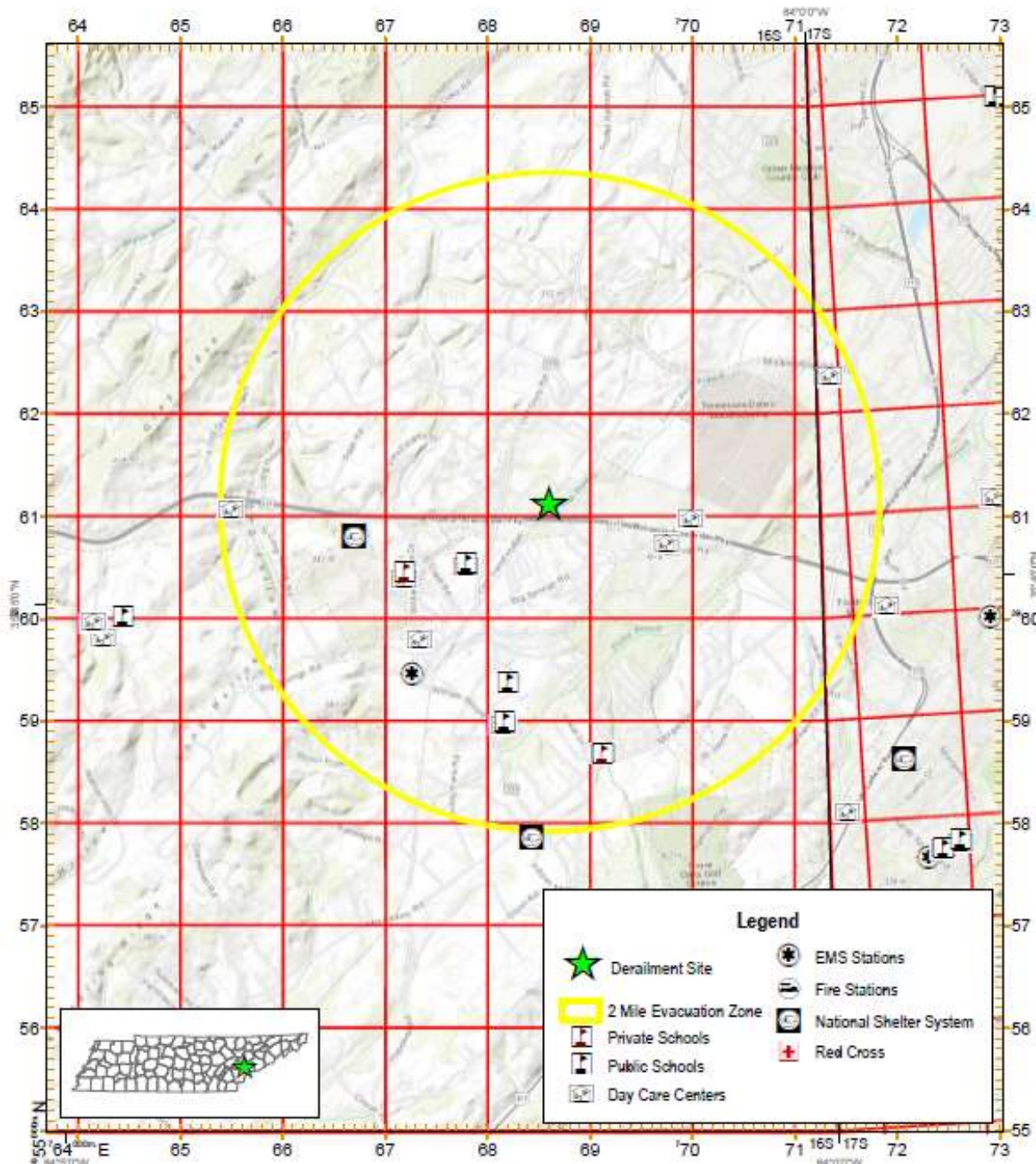
Note: Acrylonitrile is primarily used in the manufacture of acrylic and modacrylic fibers. Acute (short-term) exposure of workers to acrylonitrile has been observed to cause mucous membrane irritation, headaches, dizziness, and nausea. (EPA)

Perspective, Context, & Location





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 Blount County (Maryville), Tennessee
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■ Response

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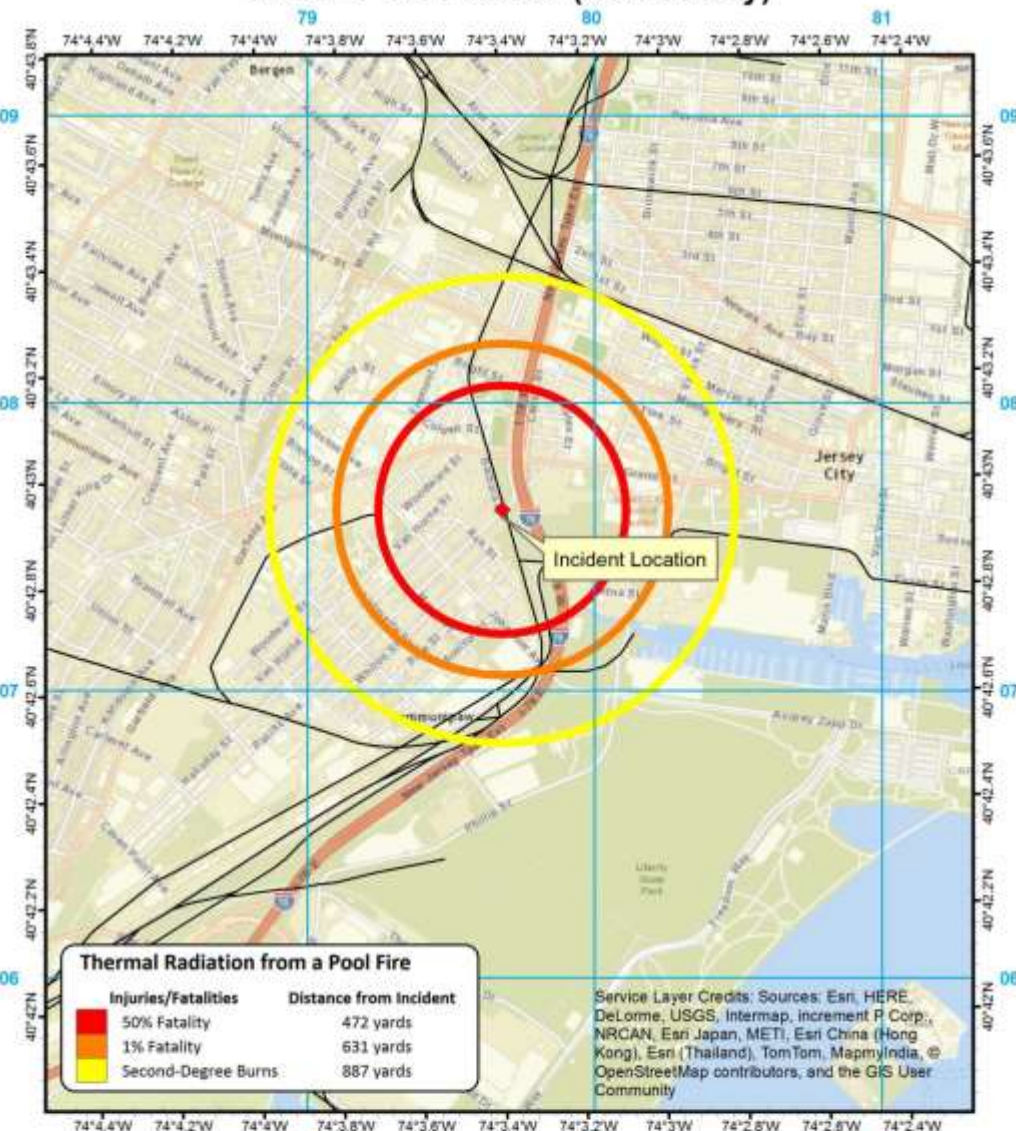
■ Points of Interest

- 11 Child Day Care
- 2 Private Schools
- 3 Public Schools
- 1 Fire/EMS

Operation Safe Delivery: Jersey City (Exercise)

- It is 2:00 p.m. Eastern Daylight Time on Wednesday, March 18, 2015 in Jersey City, New Jersey.
- A freight train carrying 90 DOT 111 tank cars (approximately 30,000 gallons each) of high vapor pressure/low flash point crude oil, derailed while crossing an elevated section of tracks near the intersection of Pacific Avenue and Barbara Place (USNG 18T WL 796 076; 40.715725, -74.056651)
- Five tank cars rupture, spilling approximately 100,000 gallons of crude oil into the surrounding area and forms a pool approximately one inch deep and 460 feet wide that ignites.
- Heat from the resulting pool fire has the potential to cause second-degree burns to unprotected individuals up to 887 yards (0.5 miles) in all directions (see Figure 1).5

JERSEY CITY AREA (New Jersey)



Affected Population Estimates for Initial Pool Fire Damage Zones (Based on 40-Second Exposure Time)

- **(1,923)** Potential 50 Percent Fatality Rate, Second- and Third-Degree Burns for Unprotected Individuals
- **(3,299)** Potential One Percent Fatality Rate, Second- and Third-Degree Burns for Unprotected Individuals
- **(9,299)** Potential Second-Degree Burns for Unprotected Individuals

Public Housing Developments within 1,333 Yard Radius from Derailment Site

Development	Address	USNG	Housing Units
Montgomery Gardens	563 Montgomery Street	18T WL 792 083	435
Lafayette Village	579 Grand Street	18T WL 793 077	77
Lafayette Senior Living Center	463 Pacific Avenue	18T WL 796 076	83
Barbara Place Terrace	471 Pacific Avenue	18T WL 799 082	40
Glennview Townhouses	463 Pacific Avenue	18T WL 796 076	63
Total Housing Units			698



AOI (~60 sq miles)
18T WL

AOR (~5 sq miles)
18T WL 7 0

- Team Alpha
 - 79 07
- Team Bravo
 - 79 08

Summary of Conclusions

The US National Grid provides a **common location language** for **planning, reporting, and navigation** and can be used for **designating ground based areas of interest or operation**.

The **scalable nature** of the grid also allows for **precision** when describing point locations and **flexibility** to define strategic operational, and tactical levels of support, coordination, and operations

- **Strategic –100,000m (62 sq miles)**
Example: 16R GU
(GZD + 100,000m ID)
- **Operational – 10,000m (6.2 sq miles)**
Example: 16R GU 6 4
(GZD & 100,000m ID + 2 digits)
- **Tactical –1,000m (.62 miles)**
Example: GU 61 07
(GZD + 4 digits)

Tactical Precision

Football Field (100m)

6 digits (16R GU 610 704)

Modest sized home

8 digits (16R GU 6103 7043)

Parking space

10 digits (16R GU 61031 70436)



FEMA



ENHANCING RESOURCE MANAGEMENT
FOR DECISION MAKERS FROM LOCAL TO
FEDERAL WITH SITUATIONAL ANALYST:
OR
WHERE IS EVERYBODY?

Brian Collins

for

Intterra



The Problem(s)

“Lets have Jim run a ‘cognos’ query to see what we have...”

“I get a pager text from my CAD, how hard can it be to see it on a map?”

“Put me in coach!”



- Opening up one of the most stove-piped databases.
- I'll show you mine if you show me yours.
- What does it all mean?

Test Question:

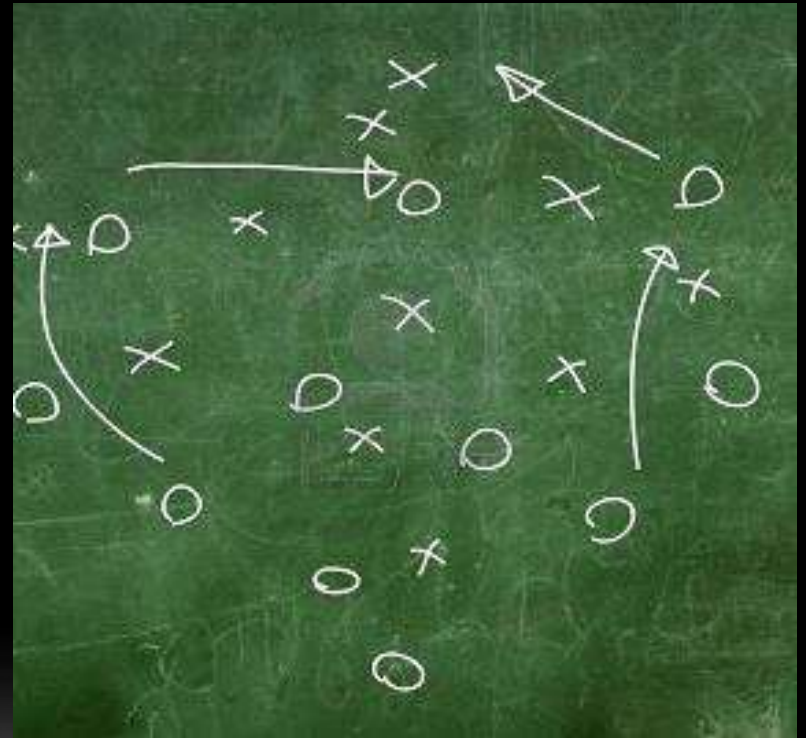
Who?

THE 'DATABASE' IS NOT THE 'OBJECTIVE'

Data...



...is not a plan





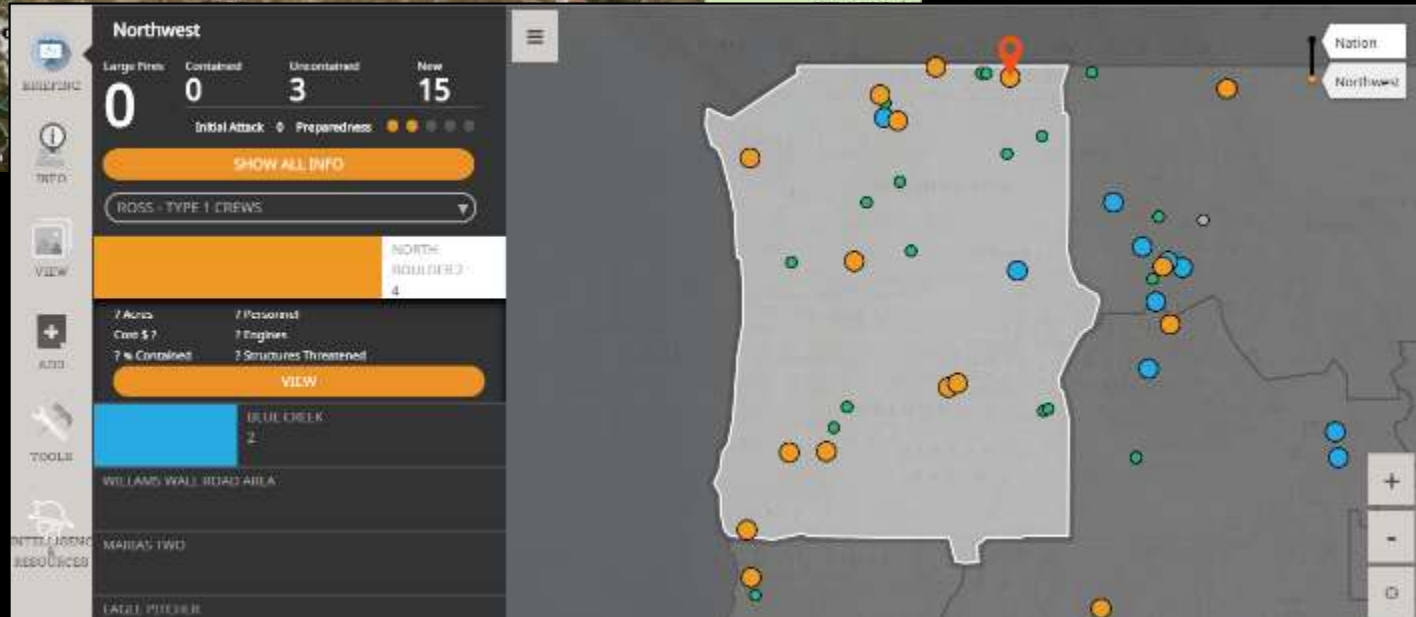
Traditional way to
view Resource
Data (COGNOS)

Last Name	First Name	Res Disp Org Name ^	Home Loc Name
PHILLIPS	AARON	APHIS Eastern Dispatch Center	WS State Director Office - OH (OH-AWAO)
MARTIN	ALBERT	APHIS Eastern Dispatch Center	WS State Director Office - OH (OH-AWAO)
HARTER	GRANT	APHIS Eastern Dispatch Center	WS State Director Office - VA (VA-AWAO)
LINDER	TIMOTHY	APHIS Eastern Dispatch Center	WS State Director Office - VA (VA-AWAO)
GEOFFROY	SCOTT	APHIS Eastern Dispatch Center	WS State Director Office - ME (ME-AWAO)
MORALES	ISELA	APHIS Eastern Dispatch Center	PPQ State Plant Health Office - FL (FL-APAO)
BLANKENSHIP	SANDRA	APHIS Eastern Dispatch Center	VS Area Veterinarian-in-Charge Office - GA (GA-AVAO)
HARMON	ANDREA	APHIS Eastern Dispatch Center	VS Area Veterinarian-in-Charge Office - GA (GA-AVAO)
MILLARD	DAKOTA	APHIS Eastern Dispatch Center	WS State Director Office - WI (WI-AWAO)
ANDERSON	PHILLIP	APHIS Eastern Dispatch Center	WS State Director Office - WI (WI-AWAO)
SIPLE	CHRISTINE	APHIS Eastern Dispatch Center	PPQ State Plant Health Office - OH (OH-APAO)
FREEBORN	RITA	APHIS Eastern Dispatch Center	PPQ State Plant Health Office - OH (OH-APAO)
RODRIGUEZ	FRANCISCO	APHIS Eastern Dispatch Center	PPQ State Plant Health Office - PR (PR-APAO)
MURDOFF	RYAN	APHIS Eastern Dispatch Center	PPQ State Plant Health Office - PR (PR-APAO)
SANTIAGO	JOAN	APHIS Eastern Dispatch Center	PPQ State Plant Health Office - PR (PR-APAO)
SEELEY	THOMAS	APHIS Eastern Dispatch Center	VS Area Veterinarian-in-Charge Office - KY (KY-AVAO)
VECCHI	PAULA	APHIS Eastern Dispatch Center	PPQ State Plant Health Office - IN (IN-APAO)
WHITE	CHARISE	APHIS Eastern Dispatch Center	WS State Director Office - IN (IN-AWAO)
SPIGA	JEREMIAH	APHIS Eastern Dispatch Center	WS State Director Office - PA (PA-AWAO)
TUMBLESON	TRAVIS	APHIS Eastern Dispatch Center	WS State Director Office - PA (PA-AWAO)

Designed to 'Manage Resources'



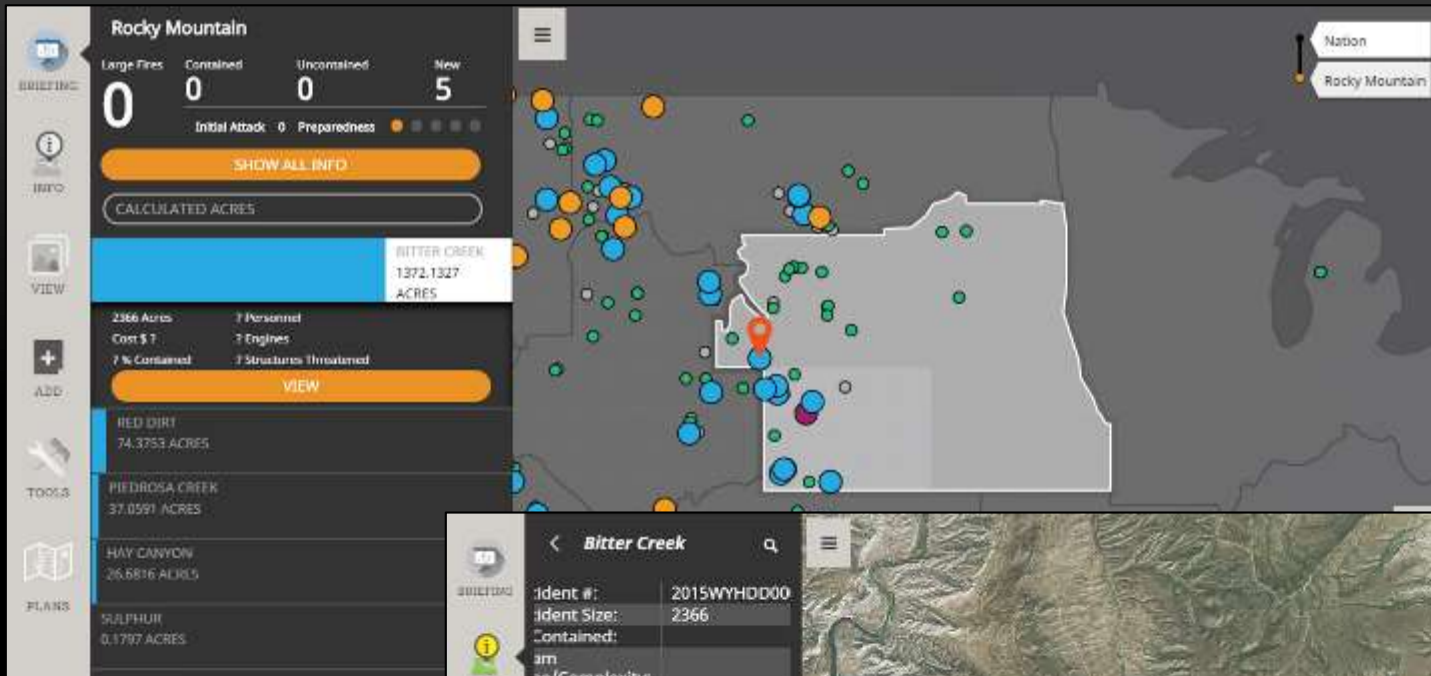
Resource data
the way
Operations and
Plans want to see
it



Designed to 'Manage Incidents'

SHARING POSITION DATA SHOULD BE 'A COMMON VIRTUE'





‘Bitter Creek’ Fire – deployment of Mutual Aid (Aircraft and Resources)

Resource Tracking

CURRENT OP: Bitter Creek - Responding NEXT OP: Bitter Creek - ICP

ASSIGN PLAN ENACT PLAN

STREET ZOOM LASSO + ADD

Resource Name	Resource Label	Kind	Type	Incident	Status	Distance
✓ E-1644	E-1644					64.8
✓ SQ-1	SQ-1			None	Available	102.6
✓ E-3621	E-3621	ENG		None	Available	110.5
✓ Rifle Helo #1	Helio #1	HEL		None	Available	115.0
E-3629	E-3629	ENG		None	Available	160.5
E-3418	E-3418	ENG		None	Available	
CARNG6	CARNG6	HEL		None	Available	
SWD Fuels	SWD Fuels			None	Available	
E-4431	E-4431	ENG		None	Available	

Home Unit

Configuration

ST or TF Name

ST or TF Label

Position

Kind: Engine

Type

Incident: None

Status: Available

Planned Incident

Planned Status

Checkin DateTime: mm/dd/yyyy

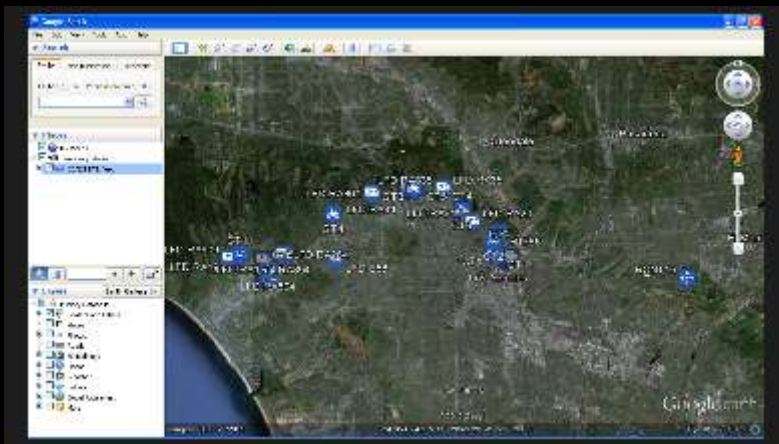
Device Id: 90043406080146

Order

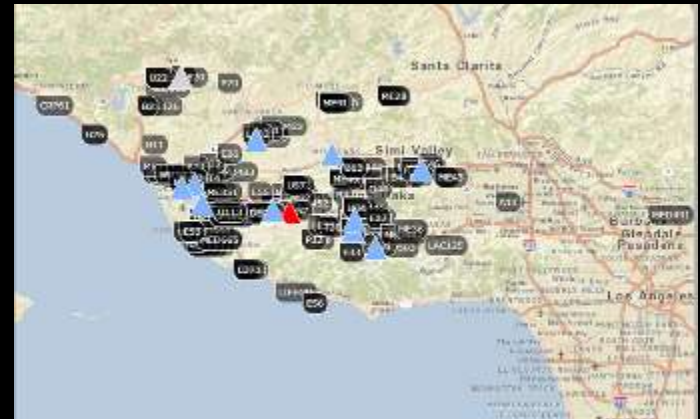
Multi-agency Position Reporting (NG, BLM, State)


USING POSITION DATA TO MAKE BETTER DECISIONS


Data...





...is not a plan





 BRIEFING

 INFO

 VIEW

 ADD

 TOOLS

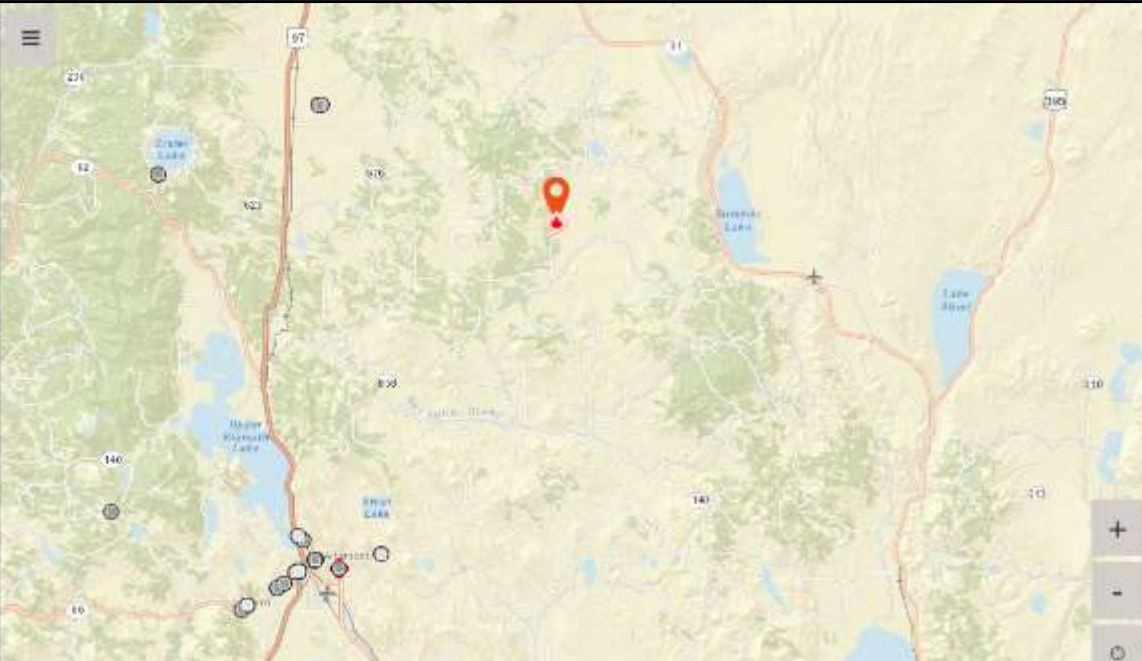
 OPERATIONS

< Sycan

Fire Name	Sycan
Last Modified	7/8/2015, 1:09:29 PM
Comments	
Added By	IC Leland Hunter (IMT3)
Fire Number	269
Agency	US-FWF Bly
Unique Fire Id	2015ORFWF000269

Edit >

Copy Feature >



Initial attack incident

Resource Tracking

CURRENT OP

Sycan - Assigned

ASSIGN

NEXT OP

Sycan - ICP

PLAN

ENACT PLAN

EDIT

ROOM

LASO

+

ADD

Resource Name	Resource Label	Kind	Type	Incident	Status	Tracking Type	Distance
Scott 518 Skidder	Skidder	OTHR		None	Available	Manual	28.8
Scott D5 Dozer	D5 Dozer	DOZR	5	None	Available	Manual	28.9
Scott Water Tender	Scott WT	WTDR	2	None	Available	Manual	29.1
E9151	E9151	ENG	6	None	Available	Manual	45.2
E2114				None	Available	Manual	47.5
							48.1
							48.7

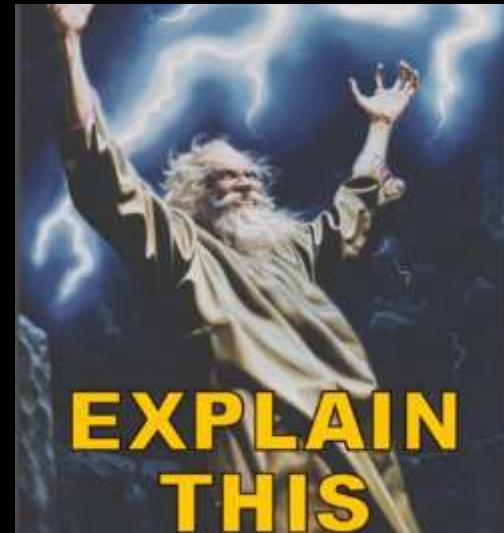
Sycan Assignment Report

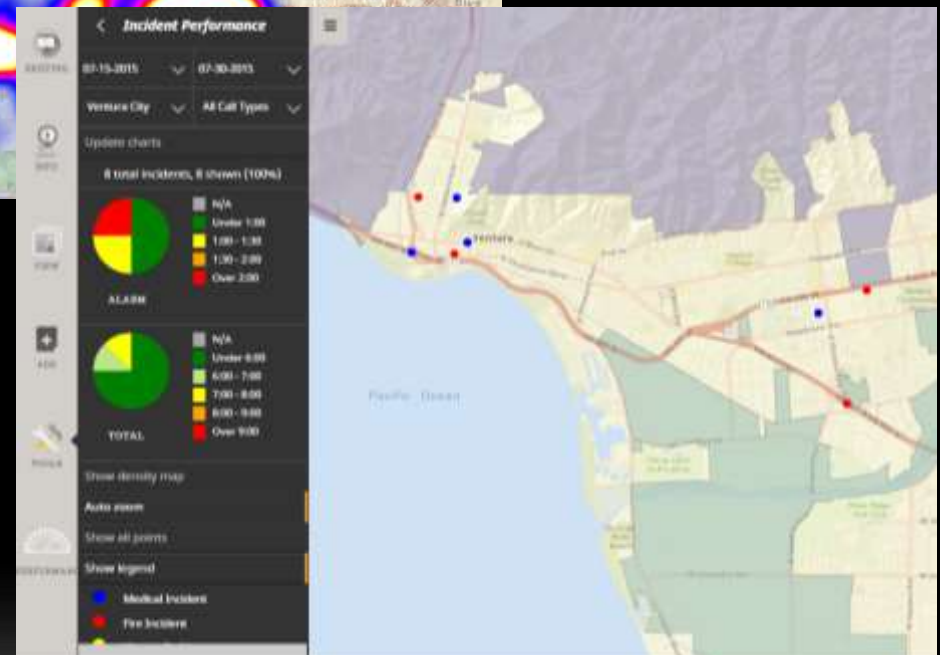
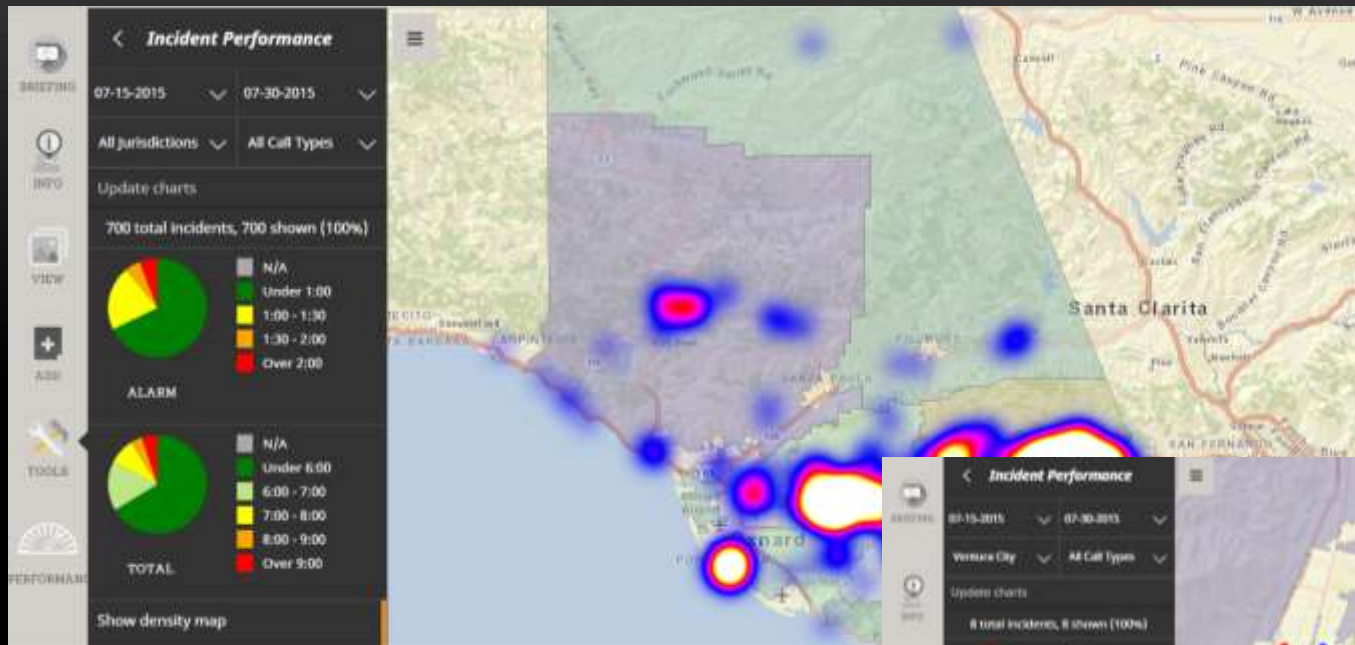
SELECT ALL

Resource Identifier	Leader	# Persons	Contact	Other: Req#, Config, Agency, Home, Kind, Type	Assignment (sorted)
Scott Water Tender	Brad Scott	1	541-419-3724	SR, PVT, WTDR, 2	Assigned
Scott D5 Dozer	Brad Scott	1	541-419-3724	SR, PVT, Privs, DOZR, 5	Assigned
Scott 518 Skidder	Ron Scott		541-419-3724	PVT, OTHR	Assigned

Assessing resources across multiple jurisdictions

USING POSITION DATA TO MAKE BETTER DECISIONS





Assessing performance for mutual aid calls across jurisdictions – ‘apples-to-apples’

The ‘Graduate Level’ – how to assess effective mutual aid

- Opening up one of the most stove-piped databases
 - Spatial enable our resource databases
 - What are the most useful elements?
- I'll show you mine if you show me yours
 - Position reporting is now a data-service
 - Can we / should we centralize? De-centralize?
- What does it all mean?
 - What key decisions are we supporting?



Building a Scalable and Flexible Geospatial Architecture to Support Mutual Aid

**National Geospatial Preparedness
Summit**

here

Prepared by Jim Dineen
Director, Government Sales
August 2015
Company confidential

Dedicated Location-Based Company with Global Reach

Employs **7,000 people** in 55 countries



Produces maps for nearly **200 countries**



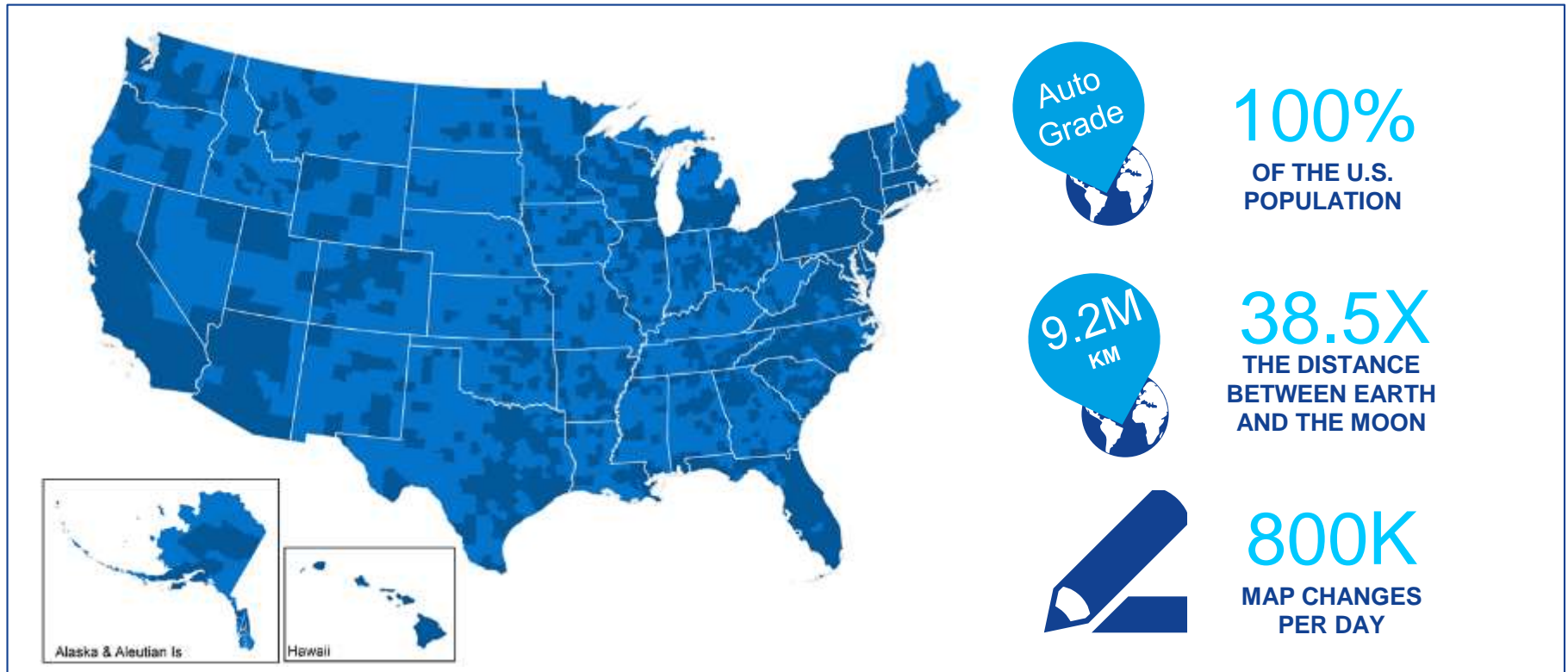
Enables **nine out of ten** in-car nav systems in North America



Enables mobile, web, and enterprise solutions for **global industry leaders** like Esri, FedEx, USPS, Oracle, Garmin

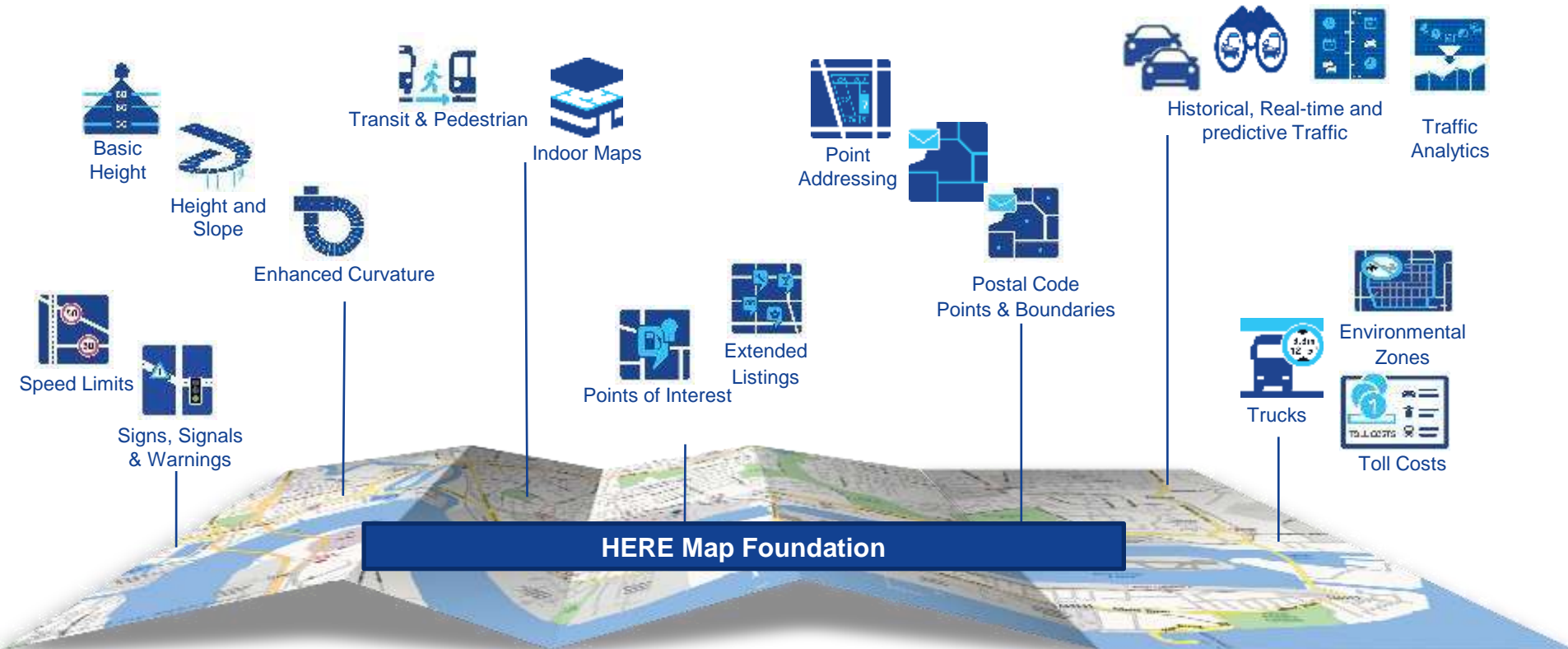


Robust United States Coverage



A Portfolio of Content to Enhance Mutual Aid Planning

Increases accuracy of decision making for government applications



A Deep Toolset to Build the Best Map in the Industry

Innovative Tooling to Collect & Process Large Datasets Quickly and Accurately

Field Collection



Tools



Conflation



Quality



Change Detection Signals with Information on New Roads and Housing Addresses

Sourcing



Community



Probe



Satellite



Situational Awareness Use Cases



Top Concerns for Building a Geospatial



Governments Require Seamless Access to Location to Collaborate with Other Departments



Agencies need a single map foundation that will allow them to work together and prevent working in silos using disparate databases

Agencies need data that can be access on premise or via cloud services that numerous departments can access

Eliminate duplication of project efforts with one consolidated view of work and activities

Better management of resources across departments based on location



Alameda County Regional Emergency Communications

Alameda County Fire (ACF) in Livermore, CA operates a regional 911 Dispatch Center for fire and medical calls. The Dispatch Center is called Alameda County Regional Emergency Communication Center (ACRECC).

ACRECC serves 4 fire departments: Alameda County Fire (ACF), Fremont Fire Dept (FRE), Alameda City (ALA), Camp Parks (PRK)

HERE Map data is loaded into their CAD system which is layered with their county data (i.e. hydrant locations). The data is then used to dispatch, track and route across the regional area.



Reference courtesy HERE reseller, American Digital Cartography, Inc

An Accurate Map is the Foundation for Success

Accurate maps are the foundation of any successful situation awareness tool.



HERE provides the most accurate and comprehensive global map available with over 400 attributes to enhance decision making and analysis.

- Hurricane Evacuation Routes
- Hazmat Restrictions
- Point Addressing
- POIs (i.e. hospitals, government buildings, etc)
- Speed Limits
- Administrative Areas
- Physical Restrictions

Reliable mapping results in saved time, money, property and lives of our citizens.

Washington/Baltimore High Intensity Drug Trafficking Area (HIDTA)

ACCURACY

The HIDTA Program is a federal grant program administered by the White House Office of National Drug Control Policy that provides resources to assist federal, state, local and tribal agencies coordinate activities that address drug trafficking in specially designated areas of the United States.

For the Washington/Baltimore HIDTA Program, HERE Map data is used in an intranet application where officers from other jurisdictions can login and access information on crimes in the surrounding area.



Reference courtesy HERE reseller, American Digital Cartography, Inc

Governments Need a Geospatial Foundation That is Flexible and Can Scale



SCALE

Consistent spec from the regional to national level

FLEXIBILITY

Accessible from one to multiple users; Flexible business models and usage rights

INSIGHTFUL

Models to draw conclusions

INTEGRATION

Desktops, mobile devices and always changing user interfaces

Department of Homeland Security

REGIONAL TO NATIONAL SCALABILITY

The Department of Homeland Security (DHS) has a vital mission to secure the nation from threats faced everyday. HERE Map Content is a critical infrastructure layer helping support an array of DHS initiatives such as aviation, border security, emergency response, cybersecurity and facility inspection.



The Presidential
Inauguration



Super Bowl & Major Sports
Events



Hurricanes & National
Disasters

HERE is Committed to Ensure the Best Experience for Mutual Aid Readiness



Commitment to the Government sector



Rich, accurate, detailed and up-to-date maps

Continuous innovation in enhanced enterprise specific content



Unmatched technical and commercial support

Flexibility in adapting to customer requirements





Discussion Questions



- ❖ What are your goals in enhancing situational awareness and resource management for mutual aid?
 - Are there specific goals that geospatial is best suited to address or contribute to?

- ❖ Where do you see shortfalls in mutual aid planning and operations?
 - Are there specific areas that geospatial has the potential to contribute?