

Substantial Damage and Improvement

Implementing New Technologies for Improved Tracking and Compliance

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Context and Background in the City of Charleston

- **30,000 Structures in the SFHA**
- **Pre-FIRM and Historic Buildings**
- **5,000 Improvement Permits per Year**
- **5-Year Cumulative Adopted 2015**
- **9 Named Storms in 10 Years**

Structure Damage



Damage Assessments



Substantial Damage Estimations



5-Year Cumulative Tracking



Repair Permits and Compliant Structures

How we leverage technology to implement a more effective floodplain management program



Public Damage Reports

Challenge: Timely follow-up of damages reported by public.



City-wide Damage Assessments

Challenge: Efficiently covering the entire SFHA and documenting visited areas.



SDE Tracking – SDE Pseudo Permit

Challenge: Track SDEs as part of 5-year cumulative and capture repair permits.



Five-Year Cumulative SI Tracking

Challenge: Track Substantial Improvement documentation within the permitting system.

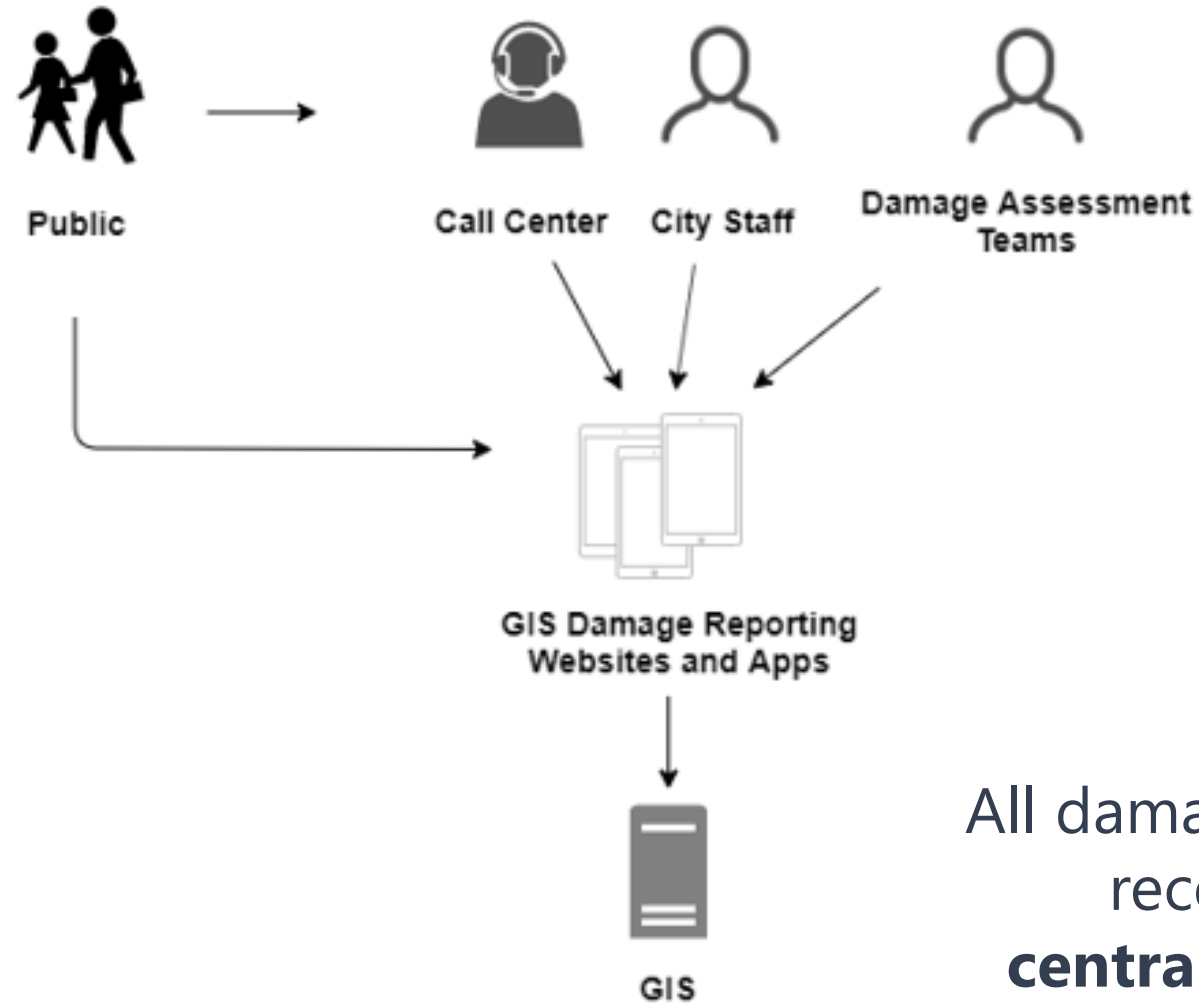




Public Damage Reports

Challenge: Timely follow-up of damages reported by public.

Real-Time Damage Reporting



All damage reports are
recoded to a
central GIS dataset.

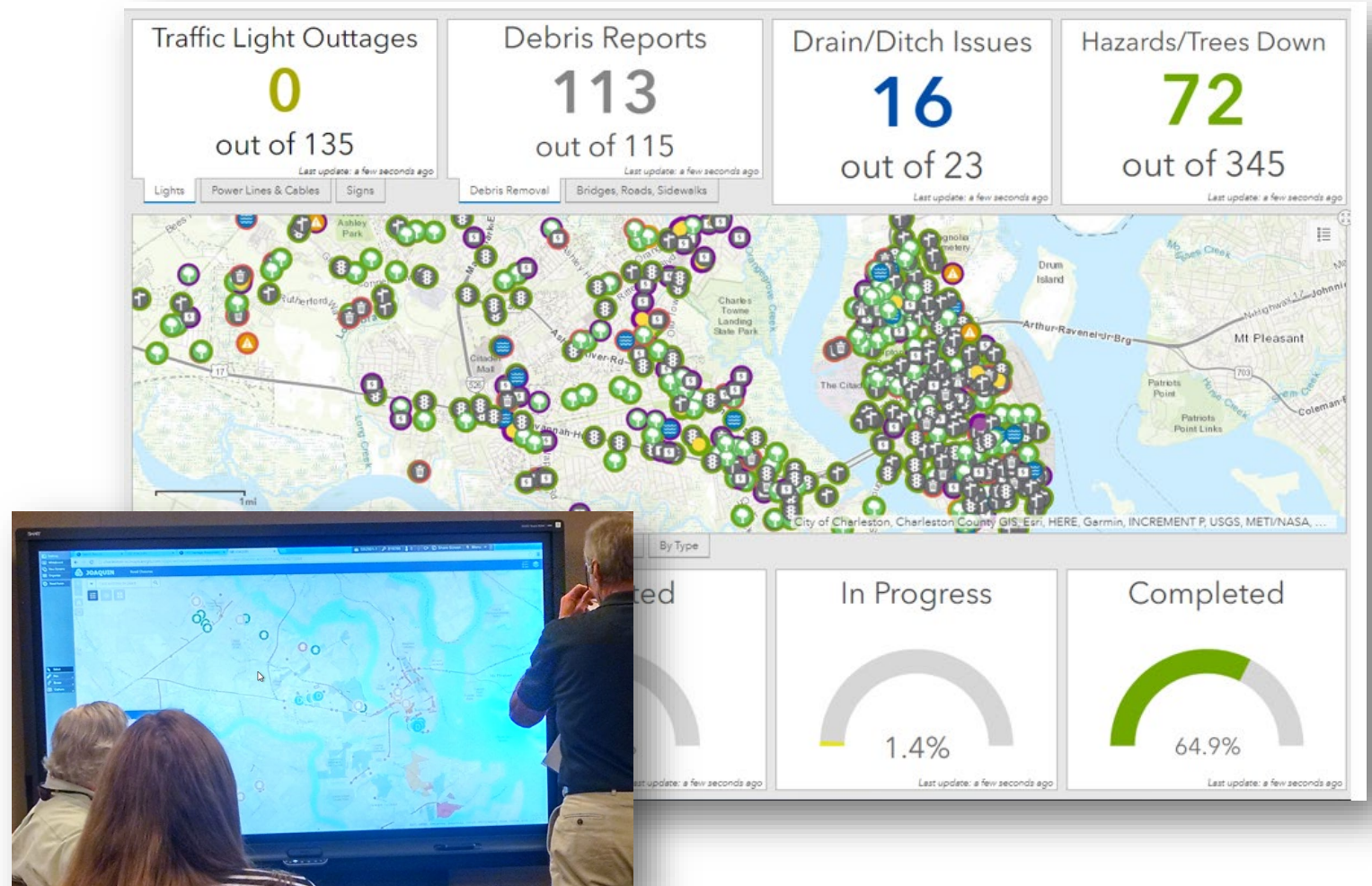


Public Damage Reports

Challenge: Timely follow-up of damages reported by public.

Damage Reporting System Supports:

- Situational Awareness
- Decision Making
- Progress Tracking





Public Damage Reports

Challenge: Timely follow-up of damages reported by public.

Damage Reports Manager

Charleston GIS

Help

Close

Delete

Save

Reports by Type

Status

WO Created

Report Type

Storm drain or ditch issue

Damage Type

Flooding

Department

Public Service

Priority

Low

Medium

High

NEEDS ASSESSMENT

GovQA ticket created 3/11/2024

Additional Comments

The drainage ditches behind my home were

+

-

Home

Clock

Find address or place

Map

Damage Report Managers



Parks



T&T



Stormwater /
Public Service



Call Center

Needs Assessment



Sends to Damage Assessment Field App



City-wide Damage Assessments

Challenge: Efficiently covering the entire SFHA and documenting visited areas.

App Layers available to Inspectors:

- Damage Reports that "Need Assessment"
- Planning Areas
- City Limits
- SFHA
- Low Elevations

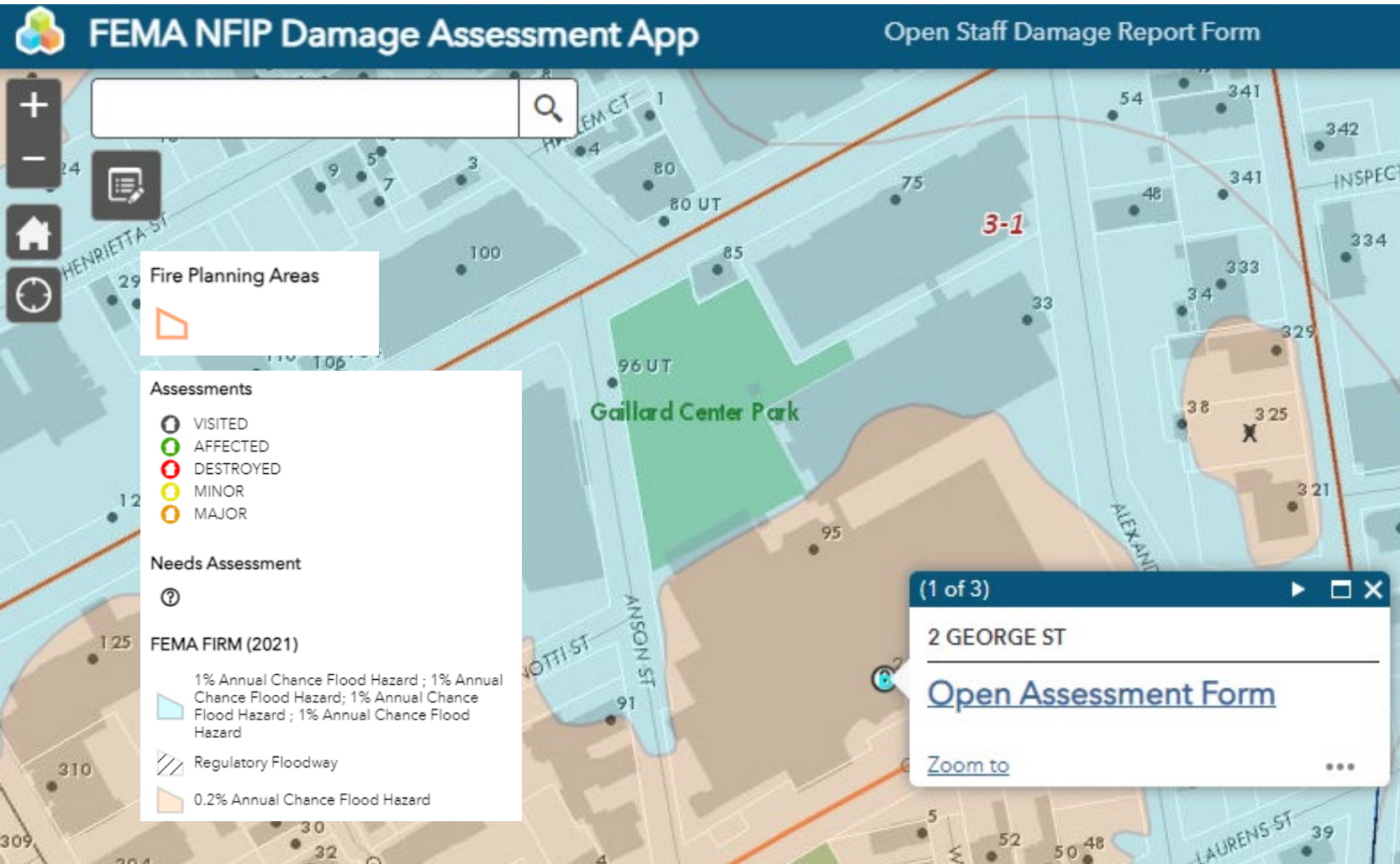
Other datasets available to Managers:

- Storm Inundation Elevation
- Repetitive Loss Properties
- Historical Road Closures
- Past Damage Assessments



City-wide Damage Assessments

Challenge: Efficiently covering the entire SFHA and documenting visited areas.



Damage Assessment Field App

- Teams must select by address.
- Property information sent to the assessment form using **URL parameters**.
- Can add missing address points.



City-wide Damage Assessments

Challenge: Efficiently covering the entire SFHA and documenting visited areas.

Site Address:

2 GEORGE ST

Address ID:

C45801010012

USER:

Caroline Schnell

Site City:

CHARLESTON

Site zip:

29401

County:

CHARLESTON

Residential / Commercial:

Select...

Damage Category: (required)

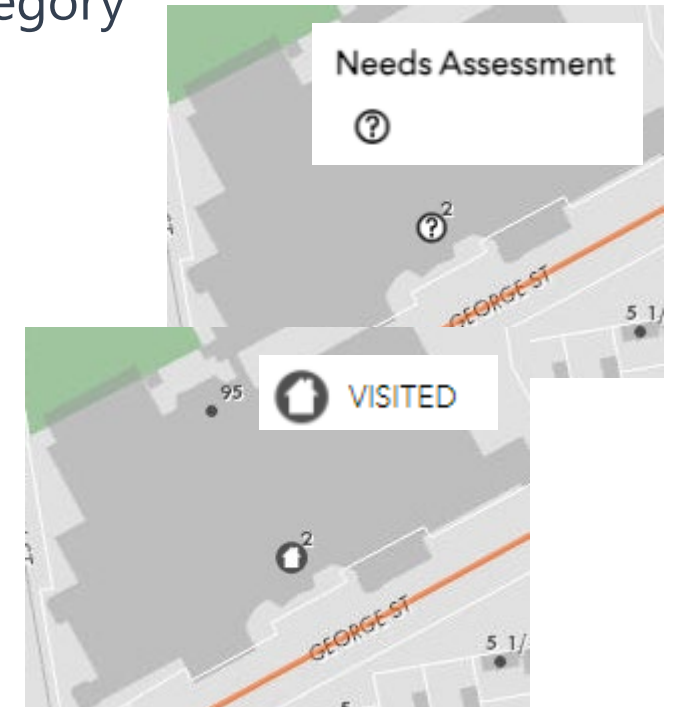
VISITED

Damage Assessment Field Form

Progress tracked with "VISITED"

Assessment category

-  AFFECTED
-  DESTROYED
-  MINOR
-  MAJOR
-  VISITED

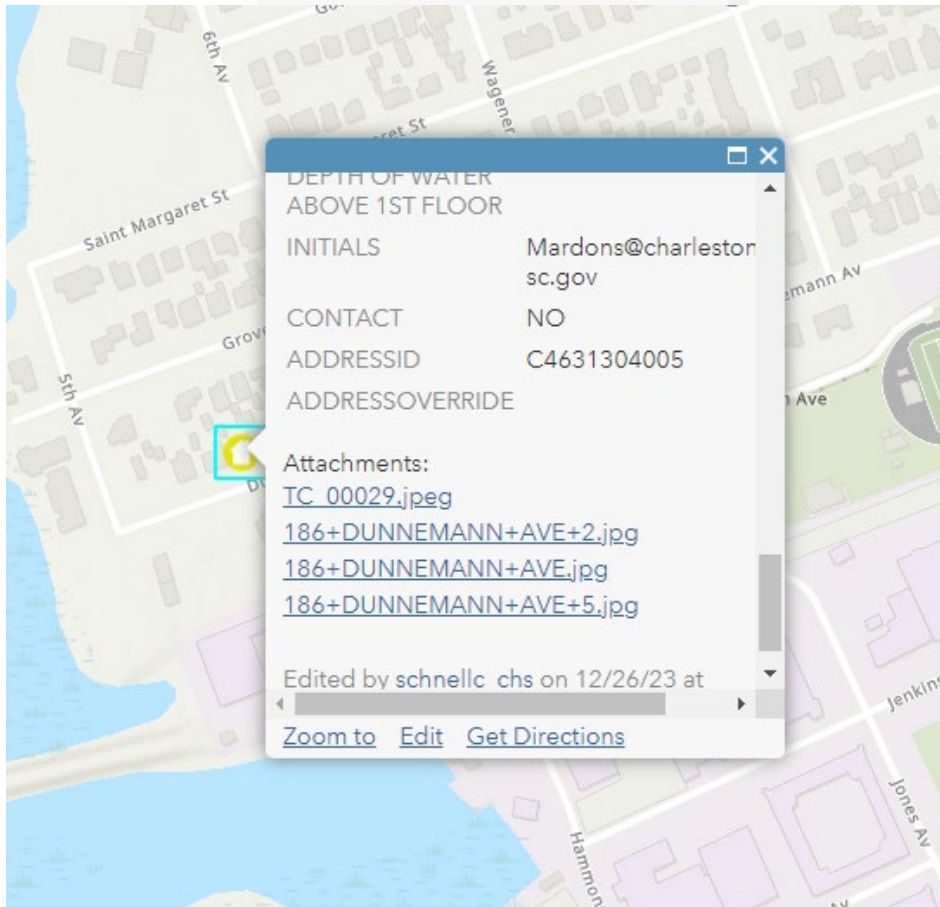




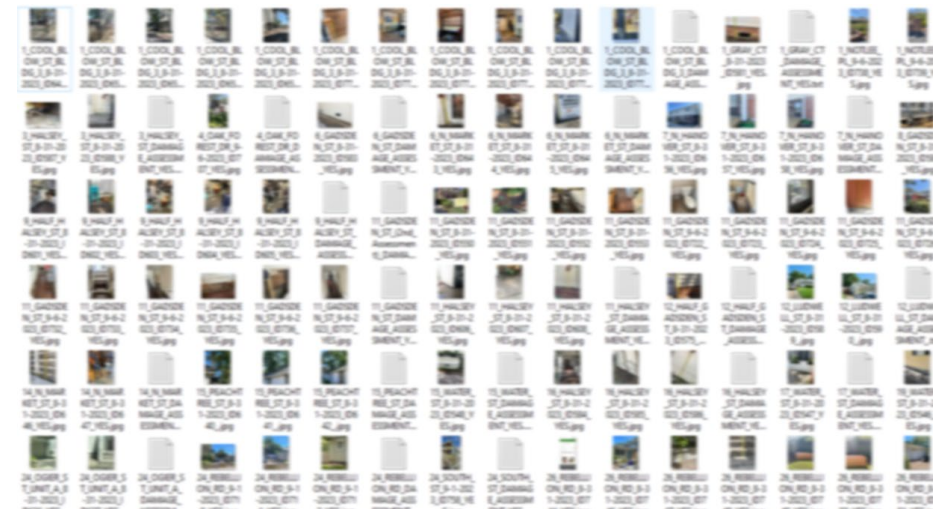
SDE Tracking – SDE Pseudo Permit

Challenge: Track SDEs as part of 5-year cumulative and capture repair permits.

ArcGIS Online



Data and **pictures** are downloaded using a Python Script.

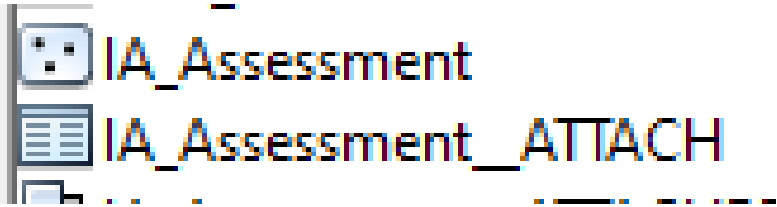




SDE Tracking – SDE Pseudo Permit

Challenge: Track SDEs as part of 5-year cumulative and capture repair permits.

Attachment table



Added Columns

MYDATE	ID	FLOODZONE
9-6-2023	11_2_GEORGE_ST	YES
9-6-2023	11_2_GEORGE_ST	YES
9-6-2023	2_GEORGE_ST	YES
9-6-2023	2_GEORGE_ST	YES
9-6-2023	2_GEORGE_ST	YES

Exported Files

 2_GEORGE_ST_9-6-2023_ID738_YES.jpg

 2_GEORGE_ST_9-6-2023_ID739_YES.jpg

 2_GEORGE_ST_9-6-2023_ID740_YES.jpg

 2_GEORGE_ST_DAMAGE_ASSESSMENT_YES.txt

GIS Steps:

1. Add **Damage Date**, **Address**, and **Flood Zone** columns to the attachment table.
2. Join assessment layer to attachment table and copy over information into the new columns.
3. Replace spaces with “_” in the address.
4. Run Python script.



SDE Tracking – SDE Pseudo Permit

Challenge: Track SDEs as part of 5-year cumulative and capture repair permits.

NFIP2023-00015 (TESSIE HAMPTON Charleston, SC 29412) **ACTIVE HOLDS** ▼

NEW PERMIT

Summary

Details

Location

Additional Info

Workflow

Linked Records

Holds (3)

Contacts

Fees

Bonds

Activities

Files (12)

Permit Type *

NFIP - Substantial Damage Estimate

Work Class *

Damage Assessment

Status *

SDE - Resolved

Project

District *

James Island

Assigned To

Caroline Schnell

Valuation

\$43,219.00

Description

PROTECTED DATA - NOT FOR RELEASE OR DISCLOSURE

Application Date

09/30/2022

Issue Date

Expiration Date

Last Inspection

Finaled Date

SDE pseudo permits are integrated into the permitting process through EnerGov.



SDE Tracking – SDE Pseudo Permit

Challenge: Track SDEs as part of 5-year cumulative and capture repair permits.

Damage assessment files
are attached to the permit.

ATTACHMENTS (12)		REVIEW FILES (0)
☐	File Name	
☐	Hurricane Ian 2022 - SDE TEST-SPREADSHEET - COMPLETED.pdf	
☐	[REDACTED] 9-30-2022_ID372.jpg	
☐	[REDACTED] 9-30-2022_ID373.jpg	
☐	[REDACTED] 9-30-2022_ID374.jpg	
☐	[REDACTED] 9-30-2022_ID375.jpg	
☐	[REDACTED] 9-30-2022_ID376.jpg	
☐	[REDACTED] DAMAGE_ASSESSMENT.txt	
☐	[REDACTED] 9-30-2022_ID343.jpg	
☐	[REDACTED] 9-30-2022_ID344.jpg	

← Completed SDE Spreadsheet

← Pictures

← Damage assessment form and
staff comments



Five-Year Cumulative SI Tracking

Challenge: Track Substantial Improvement documentation within the permitting system.

IT / GIS Division

Substantial Damage / Improvement Check

City of Charleston

Property Search

Search by Address or Street Name (without suffix)

Search

Search By: ☒ Address ☐ TMS



  dbo.vw_GIS_SDSI_PERMIT

IT-developed website
queries permitting
database for improvement
permits.

SQL Database view – Only includes improvement permits in the last 5 years.



Five-Year Cumulative SI Tracking

Challenge: Track Substantial Improvement documentation within the permitting system.

IT-developed website
queries the permitting
database.

Permit	Type	Issued	Status	Class	Value
SF2020-08147	Single Family/Duplex Dwelling	05/18/2020	Completed	Alteration	\$56,450
DEM2020-00624	Demolition	02/28/2020	Completed	Interior/Non-Structural	\$1,500
SF2020-07913	Single Family/Duplex Dwelling	02/28/2020	Completed	Alteration	\$3,000
RFR2020-01580	Roofing - Single Family/Duplex Dwelling	02/07/2020	Completed	Alteration/Repair	\$5,000

Year Built	Effective Year	Grade	Stories	Roof	Walls	Finished Area
1890	2020	Good	3	Comp sh heavy	Wood siding	1,520

Market	Land	Building	Permits	% Improved
\$530,000	\$225,000	\$305,000	\$65,950	21.6



Five-Year Cumulative SI Tracking

Challenge: Track Substantial Improvement documentation within the permitting system.

Additional Information
Tab in Energov for
SI/SD Tracking

GENERAL INFORMATION

BUILDING INFORMATION

REPORTING

SD / SI

5-year cumulative Substantial Improvement/Repair?

YES

What type of work from Compliance Matrix?

Rehabilitation, Substantial Imp.

How will the existing building be mitigated?

Elevation of FFE

Building Code Board of Appeals Variance approved?

N/A

If not a Substantial Imp., what documentation?

☐ SI CALC and County Tax Value (screenshot uploaded)

☐ Itemized Cost of Work (uploaded to files)

☐ Building in Compliance (EC Uploaded)

☐ A New Appraisal - (uploaded to files section)

☐ SI Affidavit (uploaded to files)

Energov Permits:	Blue Prince Permits:
\$15,000.00	\$0.00
Building Value:	Permits Total:
\$1,384,000.00	\$15,000.00
Existing Improvement %:	
1.08381502890173	
Appraisal Value (if applicable)*	
*Use this value for SI/SD calculations.	

Custom App Limitations

Cons

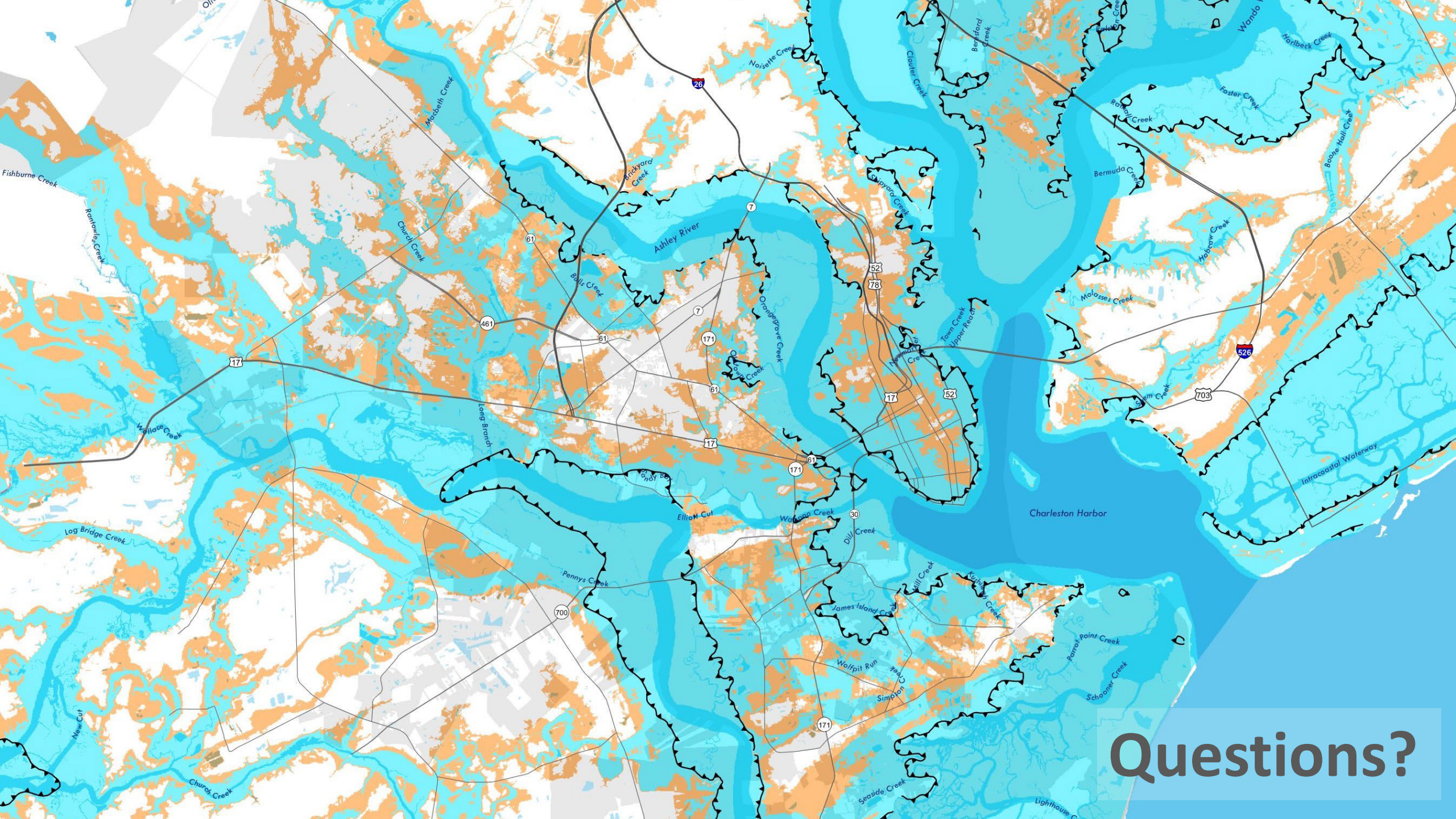
- Will eventually need to be updated or replaced.
- Requires a developer or team.
- Development needs to be documented and easily transferable

Pros

- Easy to make changes and adapt to new needs.
- Direct access to the data.

Final Thoughts

- Coordination between Damage Assessment office and field staff with "Needs Assessment" function
- Adaptable Layers in Damage Assessment App support navigation and targeting of properties based on the nature of event
- SDE Pseudo Permit closes the gap on repair permits because it is directly tied to the permitting system
- SI/SD Calc Tool and Individual Permit Tracking are used daily to document 5-year cumulative SI/SD determinations and how buildings are being mitigated



Questions?