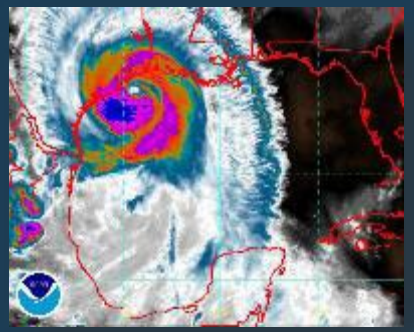
H-GAC 2026 Webinar Series






Disaster Debris Webinar 1

WORKSHOP DATE:

JUNE 18, 2026

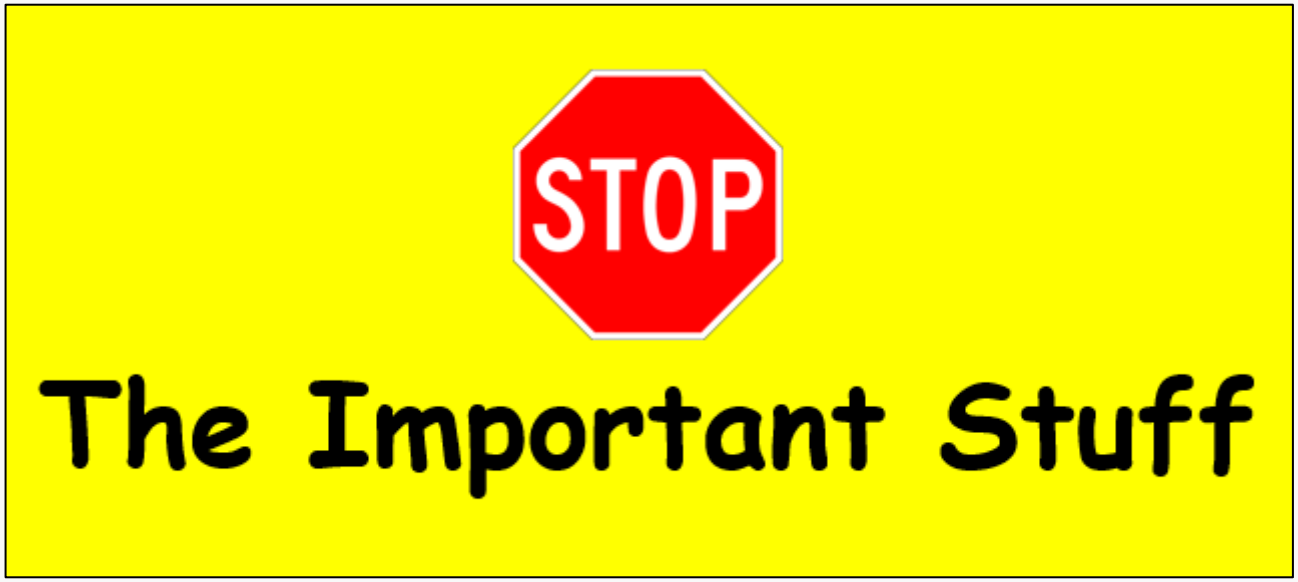
TIME:

9:00 A.M. TO 11:00 A.M.

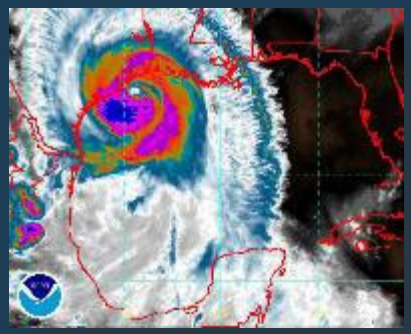
Houston-Galveston Area Council

Agenda

1. Maintaining Preparedness
2. Changes in Federal Guidance
3. Conducting Damage Assessments
4. Pre-Disaster Debris Estimates
5. The Use of Geographic Information Systems in Disaster Debris Management


STOP
The Important Stuff






Part 1: Maintaining Preparedness

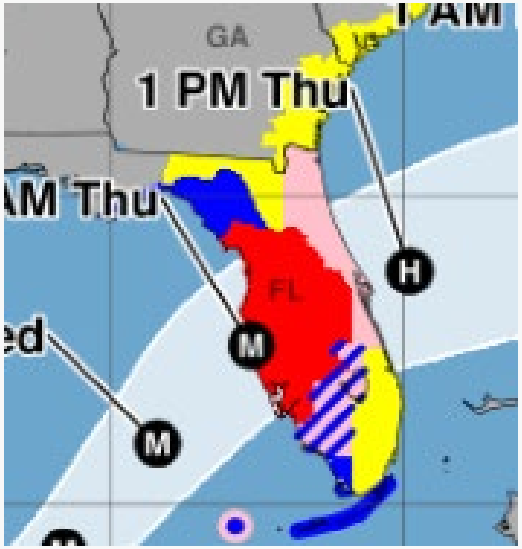
Hurricane Season Outlook

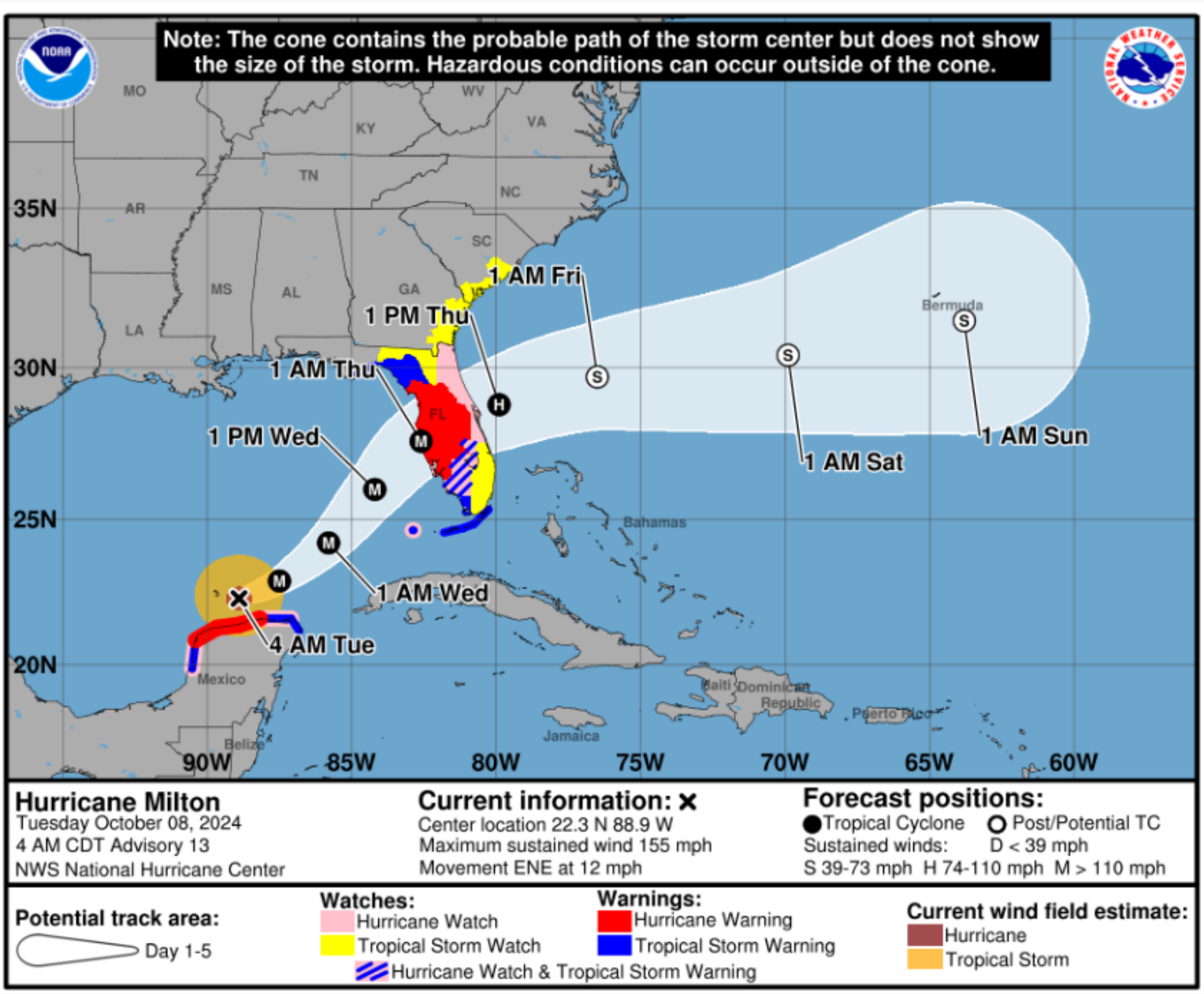
- 13 named storms
- 6 hurricanes
- 2 major hurricanes
- Chances for landfall of a major hurricane:
  - Entire continental U.S. coastline – 32%
  - U.S. East Coast – 15%
  - Gulf Coast – 20%

Hurricane Names for 2026	
Arthur ★	Leah
Bertha	Marco
Cristobal	Nana
Dolly	Omar
Edouard	Paulette
Fay	Rene
Gonzalo	Sally
Hanna	Teddy
Isaias	Vicky
Josephine	Wilfred
Kyle	

National Weather Service Enhancements

- The five-day forecast cone graphic will incorporate all land-based tropical storm and hurricane watches and warnings for the continental U.S., Hawaii, Puerto Rico, and the U.S. Virgin Islands, using single shading for the entire cone and legend symbols indicating overlapping watch and warning areas.



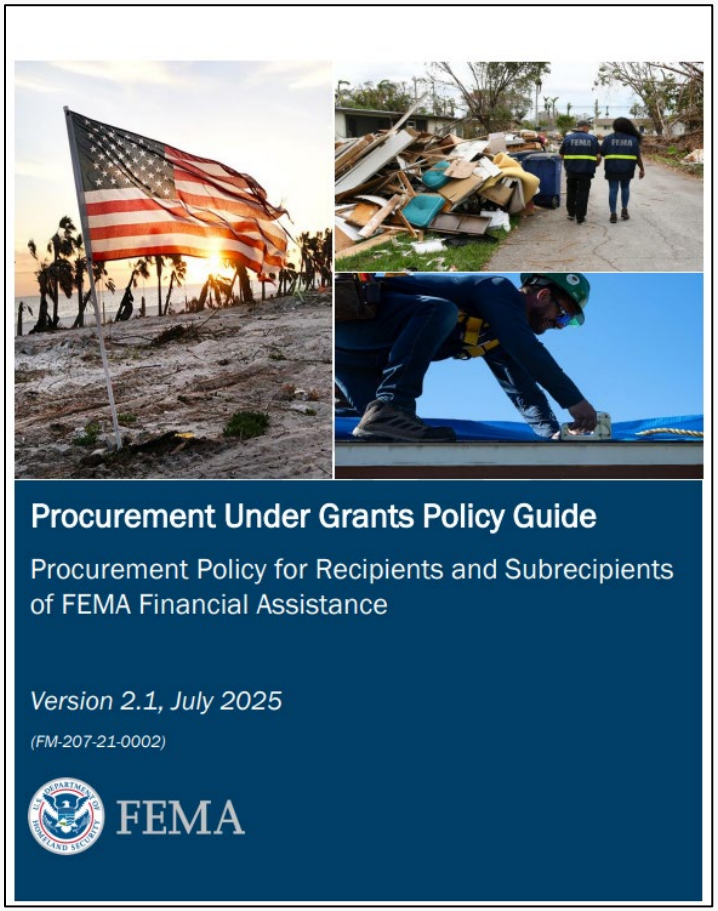

Note: The cone contains the probable path of the storm center but does not show the size of the storm. Hazardous conditions can occur outside of the cone.
1 AM Fri
1 PM Thu
1 AM Thu
1 PM Wed
1 AM Wed
4 AM Tue
1 AM Sat
1 AM Sun
Bermuda
Bahamas
Mexico
Belize
Jamaica
Haiti
Dominican Republic
Puerto Rico
35N
30N
25N
20N
90W
85W
80W
75W
70W
65W
60W
Hurricane Milton
Tuesday October 08, 2024
4 AM CDT Advisory 13
NWS National Hurricane Center
Current information:
Center location 22.3 N 88.9 W
Maximum sustained wind 155 mph
Movement ENE at 12 mph
Forecast positions:
Tropical Cyclone
Post/Potential TC
Sustained winds:
D < 39 mph
S 39-73 mph H 74-110 mph M > 110 mph
Potential track area:
Day 1-5
Watches:
Hurricane Watch
Tropical Storm Watch
Hurricane Watch & Tropical Storm Warning
Warnings:
Hurricane Warning
Tropical Storm Warning
Current wind field estimate:
Hurricane
Tropical Storm

Prepositioned Contracts

- Identifying prequalified contractors and contracting needs in advance can save time and money during disaster response efforts.
- After a major disaster, multiple communities might be competing for the same resources, which may be limited.

Guidance for Procurement

- Procurement Under Grants Policy Guide (PUGPG)
  - Provides guidance regarding the mandatory requirements for FEMA award recipients and subrecipients using federal grant funding to finance the procurement of property and services.



https://www.fema.gov/sites/default/files/documents/fena_gpd_procurement-under-grants-policy-guide_fiscal-year-2025.pdf

9

Debris Management Sites

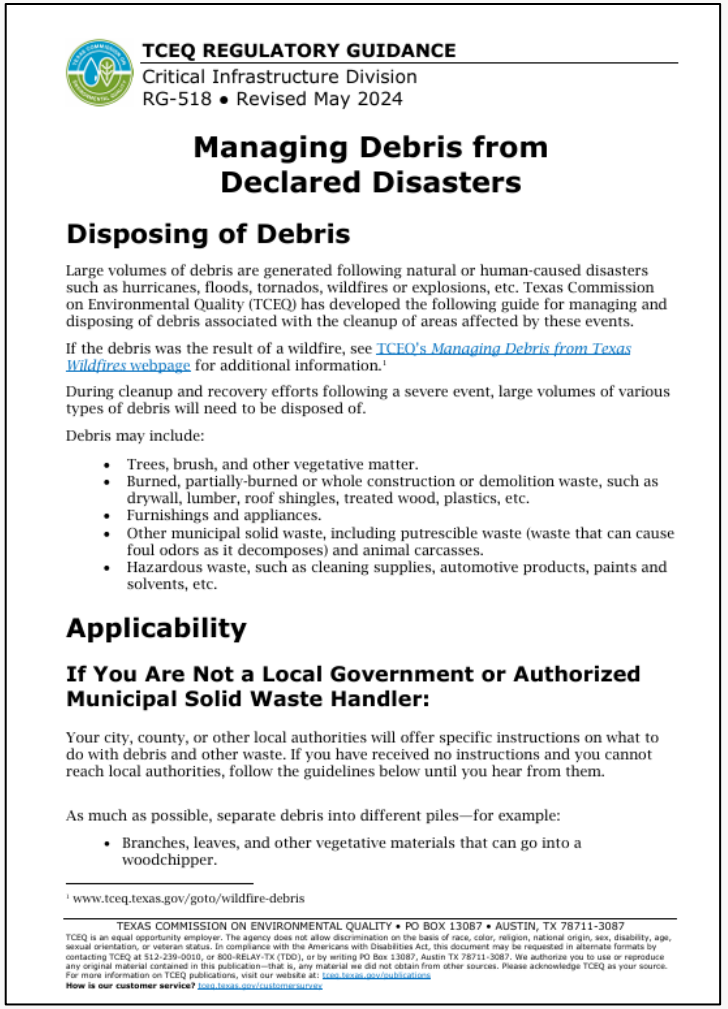
- Temporarily store, process, and reduce debris before it is transported to a final disposal facility.

Debris Management Sites

- Are the properties you are planning to use as debris management sites still available?
  - Confirm that the sites you are planning to use are still available and suitable for use as a debris management sites.
- Do you have enough sites to provide for the needs of the community after a disaster?
  - Examine the potential debris generation from a disaster and determine if the sites you have are sufficient.

Disposal and Recycling Options

- Examine recycling and disposal options in your community.
- The Texas Commission on Environmental Quality has guidance regarding recycling and the proper disposal of disaster debris (RG-518).



TCEQ REGULATORY GUIDANCE
Critical Infrastructure Division
RG-518 • Revised May 2024

Managing Debris from Declared Disasters

Disposing of Debris

Large volumes of debris are generated following natural or human-caused disasters such as hurricanes, floods, tornados, wildfires or explosions, etc. Texas Commission on Environmental Quality (TCEQ) has developed the following guide for managing and disposing of debris associated with the cleanup of areas affected by these events.

If the debris was the result of a wildfire, see TCEQ's *Managing Debris from Texas Wildfires* webpage for additional information.[1]

During cleanup and recovery efforts following a severe event, large volumes of various types of debris will need to be disposed of.

Debris may include:

- Trees, brush, and other vegetative matter.
- Burned, partially-burned or whole construction or demolition waste, such as drywall, lumber, roof shingles, treated wood, plastics, etc.
- Furnishings and appliances.
- Other municipal solid waste, including putrescible waste (waste that can cause foul odors as it decomposes) and animal carcasses.
- Hazardous waste, such as cleaning supplies, automotive products, paints and solvents, etc.

Applicability

If You Are Not a Local Government or Authorized Municipal Solid Waste Handler:

Your city, county, or other local authorities will offer specific instructions on what to do with debris and other waste. If you have received no instructions and you cannot reach local authorities, follow the guidelines below until you hear from them.

As much as possible, separate debris into different piles—for example:

- Branches, leaves, and other vegetative materials that can go into a woodchipper.

[1] www.tceq.texas.gov/goto/wildfire-debris

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY • PO BOX 13087 • AUSTIN, TX 78711-3087

Updated EPA Guidance

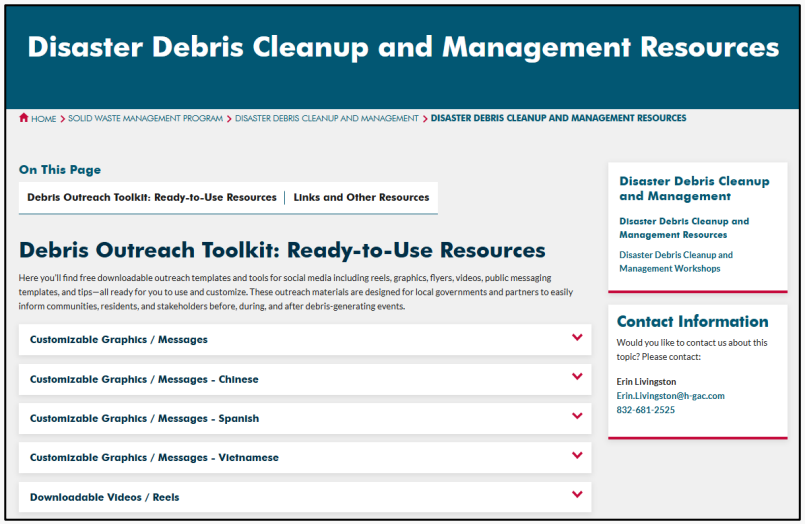
- The U.S. Environmental Protection Agency (EPA) updated its "Planning for Natural Disaster Debris" guidance:
  - Focus on pre-planning
  - New case studies

Develop/Update Disaster Debris Management Plans

- Overview
- Debris estimates – types and quantities
- Debris collection and removal strategy
- DMS and disposal locations
- Debris removal from private property
- Use and procurement of contracted services
- Use of force account labor
- Monitoring of debris operations
- Health and safety requirements
- Public information
- Identification of debris removal contractors
- Priority road list
- Debris zones

Public Information Messages

- Have public information messages and graphics ready so you can push out instructions quickly regarding debris separation and other aspects of debris operations.



- Helpful messages, graphics, and videos are provided on the H-GAC website: www.h-gac.com/solid-waste-management/disaster-debris-cleanup-and-management/resources

Training

- 8-hour virtual class: “Planning for Disaster Management.” MGT-460
- 4-day class: “Debris Management Planning for State, Tribal, Territorial and Local Officials” ELK0202
- Check the FEMA National Training and Education Division website for the class schedule: www.firstrespondertraining.gov/frts/npccatalog?id=2056

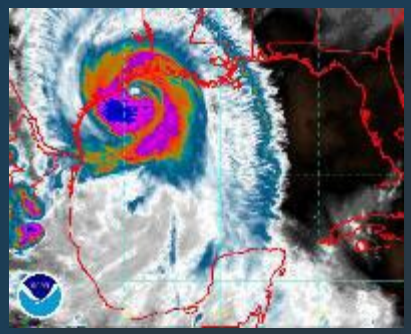
STOP

The Important Stuff

Exercise Plans

- Conduct an annual meeting with staff and contractors.
- Conduct workshops to refine plans and procedures.
- Conduct tabletop exercises to talk through potential scenarios.






Part 2: Changes in Federal Guidance

Houston-Galveston Area Council

STOP

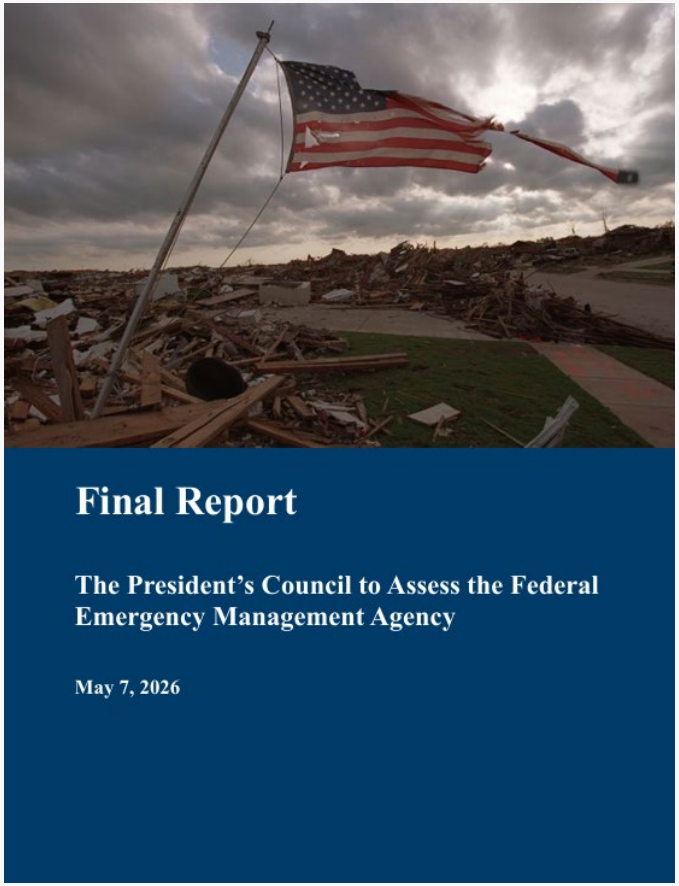
The Important Stuff

Recovery Priorities

- Focus on speed
- Progress as judged by meeting specific deadlines

Policy and Procedure Changes in 2026

- FEMA procedural changes
- Request for Information (RFI) examples from recent FEMA projects in TX
- FEMA Review Council
- FEMA Act (H.R. 4669)



FEMA Accelerated Deadlines

- Recent memo from DR-4909 (Region 9) establishes new timelines.
- FEMA is strictly adhering to these dates and any failure to meet takes the project directly to Determination Memo.

Phase	Description	Maximum Allowable Days within Phases (Non-PNPs)	Maximum Allowable Days within Phases (PNPs)
Phase 1	Operational Planning	70 days	105 days
Phase 2	Impacts and Eligibility	125 days	125 days
Phase 3	Scoping and Costing	60 days	60 days
Phase 4	Final Reviews	90 days	90 days

FEMA Accelerated Deadlines

Task	New FEMA Expectations (Days Post-Declaration)	Traditional FEMA Pace (Days Post-Declaration)
Recovery Scoping Meeting	30	75-90+
Submit Final Damage Inventory	90	135-150+
Complete Site Inspections	110	250-300+
Submit EEls following site inspections	115	250-360+
Submit Streamlined Project Applications	115	365-400+
Complete DDD	140	275-360+

Changes to Debris Project Formulation

- Force account documentation
- Contracted documentation
- Force account labor (FAL) monitoring requirements
- Photographs and other support

Example RFIs

- List of temporary debris storage and reduction (TDSR) sites specific to project #754346 with address/GPS, permit #, and description of the work that the Applicant did or will do to restore the site back to its condition prior to the Applicant's use.
- Final disposal sites address/GPS, permit #, type of site, who owns the site.
- Type and quantity of debris hauled: quantity hauled, method of calculation, location of debris, type of labor, quantity taken to each disposal site, how debris was loaded and/or hauled, type of labor, haul price, reduction method, reduced quantity, reduction price per unit, total reduction cost, tipping fee, cost of disposal, etc.

Example RFIs

- Environmental and Historic Preservation Survey Provide Permit for Coordination with a regulatory agency regarding Invasive Species.
- If it was monitored by FAL, then the summary must indicate who performed the monitoring.

FEMA Review Council

- On January 24, 2025, President Trump established the FEMA Review Council through Executive Order 14180 to advise on FEMA's ability to "capably and impartially address disasters occurring within the United States" and to recommend structural changes to "best serve the national interest."

Key Recommendations

With the aforementioned guiding principles as a framework, the Council's report provides ten key recommendations that will boldly transform FEMA as an agency as well as address the return of leadership and responsibility for disaster management to the States, Local Communities, Tribes, and Territories.

1. Equip SLTT to lead disaster response with the federal government in a supporting role
2. Enhance critical federal programs & resources to support communities
3. Realign the criteria for federal disaster assistance
4. Replace the Hazard Mitigation Grant Program with a two-phase funding structure
5. Streamline the Individual Assistance program into a single direct payment program
6. Reform the Public Assistance program to provide direct funding
7. Reform the National Flood Insurance Program for financial stability and risk resilience
8. Maximize every dollar spent by reducing administrative costs
9. Revitalize A Unified National Network for Partnership
10. A Transformed Agency

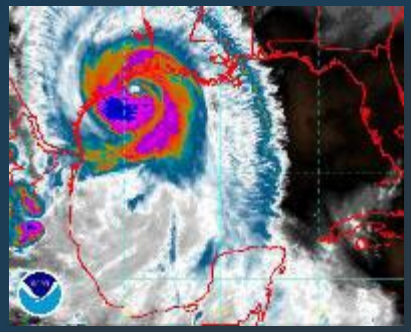
Implementation of Recommendations

Recommendation	Minimum Action Required to Implement			
	Policy	Legislation	Regulation	Executive Order
#1 Equip SLTT to Lead	✓			
#2 Enhance Critical Programs	✓		✓	
#3 Realign Criteria for Assistance			✓	
#4 Replace HMGP		✓		
#5 Streamline IA		✓		
#6 Reform PA		✓		
#7 Reform NFIP		✓		
#8 Reduce Admin Costs				✓
#9 Network for Partnership	✓			
#10 Transform FEMA		✓		✓

The FEMA Act

- On July 22, 2025, the House Transportation and Infrastructure (T&I) Committee introduced H.R. 4669, the FEMA Act, arguably the most comprehensive proposed rewrite of the Robert T. Stafford Disaster Relief and Emergency Assistance Act since 1988. The bill cleared the T&I Committee on September 3, 2025, and awaits House floor action.
- Action was stalled waiting for the FEMA Review Council Findings.



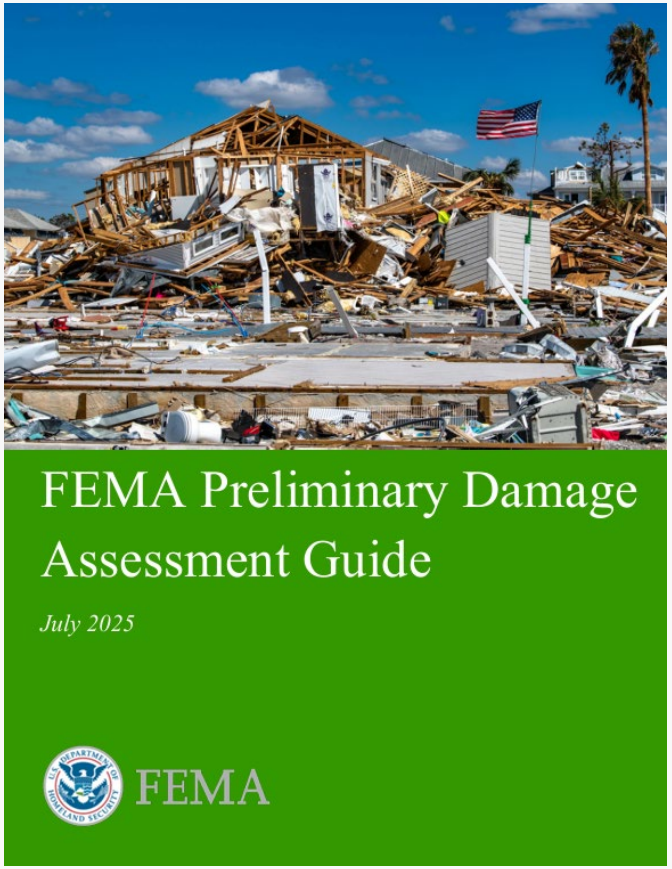


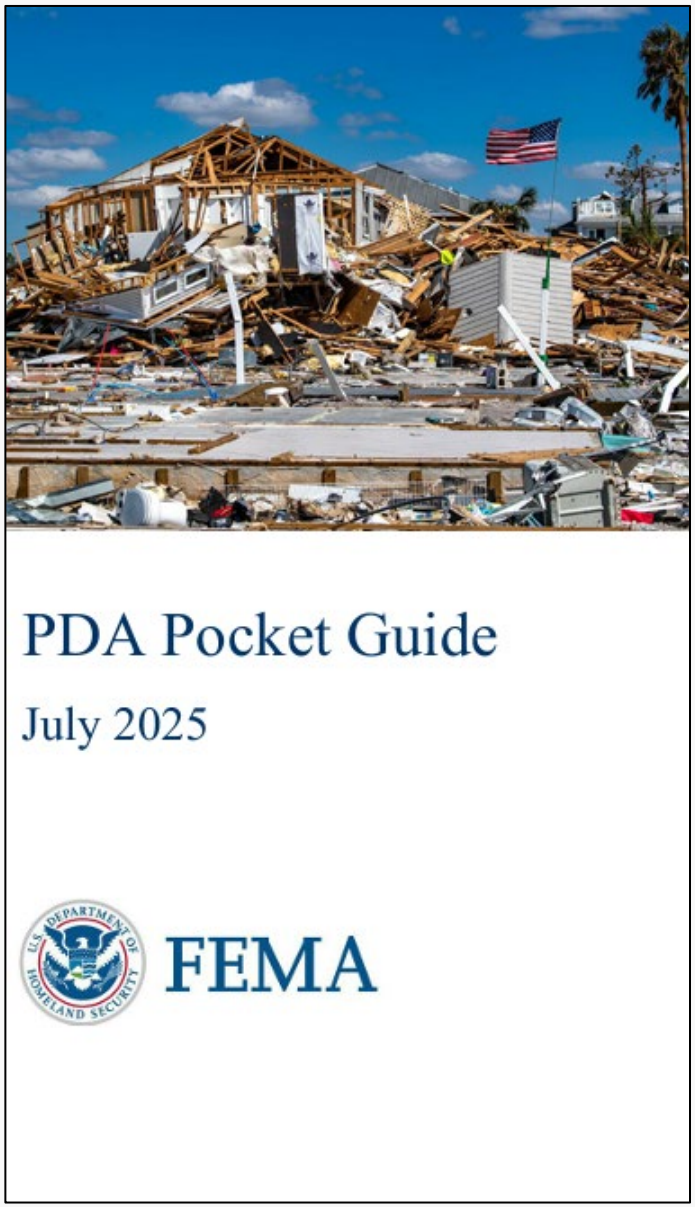

Part 3: Conducting Damage Assessments

Houston-Galveston Area Council

FEMA Preliminary Damage Assessment (PDA) Guide

- The FEMA PDA Guide helps emergency management officials at all levels of government to efficiently complete accurate and consistent PDAs.

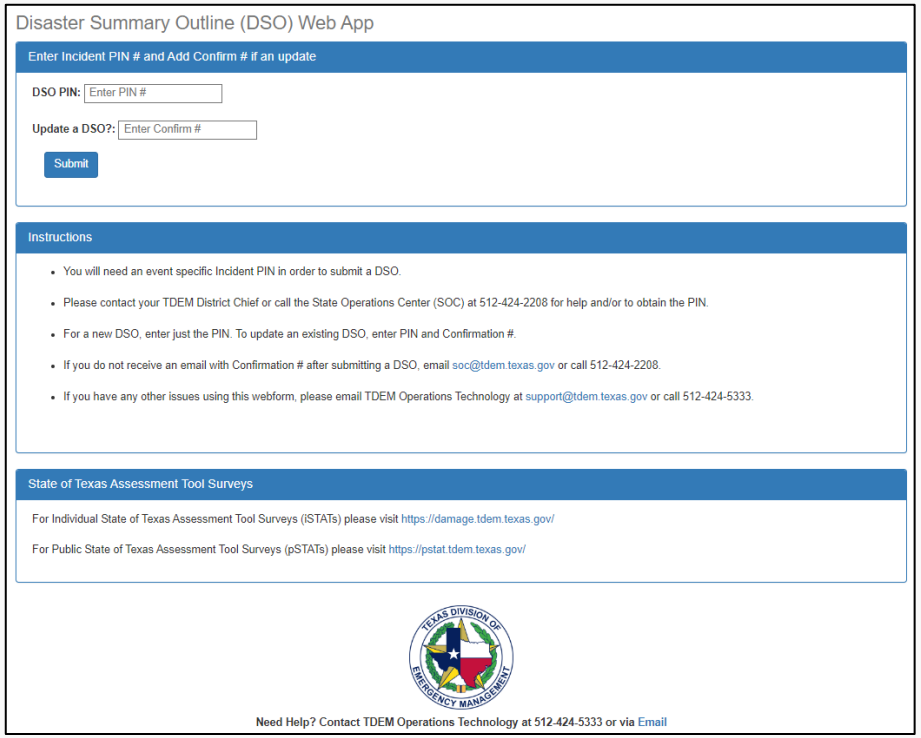




PDA Pocket Guide

- The PDA Pocket Guide is a quick reference tool for those conducting PDAs to determine the magnitude of damage and impact of disasters.

Disaster Summary Outline (DSO)



https://dso.soc.texas.gov/

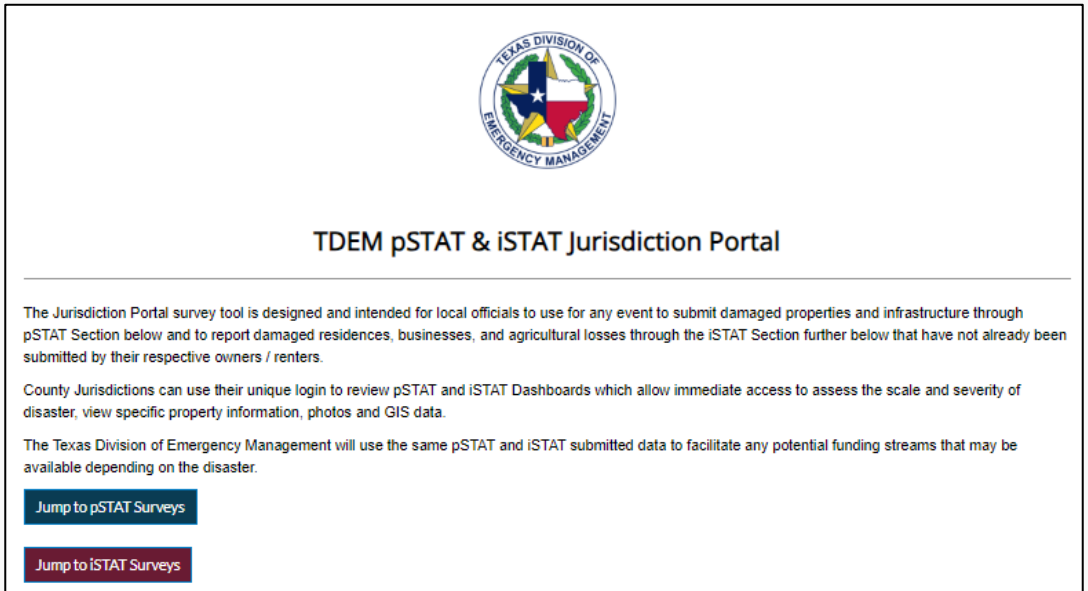
- As soon as possible, all jurisdictional departments should begin gathering response costs and initial damage estimates for the DSO.
- Figures do not have to be exact.
- The DSO will be automatically submitted to the State Operations Center.

STOP

The Important Stuff

Public Assistance State of Texas Assessment Tool (pSTAT)

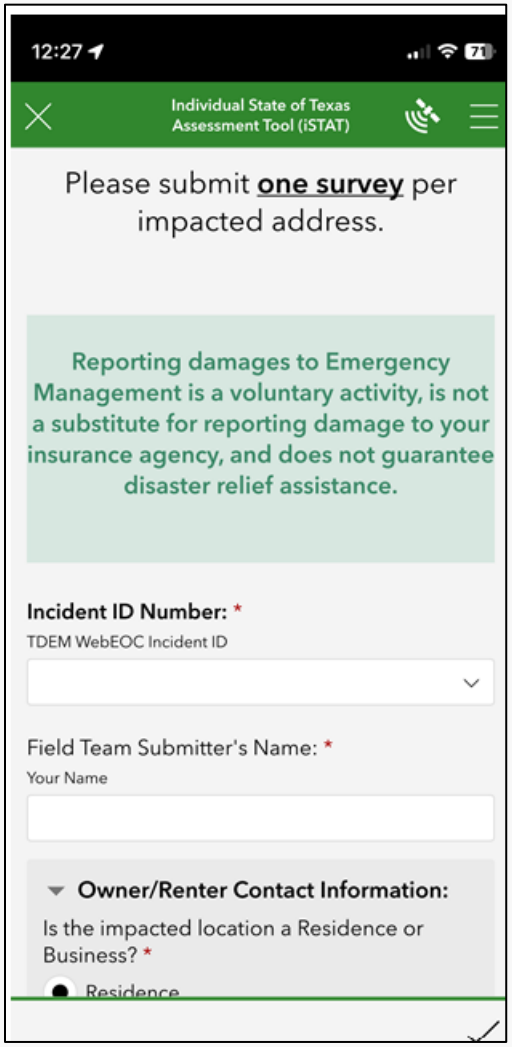
- pSTAT is a mobile platform to capture storm-related damages to public infrastructure, debris, and other FEMA designated categories of work: pstat.tdem.texas.gov



Information to Be Collected

- Information to be collected includes:
  - Both GIS location and street address of damaged properties
  - Dimensions, materials, and size or capacity of damaged facilities
  - Photos of the damage showing the scale and the information being reported
- Begin collecting supporting documentation that may need to be submitted in the event of a federally declared disaster.

iSTAT Survey123 for Local Jurisdictions and Designated Partners

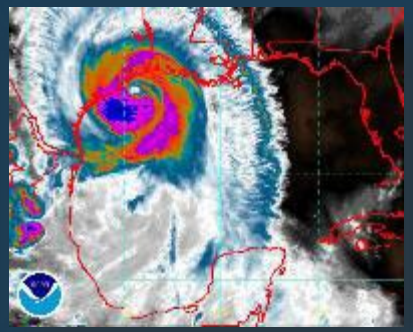


- Citizens are encouraged to report damage to property, homes, and businesses using the Individual State of Texas Assessment Tool (iSTAT) damage survey: pstat.tdem.texas.gov/#iSTATForms

Building Officials Association of Texas (BOAT)

- Can deploy damage assessment teams to areas in Texas affected by disaster.
- Will conduct rapid safety evaluations of structures.
- Will respond to a Texas STAR request or a request from a City or County official.
- Can deploy 2 to 20 teams of 2 inspectors.
- Can be reached at: 214-850-5077






Part 4: Pre-Disaster Debris Estimating

Purpose of Pre-Disaster Debris Estimates

- Helps you to understand the types and quantities of debris you might have to manage after a disaster.
- Provides a basis for determining the resources that will be needed to manage debris.

Hazard Mitigation Plans

- Hazard mitigation plans (HMPs) provide a good place to start to gain an understanding of the types of hazards the jurisdiction may be vulnerable.
- The HMPs will typically rate the disasters on a scale that consider the severity of impact and potential frequency.

Developing Debris Estimates

- Hazus can be used to map, model, and analyze risk from earthquakes, floods, hurricanes, and tsunamis.
- Hazus was developed by FEMA and operates as a GIS-based desktop application, specifically utilizing Esri's ArcGIS Pro.

U.S. Army Corps of Engineers (USACE) Hurricane Debris Estimation Model

- The forecasted amount of residential debris is based on the following formula:

$$Q=H(C)(V)(B)(S)$$

- Where:
  - Q = Cubic yards (CY) of debris
  - H = Number of households in the community
  - C = Storm category factor
  - V = Vegetative characteristic multiplier
  - B = Commercial multiplier
  - S = Precipitation characteristic multiplier

Storm Category Factor

Hurricane Category	Value of "C" Factor
1	2
2	8
3	26
4	50
5	80

Vegetation Characteristic Multiplier

- Light, 1.1 multiplier – More ground is visible than trees.
- Common to newer subdivisions.

League City – Bay Colony Subdivision

Vegetation Characteristic Multiplier

- Medium, 1.3 multiplier – Uniform pattern of open space and tree canopy cover.
- This is the most commonly used multiplier.

Houston – Lazybrook Subdivision

Vegetation Characteristic Multiplier

- Heavy, 1.5 multiplier – The ground or houses cannot be seen due to the tree canopy cover.

Houston Near Memorial Drive

Commercial Multiplier

Commercial Density	Value of "B" Factor
Light	1
Medium	1.2
Heavy	1.3

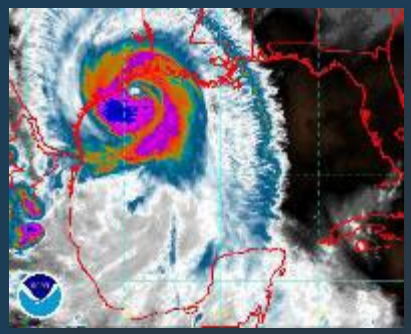
Precipitation Multiplier Factor

Precipitation Characteristic	Value of "B" Factor
None to Light	1
Medium to Heavy	1.2

Use of the Debris Estimates

- Having the debris estimate information helps the jurisdiction determine:
  - Number of debris management sites that might be needed
  - Resources that might be needed for street clearance operations
  - Whether contractor resources or memoranda of understanding (MOUs) might be needed to collect and dispose of debris
  - Recycling and disposal resources that might be needed



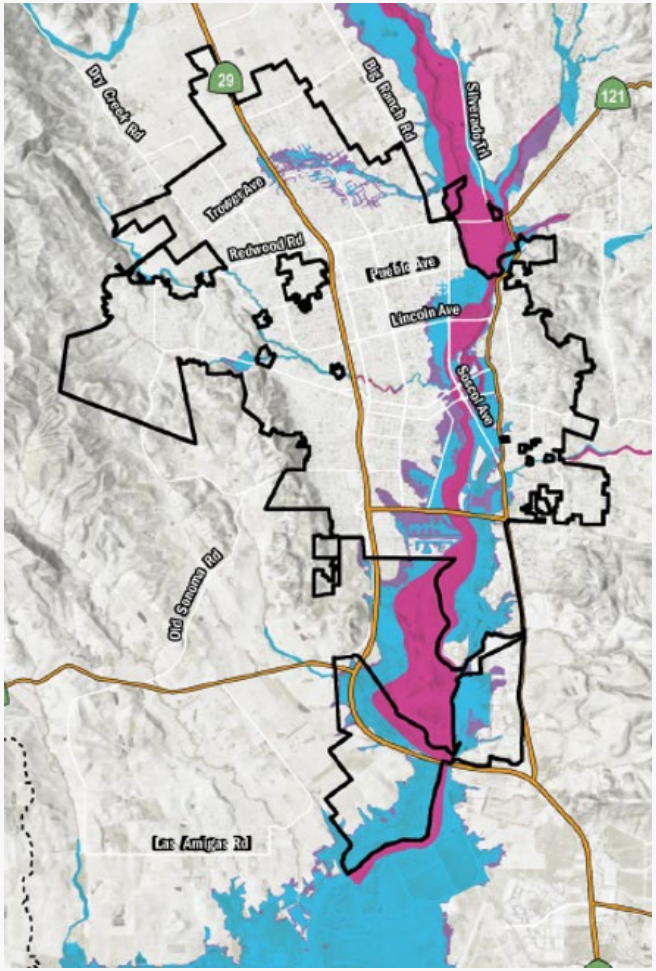



Part 5: Use of GIS in Disaster Debris Management

Houston-Galveston Area Council

GIS in Preparedness Planning

- Aid in developing debris estimates for planning purposes.



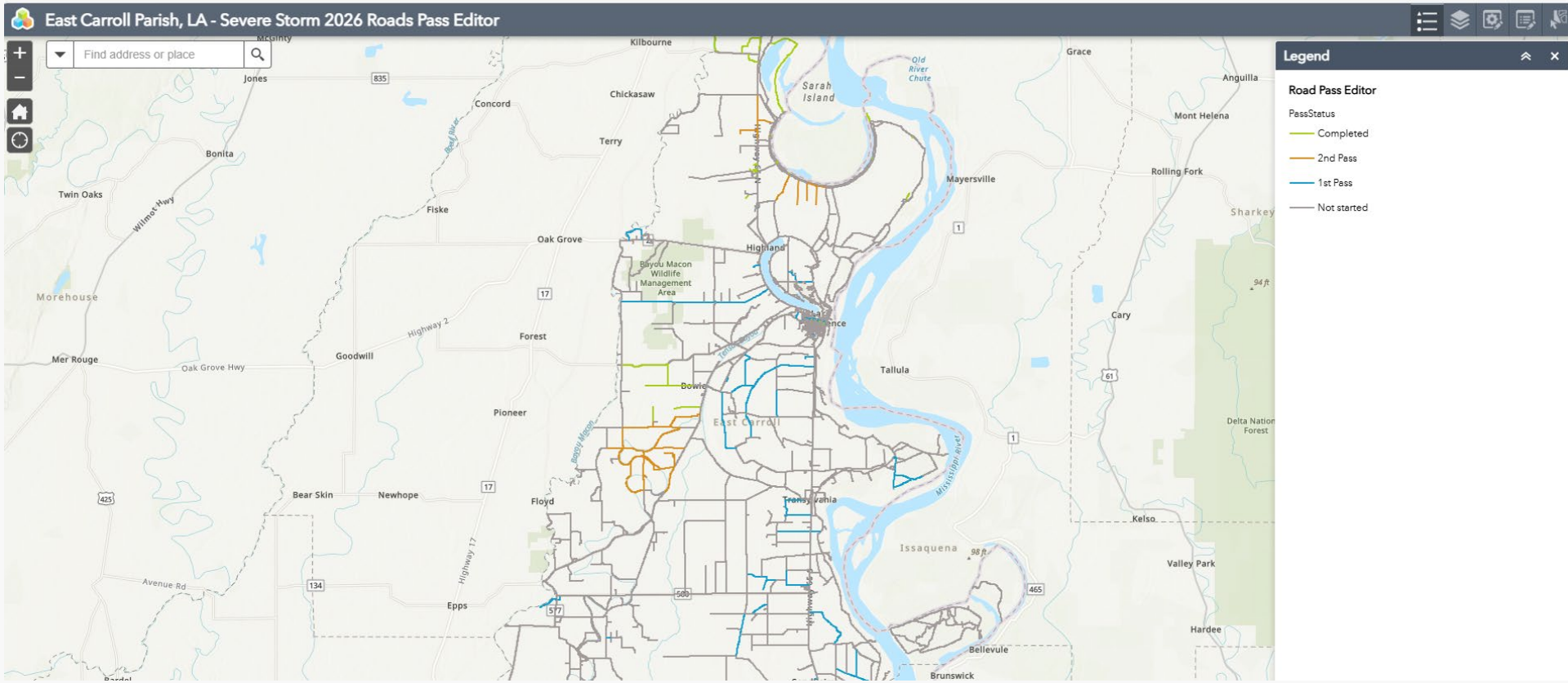
Damage Assessment and Planning

- GIS allows managers to assess debris volumes and identify heavily impacted areas quickly. Satellite imagery and drones, integrated into GIS, identify hazardous areas and prioritize clearing roadways.

Damage assessments by drone. Camp Fire – Paradise, California

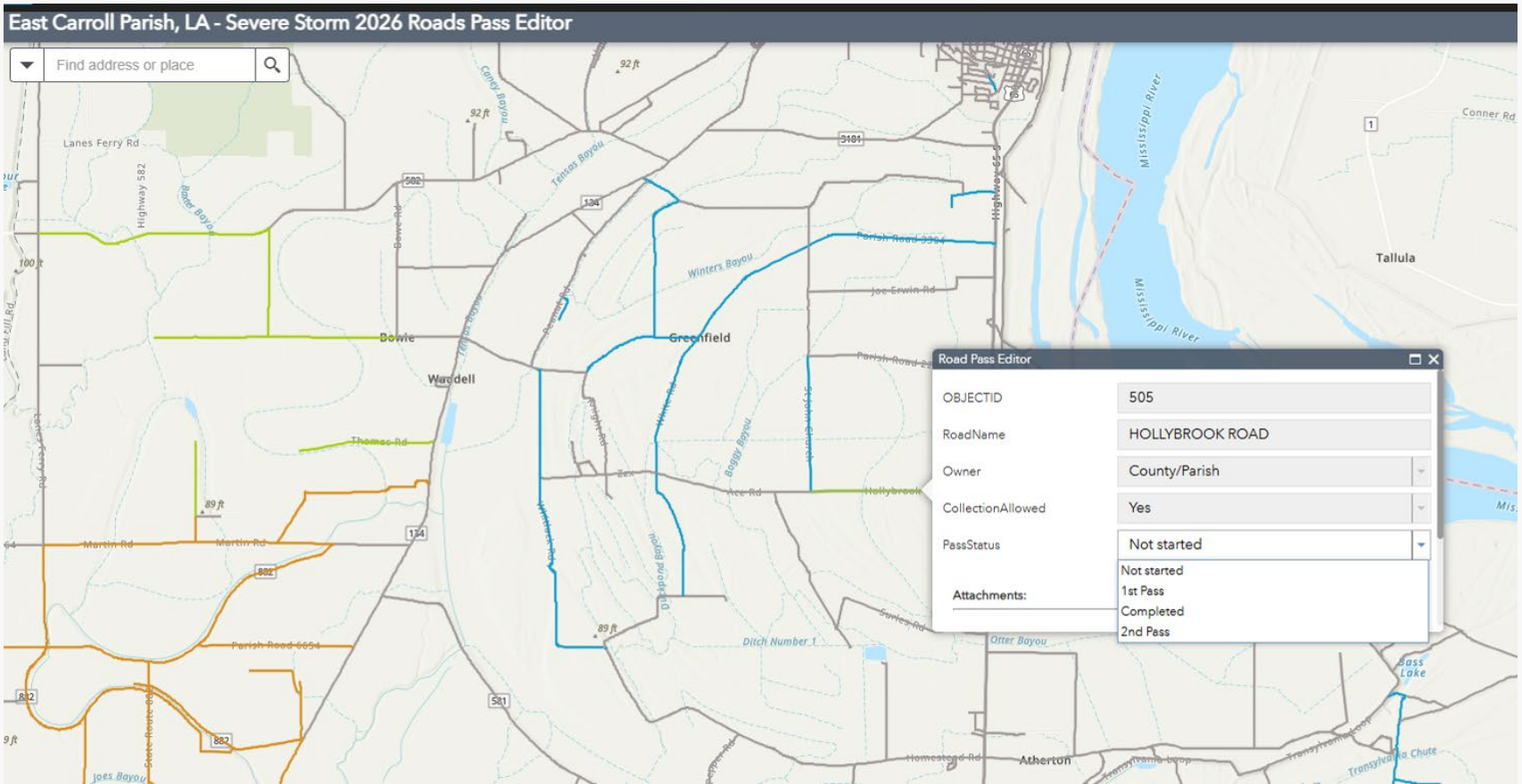
GIS in Debris Collections

- During recovery GIS can be used to track the progress of debris collections.



GIS in Debris Collections

- GIS can be used to check the status of each road during the debris collection process.

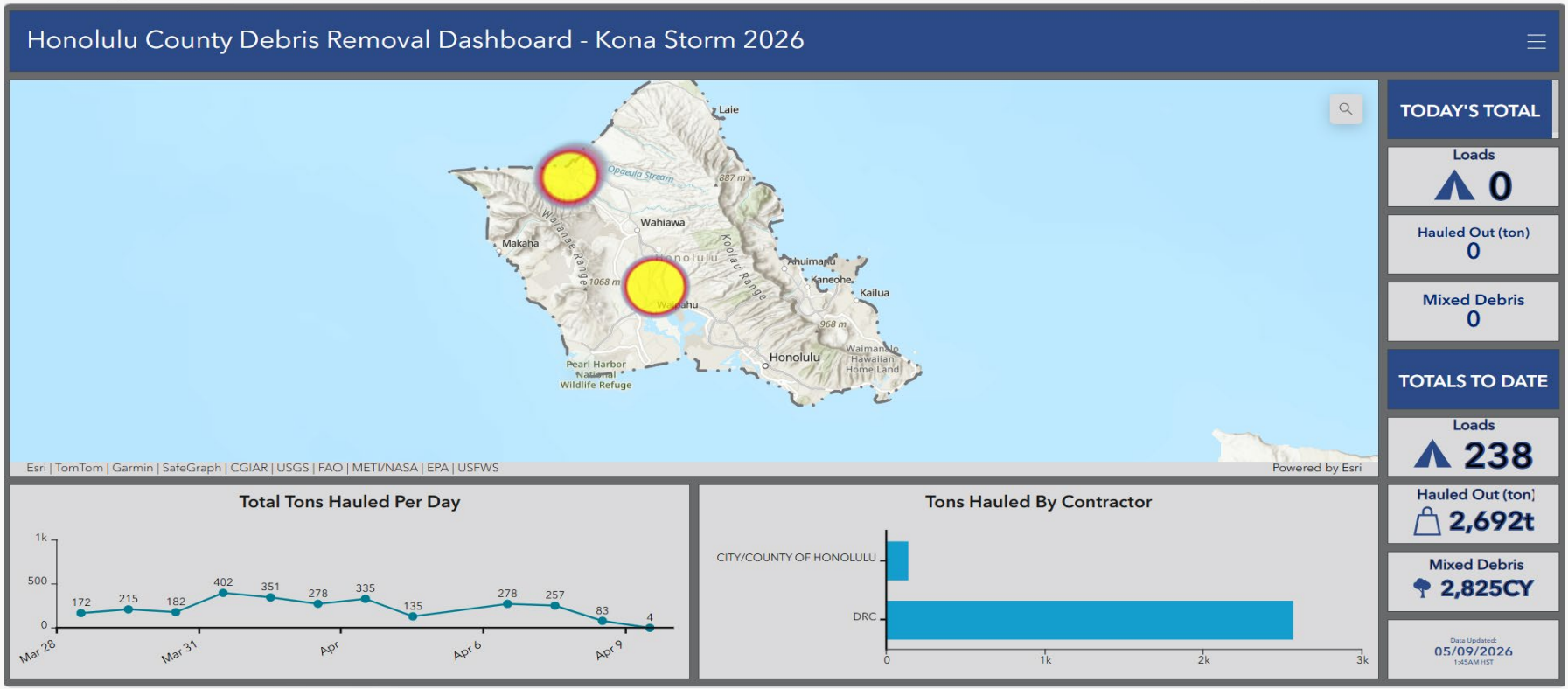


Route Optimization

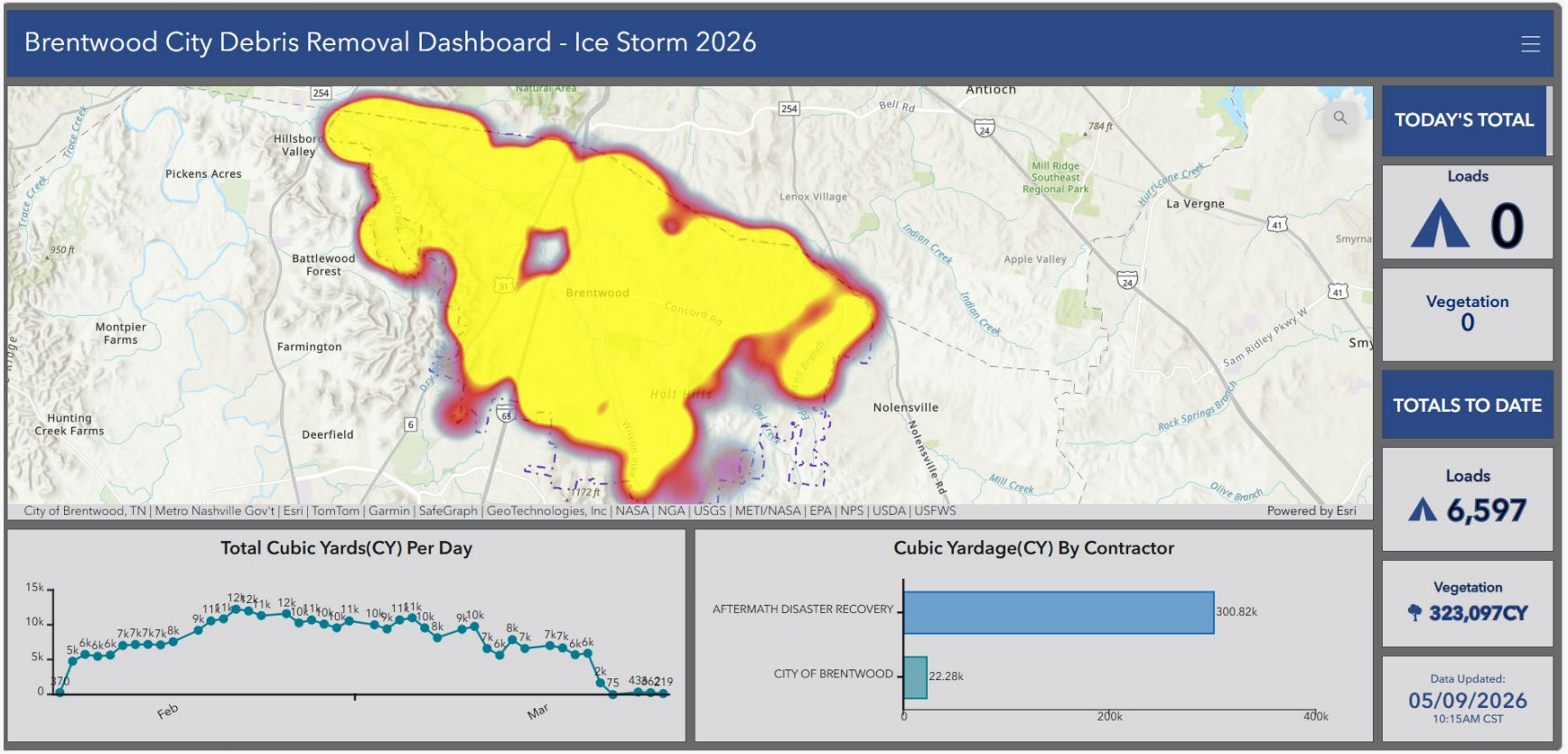
- GIS can help identify the best routes for heavy machinery to access restricted or rural areas.

GIS Dashboards

- GIS dashboards can provide data and graphics showing the status of disaster debris removal operations.

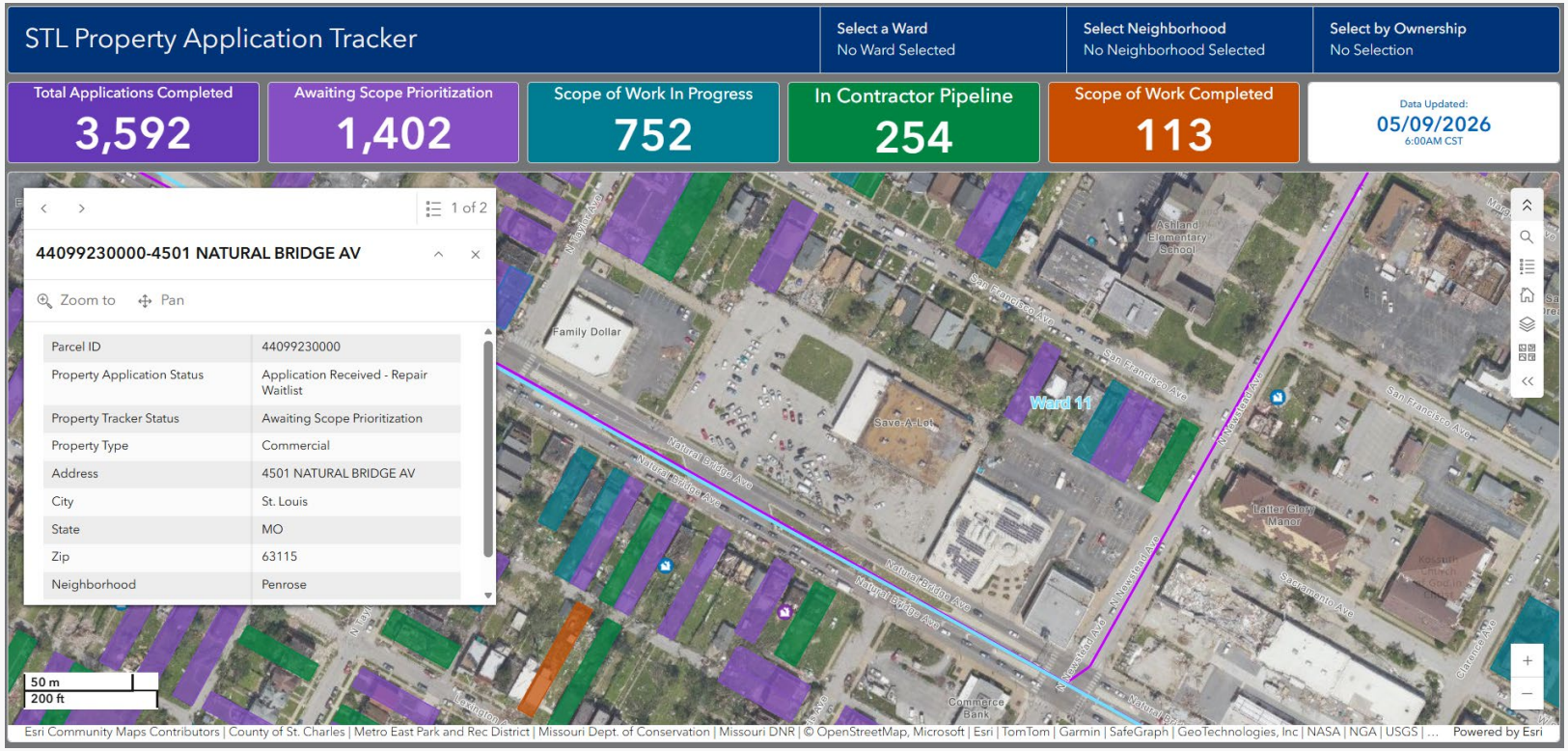


City of Brentwood, TN Ice Storm Debris Removal Dashboard

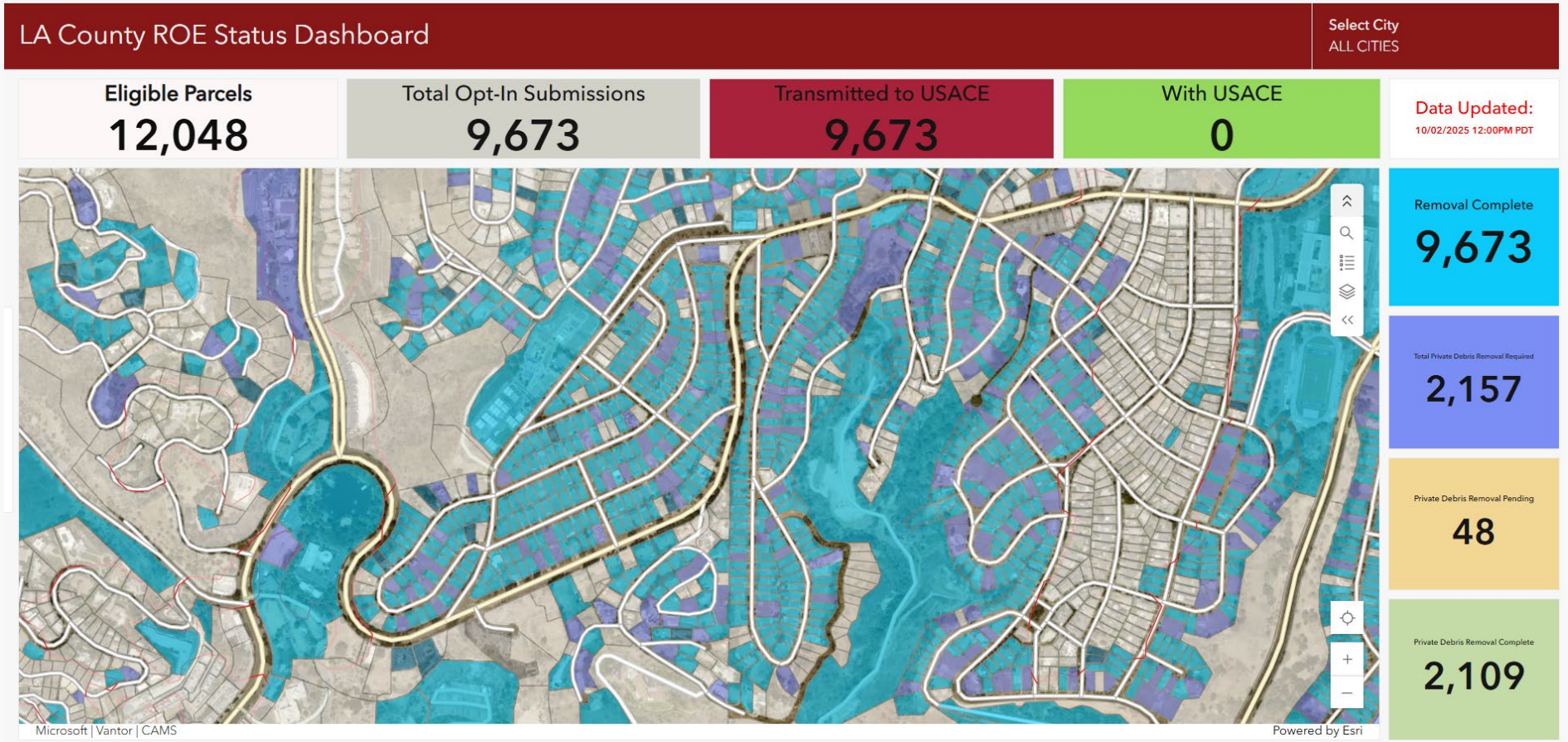


GIS in Private Property Debris Removal

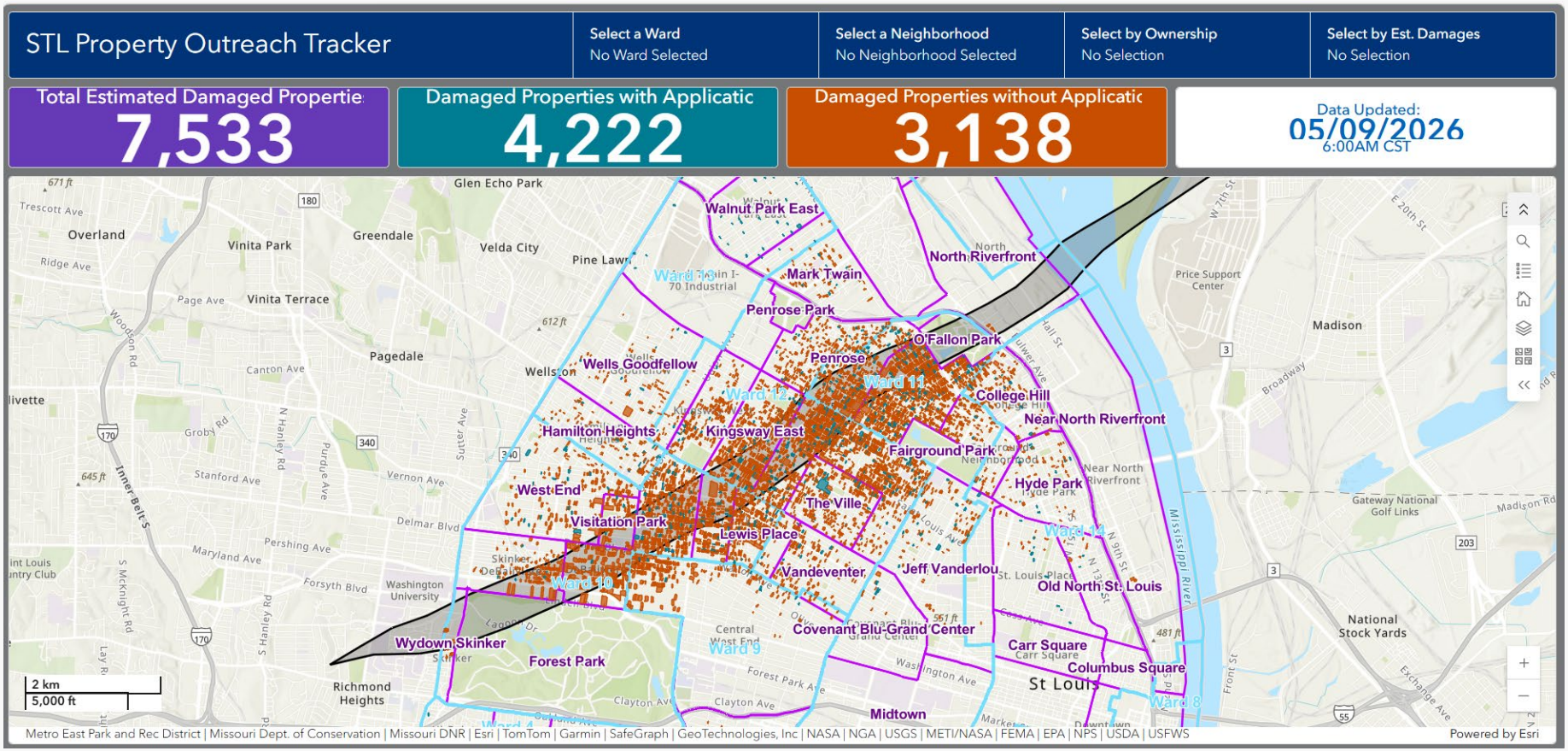
- GIS dashboards can be used to track the progress of each parcel.



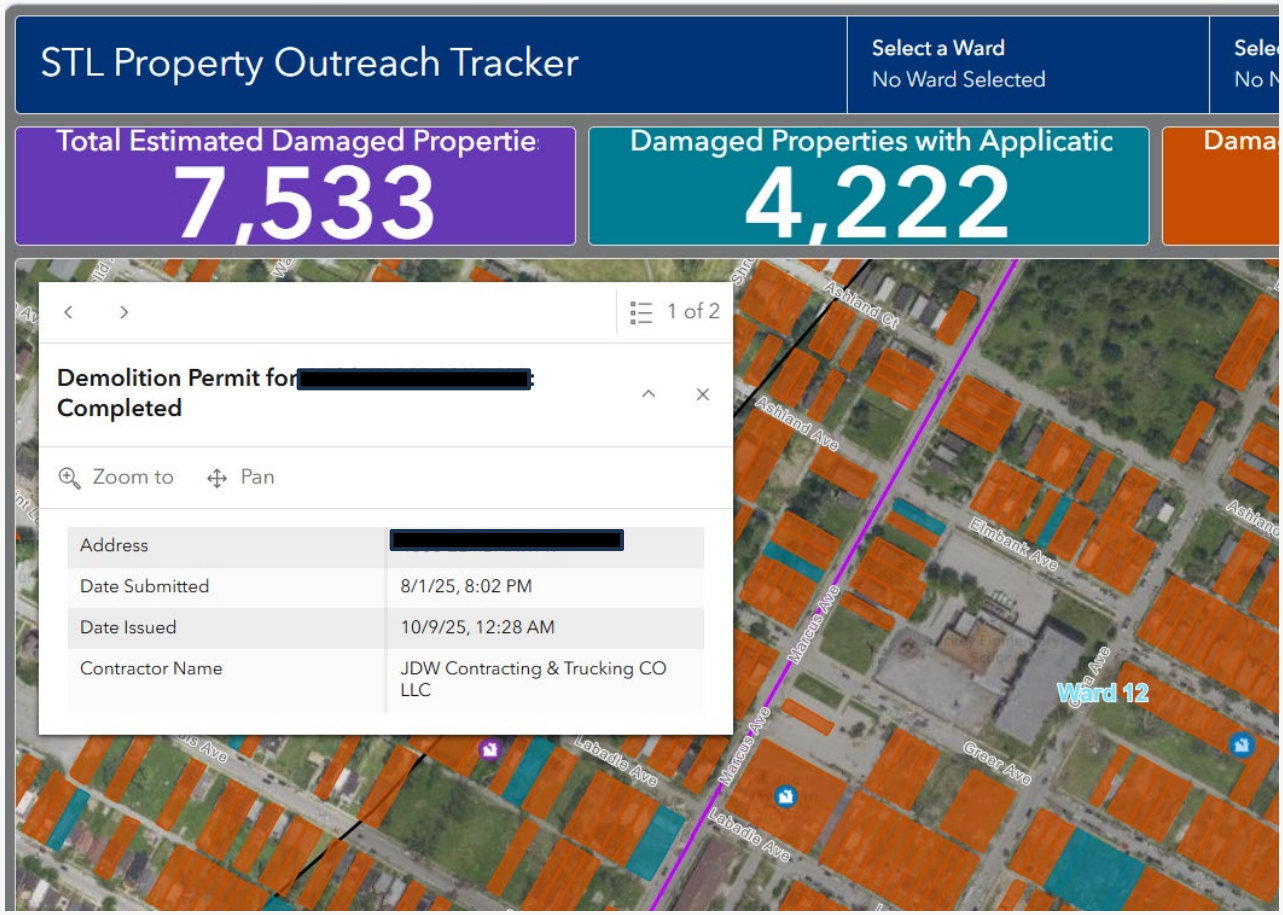
Los Angeles County Fire Right of Entry Status Dashboard



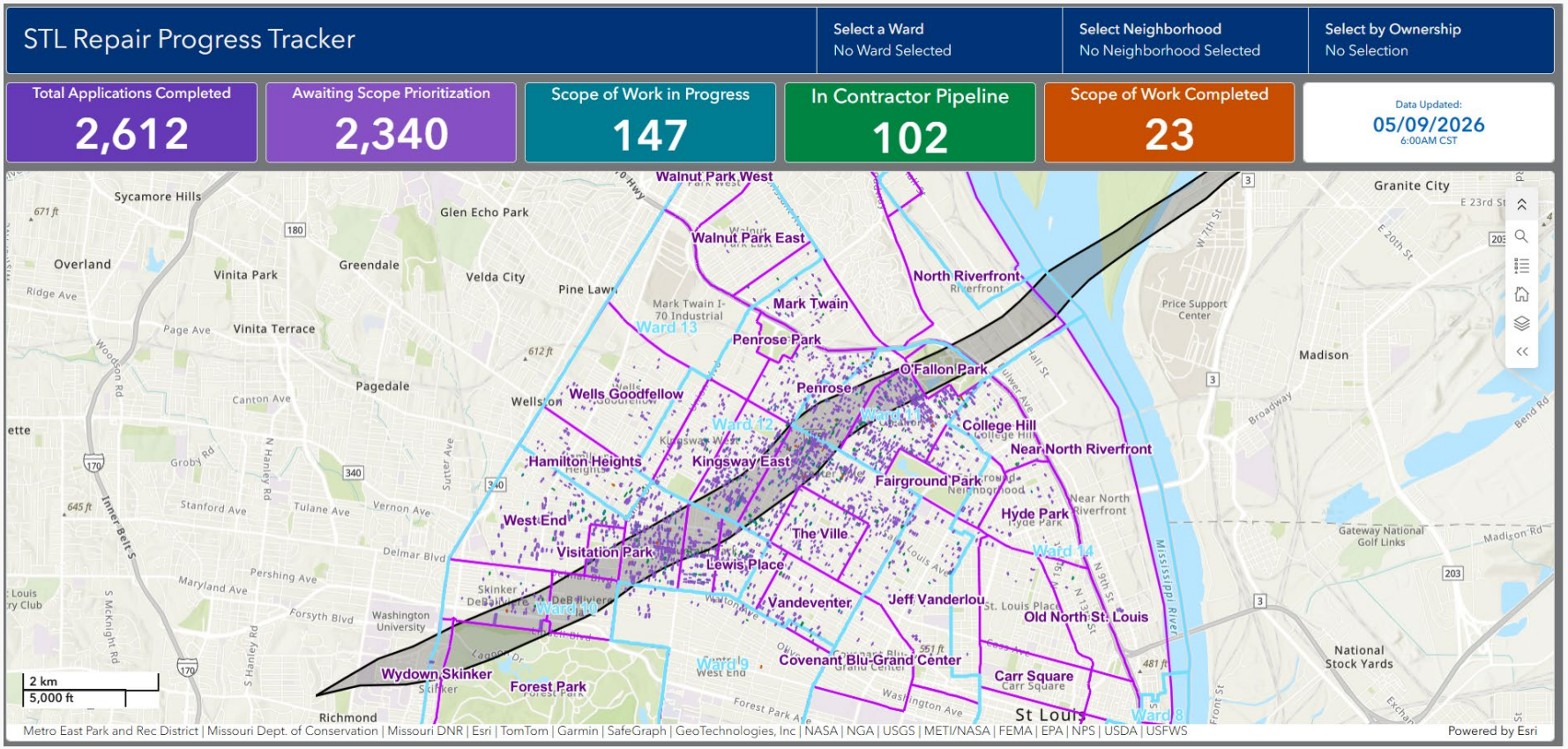
St. Louis Tornado Private Property Debris Removal Outreach Dashboard



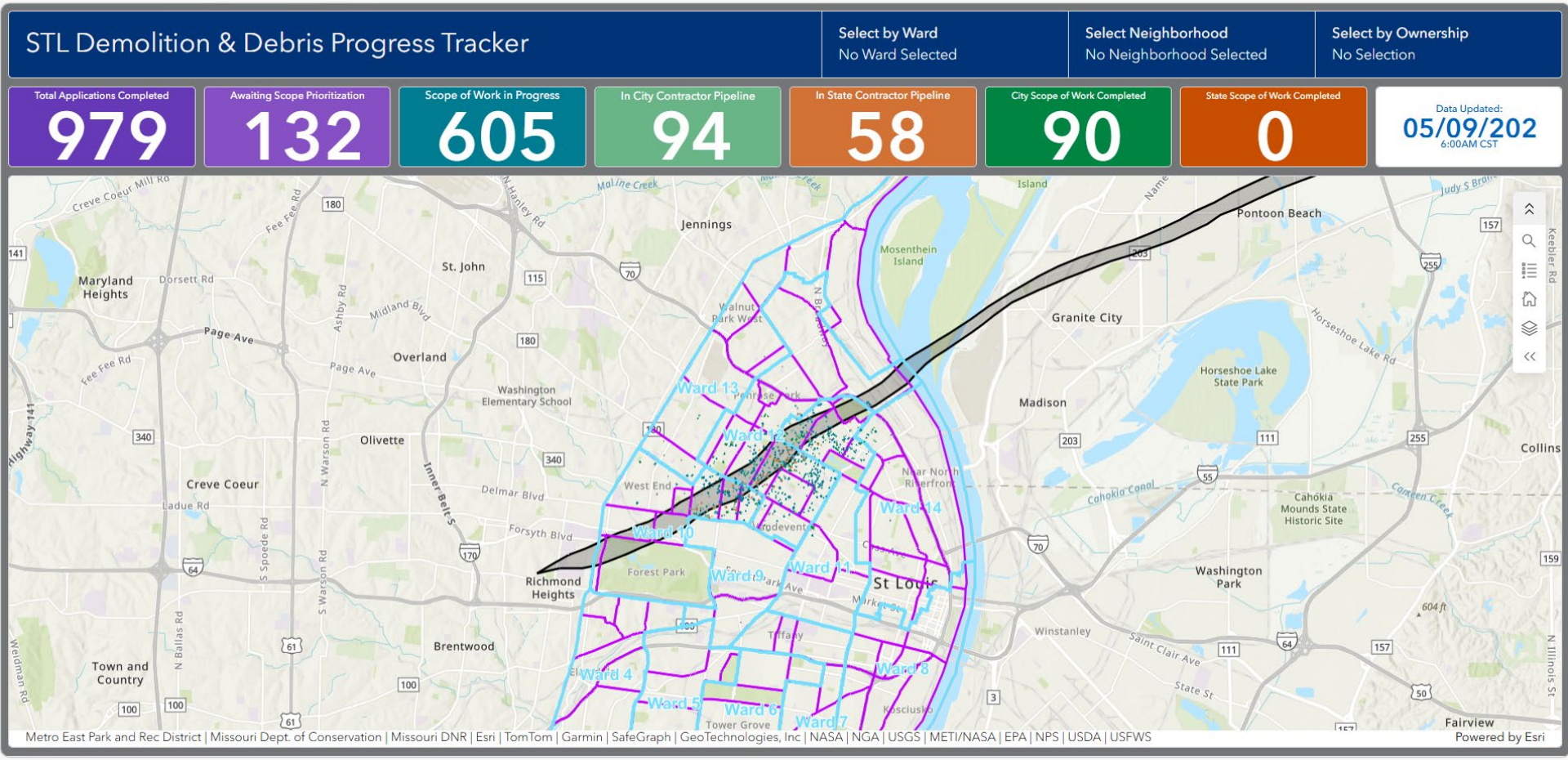
Zoom In on Specific Properties to Determine Their Status

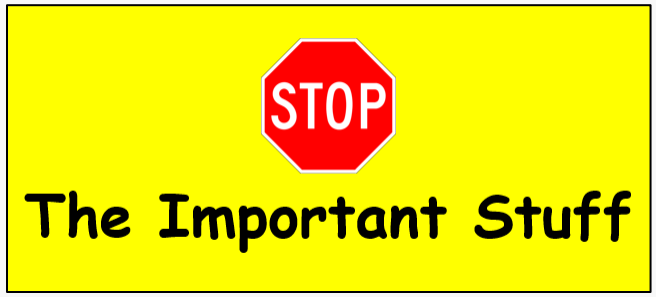


St. Louis Tornado Repair Progress Tracker Dashboard



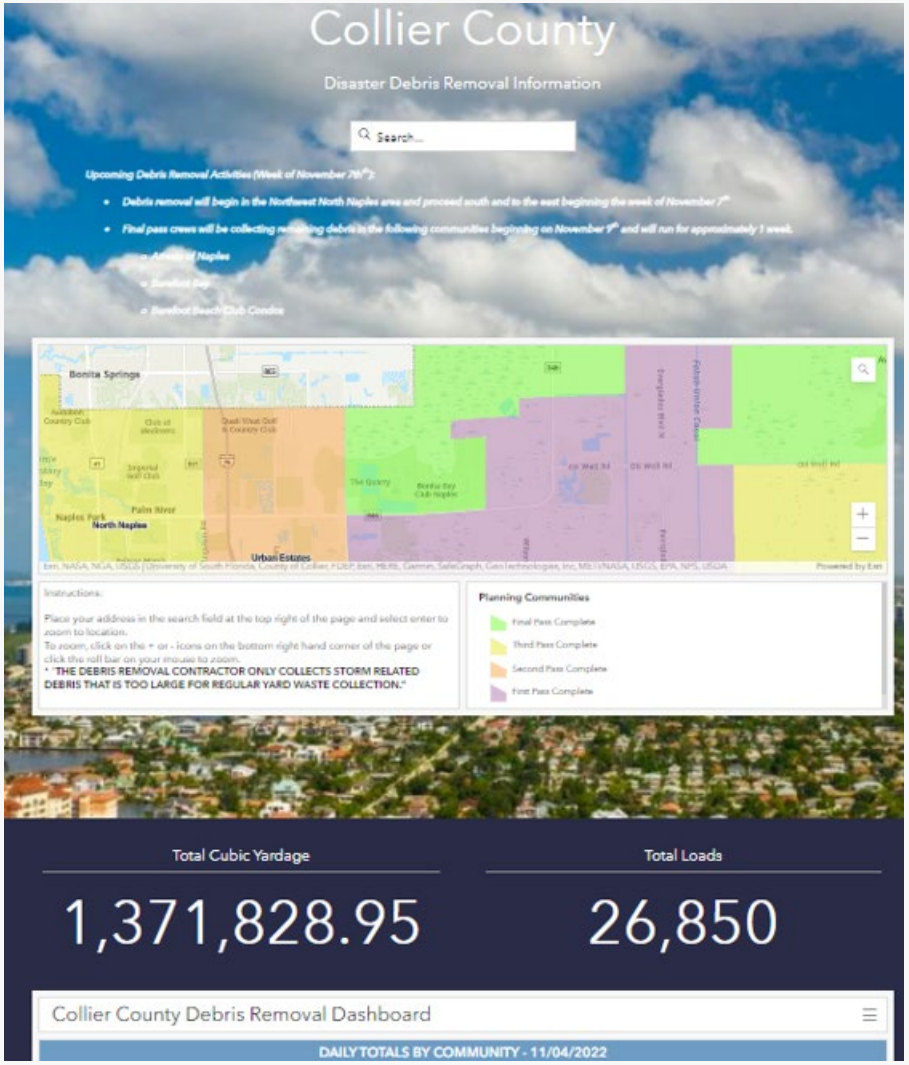
St. Louis Demolition and Debris Progress Tracker Dashboard





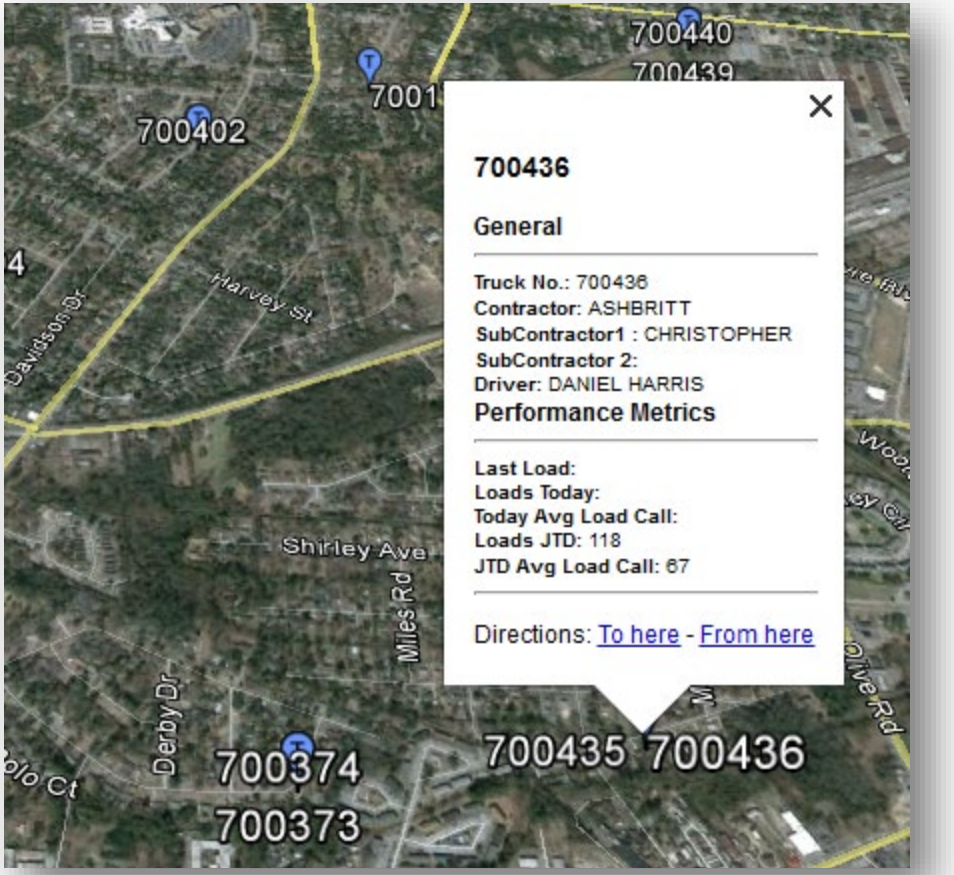
GIS in Public Information

- Can provide data and maps in a public-facing format to report the status of disaster debris operations.

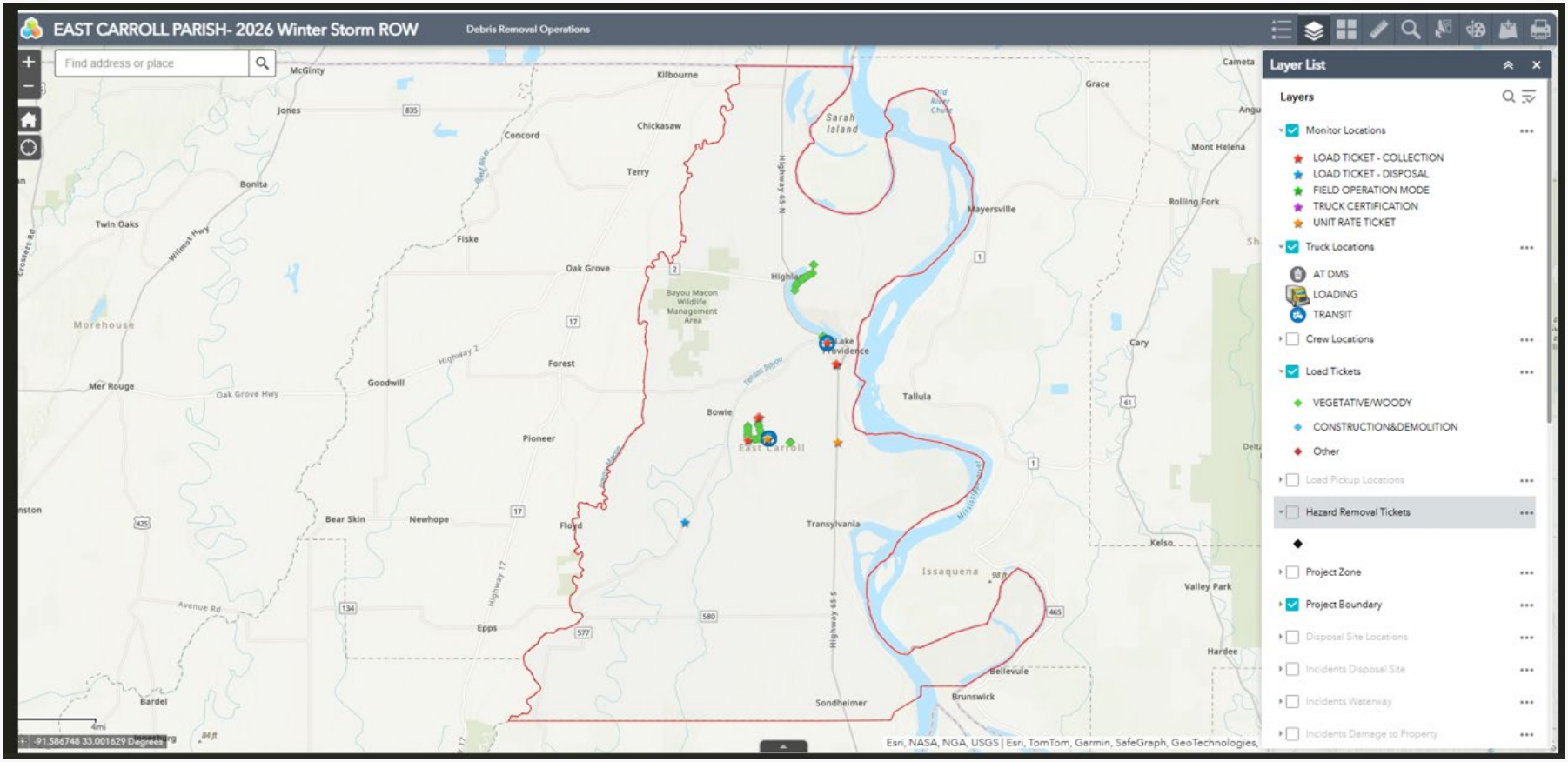


GIS in Contractor Monitoring

- Can track the locations of contractors as well as what work has been completed and what work remains to be done.



Unit Rate Tracking Map



Questions?

Thank You!