

3D Analysis of Flood Impacts Considering Rainfall Rates and River Flooding

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GIS Administrator



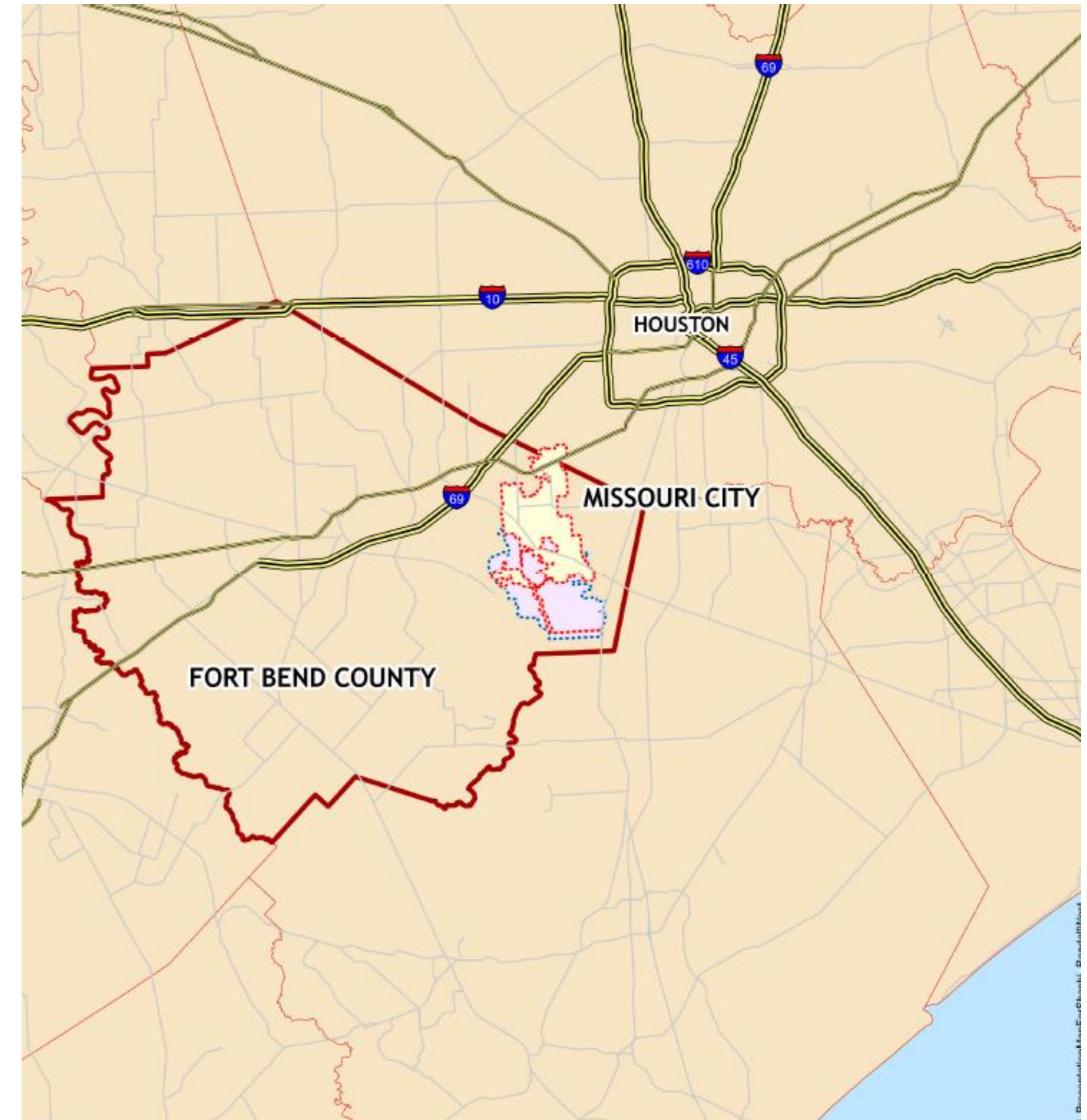
Outline

- Missouri City Location
- 3D Building(LOD2:Level of detail2: a slightly more complex model with a simplified roof shape)
- Flood Scenarios Raster
- Flood View in 3D
- Improvements



Missouri City is Prone to Hurricanes and Flooding

- Proximity to the Gulf of Mexico
- Flat, Low-Lying Terrain
- Heavy **Rainfall** from Slow-Moving Storms
- **Brazos River**
- Rapid Urbanization
- Climate Change



The Role of GIS in Flood Management and Response

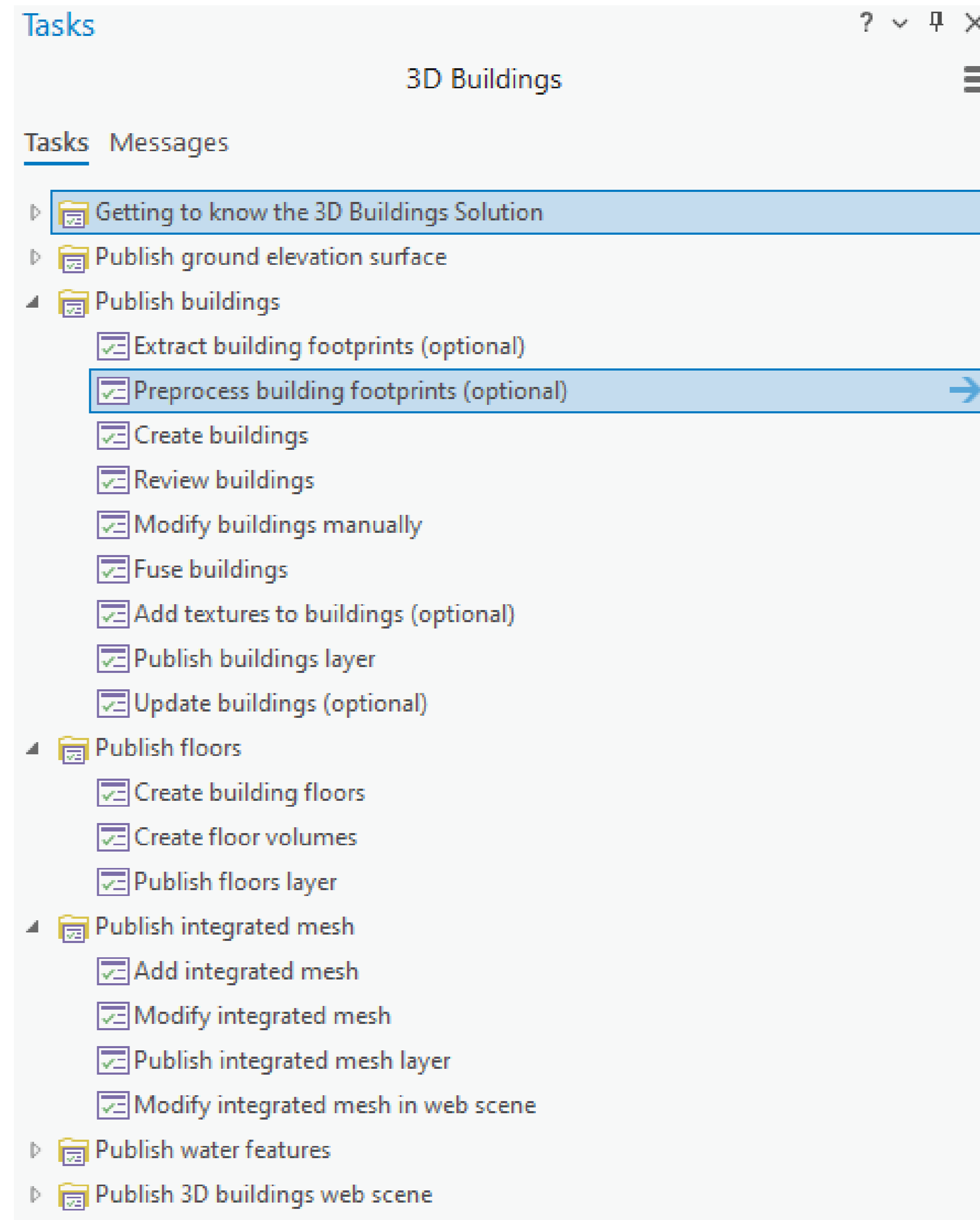
- Dashboard of Conditions and Visualization of City Assets
- **Flood Impact Analysis and Prediction**
- Damage Assessment and Recovery Planning

<https://missouricitytx.maps.arcgis.com/apps/dashboards/cfcc1742ed4843a7aa5afc071d72d162>



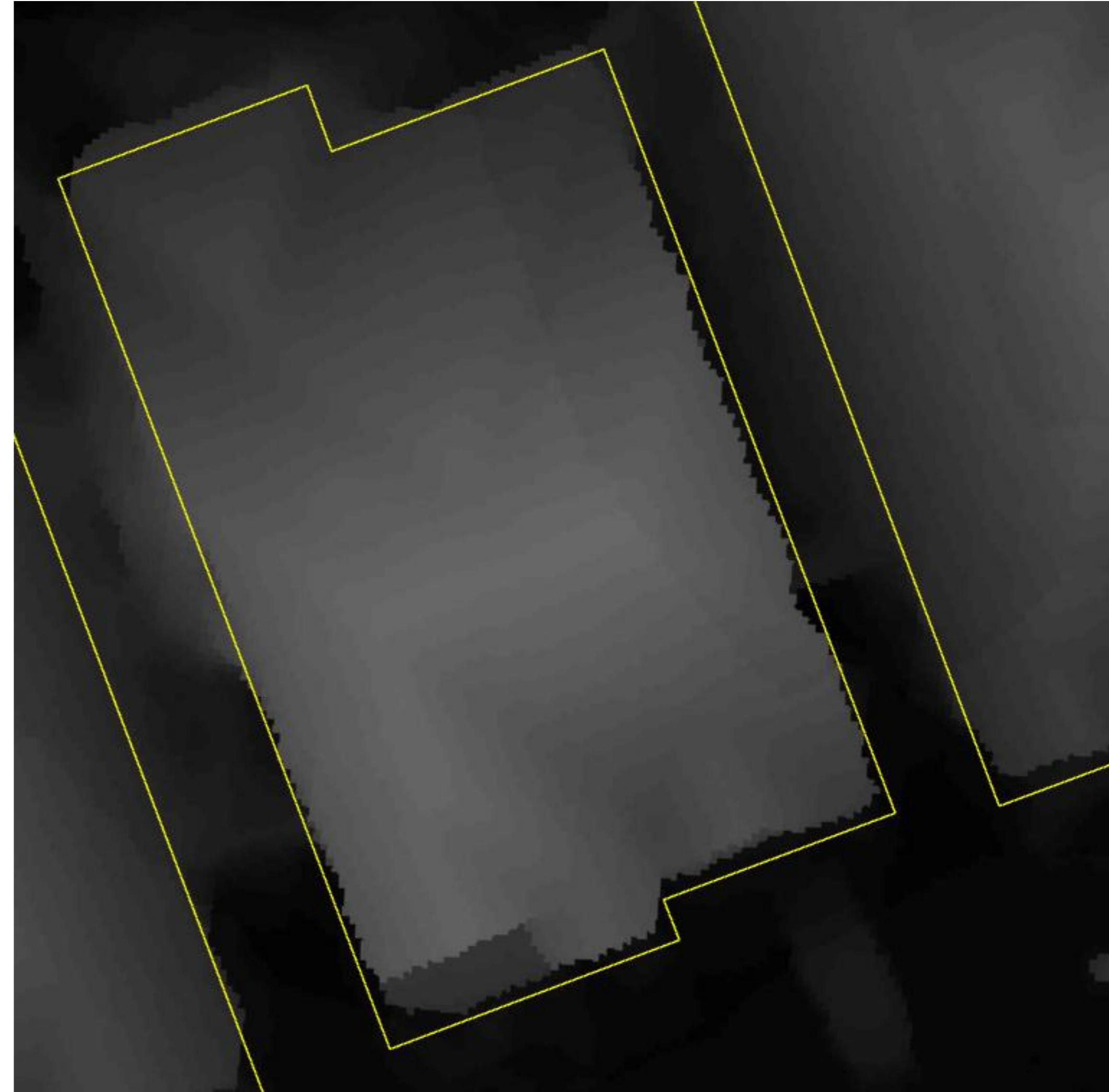
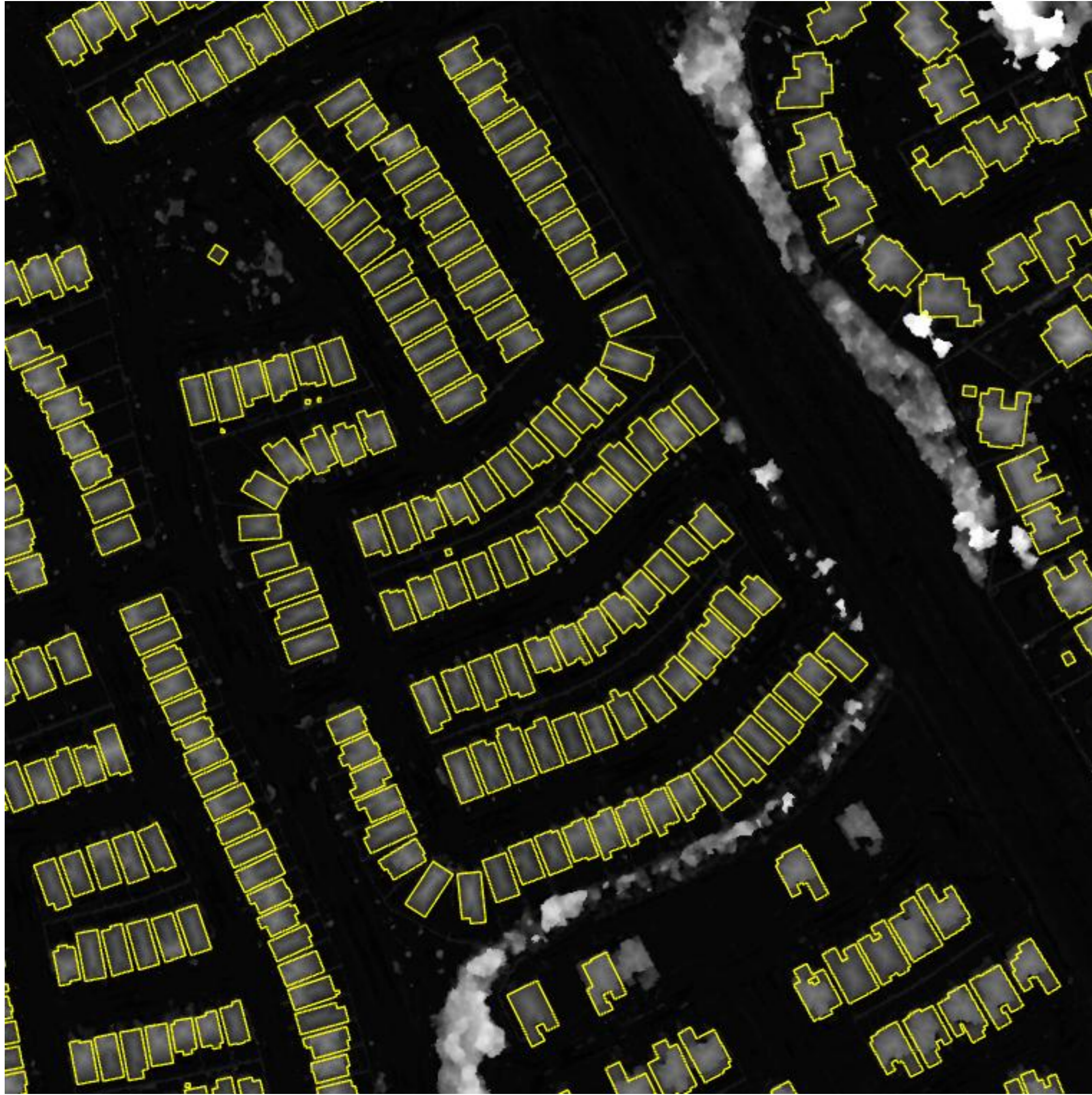
Lod2 Building

- DSM (0.5ft)
- DTM (0.5ft)
- Building Footprint



Lod2 Building

- DSM – DTM



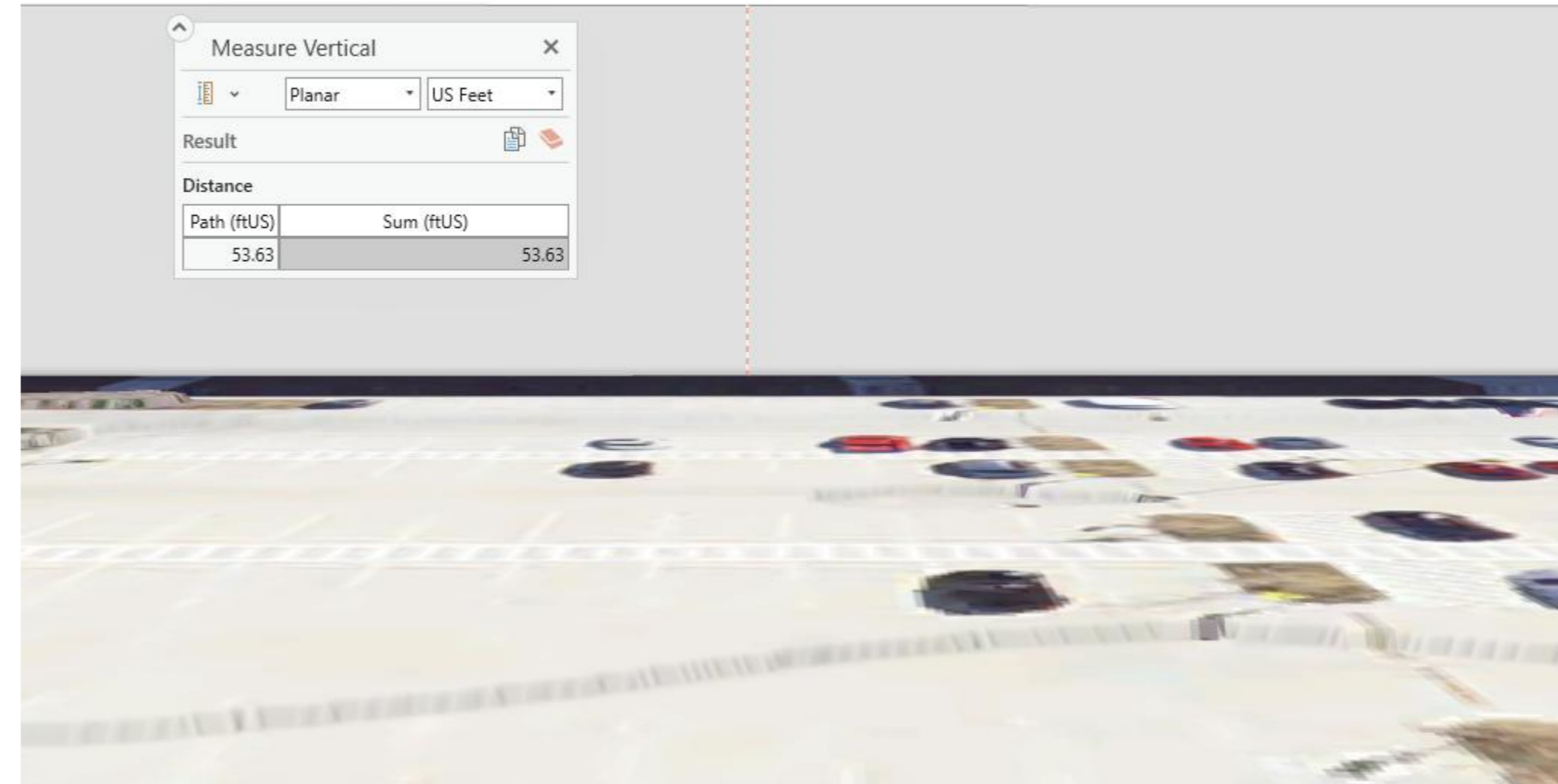
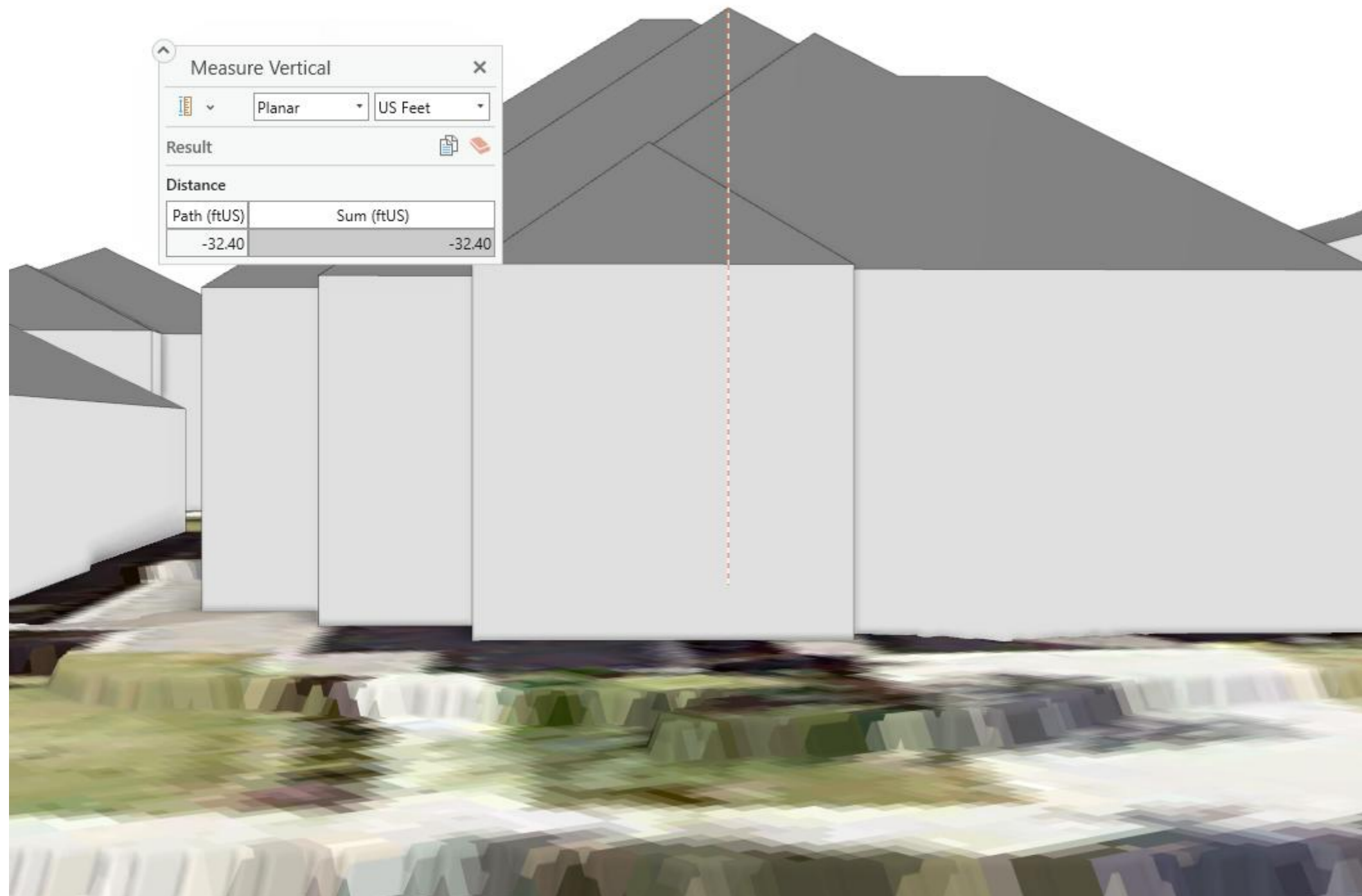
Lod2 Building

- Building roof form



Lod2 Building

- Building height



BuildingHeightM	BuildingHeightFt
9.175781	30.10427
7.917969	25.977589
8.829102	28.96687



Lod2 Building + CAD Info



336 m | 254,862.72E 3,266,034.43N m | 0 m | Selected Features: 4

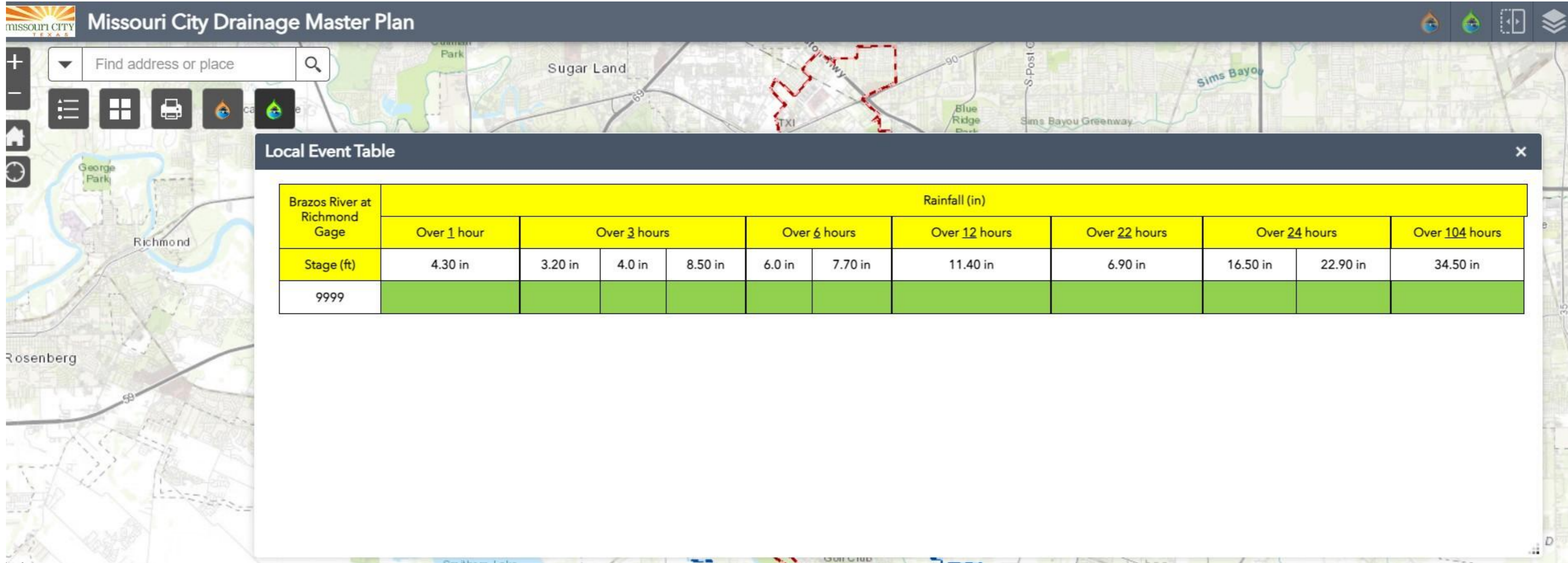
BuildingFootprin_Spa...ngBuildingParts X

Field: Selection: Highlighted:

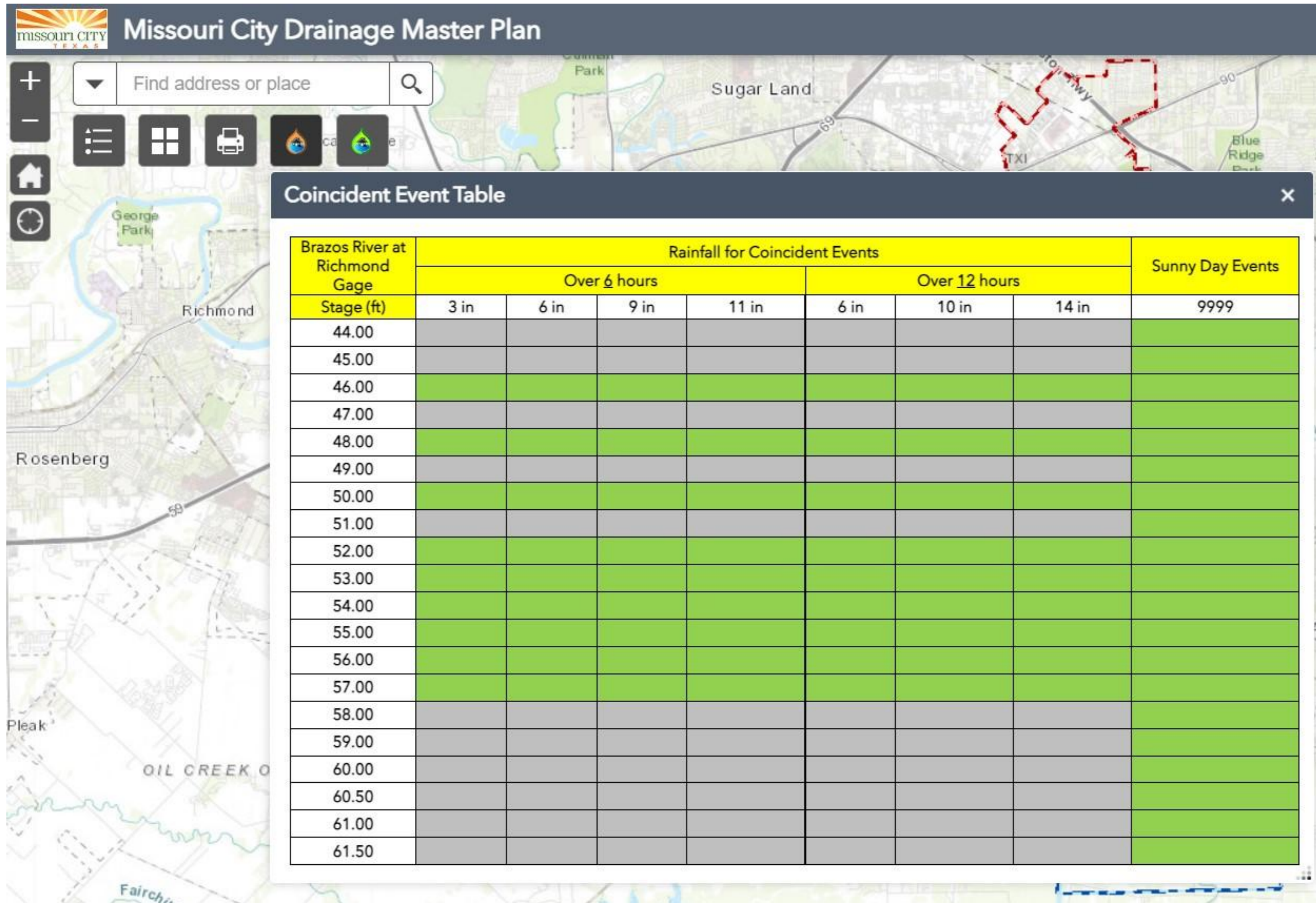
PropertyNu	XReference	OwnerName	OwnerAddre	OwnerCity	OwnerState	OwnerZip	Situs	YearBuilt	Neighborho
8130-22-003-0310-907	8130-22-003-0310-907	Lauga Kirin	9402 S Fitzgerald WAY	Missouri City	TX	77459-6248	9402 S Fitzgerald WAY,...	1999	4320
8130-22-003-0300-907	8130-22-003-0300-907	Penick Jenna	9406 S Fitzgerald WAY	Missouri City	TX	77459-6248	9406 S Fitzgerald WAY,...	1998	4320
8130-22-002-0020-907	8130-22-002-0020-907	Tucker Thomas & Ashley	9407 S Fitzgerald WAY	Missouri City	TX	77459-6249	9407 S Fitzgerald WAY,...	1998	4320
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Flood Raster – Local Event



Flood Raster – Coincident Event



Flood Raster – Depth&WSEL

- LocalEvents
 - Empty
 - Empty2
 - prevVersion
 - Depth_9999_3.20_3.tif
 - Depth_9999_4.0_3.tif
 - Depth_9999_4.30_1.tif
 - Depth_9999_6.0_6.tif
 - Depth_9999_6.90_22.tif
 - Depth_9999_7.70_6.tif
 - Depth_9999_8.50_3.tif
 - Depth_9999_11.40_12.tif
 - Depth_9999_16.50_24.tif
 - Depth_9999_22.9_24.tif
 - Depth_9999_34.50_104.tif
 - WSEL_9999_3.20_3.tif
 - WSEL_9999_4.0_3.tif
 - WSEL_9999_4.30_1.tif
 - WSEL_9999_6.0_6.tif
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 - WSEL_9999_22.90_24.tif
 - WSEL_9999_34.50_104.tif

- MissouriCityRasters
 - Brazos_CoincidentEvents
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 - Depth_46.00_9.0_6.tif
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Flood Impact Analysis

- Lod2 Building
- Depth Raster
- WSE Raster

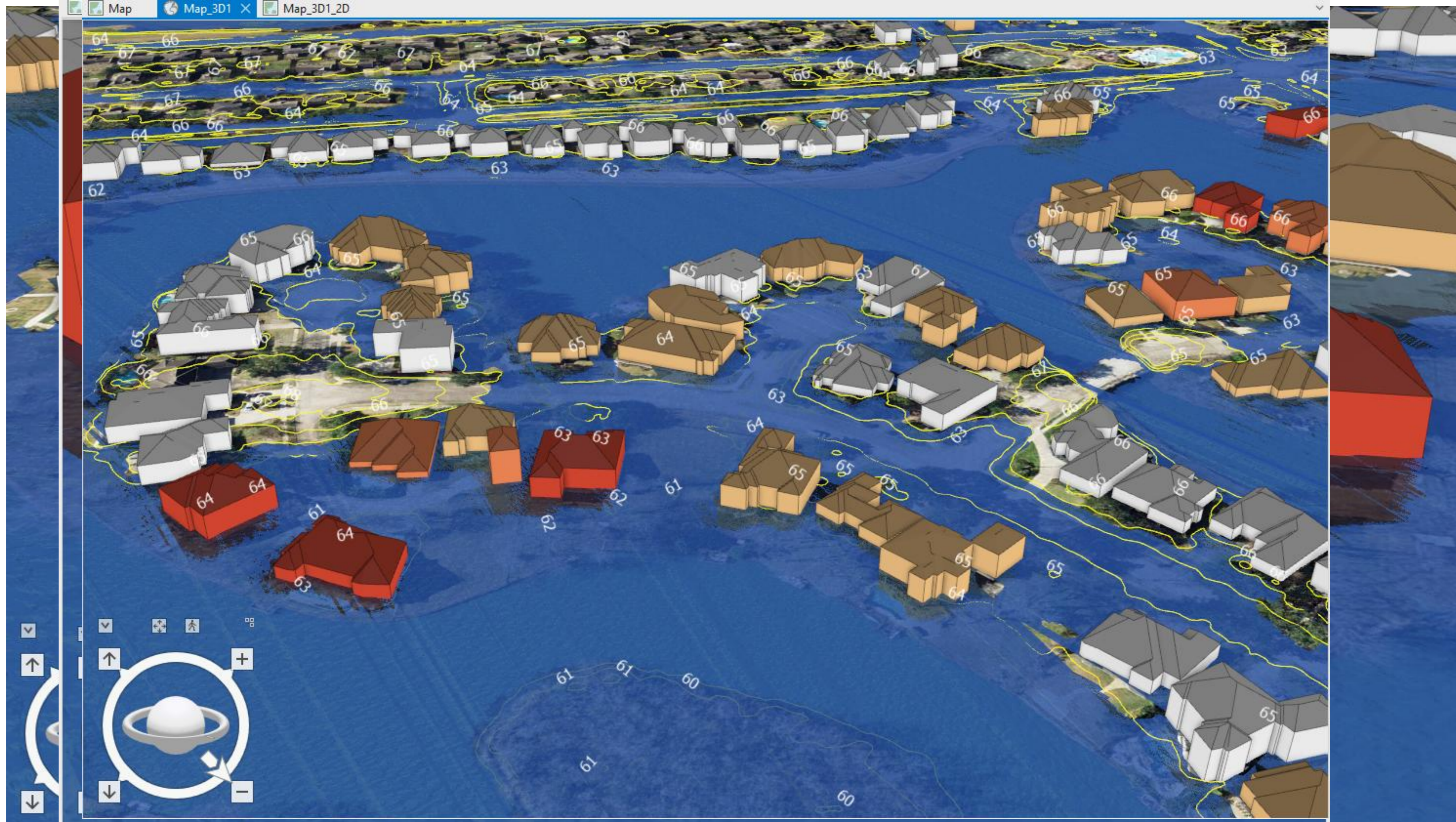
Tasks

How to use Flood Impact Analysis

- Prepare flood depth and elevation data
 - Prepare flood depth rasters
 - Prepare water surface elevation rasters
- Define flood impact
 - Create flood impact areas
 - Analyze roads
 - Analyze low-level water crossings
 - Analyze bridges
 - Analyze buildings
- Share flood impact information (optional)
 - Share flood impact information
- Visualize flood scenarios in 3D (optional)
 - Show flood impact map in 3D
 - Create 3D flood levels from raster
 - Source 3D content
 - Create depth elevation raster
- Share 3D flood impact scene (optional)
 - Project ground elevation surface
 - Publish 3D flood impact scene
 - Share depth elevation raster



Flood Impact Analysis



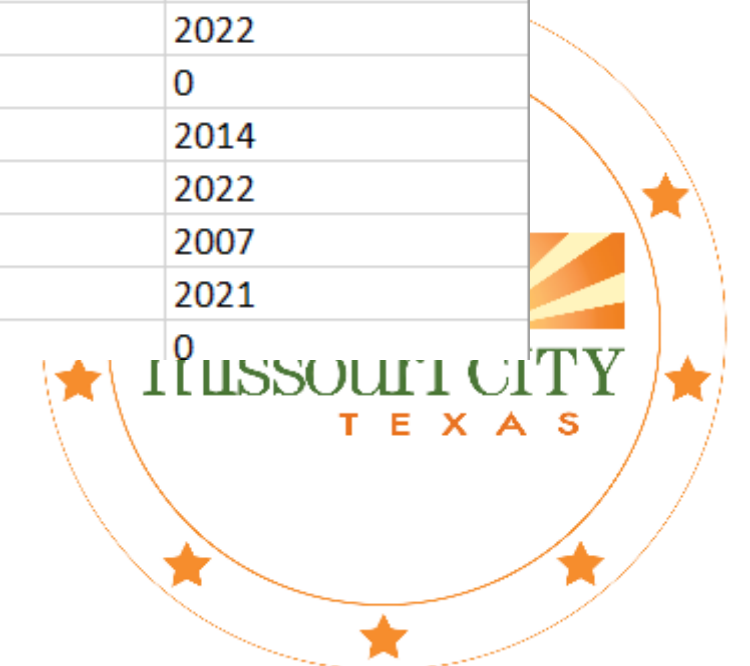
- 22.9 inch
- 24 hours



Flood Impact Analysis

- Filter out flooded buildings
- <https://missouricitytx.maps.arcgis.com/apps/instant/3dviewer/index.html?appid=8891c36560f548fbae21cbb9c6cb817d>

OBJECTID	Floodlevel Depth	Property Number	Address	Owner Name	Owner Address	Owner City	Owner State	Owner Zip	YearBuilt
10751	1.547833	5902-00-015-2101-907	W Pebble Beach DR, Missouri City, TX 77459	Hutchinson-Arvizu Malkia &	2822 W Pebble Beach DR	Missouri City	TX	77459-2521	0
15385	6.034089	0013-00-000-0537-907	Peninsulas DR	Palmer Plantation Municipal	6363 Woodway DR	Houston	TX	77057-1762	0
7076	1.223413	0077-00-000-1441-907	Knights CT, Missouri City, TX 77459	MCOCC LLC	206 E 9th ST	Austin	TX	78701-4411	0
20956	1.641152	0077-00-000-1441-907	Knights CT, Missouri City, TX 77459	MCOCC LLC	206 E 9th ST	Austin	TX	78701-4411	0
18119	1.066103	8121-00-001-0011-907	Highway 6, Missouri City, TX 77459	Navarre Ventrure Sienna LLC	2225 Longue Vue DR	Lake Charles	LA	70605-4130	0
22189	2.182937	0077-00-000-0368-907	Highway 6	Fort Bend County	301 Jackson	Richmond	TX	77469-3108	0
19365	2.727014	0077-00-000-0368-907	Highway 6	Fort Bend County	301 Jackson	Richmond	TX	77469-3108	0
42646	2.94914	0077-00-000-0368-907	Highway 6	Fort Bend County	301 Jackson	Richmond	TX	77469-3108	0
39165	3.385563	0077-00-000-0368-907	Highway 6	Fort Bend County	301 Jackson	Richmond	TX	77469-3108	0
12036	3.975611	0077-00-000-0368-907	Highway 6	Fort Bend County	301 Jackson	Richmond	TX	77469-3108	0
27640	4.148456	0077-00-000-0368-907	Highway 6	Fort Bend County	301 Jackson	Richmond	TX	77469-3108	0
12189	4.300306	0077-00-000-0368-907	Highway 6	Fort Bend County	301 Jackson	Richmond	TX	77469-3108	0
13880	4.400774	0077-00-000-0368-907	Highway 6	Fort Bend County	301 Jackson	Richmond	TX	77469-3108	0
33021	4.66006	0077-00-000-0368-907	Highway 6	Fort Bend County	301 Jackson	Richmond	TX	77469-3108	0
5559	4.734678	0077-00-000-0368-907	Highway 6	Fort Bend County	301 Jackson	Richmond	TX	77469-3108	0
2802	4.771876	0077-00-000-0368-907	Highway 6	Fort Bend County	301 Jackson	Richmond	TX	77469-3108	0
33111	2.111359	2748-07-000-0040-907	Dusty RDG, REAR, Missouri City, TX 77459	City of Missouri City	1522 Texas PKWY	Missouri City	TX	77489-2170	0
7435	2.144192	5902-00-000-0301-907	Blue Lakes LN, REAR, Missouri City, TX 77459	Quail Valley MUD	3134 CARTWRIGHT RD	MISSOURI CITY	TX	77459-2543	0
40683	2.10274	4160-01-001-0160-907	98 Island BLVD, Missouri City, TX 77459	Cienfuegos Valeria	98 Island BLVD	Missouri City	TX	77459-4657	2018
14348	2.114153	4160-01-001-0170-907	94 Island BLVD, Missouri City, TX 77459	Joseph Jesfin	94 Island BLVD	Missouri City	TX	77459-4657	2019
2790	1.181355	8122-01-000-0010-907	9340 Highway 6, Missouri City, TX 77459	Sienna Retail Development L	1600 West LOOP	Houston	TX	77027-3050	0
30761	1.801214	0077-00-000-0507-907	9303 Highway 6, Missouri City, TX 77459	Lorenzo Investments III LLC	2848 Park AVE	Merced	CA	95348-3395	0
10841	1.190891	5825-00-001-0120-907	922 Pine Meadow DR, Missouri City, TX 77459	Rubio Angel	922 Pine Meadow DR	Missouri City	TX	77489-1310	2009
32483	1.55532	0077-00-000-0506-907	9211 Highway 6, Missouri City, TX 77459	Team Springs Property LLC	1327 Forest Cove CT	Dickinson	TX	77539-6392	0
7987	1.621762	0077-00-000-0502-907	9129 Highway 6, Missouri City, TX 77459	Harris Brazoria LLC	2424 Wilcrest DR	Houston	TX	77042	0
24357	2.188937	4160-01-001-0710-907	91 Island BLVD, Missouri City, TX 77459	Baby Kaithamattathil	142 Palm BLVD	Missouri City	TX	77459-4555	2022
748	1.652494	0077-00-000-0481-907	8927 Highway 6, Missouri City, TX 77459	U S Realty Acquisitions LLC	1601 Elm ST	Dallas	TX	75201-7282	0
4823	1.028366	7765-02-003-0130-907	89 Palm BLVD, Missouri City, TX 77459	Simon Sigil & Ancy	89 Palm BLVD	Missouri City	TX	77459-4547	2014
13411	2.495517	4160-01-001-0700-907	87 Island BLVD, Missouri City, TX 77459	Asthappan Joseph Kaithama	1 Flamingo ESTS	Missouri City	TX	77459-4491	2022
15236	1.133982	6560-04-002-0580-907	84 Palm BLVD, Missouri City, TX 77459	Michaud Curtis	84 Palm BLVD	Missouri City	TX	77459-4553	2007
17341	1.719154	5741-16-005-0010-907	839 Dahlia Petal DR, Missouri City, TX 77459	Multiple Owners					2021
16756	2.311185	5825-00-001-0270-907	807 Pine Meadow DR	Bush Andre F & Stephanie C	807 Pine Meadow DR	Missouri City	TX	77489-1307	0



Improvements

- ESRI's Flood Simulation
- DEM and New Constructions
- Lidar 2024

