

Street Level Imagery and Lidar... a Step Toward the Making a Digital Twin



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APPRAISAL DISTRICT

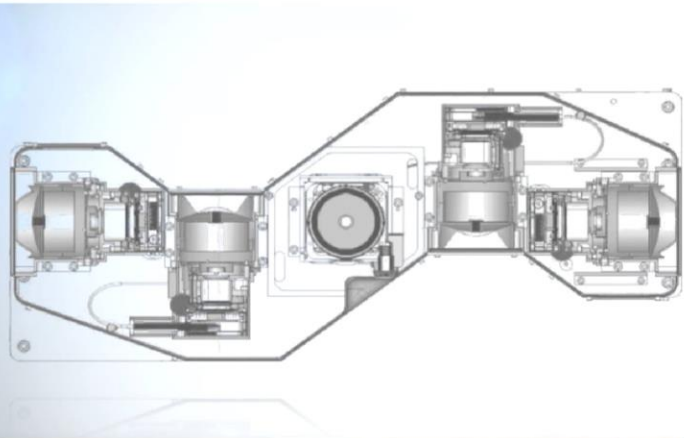


ALFRED 'DOC' HENSON
MANAGER, GIS
CITY OF HOUSTON

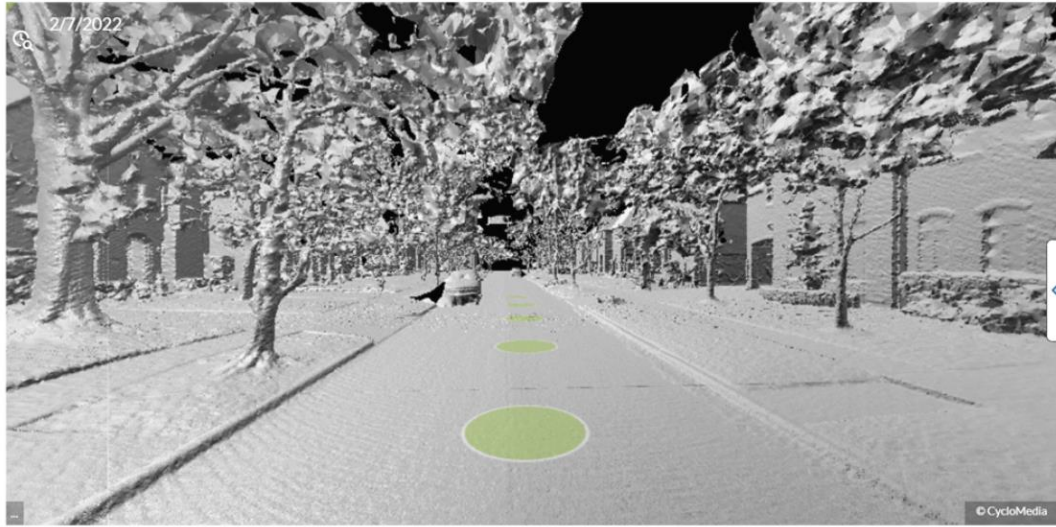


BRUCE DAVIDSON
MANAGER, GIS
HARRIS COUNTY
FLOOD CONTROL DISTRICT

TECHNOLOGY (Vendor: Cyclomedia)



Patented 5-camera imaging system





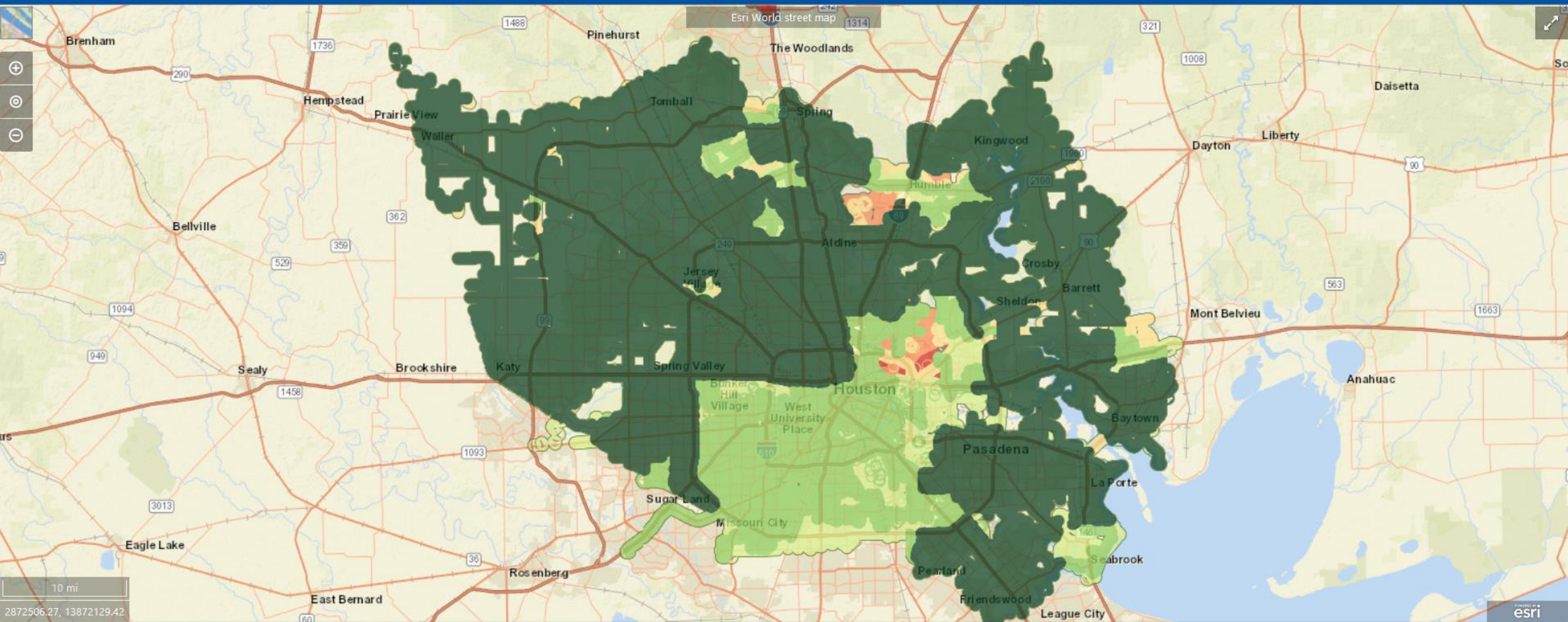
Search



Search



DDignum@hcad.org





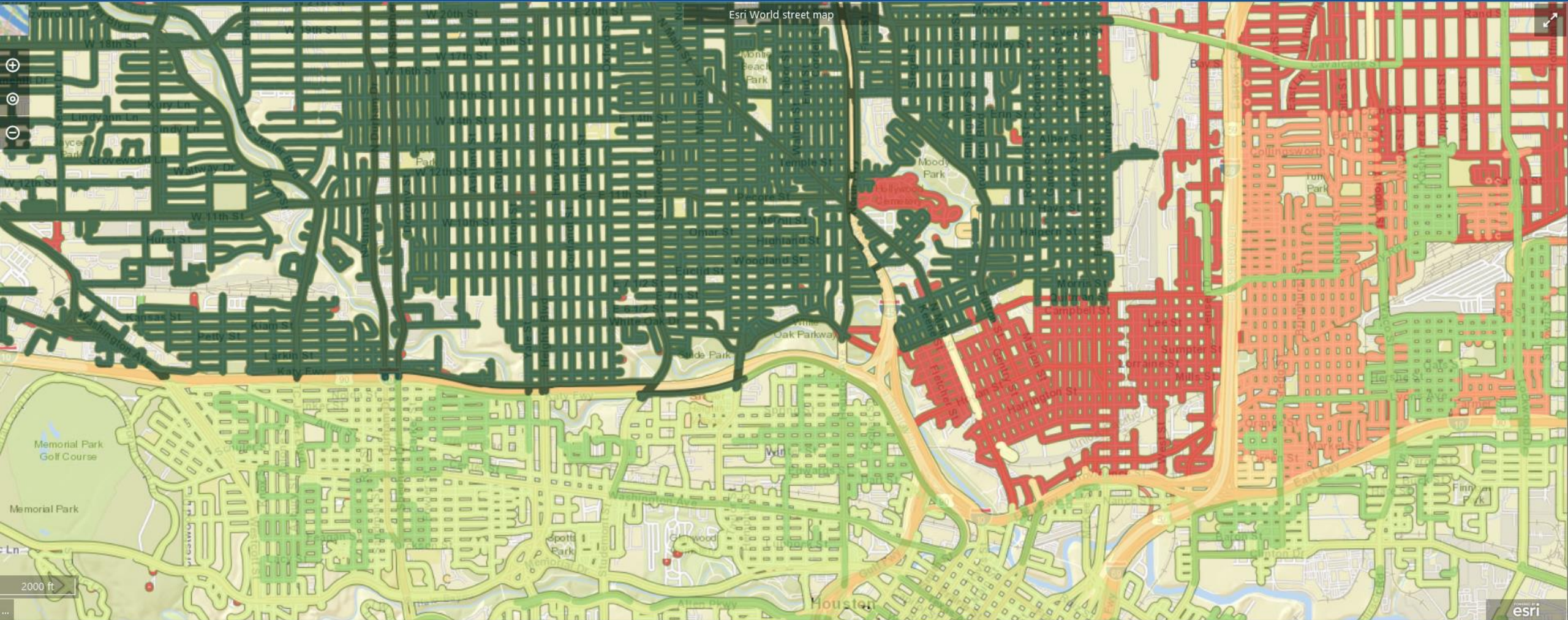
Search



Search



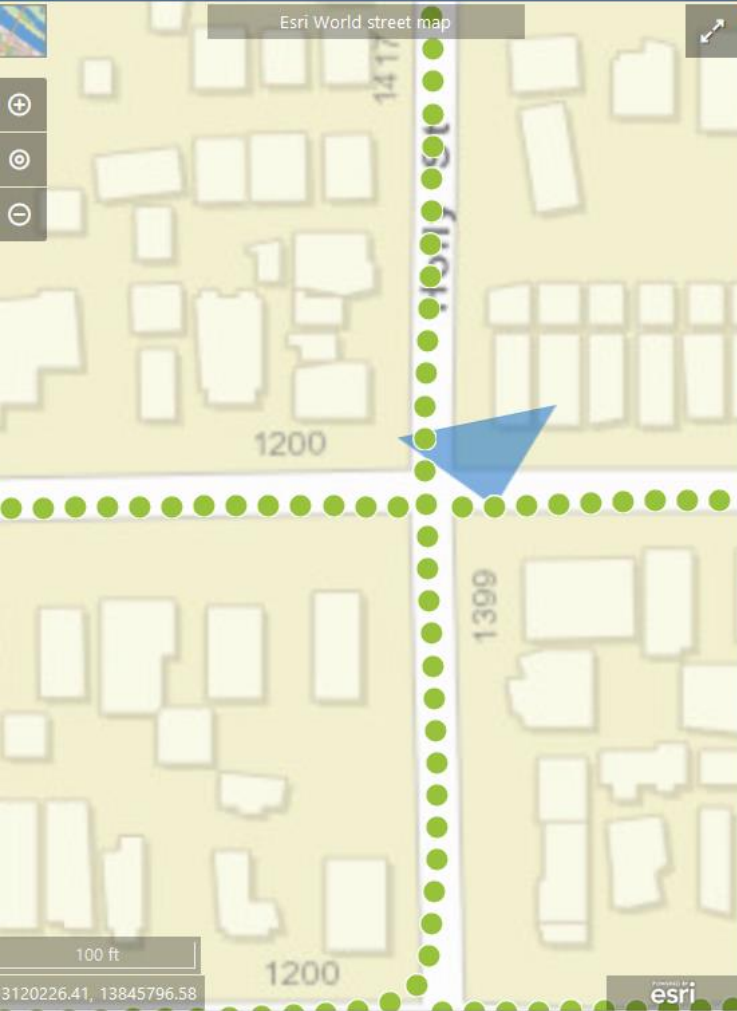
DDignum@hcad.org





Search

Search



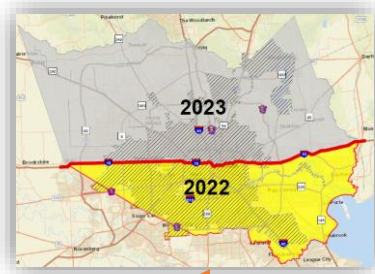
PARTNERSHIP TIMELINE

2017

City of Houston



HARVEY



2018/19

RFP/Harris County/Appraisal District/ILA



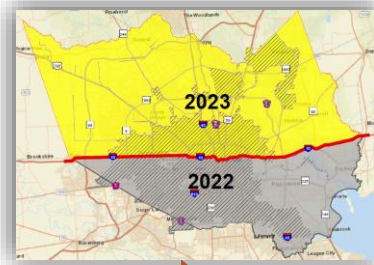
2019

Full drive/Founding partners



2022

South of I-10 drive/Asset extractions

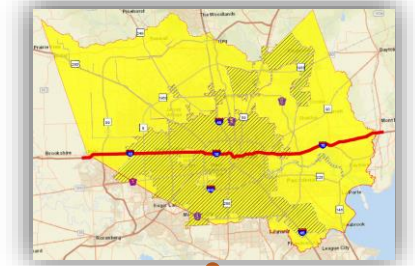


2023

North of I-10 drive

2020/21

ILA/Infill drives/F.F.E/Bus-stops

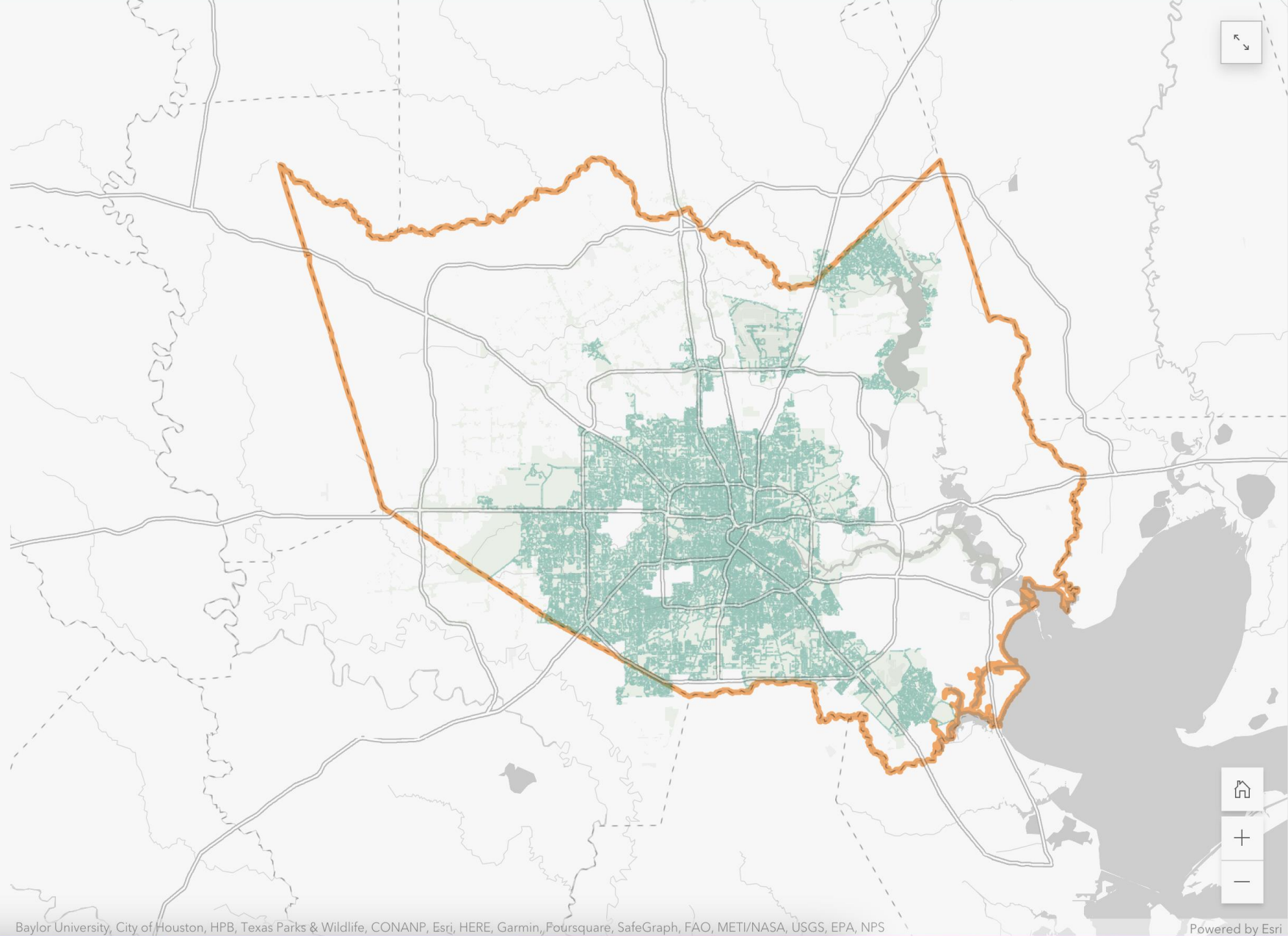


2024 onwards

Full County drive

Cyclomedia City Drive Network

Time Frame: 2018



Baylor University, City of Houston, HPB, Texas Parks & Wildlife, CONANP, Esri, HERE, Garmin, Foursquare, SafeGraph, FAO, METI/NASA, USGS, EPA, NPS

Powered by Esri

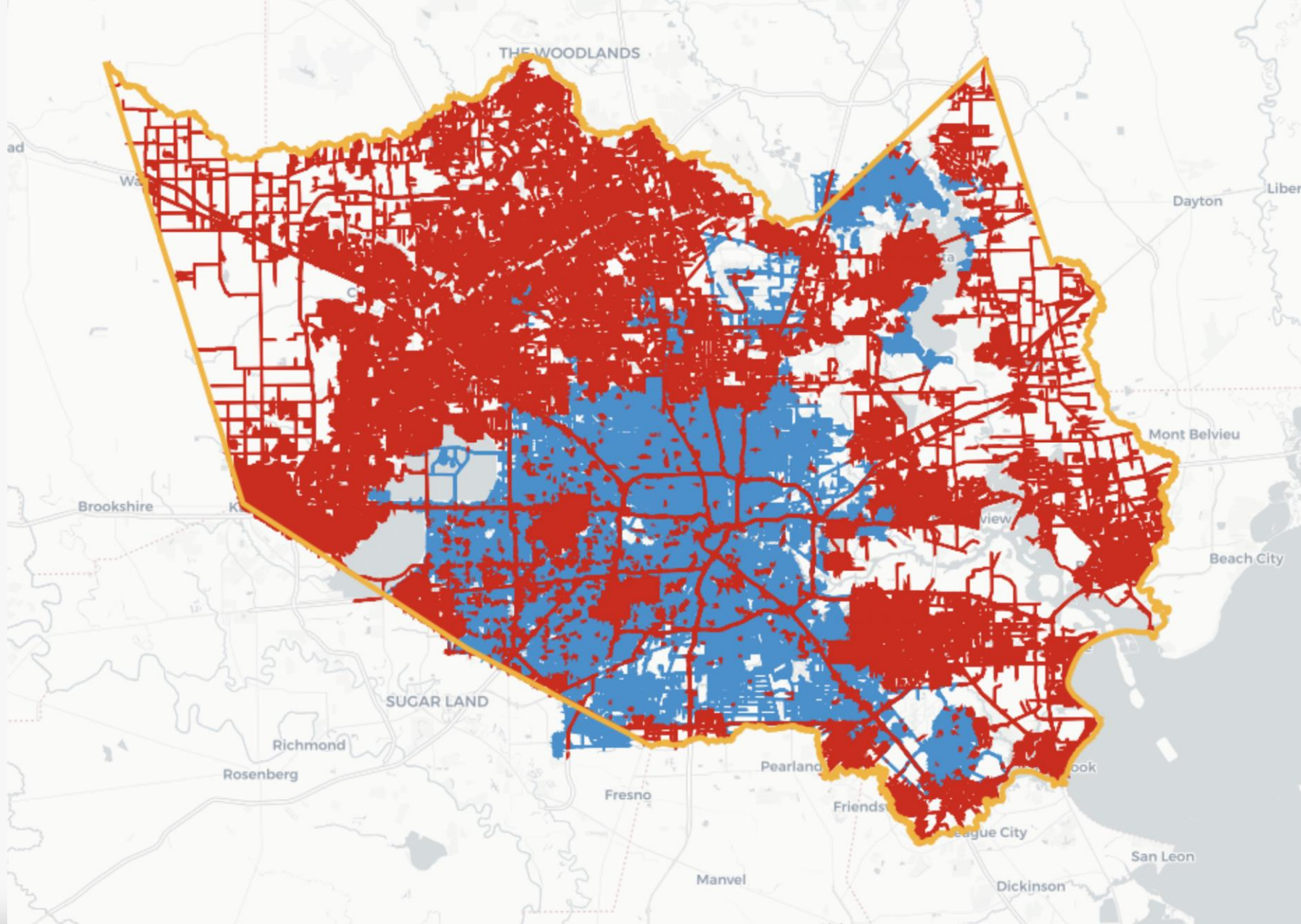
09
/
12



HCPARTNERSHIPS.NET

Cyclomedia Harris County Drive Network

Time Frame: 2019



10
/
12

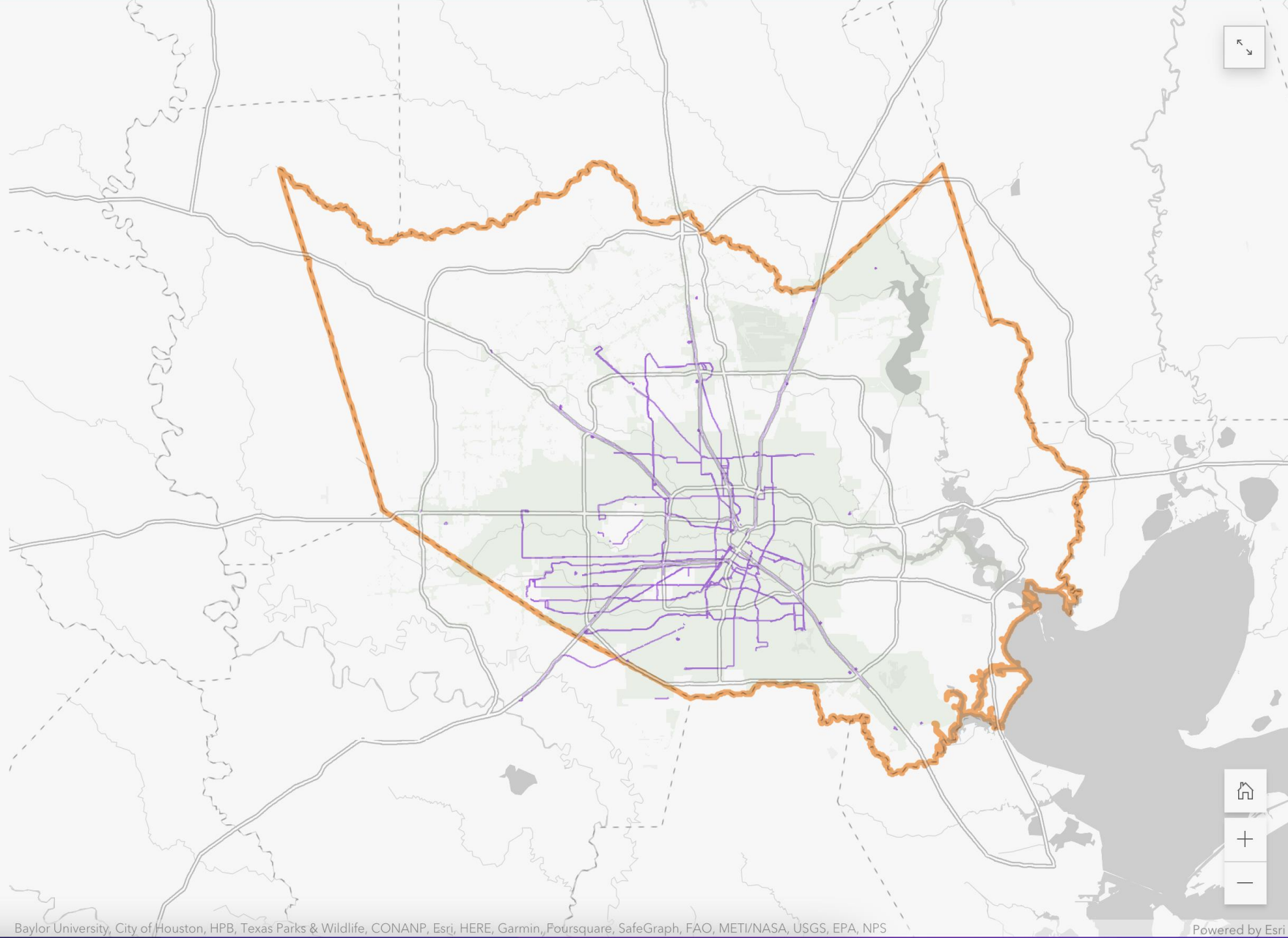


HCPARTNERSHIPS.NET

Cyclomedia Metro Drive Network

Time Frame: 2020

Includes HOVs, Managed Lanes,
and
Park-n-Rides



Baylor University, City of Houston, HPB, Texas Parks & Wildlife, CONANP, Esri, HERE, Garmin, Poursquare, SafeGraph, FAO, METI/NASA, USGS, EPA, NPS

Powered by Esri

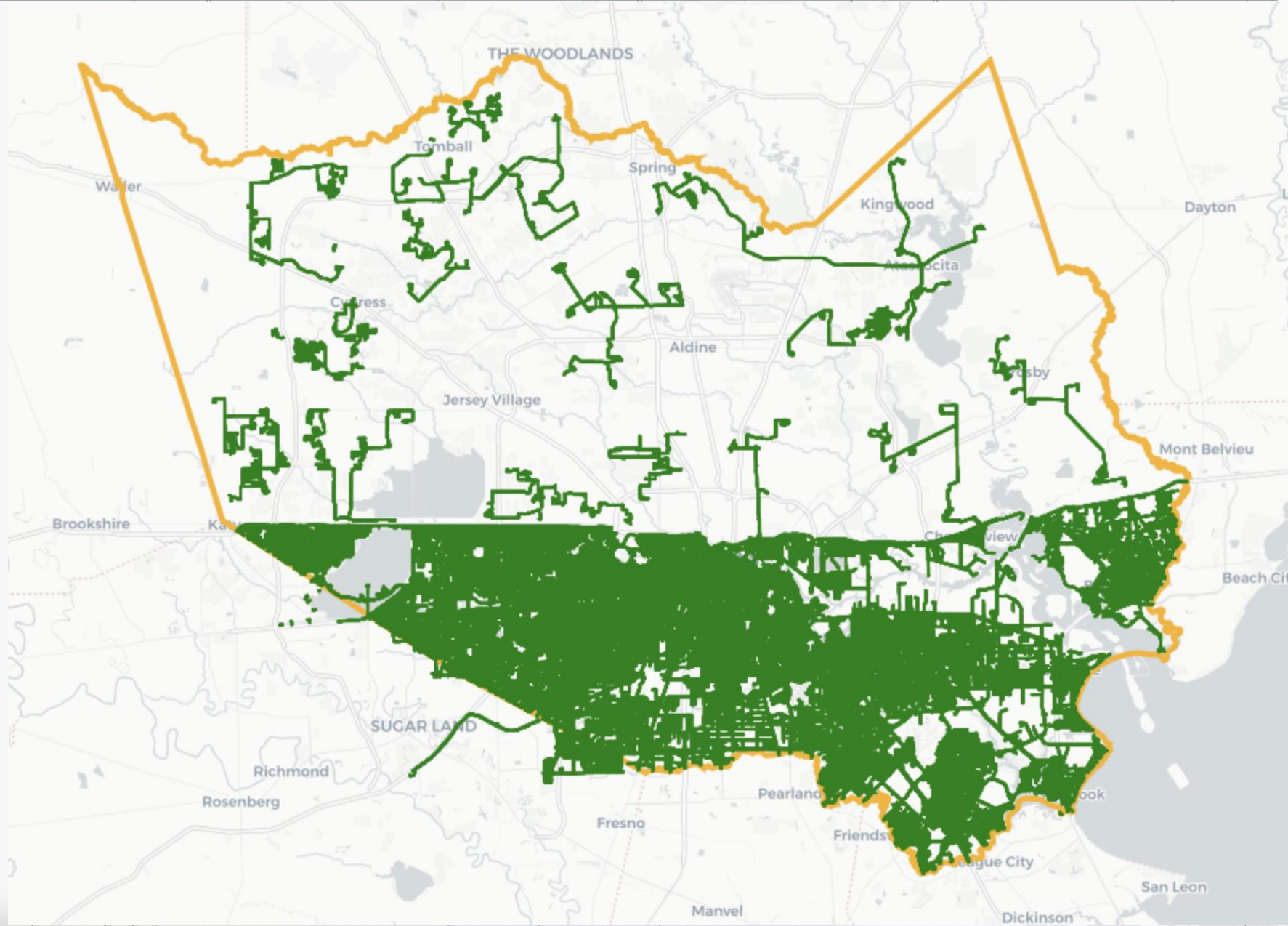


HCPARTNERSHIPS.NET

Cyclomedia Latest Drive Network

Time Frame: 2022

Under I-10



12
/
12





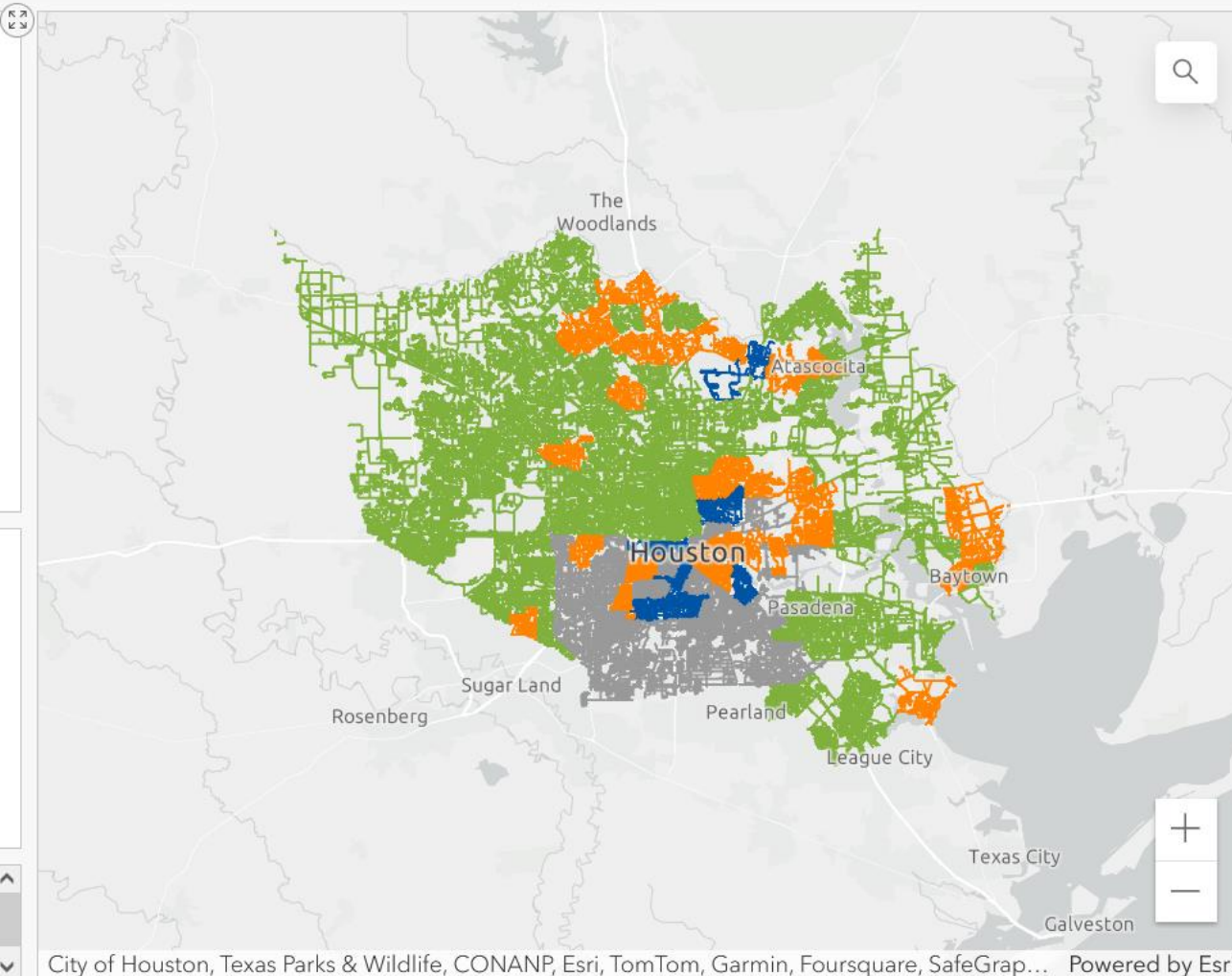
Cyclomedia Project Dashboard for Harris County TX 2023

Harris Drive Area 2023

- Planning
- Capturing
- Processing
- Published



Status for this dashboard is updated each Tuesday until publishing is complete.



- A-001
- A-002
- A-003
- A-004
- A-005
- A-006
- A-007
- A-008
- A-009
- A-010
- A-011
- A-012
- A-013
- A-014
- A-015

Areas in Planning

32

Active Capturing

7

Captured in Processing

29

Capture Published

110

City of Houston, Texas Parks & Wildlife, CONANP, Esri, TomTom, Garmin, Foursquare, SafeGrap... Powered by Esri





SPEAKER

BRUCE DAVIDSON

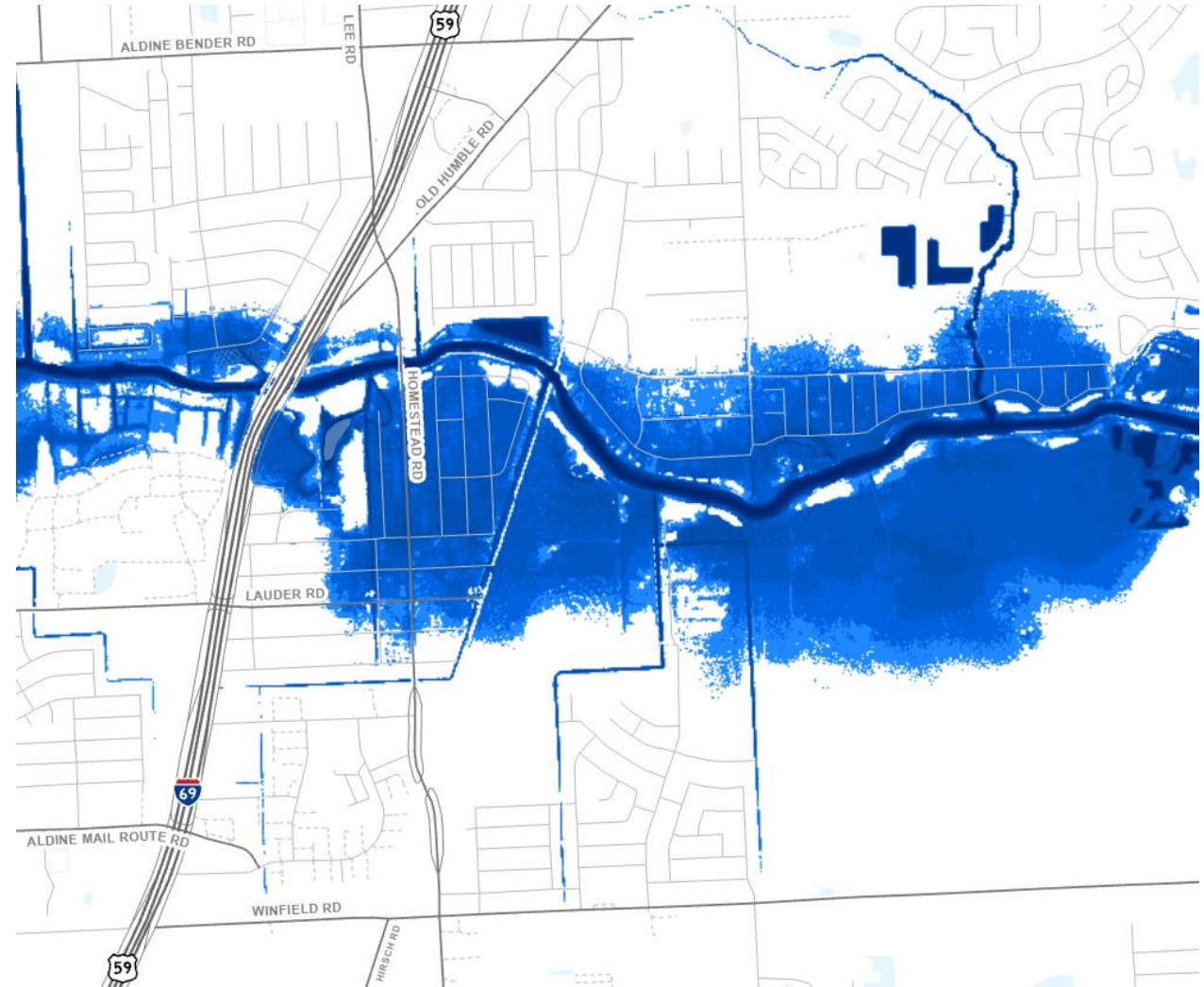
MANAGER, GIS

**HARRIS COUNTY
FLOOD CONTROL DISTRICT**



District Need

- Model number of structures inundate during a modeled event.
- Quantify anticipated structure benefits of projects
- Use inundation models and FFE's (*Finished Floor Elevations*) during an event to identify structures at risk
- Use inundation models and FFE's to focus on areas to send inspection staff after an event



Issue

- Number of residential and commercial structures 1.2M
- Cost to survey the FFEs is expensive at approximately **\$550 per structure**, making it cost prohibitive
- Cyclomedia was able to capture the FFE structure at cost of approximately **\$1 per structure**. While not survey grade, the accuracy is acceptable for planning purposes



Capture the elevation of the bottom of the front door (1,084,675)



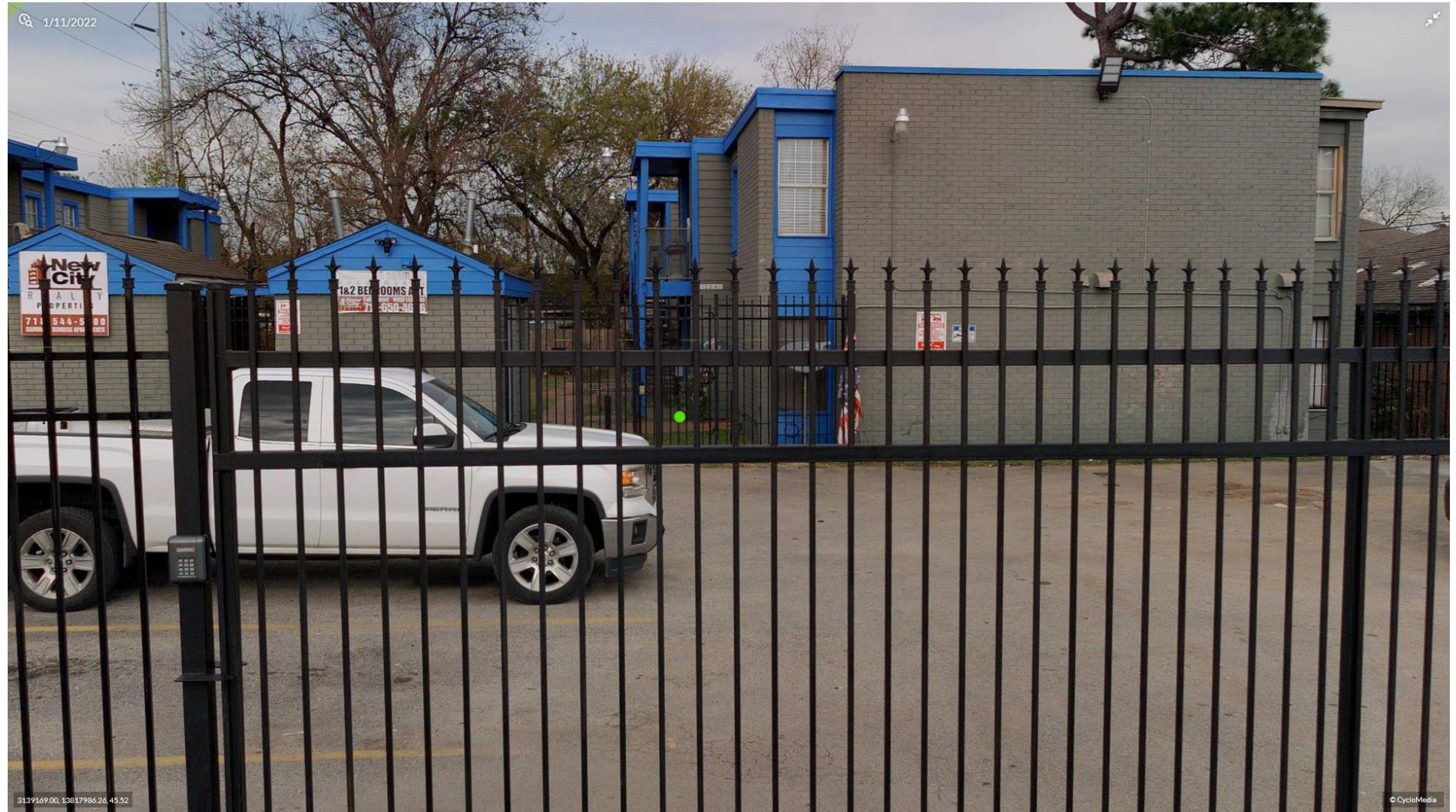
Capture the elevation of the garage door, if attached (38,825)



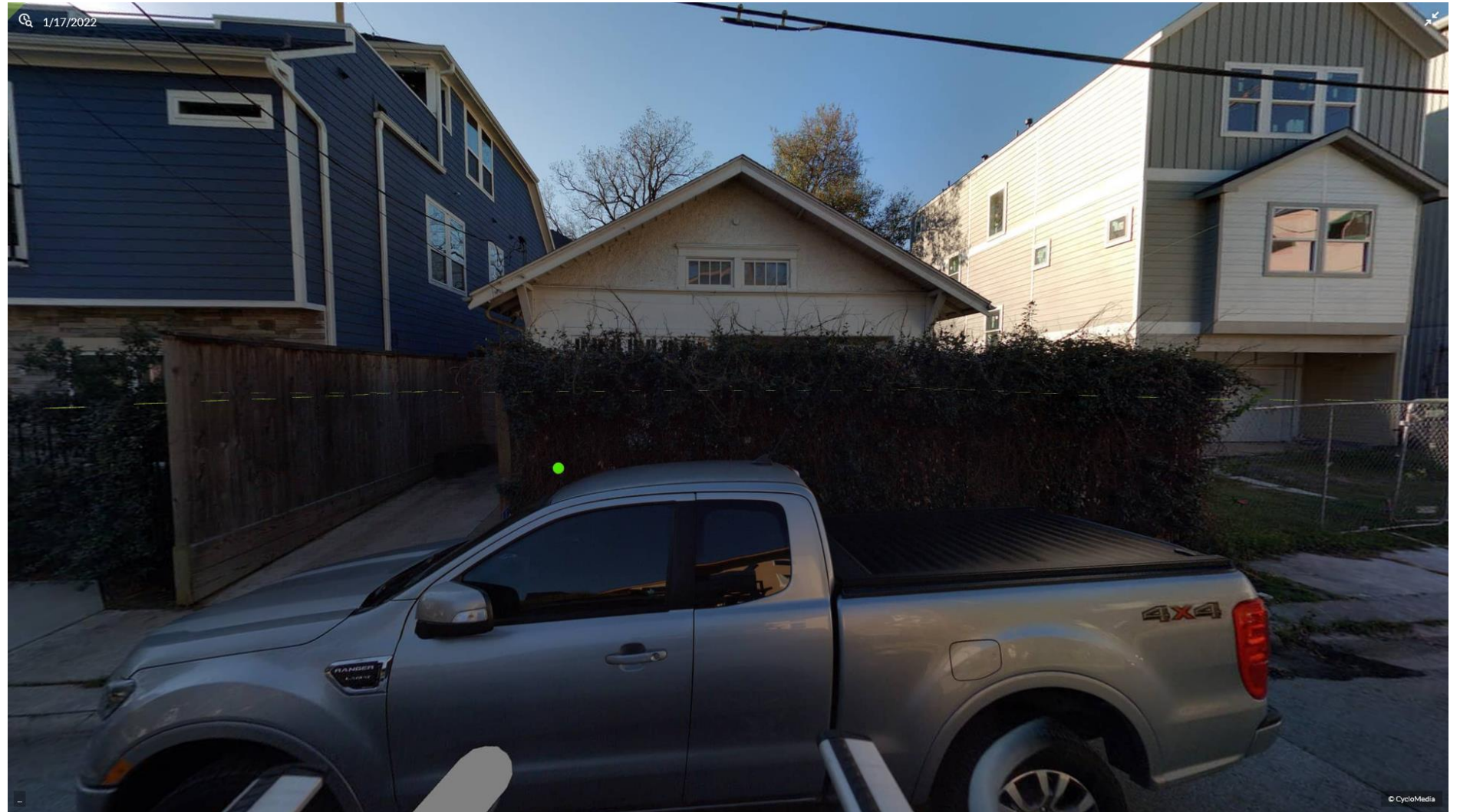
Capture the elevation of the top of a sliding glass door (1,166)



Capture the elevation of the top of a concrete slab (1,389)



Obstructed
(56,237)



Delivery

- Latitude/Longitude
- Elevation
- Location
- Harris County Appraisal District Account Number
- Grid ID
- Recorded Date (City of Houston)
- StreetSmart URL (City of Houston)

Presentation - ArcGIS Pro

FFE_2018 (Houston Phase 2) X

Field: Add Calculate Selection: Select By Attributes Zoom To Switch Clear Delete Copy

	OBJECTID *	Shape *	ID	Longitude	Latitude	Elevation (ft)	Location	Height Precision (in)	HCAD_NUM	Grid ID	RecordedAt	StreetSmart URL
1	1	Point Z	85768813446166518	-95.145481	29.55438	32.59	Front Door	0.24	1153270170005	5949	2/8/2018 9:21:47 PM	https://streetsmart.cycl
2	2	Point Z	8679297610418172053	-95.145337	29.554276	33.88	Front Door	0.28	1153270170006	5949	2/8/2018 9:21:46 PM	https://streetsmart.cycl

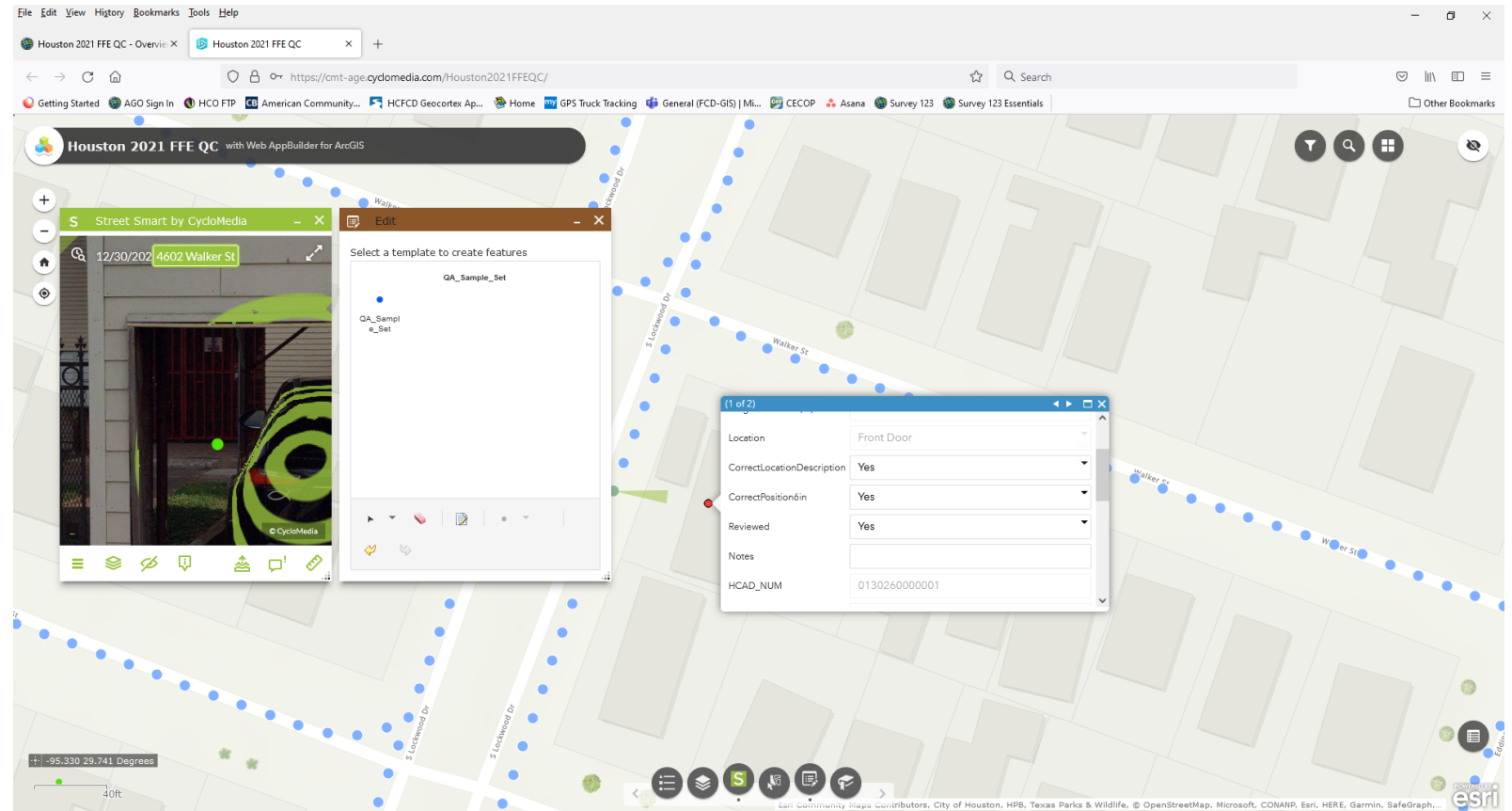
0 of 217,616 selected

Filters: 100%



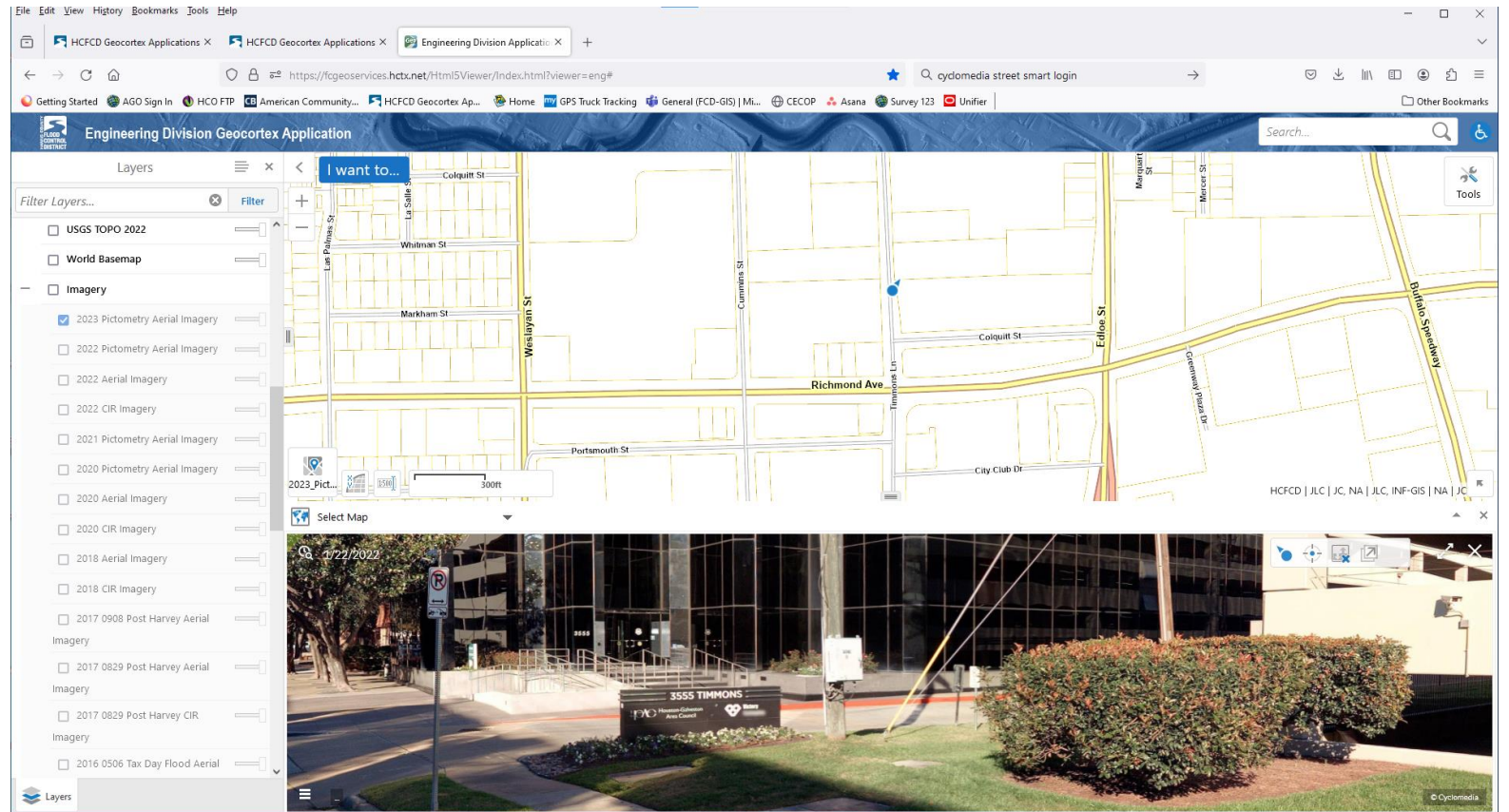
QA/QC

- Reviewed random 5%
- Verified Location and Elevation
- QA App developed by Cyclomedia
- Compared Drive Pt elevations to 2018 LiDAR

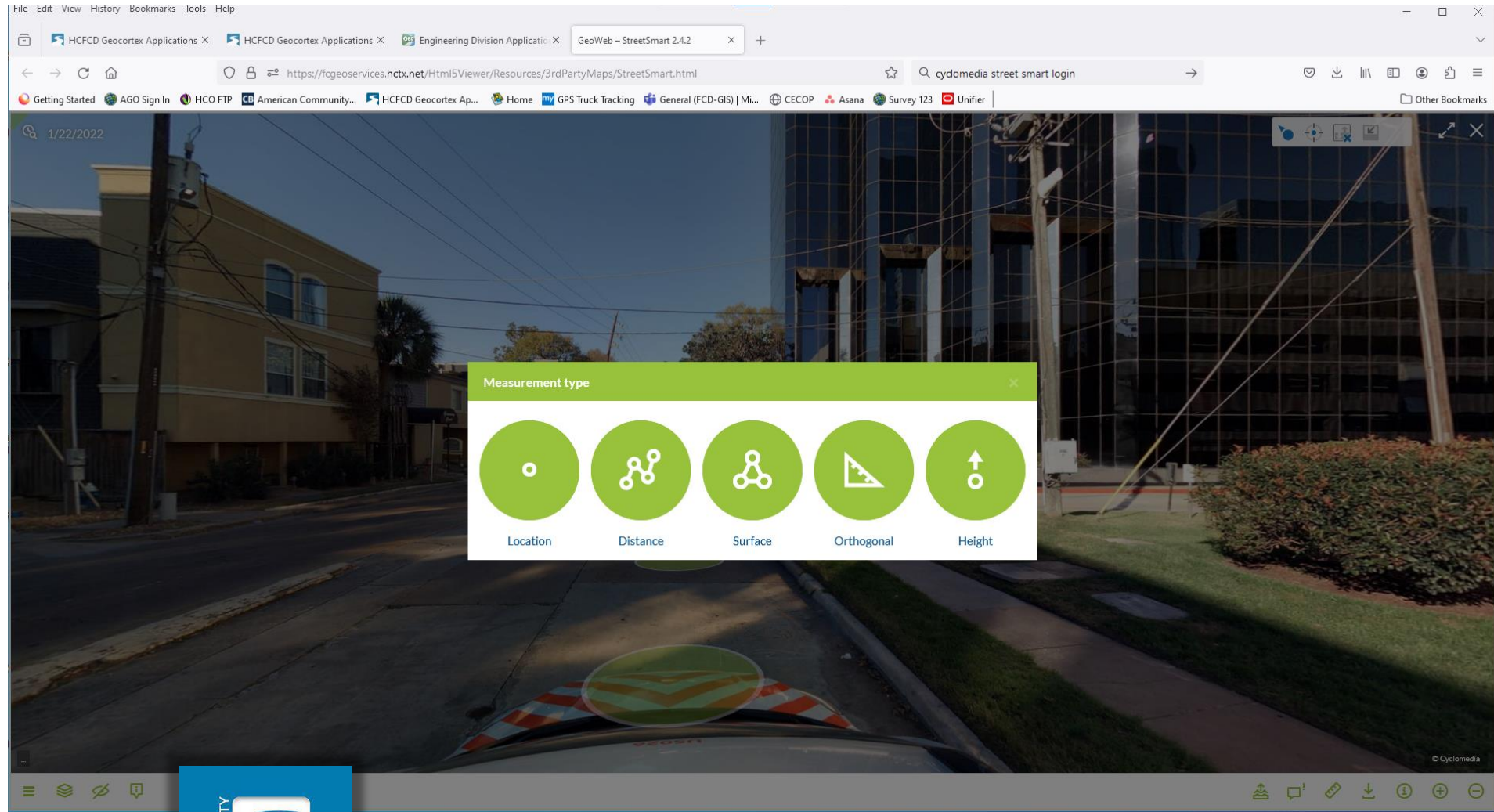


Accessing data Cyclorama's

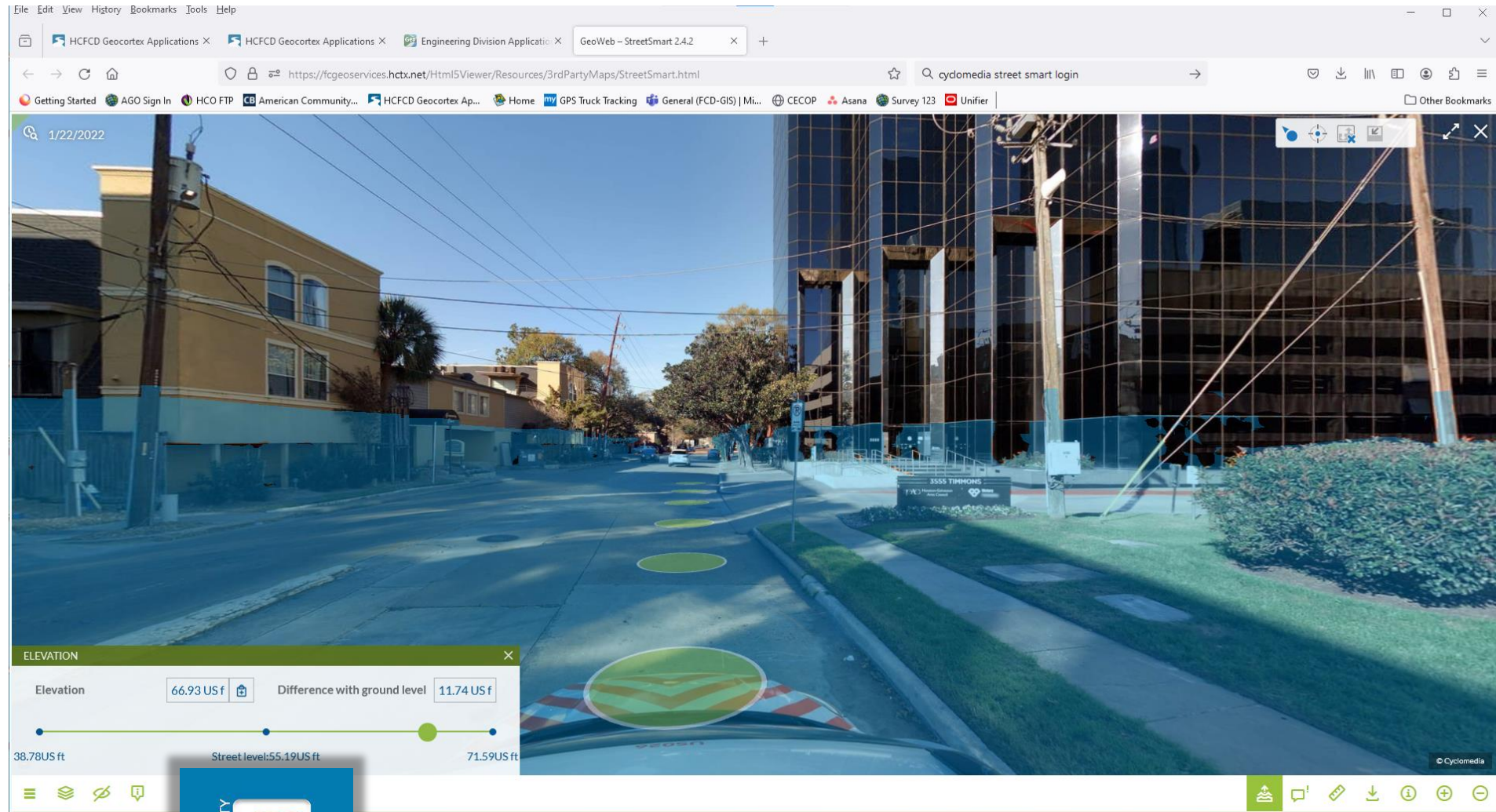
- ArcGIS Desktop add-ins
- Cyclomedia Street Smart web map
<https://streetsmart.cyclomedia.com>
- Geocortex Plug-in



Measuring Tools



Estimating Flooding





SPEAKER

DAVID DIGNUM

DIRECTOR, GIS

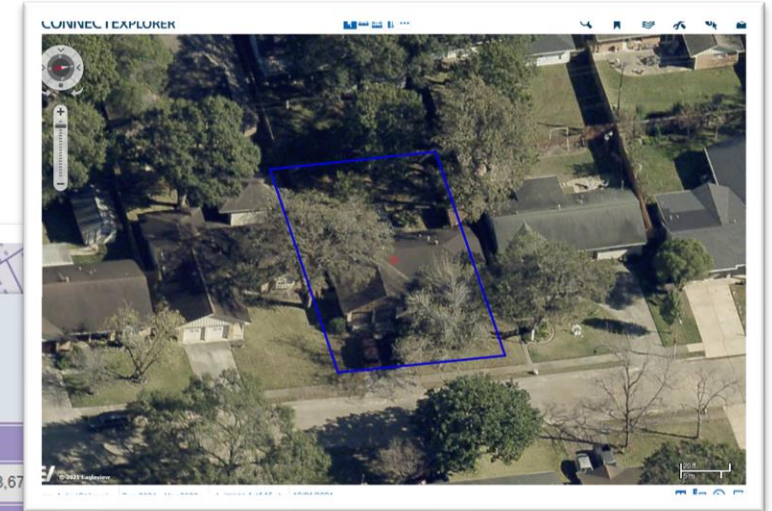
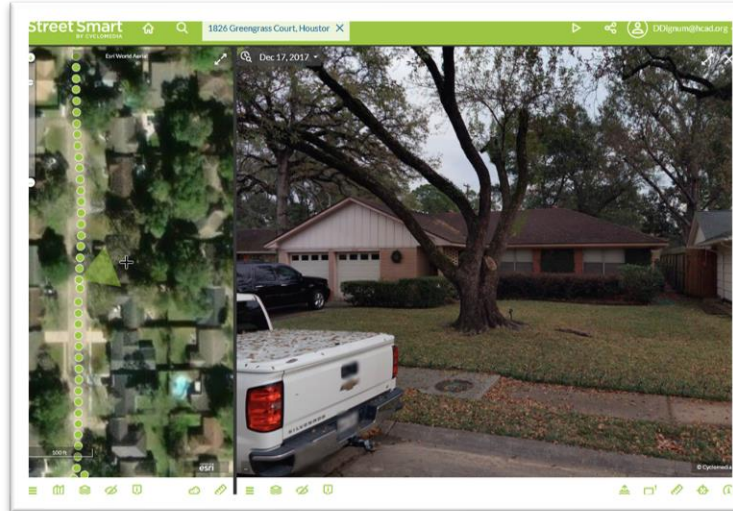
HARRIS CENTRAL APPRAISAL DISTRICT



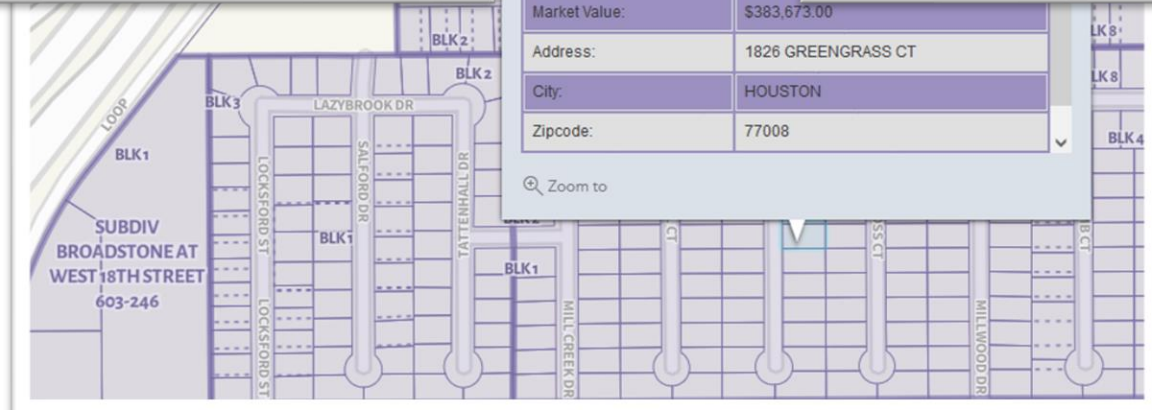
HCAD: Appraisal Districts

We appraise property value based on...

- Location
- Improvements
- Age
- Condition
- Market/Sales
- Neighborhood



1826 GREENGRASS CT HOUSTON, 77008	
State Class:	A1
Appraised Value:	\$383,673.00
Market Value:	\$383,673.00
Address:	1826 GREENGRASS CT
City:	HOUSTON
Zipcode:	77008
Zoom to	



Completed: Street Level Images Into CAMA

Goal to update building images used in appraisal and protest hearing processes

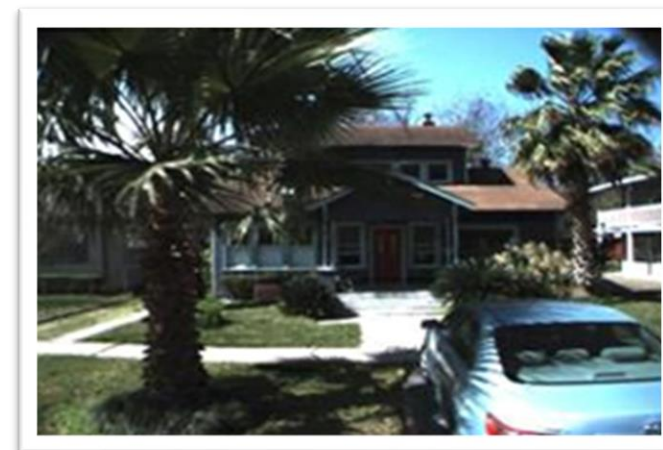
Extracted 800,000 plus new Residential building street level images

Automated extraction with Cyclomedia API

Loaded into CAMA with data source and date stamp

Gated communities, Industrial and other exceptions were not extracted at this time

In Process: Extraction of 280,000 plus Commercial street level images




Completed: QA/QC and Change Image Perspective Tool


Goal to review extracted images for acceptance/replacement before loading into CAMA

Interactive street level imagery built with Cyclomedia API

Near Completion: Button to be added to frame and make replacement images

HCAD - GIS Image Quality (QA / QC) Application v2019.4

Old - CAMA 

New - Cyclomedia 

Parcel Information

RecordingID: 505RFBIL

Account Number: 020253000006

Owner Name: JUNCK KRAG A & MEDI N

Coordinates: x = 3063421.97055911, y = 9920109.85437956

Capture Date: 12/28/2017 11:44:00 AM

Site Address: 725 COLUMBIA ST HOUSTON, TX 77007

Notes:

ID	Description	AccountNumber	TaxYear	ImageLocation	Image	CyclomediaImage	CyclomediaImage	Staff/Reviewer	TotalImageArea	OwnerName	OwnerAddress	CrossStreet	Latitude	Longitude	Elevation
1		000000000000	0	USRPFL007JAB...						WIGGAY BRUCE J			3064832.367336...	993407.8782102...	0
2		020253000006	0	USRPFL007JAB...						DEVAN JONES L			3064779.218216...	992177.8800006...	0
3		021812000000	0	USRPFL007JAB...						DEBBY JAMES R			3063453.818000...	9916491.767817...	0
4		020253000006	0	USRPFL007JAB...						BARROW DAVID			3063994.854521...	992073.540758...	0
5		129279001000	0	C:\Development\...						SHROLD KATH...			3061819.847964...	9918679.178781...	0
6		128889001000	0	C:\Development\...						HUNANG WEND			3061416.808788...	9919796.404128...	0
7		129102001000	0	USRPFL007JAB...						POWADCK PERM...			3061475.834756...	9918625.221136...	0
8		020253000006	0	USRPFL007JAB...						DAVID CANTON...			3061168.028934...	9913961.891460...	0
9		020253000006	0	USRPFL007JAB...						JUNCK KRAG A...			3063421.970559...	9920109.854379...	0

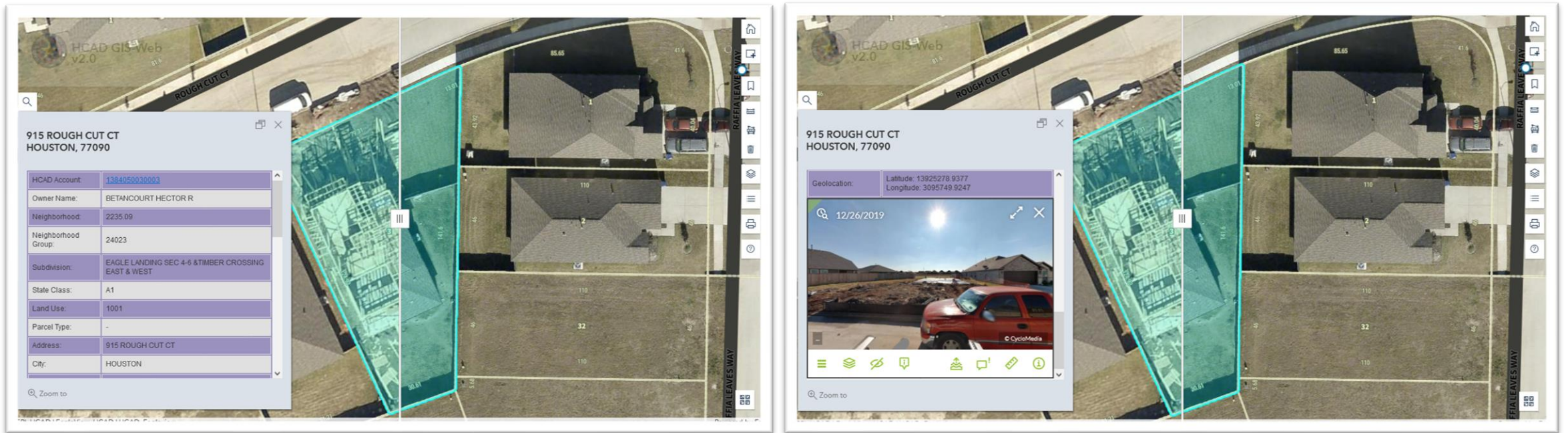
cyclomedia Smart Imagery Solutions

Load Good Not Good

Year of Refreshes - GIS



In Progress: Internal Web Map Application



Goal to integrate interactive street level imagery and measurement capabilities

Staff use daily to review properties

Used Cyclomedia API



In Progress: Address Congruency Tool

Goal to find and solve address incongruencies with addressing authorities

Loads multiple addressing authorities address points and street centerlines for comparison

Identifies locations that there are incongruent addresses

Uses Cyclomedia interactive street level imagery to identify street numbers on curbs and buildings, and street names signage

The screenshot displays the 'Address Congruency Tool' interface. At the top, a blue header contains the Harris County logo and the title 'Address Congruency Tool'. Below the header is a map showing street centerlines and address points. A 'Parcel Site Info' window is open, displaying the following information:

site number (CAMA)	1411
Site Number (CAMA)	1211
Address (CAMA)	1211 WALLFLOWER AVE
Starmap site list	1211
COH site list	1211
HC site list	1211
Baytown site list	1111

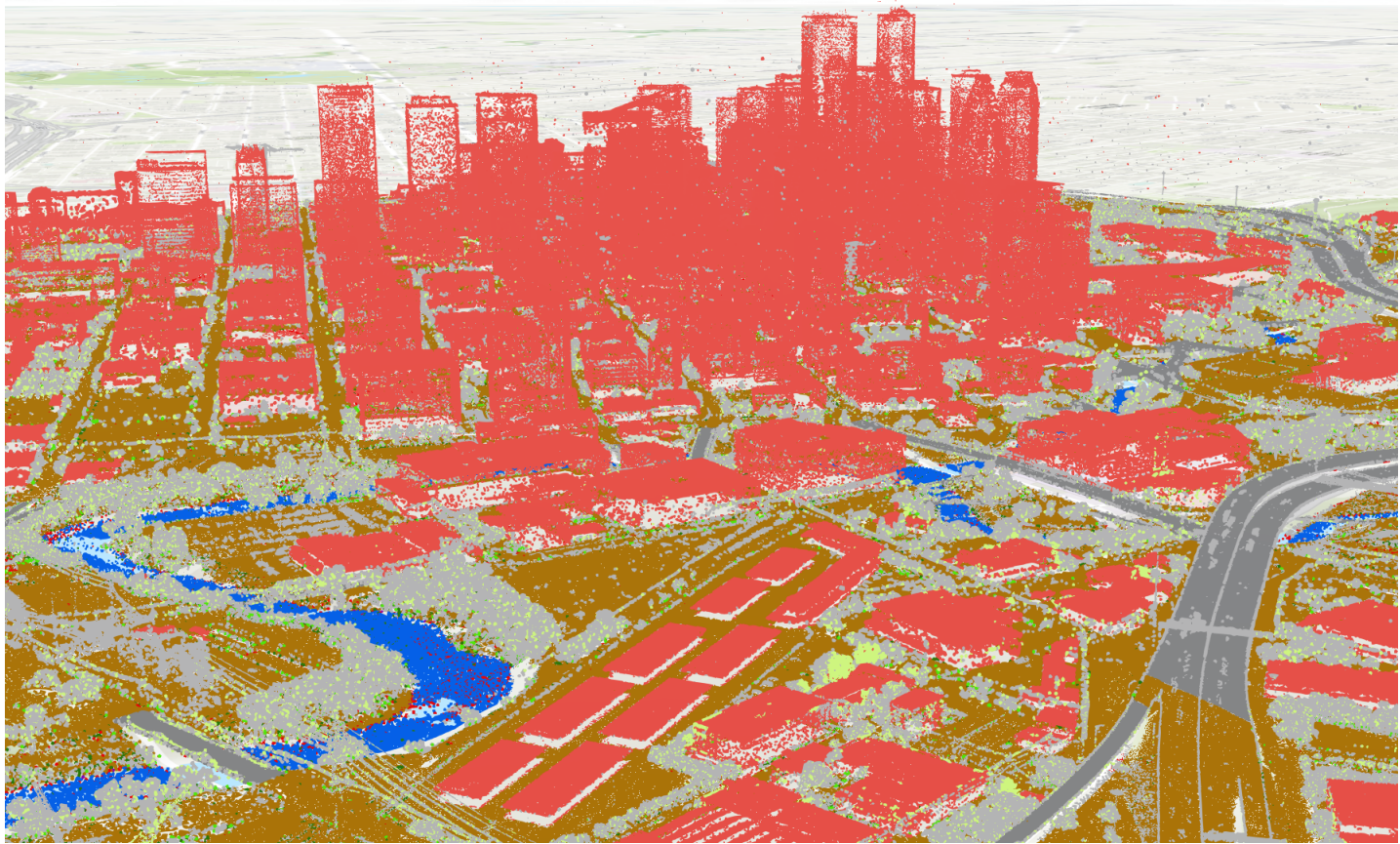
Below the map, there is a table titled 'Unmatched Addresses (Features: 51, Se...)' with the following data:

HCAD_NUM	site
1293160000185	7122
1293160000162	7039
1352760020010	

The interface also includes a street-level image from Cyclomedia showing a house with a green target overlay on the number '1211'. A 'Zoom to' search bar is visible at the bottom of the map area.



Looking Forward: Street & Aerial to Create Digital Twin



HARRIS COUNTY PARTNERSHIP

Q&A



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