



Organized Chaos

Making Sense of
Emergency Data

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TABLE OF CONTENTS

Problem Framing

What are we dealing with here?

01.

02.

Prioritization

What is most important?

Collection

Where do we find it all?

03.

04.

Visualization

How do we see it?

01.

Problem Framing

What are we dealing with here?









Coup D' oeil!!

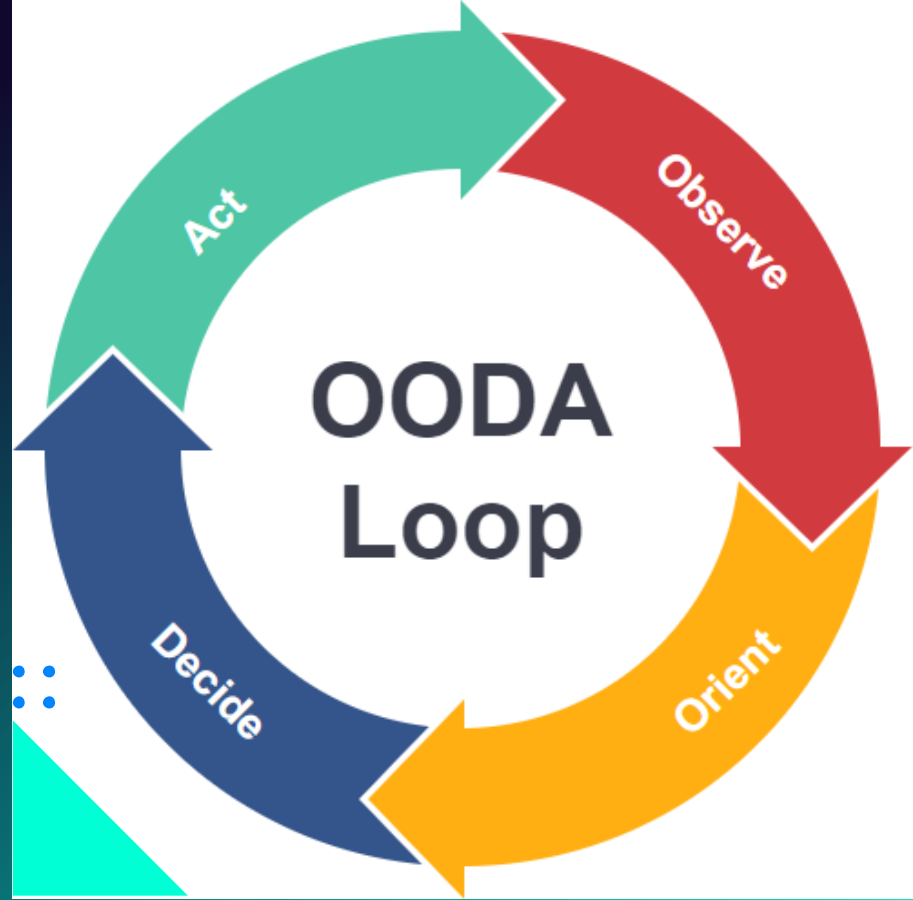
Getty



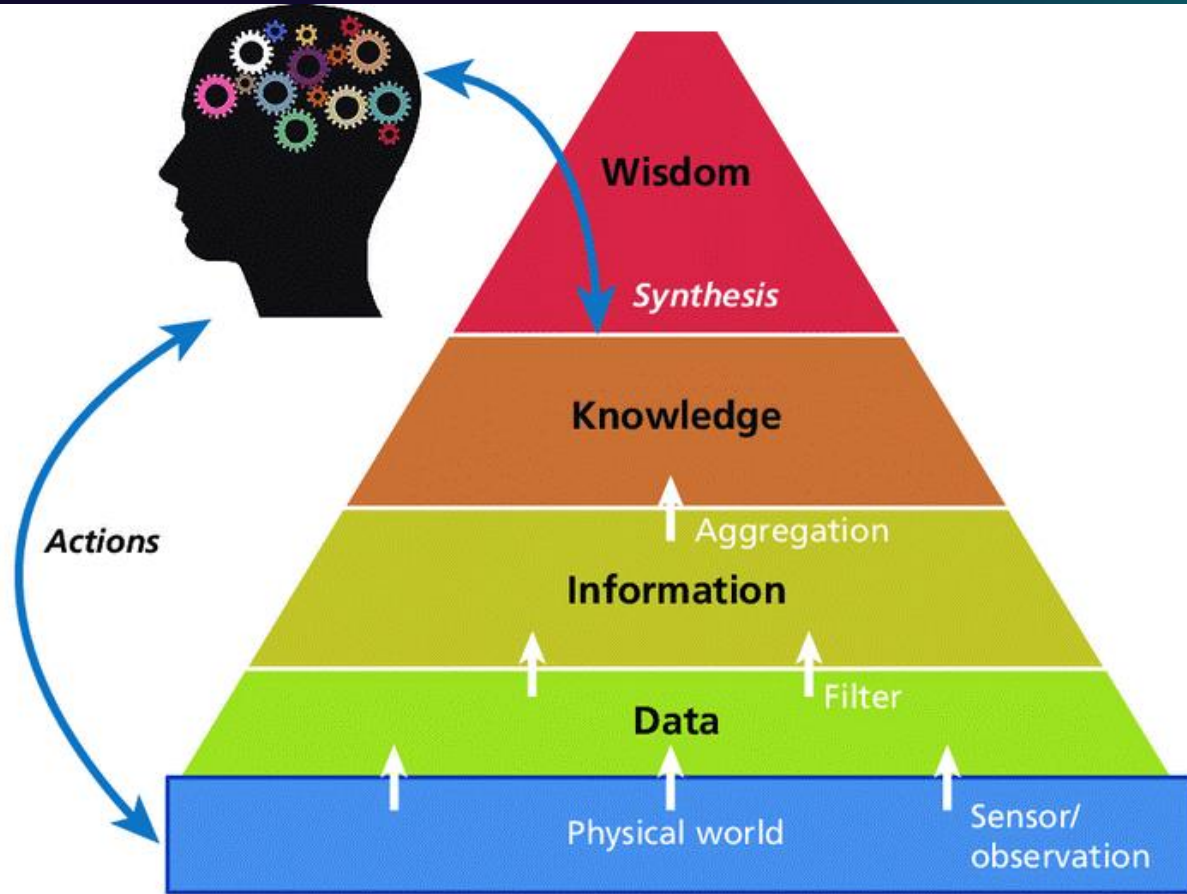
**Godel's Incompleteness
Theorem**

**Heisenberg's
Uncertainty Principle**

**Second Law of
Thermodynamics**



Col John Boyd



SOURCE: Based on Zeleny's model of knowledge management (Zeleny, 2005).

Whats the Issue?

1. Intelligence / information driven Operations
2. Uncertainty
3. Silos of information
4. Need timely, relevant, accurate information



What to do?



Threat Capabilities

Identify and evaluate existing conditions and capabilities.



Threat COAs

Based on threat conditions and capabilities estimate possible threat COAs



Vulnerabilities

Identify vulnerabilities the threat can exploit



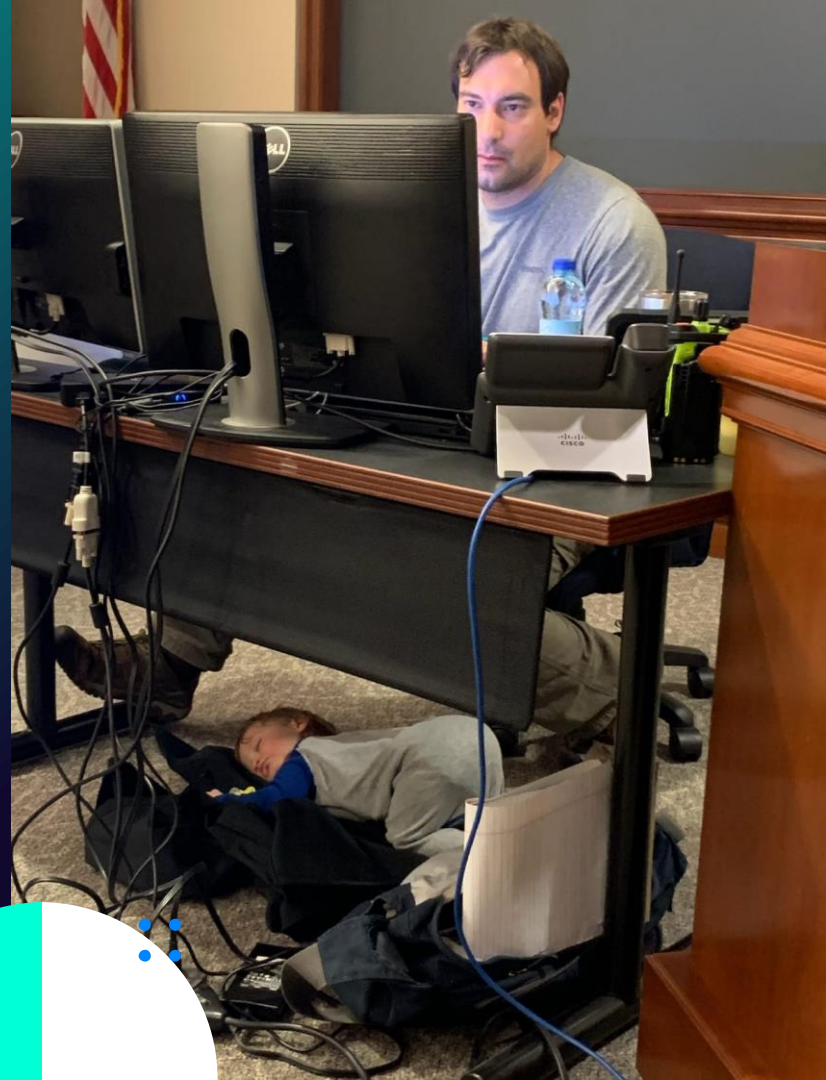
Team COAs

Assist in the development and evaluation of team courses of action

02.

Prioritization

What is most important?





TECHNIQUES



EIs

Essential Elements of
Information



Lifelines

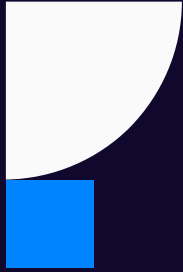
FEMA evidence based
Community Lifelines



Organizational

ICS structure driven
priorities





“Any critical intelligence information required by intelligence consumers to perform their mission. The EEI are specific to a particular event, thing, or other target individual. The EEI are written out in advance as questions by consumers of the EEI information.”



–Essential Elements of Information



Priority of Effort



OPE / Shaping

Operational preparation of the environment. Baseline understanding and influence.



Decision Making

Change detection and situational awareness

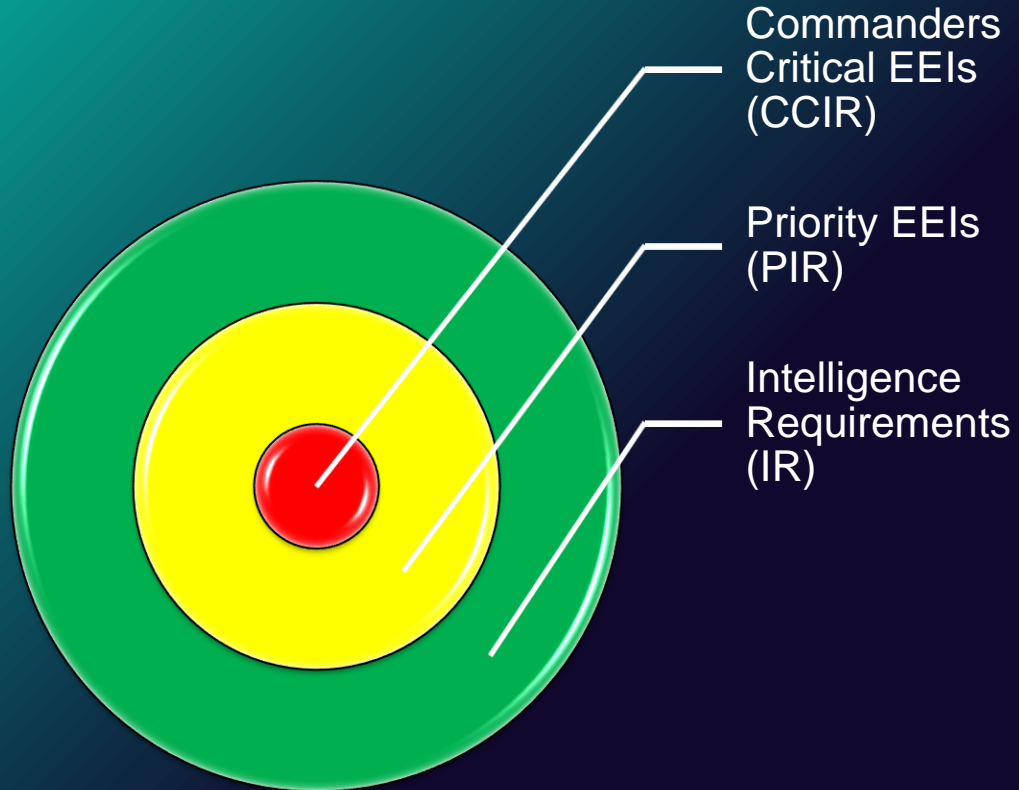


Transitional

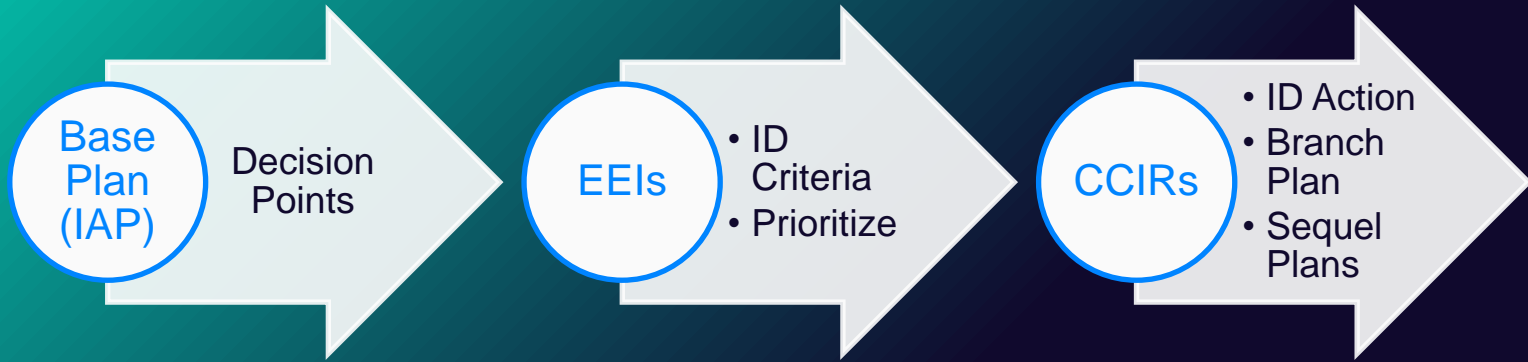
Operational mode shifts (e.g. response to recovery)



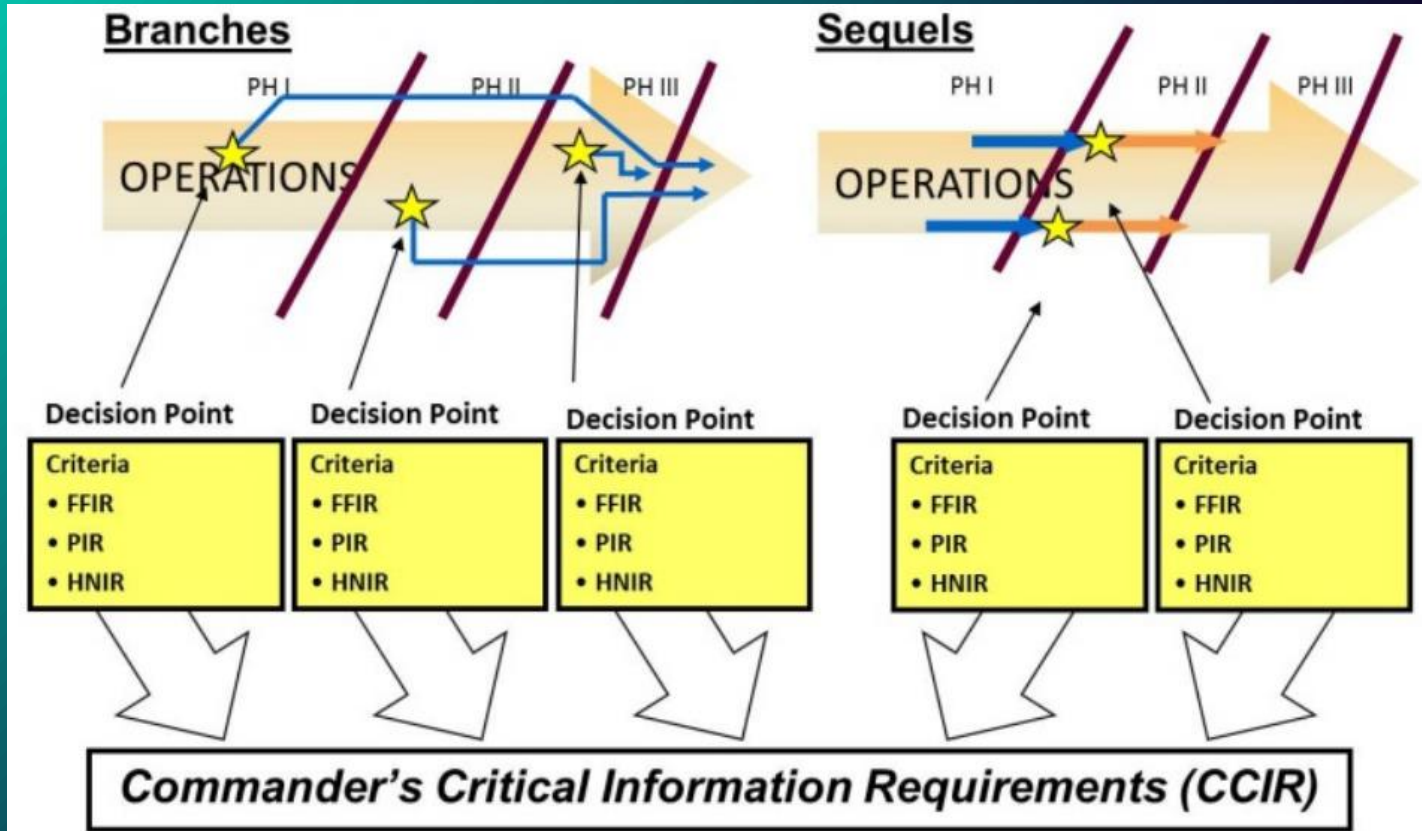
Types of EEIs



CCIR Development



CCIRs



Community Lifelines



Transportation



Communications



Safety & Security



Health & Medical



Energy



HAZMAT



Food
Shelter/Water

03.

Collection

Where do we find it all?





Collection



Sensors

Technological
reporting and
detecting



Networks

People and
organizations with
information



Field Reporting

- How is data gathered?
- Where is it stored?
- How easy is it for the end user?

COSL EOC Significant Events

Survey submissions will notify the EOC of significant events occurring around the city during an event.


Date/Time of Incident*

Is this a Significant Event?

Yes No

Location*

Use the map to mark the incident location. To search for a specific address, use the search bar.



Esri, USGS | Esri, FAO, NOAA Powered by Esri

Lat: 29.58142 Lon: -95.62253

Description*

Multiple Vehicle MVA, MCI, Flooded subdivision, etc...



04.

Visualization

How do we see it?

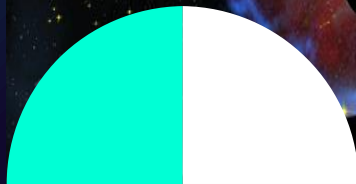
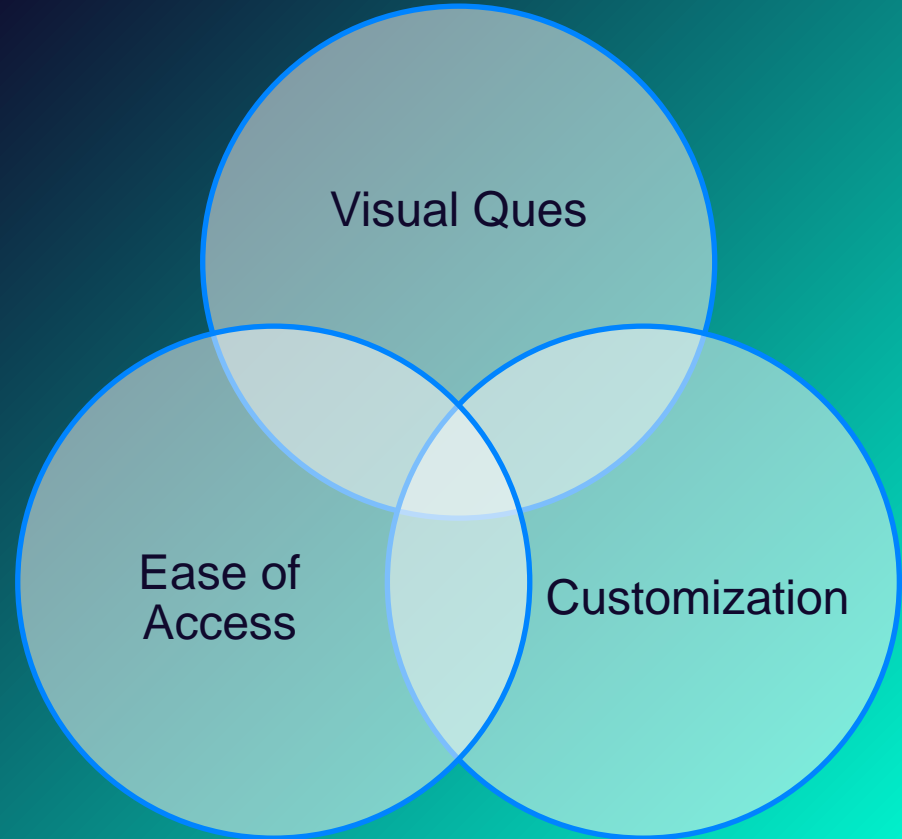




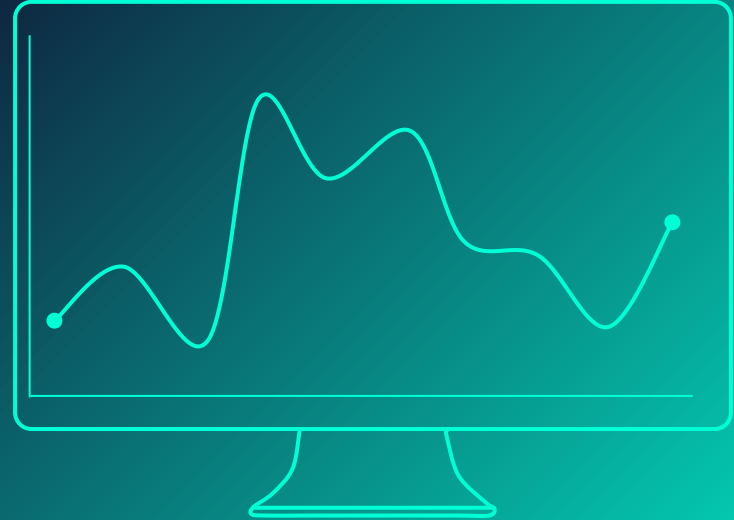
Image Theory

“Human beings do not normally think in terms of data or even knowledge. People generally think in terms of ideas or images—mental pictures of a given situation. Not only do people generally think in images, they understand things best as images and are inspired most by images.”

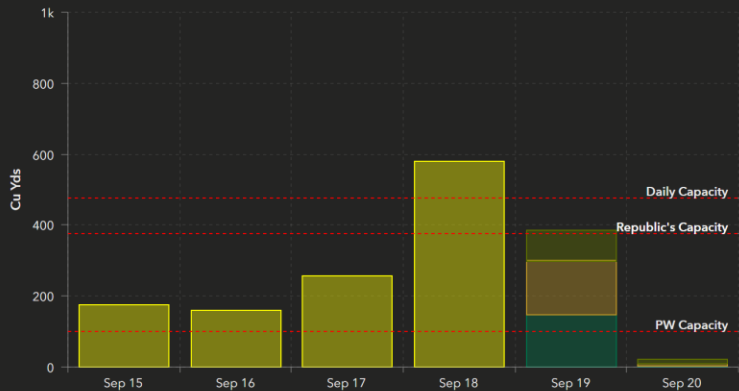


Analysis

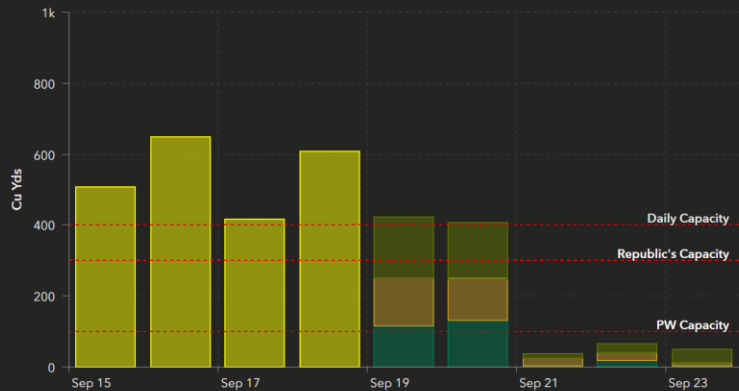
- Resource decisions
- Priorities of work
- Measures of performance
- Measures of effectiveness



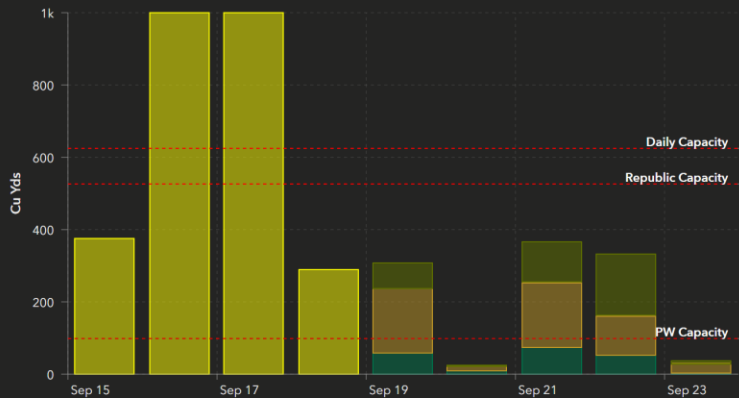
Monday



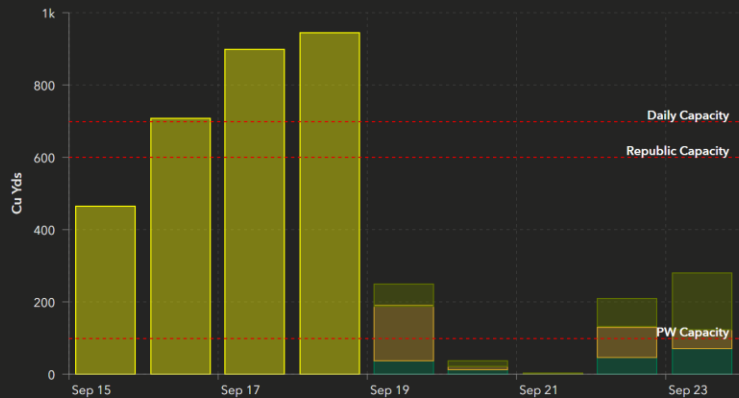
Tuesday



Thursday



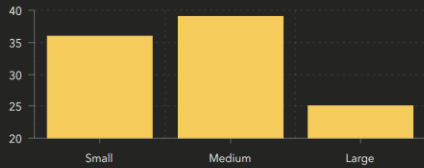
Friday



Today Values

Bulk Waste

100

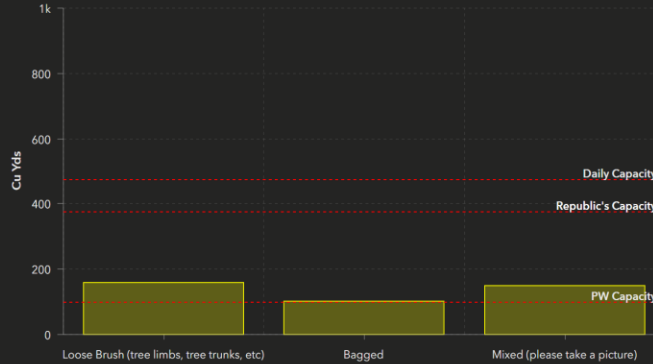


Green Waste

1,311

5,080 Number of Bags 943.6 Cu Yd

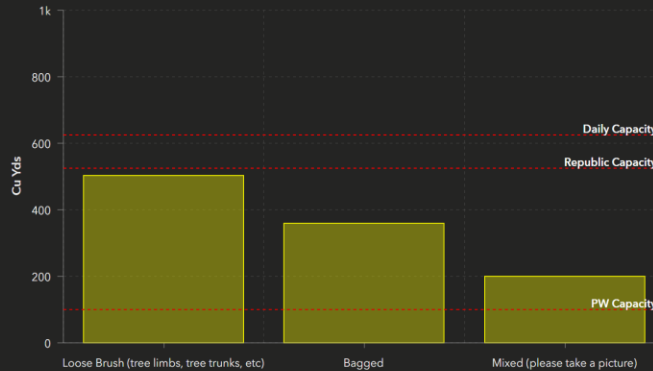
Monday



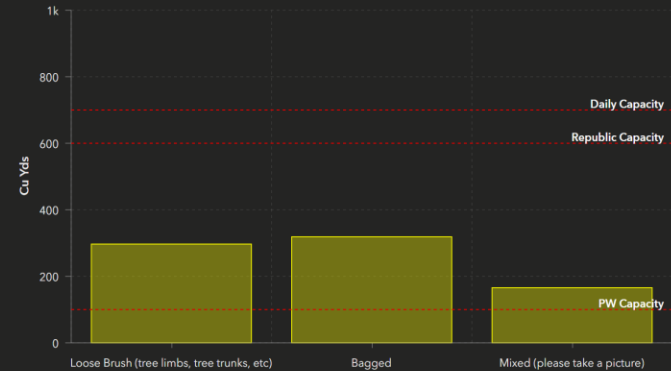
Tuesday



Thursday



Friday



Assessments

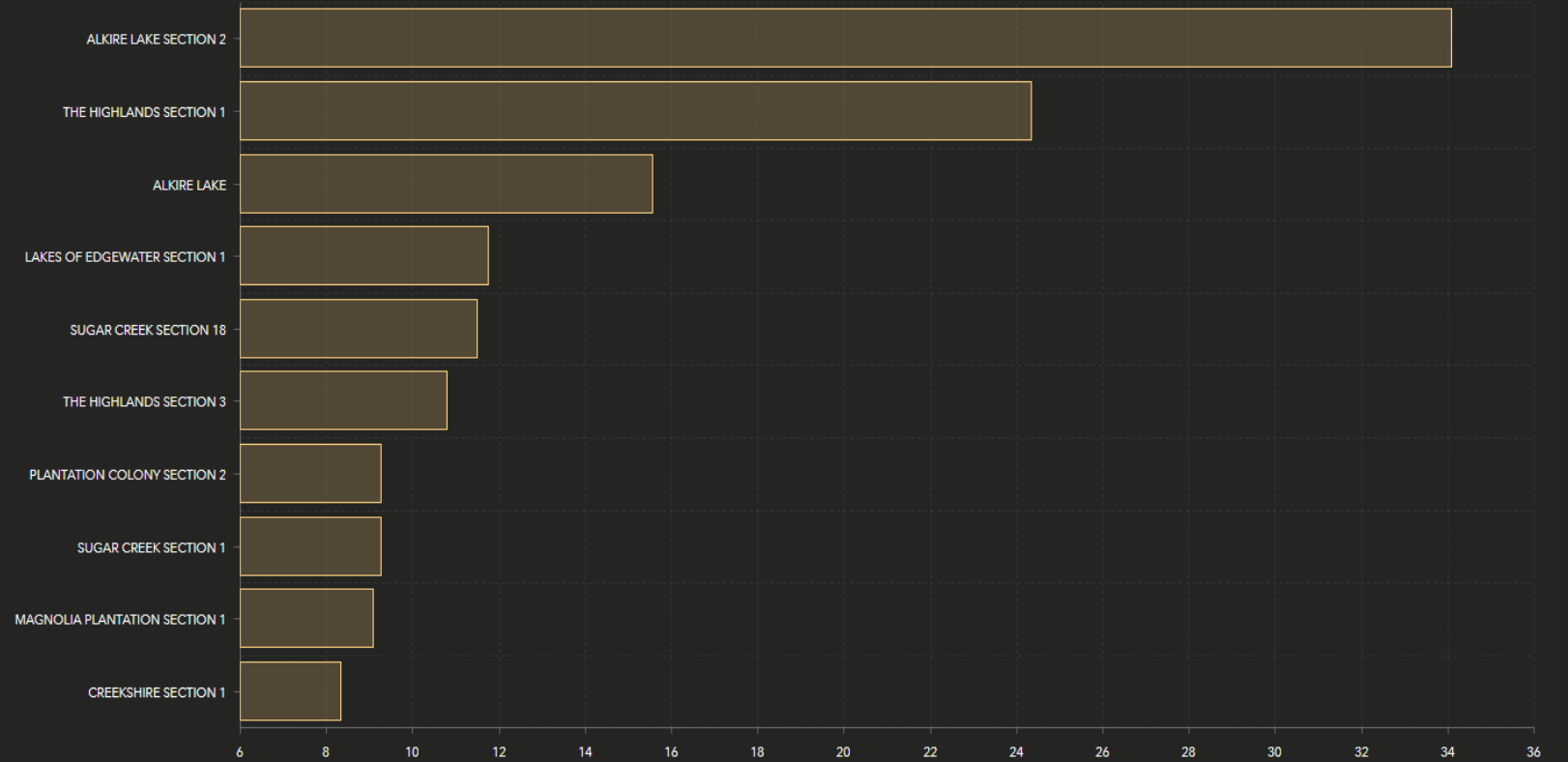
Completed Zones

Green Waste Days

Subdivision Breakdown

Green Waste Type

Subdivision Breakdown | 9/21



Assessments

Completed Zones

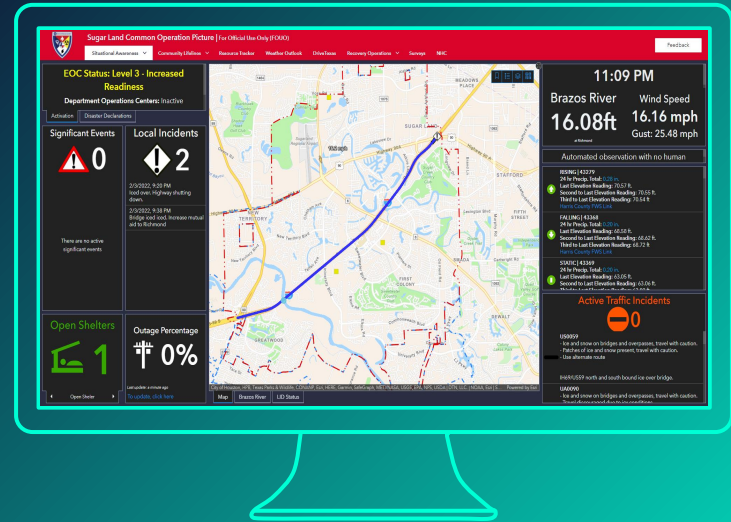
Green Waste Days

Subdivision Breakdown

Green Waste Type

Common Operational Picture (COP)

“A common operation picture (COP) is a continuously updated overview of an incident compiled throughout an incident's life cycle from data shared between integrated communication, information management, and intelligence and information sharing systems. The goal of a COP is real-time situational awareness across all levels of incident management and across jurisdictions.”





EOC Status: Level 3 - Increased Readiness

Department Operations Centers: Inactive

Activation | Disaster Declarations

Significant Events



There are no active significant events

Local Incidents



2/3/2022, 9:20 PM Iced over. Highway shutting down.

2/3/2022, 9:38 PM Bridge iced iced. Increase mutual aid to Richmond

Open Shelters



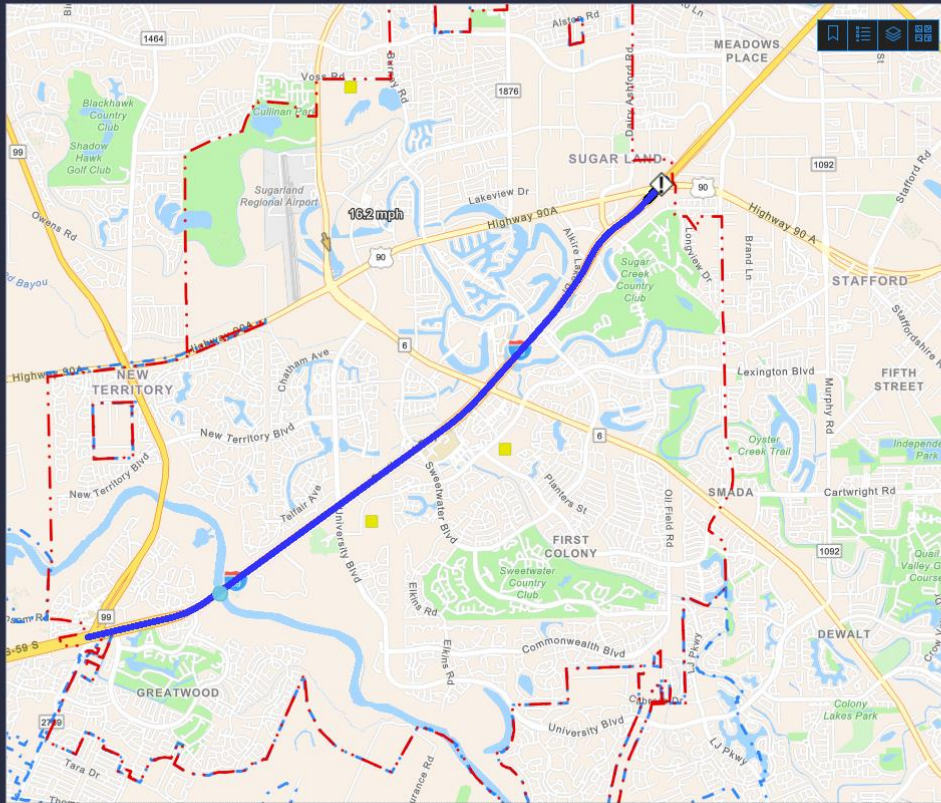
Open Shelter

Outage Percentage



Last update: a minute ago

To update, click here



11:09 PM

Brazos River Wind Speed 16.08ft 16.16 mph Gust: 25.48 mph at Richmond

Automated observation with no human

RIISING | 43279 24 hr Precip. Total: 0.28 in. Last Elevation Reading: 70.57 ft. Second to Last Elevation Reading: 70.55 ft. Third to Last Elevation Reading: 70.54 ft. Harris County FWS Link

FALLING | 43368 24 hr Precip. Total: 0.20 in. Last Elevation Reading: 68.58 ft. Second to Last Elevation Reading: 68.62 ft. Third to Last Elevation Reading: 68.72 ft. Harris County FWS Link

STATIC | 43369 24 hr Precip. Total: 0.20 in. Last Elevation Reading: 63.05 ft. Second to Last Elevation Reading: 63.06 ft. Third to Last Elevation Reading: 63.06 ft.

Active Traffic Incidents



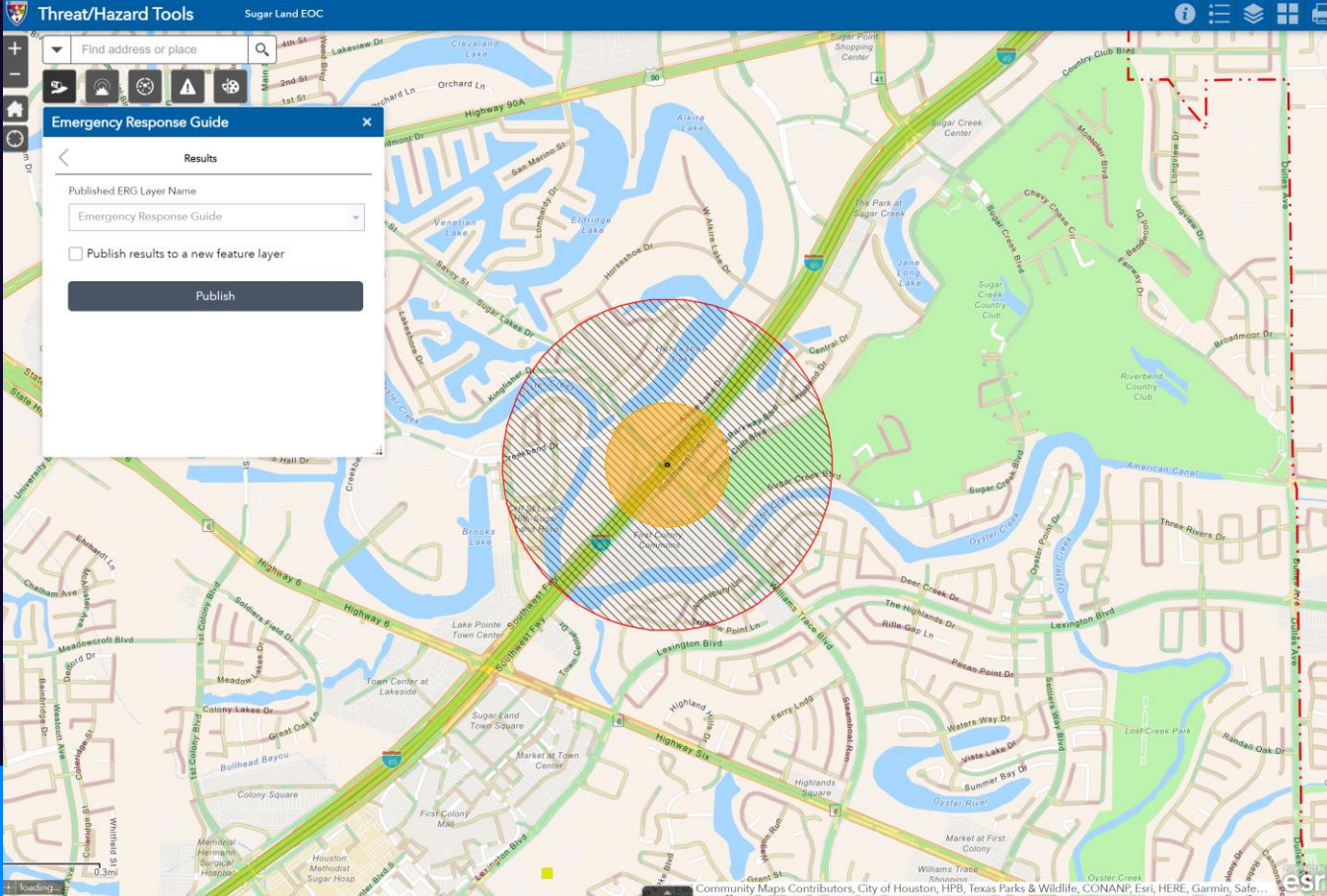
US0059 - Ice and snow on bridges and overpasses, travel with caution. - Patches of ice and snow present, travel with caution. - Use alternate route

IH69/US59 north and south bound ice over bridge.

UA0090 - Ice and snow on bridges and overpasses, travel with caution. Travel discouraged due to icy conditions.



Feedback



Wind Speed
4.35 mph
 Gust: 0 mph

Wind Origin: 80°
 Blowing to: 100

Brazos River @ Richmond
24.88ft
 action level

Broken Clouds at 1400
 meters AGL, Overcast
 Cloud Deck at 1800
 meters AGL

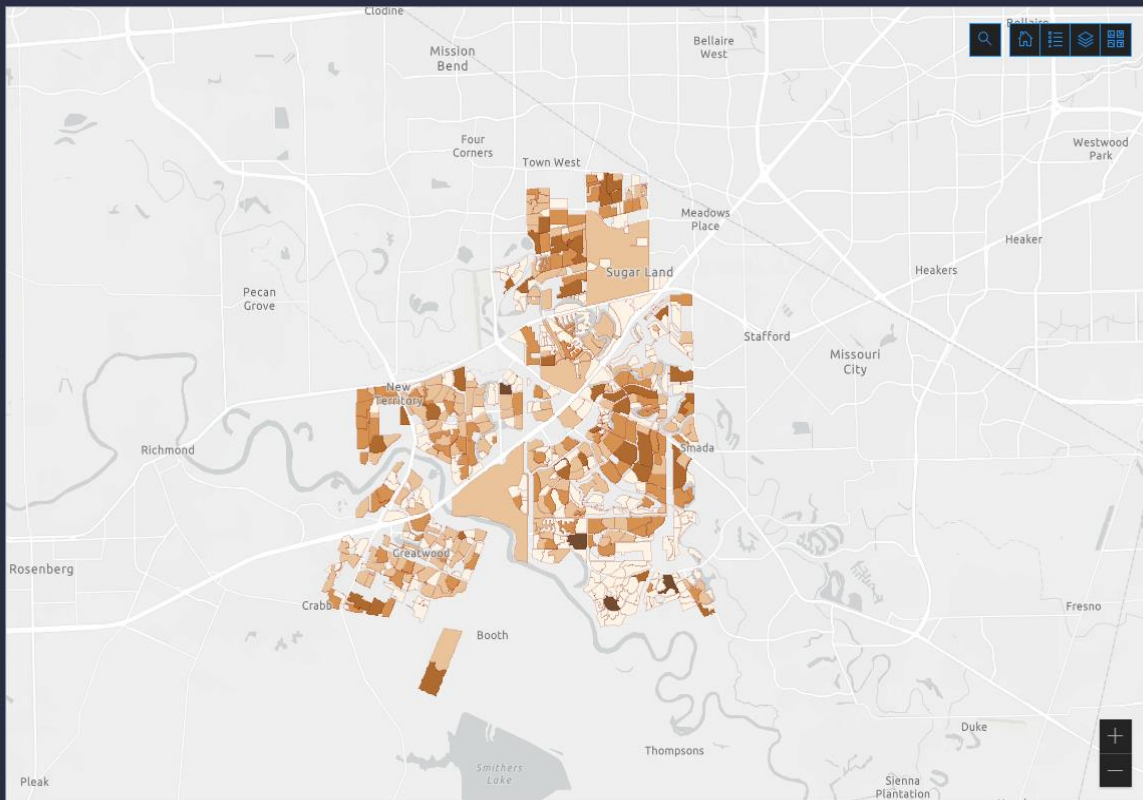
No significant weather
 present at this time.

Prioritizing Operations Support Tool (POST)

Choose subdivision to filter:
None

Total Population
111.8k

Housing Units
38.2k



Households below Poverty
1.7k

Households w/ Disability
5.7k

Unemployment Rate
4.6%

Using this Dashboard
The data shown on the map by default is the population for each unit. You can filter subdivisions in the header to see specific stats about certain areas.



Sugar Land Common Operation Picture | For Official Use Only (FOUO)

Situational Awareness

Community Lifelines

Resource Tracker

Weather Outlook

DriveTexas

Recovery Operations

Surveys

NHC

Feedback



Safety and Security

Law Enforcement/Security
No significant reporting / impact
Fire Service
No significant reporting / impact
Public Works
No significant reporting / impact
Government Services
No significant reporting / impact
Community Safety
No significant reporting / impact
Actions/Resources
No significant reporting / impact



Health and Medical

Fatalities
None
Medical Care
Bed capacity limited due to COVID patient increases.
Patient Movement
Hwy 59 closures in the region restricting access to Level 1 trauma and specialty centers.
Public Health
Increase in COVID cases due to variant spike
Fatality Management
No significant reporting / impact
Medical Supply Chain
No significant reporting / impact
Actions/Resources
No significant reporting / impact



Food, Water, Shelter

Food
No significant reporting / impact
Water
No significant reporting / impact
Shelter
No significant reporting / impact
Agriculture
No significant reporting / impact
Actions/Resources
No significant reporting / impact



Communications

Infrastructure
No significant reporting / impact
Alerts, Warnings, Messages
No significant reporting / impact
911 & Dispatch
No significant reporting / impact
Responder Comms
No significant reporting / impact
Financial Services
No significant reporting / impact
Actions/Resources
No significant reporting / impact



Transportation

Highways/Roadways
Interstate 59/69 closed due to icing. Multiple city/county roads experiencing icing delaying travel.
Mass Transit
No significant reporting / impact
Railways
No significant reporting / impact
Aviation
No significant reporting / impact
Maritime
No significant reporting / impact
Actions/Resources
Tx DOT treating interstate. City PW treating local bridges.



Energy (Power & Fuel)

Power
No significant reporting / impact
Fuel
No significant reporting / impact
Responder Fuel
No significant reporting / impact
Actions/Resources
No significant reporting / impact



Hazardous Materials

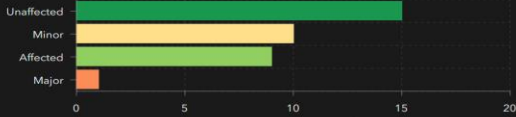
Facilities
No significant reporting / impact
HAZMAT, Pollutants, Contaminants
No significant reporting / impact
Actions/Resources
No significant reporting / impact



Damage Assessment Tracker

Commercial Buildings Assessed

35



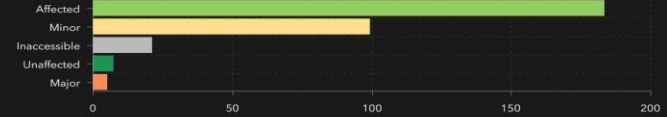
Public Buildings Assessed

61



Residential Buildings Assessed

312



Public Bldgs Damage Assessment

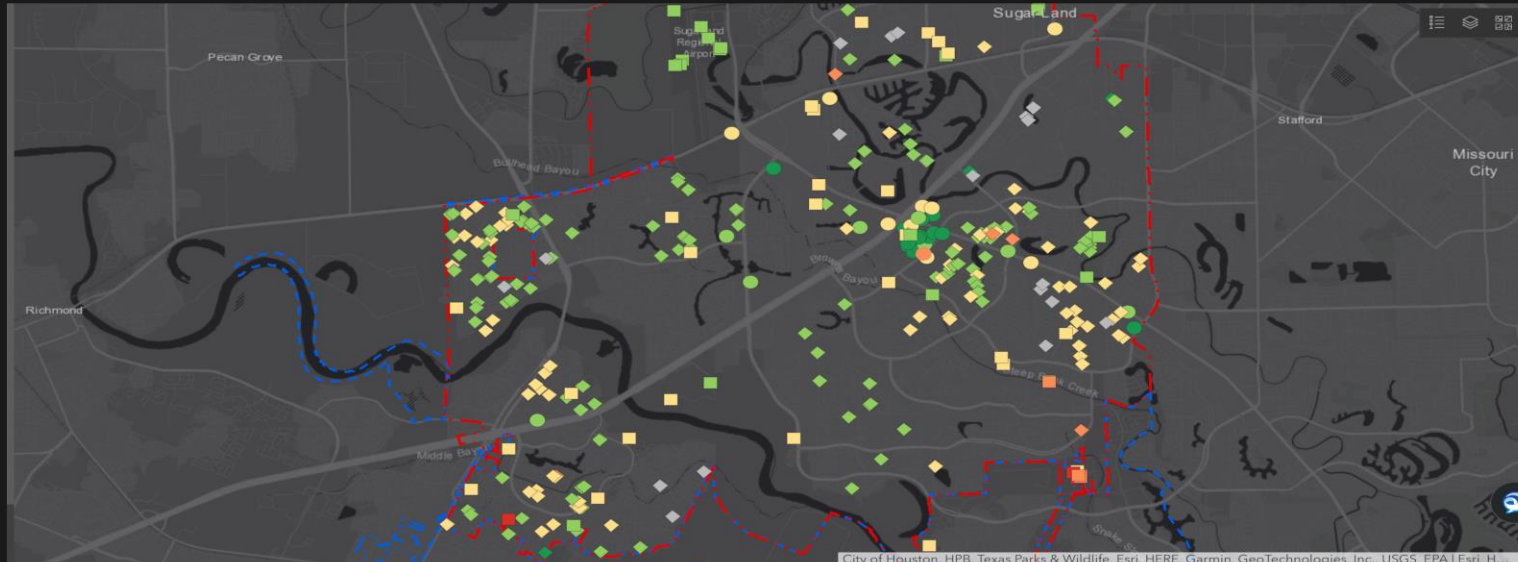
- Unaffected
- Affected
- Minor
- Major
- Destroyed
- Inaccessible

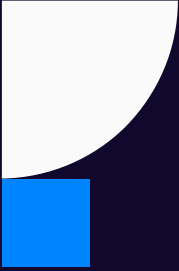
Residential Bldgs Damage Assessment

- Unaffected
- Affected
- Minor
- Major
- Destroyed
- Inaccessible


Commercial Bldgs Damage Assessment

- Unaffected
- Affected
- Minor
- Major

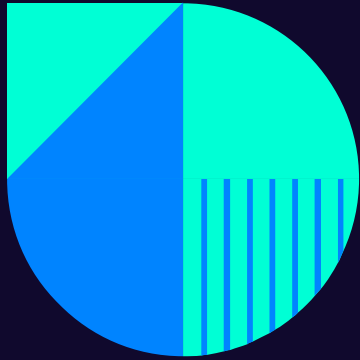




“Many intelligence reports in war are contradictory; even more are false, and most are uncertain. What one can reasonably ask of an officer is that he should possess a standard of judgment, which he can gain only from knowledge of men and affairs and from common sense. He should be guided by the laws of probability. These are difficult enough to apply when plans are drafted in an office, far from the sphere of action; the task becomes infinitely harder in the thick of fighting itself, with reports streaming in.”



—Clausewitz, On War



THANKS



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