

Bond Election and Buffalo Bayou

flood control enhancement:
improving conveyance,
preserving natural beauty

keeping Buffalo Bayou green
while making it a better floodway to protect homes

Improving Buffalo Bayou

- Impacts: estimated number of flooded houses and other structures
 - April 2009 - 1000 Memorial Day - 300 Tax Day - 700
 - Harvey - 3000 USACE Release – 10000 + roads, wastewater, electrical station

Buffalo not really testeduntil Harvey!

- received less than 100 yr rains in Allison, Memorial Day, Tax Day
- Conveyance Improvement
 - Remove restrictions to flow (east of BW8) that cause backwater west of Gessner
 - Bridges - elevate above storm water level
 - Oxbows – bypass, not rectification
- Detention Addition
 - At stormwater sources: Clodine; Brittmore; Memorial City: I-10; BW-8; Westpark
 - In channel detention - little help in major event - filled by upstream flows
- Protect Addicks and Barker: integrity + overland flow + upstream development

Harris County Commissioners Court plans to call a bond election for **August 25, 2018**, for the [Harris County Flood Control District](#).

Registered voters in Harris County will be asked to vote on what could be **\$2.5 billion in bonds for flood risk reduction projects throughout the county**.

➤ [2018 Bond Proposed Project List as of August 6, 2018 \(PDF\)](#)

➤ <https://www.hcfcd.org/media/2682/2018-bond-proposed-project-list-public-distribution061318.pdf>

View our [interactive map](#) to see the approximate location of more than 150 potential projects that are candidates for bond funding, and to learn more about proposed projects in your area of interest. These potential projects have been identified by the [Flood Control District](#) and provide flood risk reduction benefits in the watersheds in which the projects are located.

Potential projects indicated on the interactive map represent projects that would meet **the goal of the bond election to both assist with recovery after previous flooding events and to make our county more resilient for the future**.

Step 1: Find Your Watershed

Enter Address FIND

eg 888 Northwest Fwy Austin, TX 78701

☒ All Watersheds ☐ Already know your watershed?

LEGEND

PROPOSED BOND PROJECTS

- ★ Rural Area
- ▲ Storm Ponds
- Suburban Drainage Improvements
- Urban Projects
- ◆ Partnership Projects

WATERSHED BOUNDARIES

- Watersheds

JURISDICTIONS

- Texas House Districts
- Texas Senate Districts
- US House of Representatives

Harris County Commissioners Court

County Judge - Ed Eversett

At-Large - Rodney Ellis

At-Large - Jack Marshall

At-Large - Steve Nelson

At-Large - Jack Doyle

Political Subdivisions

Other Municipalities

City of Houston

Unincorporated Harris County

Unincorporated Harris County

Unincorporated Harris County

Unincorporated Harris County

Unincorporated Harris County

Unincorporated Harris County

Unincorporated Harris County

Unincorporated Harris County

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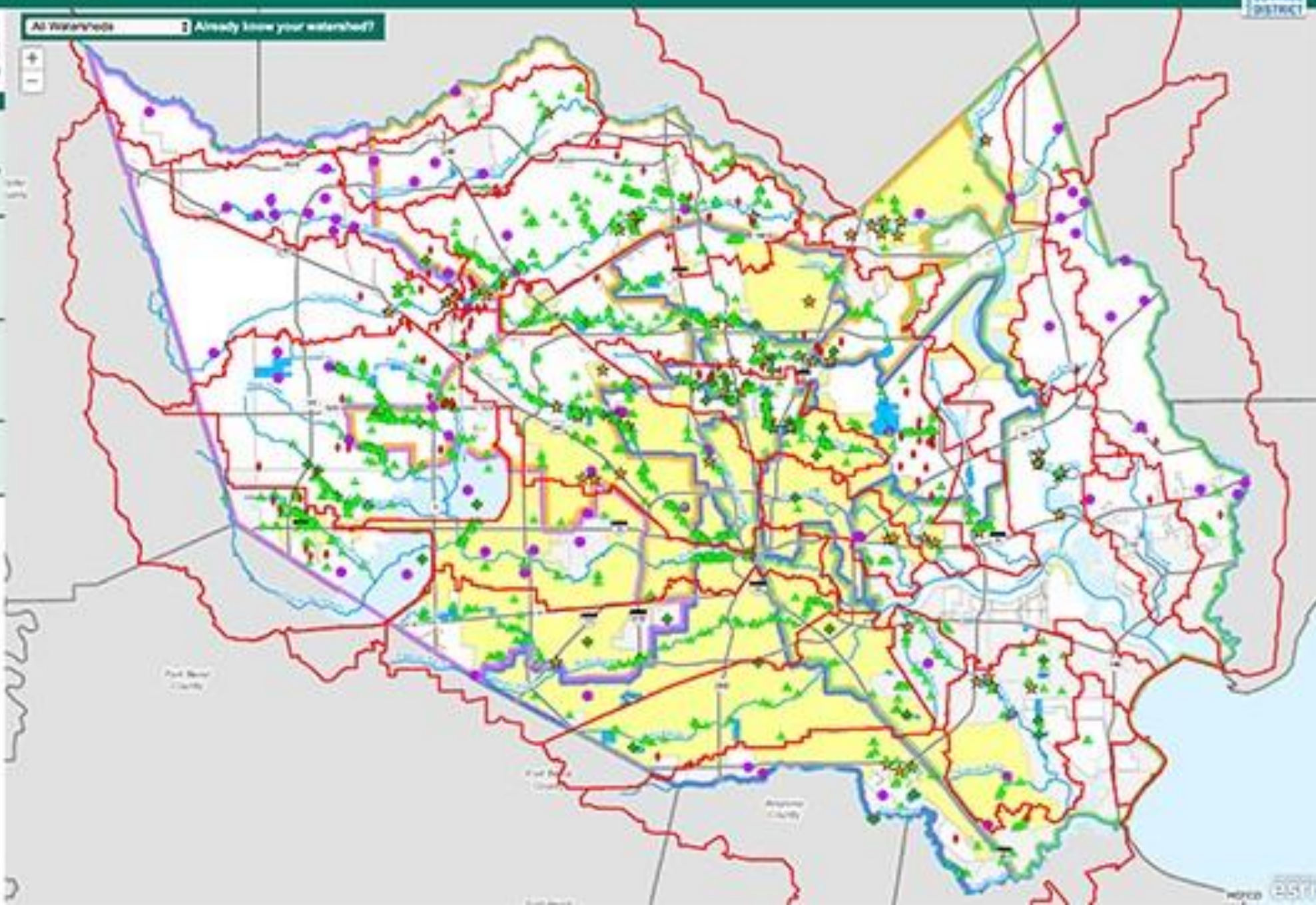
Unincorporated Harris County

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Disclaimer

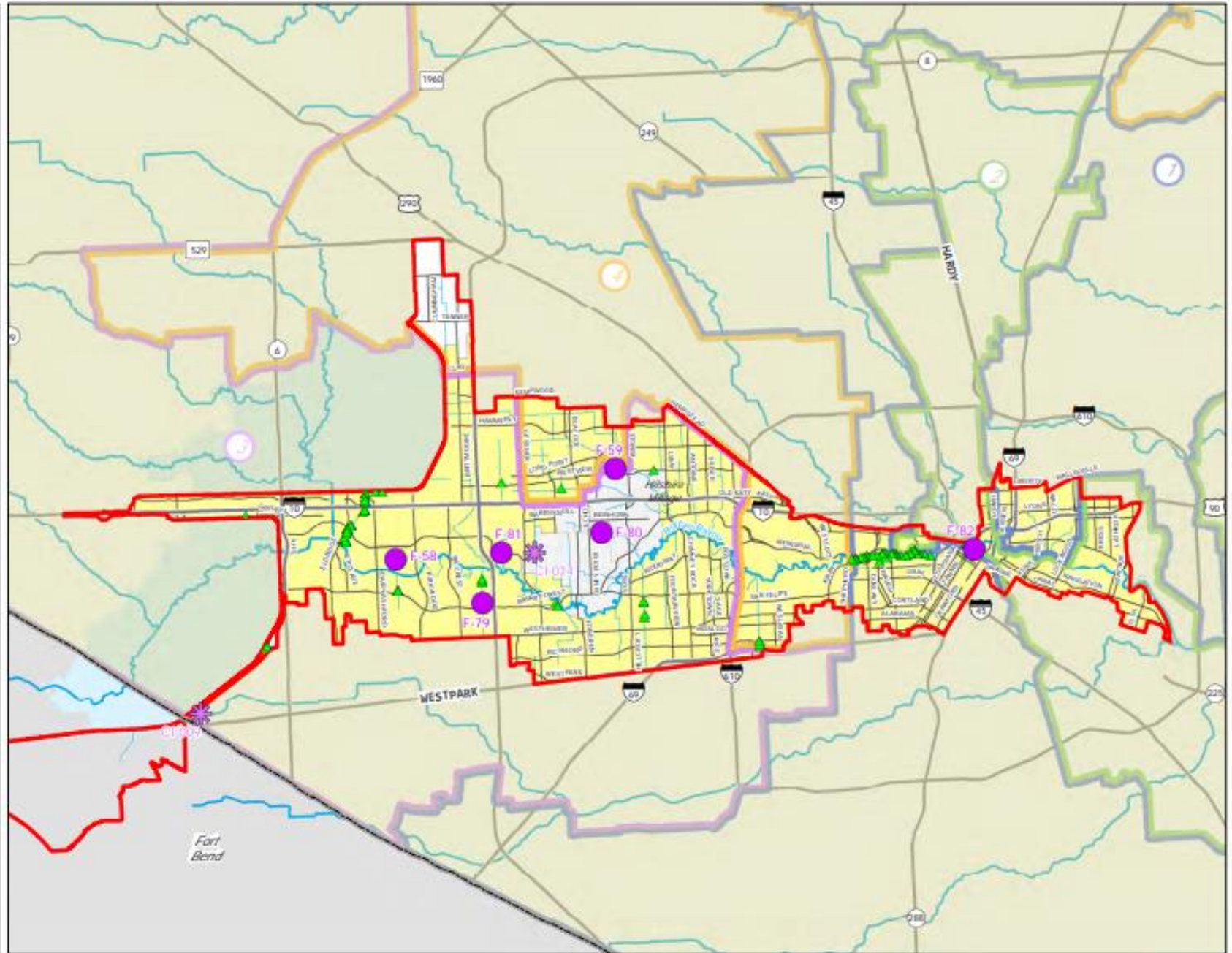
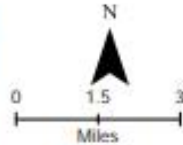


An interactive map of the
Harris County Flood Control
District

- Proposed Bond Projects**
- ★ Buyout Areas
 - ▲ Storm Repairs
 - ◆ Subdivision Drainage Improvements
 - Local Projects
 - ✚ Partnership Projects
 - ✿ Community Input

- Harris County Precincts**
- Pct. 1 - Rodney Ellis
 - Pct. 2 - Jack Morman
 - Pct. 3 - Steve Radack
 - Pct. 4 - R. Jack Cagle

- Jurisdictions**
- Other Municipalities
 - City of Houston
 - Unincorporated Harris County

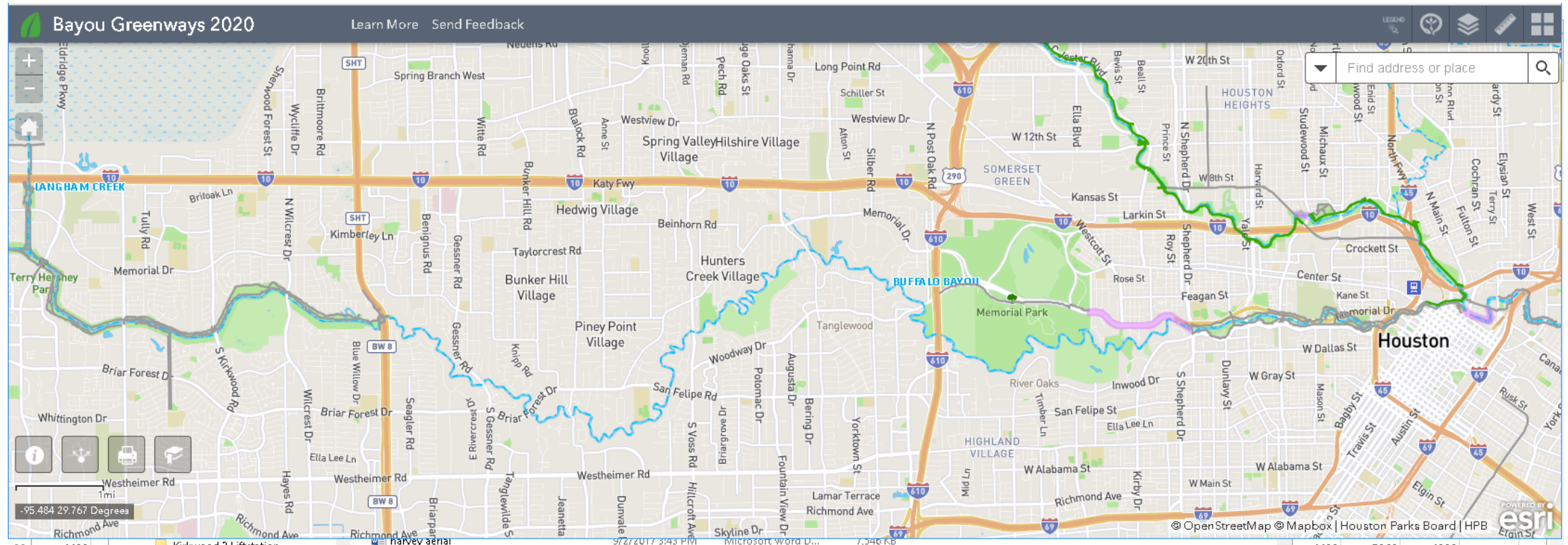


Buffalo Bayou Projects in Flood Bond

- \$10 M - W100-00-00-Lin F 58 - Linear detention channel widening in Terry Hershey Park
- \$ 4 M - W140-00-00-X005 F 59 - Spring Branch Creek Stabilization maintain conveyance
- \$ 10 M - W157-00-00-GEN F 79 – local drainage – Walnut Bend
- \$ 10 M - W141-00-00-GEN F 80 – local drainage Soldiers Creek
- \$ 10 M - W153-00-00-GEN F 81 – local drainage – Frostwood to Legend Lane
- \$ 2 M - W100-COMMERCE F 82 – Improve conveyance
- \$ 30 M - W190-JOINT - CI-009 – Ft Bend partner – Clodine Improvements
- \$ 30 M – W100-BCON – CI-017 - Bridge replacement
- \$ 0.5M – W100-Study – CI-016 – Investigate bridges and potential channel bypass
- \$ 2 M - W 140-00-00 –X005 –CI-018 – Rehabilitate to Restore channel capacity
- \$ 0.2M- W500-Micro - CI-024 -Investigation of Effectiveness of Micro-Detention
- \$ 8 M - Storm Water Repair W-StormRep

Meaningful conveyance improvement for Buffalo Bayou needs emphasis and community support

Buffalo Bayou: west of Beltway 8 – straight, smooth
east of Beltway 8 - torturous, constricted – restricted conveyance
both sections - numerous bridges – restricted conveyance



Hwy 6 to Shepherd is naturalized, riparian habitat
From BW8 to Shepherd is unimproved with many oxbows

Bridge Submergence Level Buffalo Bayou

Bridge	event year	level	10	50	100	500
• Highway 6	-	-	-	-	-	1.5
• Eldridge	-	-	-	-	-	0
• Dairy Ashford	-	-	-	-	0	3.5
• Kirkwood	-	-	-	-	-	0
• Wilcrest	-	-	-	0	2	5
• Sam Houston	-	-	-	-	0	4
• Gessner	-	-	-	1	3	7
• Briar Forest	-	-	-	-	-	3
• S. Piney Point	-	-	-	-	-	2

Bridge Submergence Level Buffalo Bayou

Bridge	event year level	10	50	100	500
• San Felipe		-	-	1.5	6.5
• Voss		-	-	-	2
• Further Point		-	-	1.5	6.5
• Chimney Rock		-	-	-	2
• Woodway		-	-	2.5	7.5
• I-610		-	-	-	5
• Shepherd		-	-	1.5	7.5
• Waugh		-	-	-	4
• Montrose		-	-	1	7
• Memorial		2	6	9	15
• Memorial		4	8	11	17

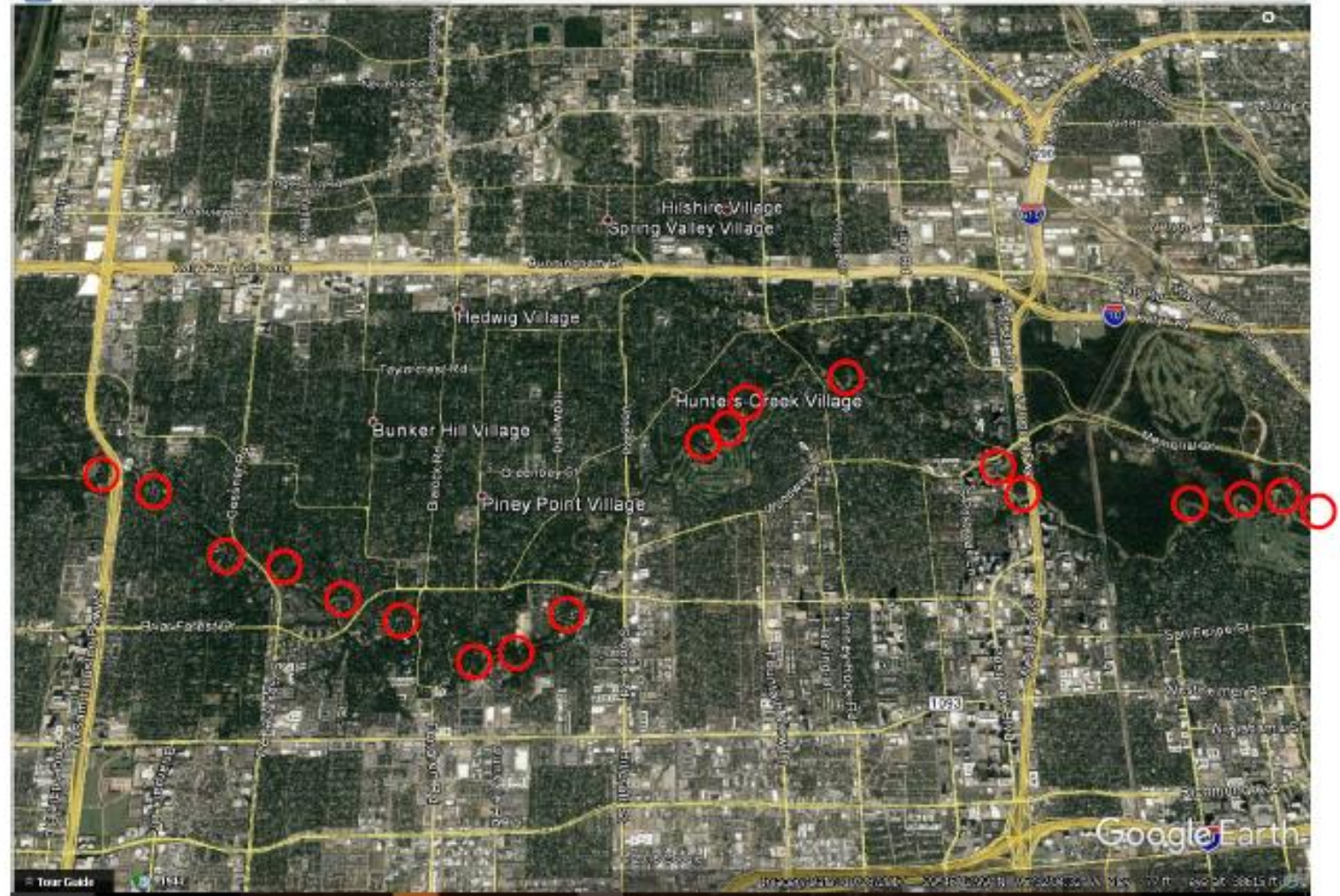
Bridge Submergence Level Buffalo Bayou

Bridge	event year level	10	50	100	500
• Main		-	-	-	-
• Fannin		-	-	0	5
• San Jacinto		-	-	1.5	8
• Texas/Sabine		-	-	2	7
• Louisiana /Franklin/ Capital/Allen		-	5.5	8.5	13.5
• Milam		7	11	14	19
• Travis/Smith/Preston		-	4	7	12
• Prairie/Bagby		-	-	0	5
• Congress		-	1.5	4.5	9.5

20 oxbows on Buffalo Bayou Beltway to Shepherd

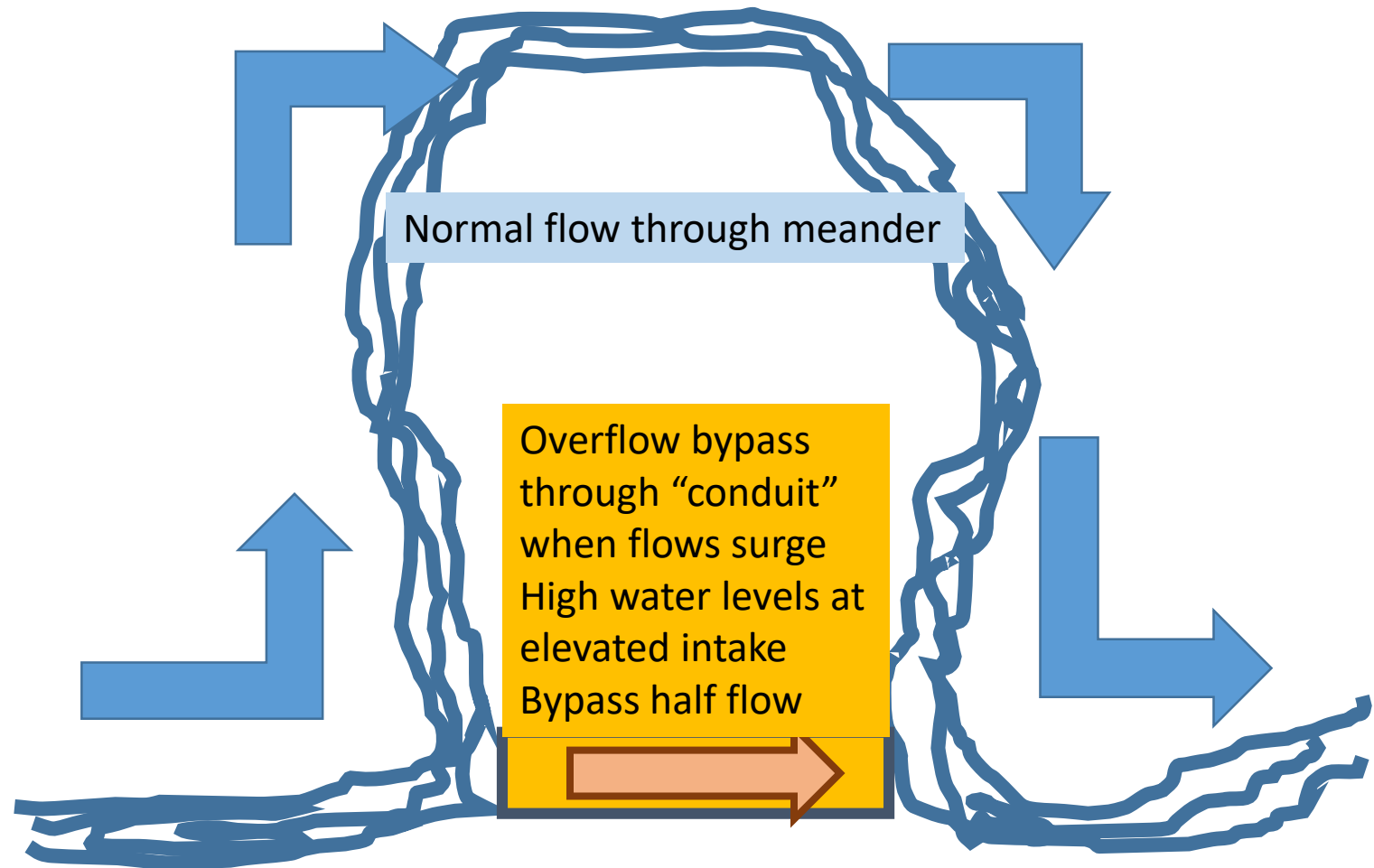
Oxbows are
constrictions

Targeting a portion,
half of these will
improve conveyance
and reduce water
surface elevation



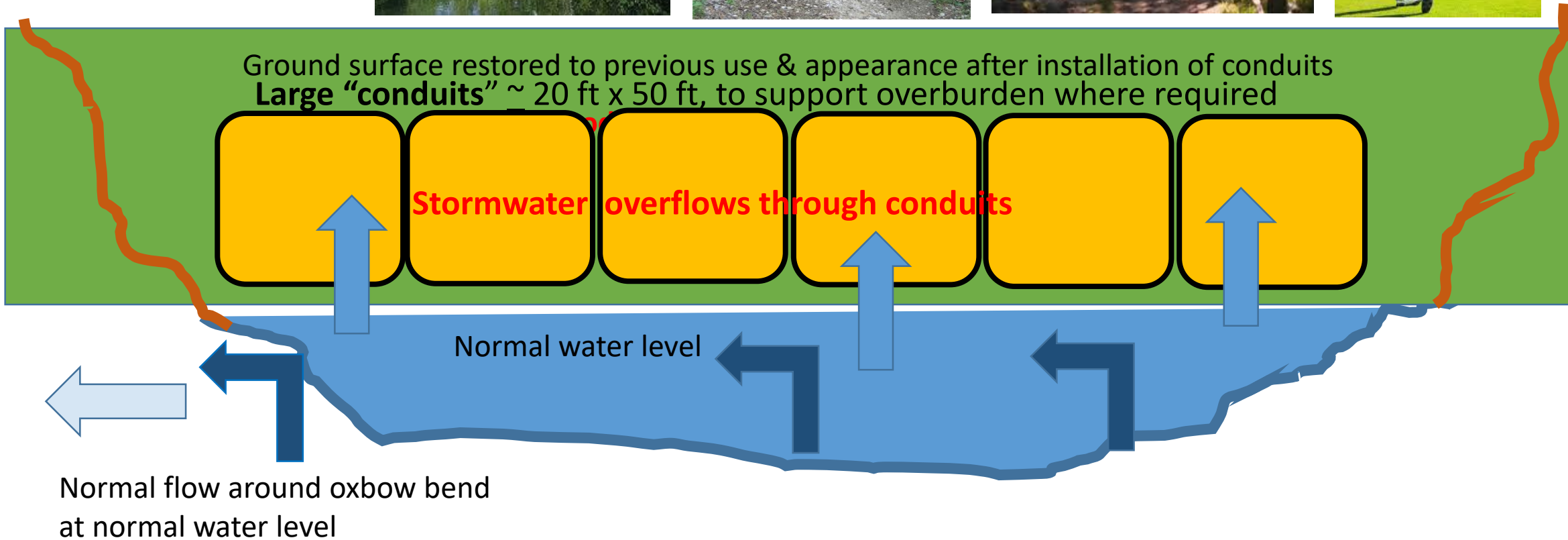
Need additional detention, but we also need expanded conveyance capacity

Buffalo Bayou is very limited, as we all know, but with some cost-effective help, it can do a lot more to keep storm water away from people and their property – while retaining the natural, meandering-stream feel that adds to our quality of life.



Relieving constraints, maintain natural channel character

A cross-section view looking toward intake from midstream at normal water level



Keeping Buffalo Bayou green while making it a better floodway to protect homes

Both goals have strong constituencies, ample justification. But fulfilling them must be harmonized.

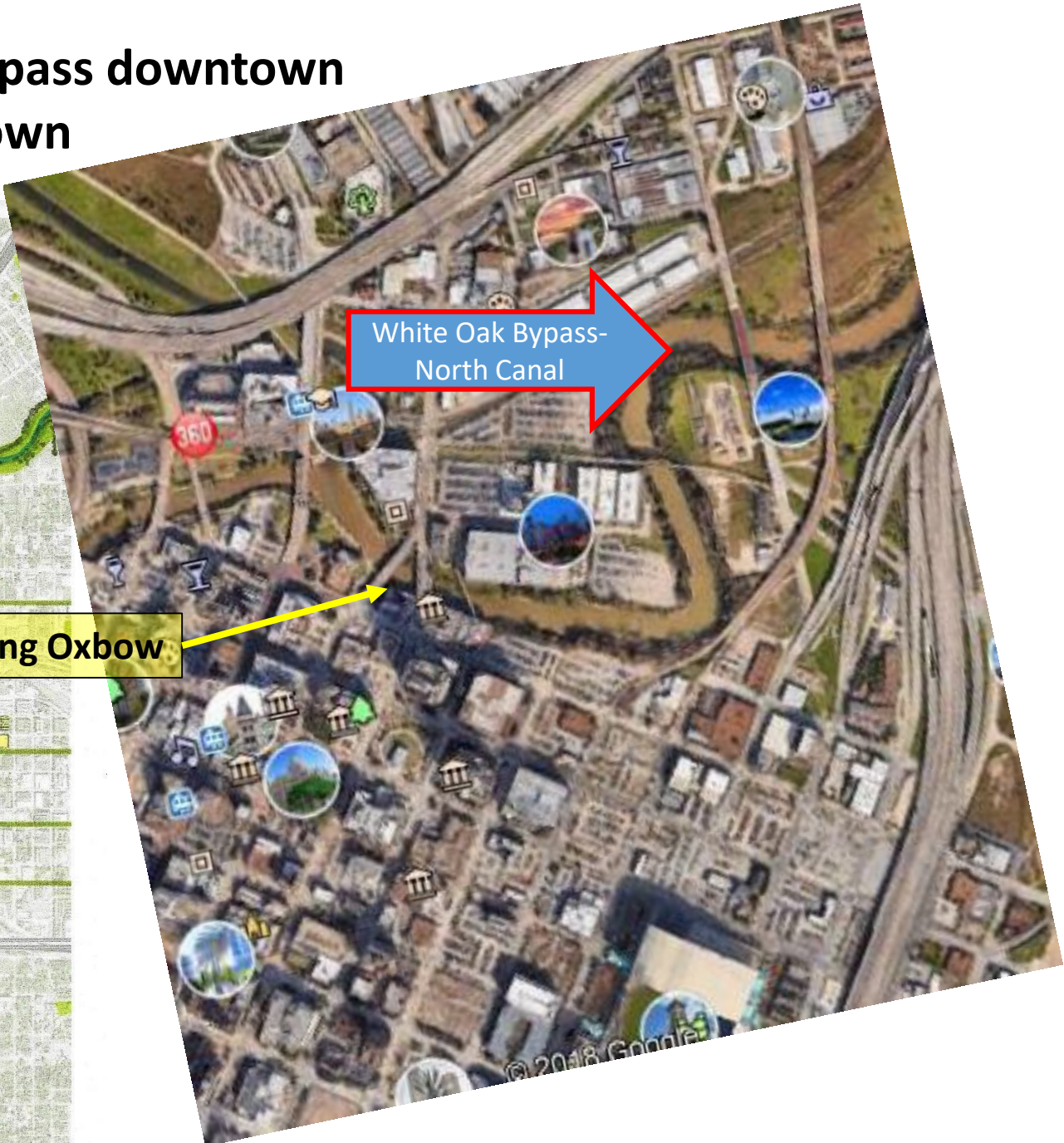
To boost stormwater conveyance in Buffalo Bayou when storms elevate the water level, big box culverts like these could be buried in bends to create high-water overflow conduits. These conduits would be dry and invisible when flow is normal, but they would be positioned to accept overflow during storms. The ground above could be restored to its previous condition after conduit installation – as golf course or park or simply natural grassland and woods. The following slides identify potential locations and the length of conduit that would be required. Not all will work. Some will, and that would be a significant step forward.



Buffalo Bayou Flow Demands

- Water shed protected by Addicks and Barker, YET.....
- Storm water load increasing due to development along face of
Addicks - south face, west of Beltway 8 north to Jersey Village
Barker north face, east face, and south out to Grand Parkway
- Storm water flow from west of Highway 6 is 50% of flow at BW8
(Clodine, Mission Bend into Clodine Ditch plus I-10 Ditch)
- Structural Flooding west of Beltway 8 begins at 3800 cfs
- Several hundred structures flood at 6000 – 7000 cfs
- Several thousand structures flooded at 10000 – 12000 cfs
- East of Piney Point, few structures flooded even at 16000 cfs

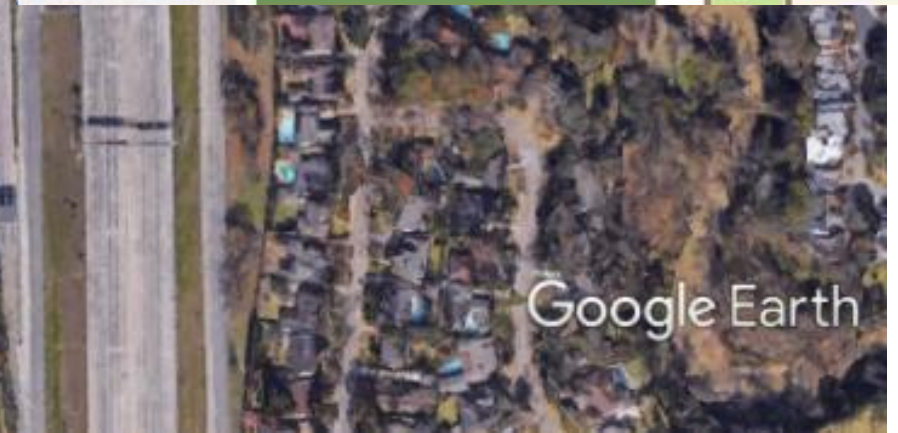
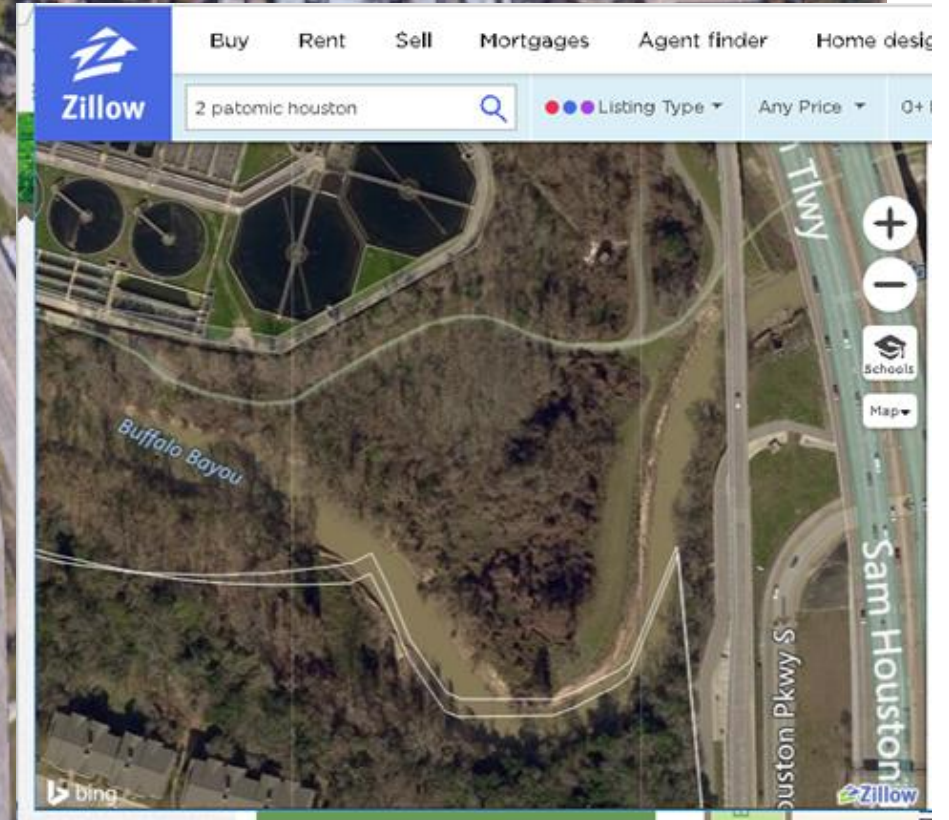
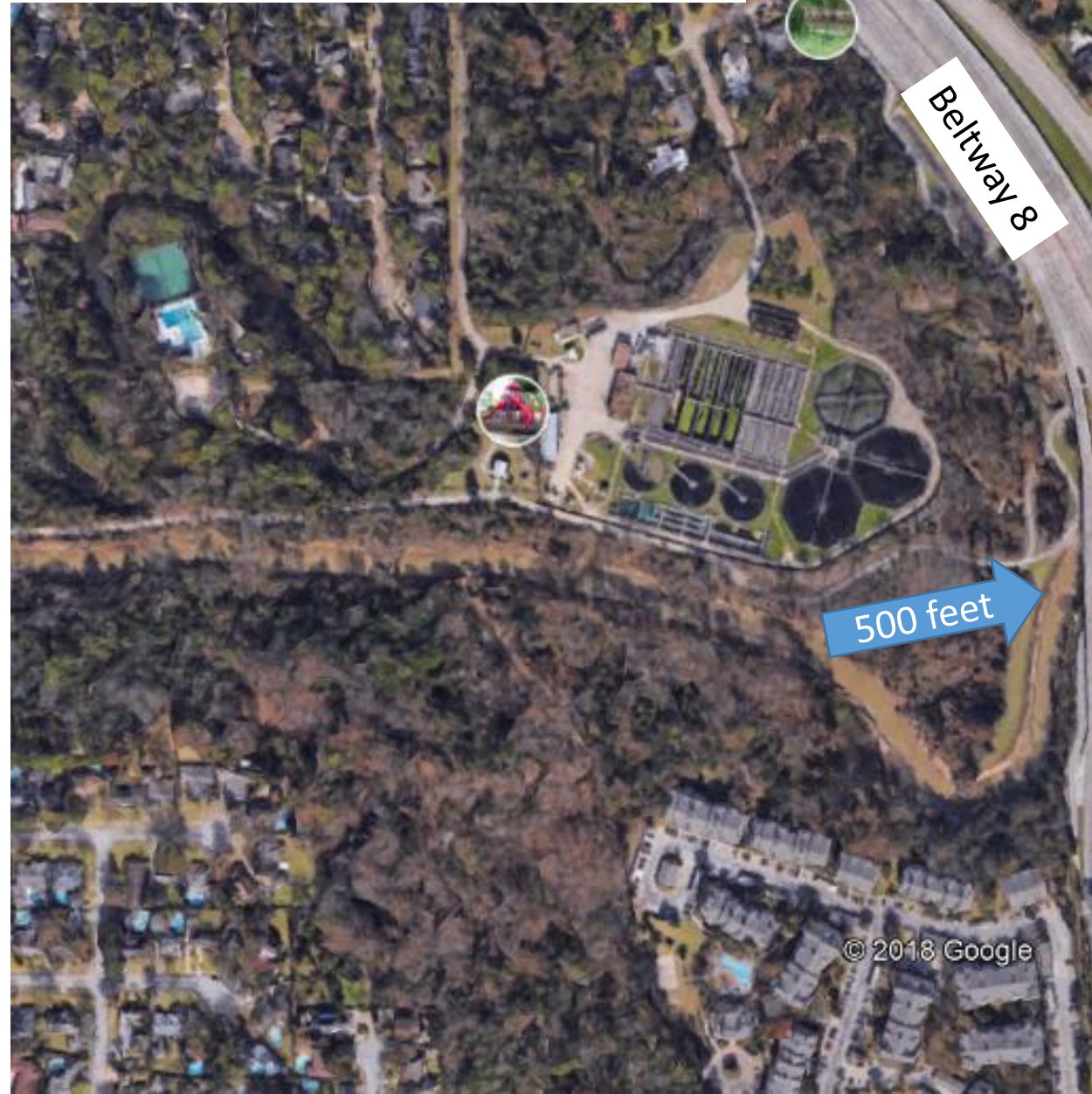
**White Oak Bypass-North Canal - an oxbow bypass downtown
needs to be completed first to protect downtown
can accommodate increased flow.**



Buffalo Bayou Observed Harvey Hydraulics

- Post Harvey, during controlled release
16000 CFS (14000 release plus 2000 overflow)
- Elevation profile from gages and google earth
- Water back up in Bayou:
 - San Felipe to Beltway 8 = 15 ft
 - Beltway 8 to Dairy Ashford = 5 ft
- Water surface elevation west of BW 8: 6 ft above 100 yr floodplain, major flooding
- Entire channel loaded at 16000 CFS; less flooding east of Piney Point/San Felipe
- Each ox-bow indicated approximately 6 in water back up;
20 oxbows impose 10 feet of water back up; bridges add more back up

Oxbow west of BW8 bridge, HCFCD owned land



Zillow

Buy Rent Sell Mortgages Agent finder Home design

Address, Neighborhood, or ZIP

Listing Type Any Price 0+ Beds

Buffalo Bayou

Briar Dr

\$1.27M

\$598K

\$583K

\$601K

\$554K

\$585K

\$561K

\$551K

\$809K

\$839K

\$617K

\$618K

\$806K

\$527K

\$420K

\$358K

\$334K

\$428K

\$600K

\$333K

\$255K

\$415K

\$330K

\$347K

\$474K

\$486K

\$7K

\$8K

\$379K

\$413K

\$585K

\$363K

\$312K

\$300K

\$536K

\$273K

\$270K

\$290K

\$308K

\$299K

\$318K

\$324K

\$304K

\$25K

Map

Schools

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PAGE 1 OF 1

READY RECOVERED

Type here to search

Taskbar icons: Windows, Search, File Explorer, HP, Media Player, Chrome, Word

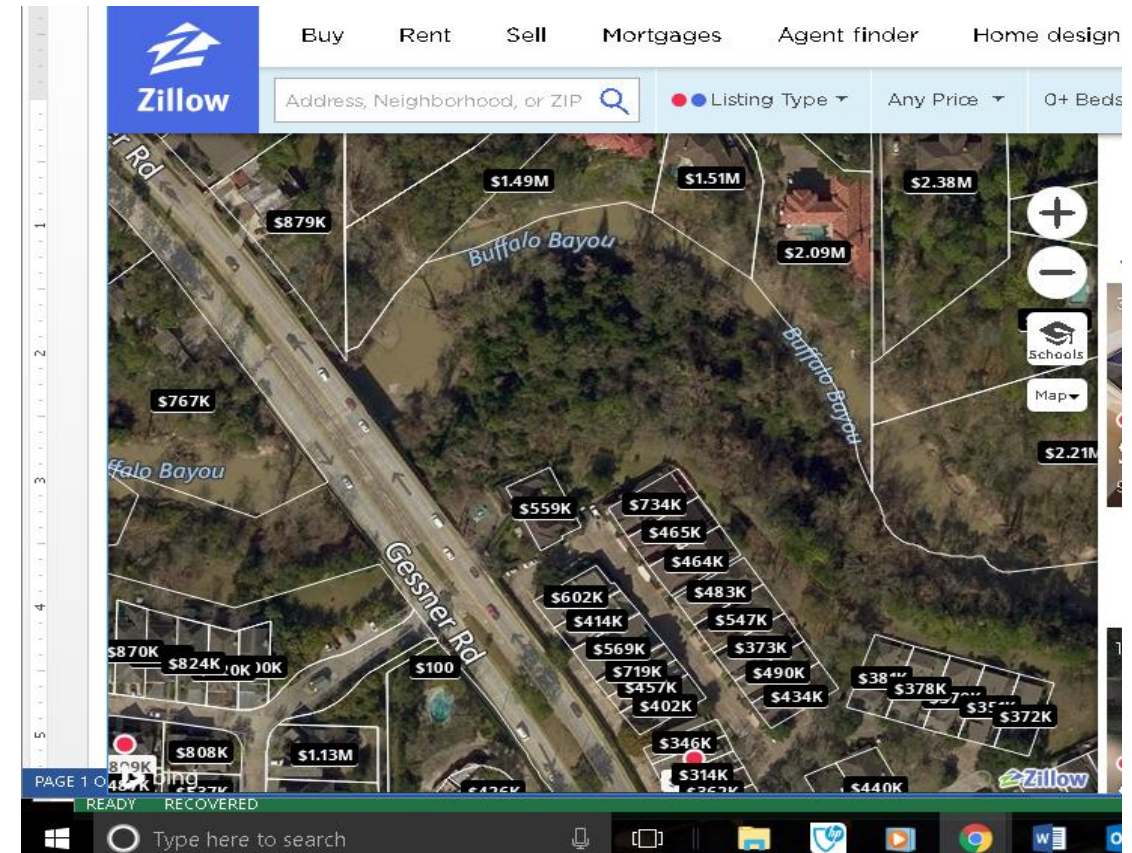
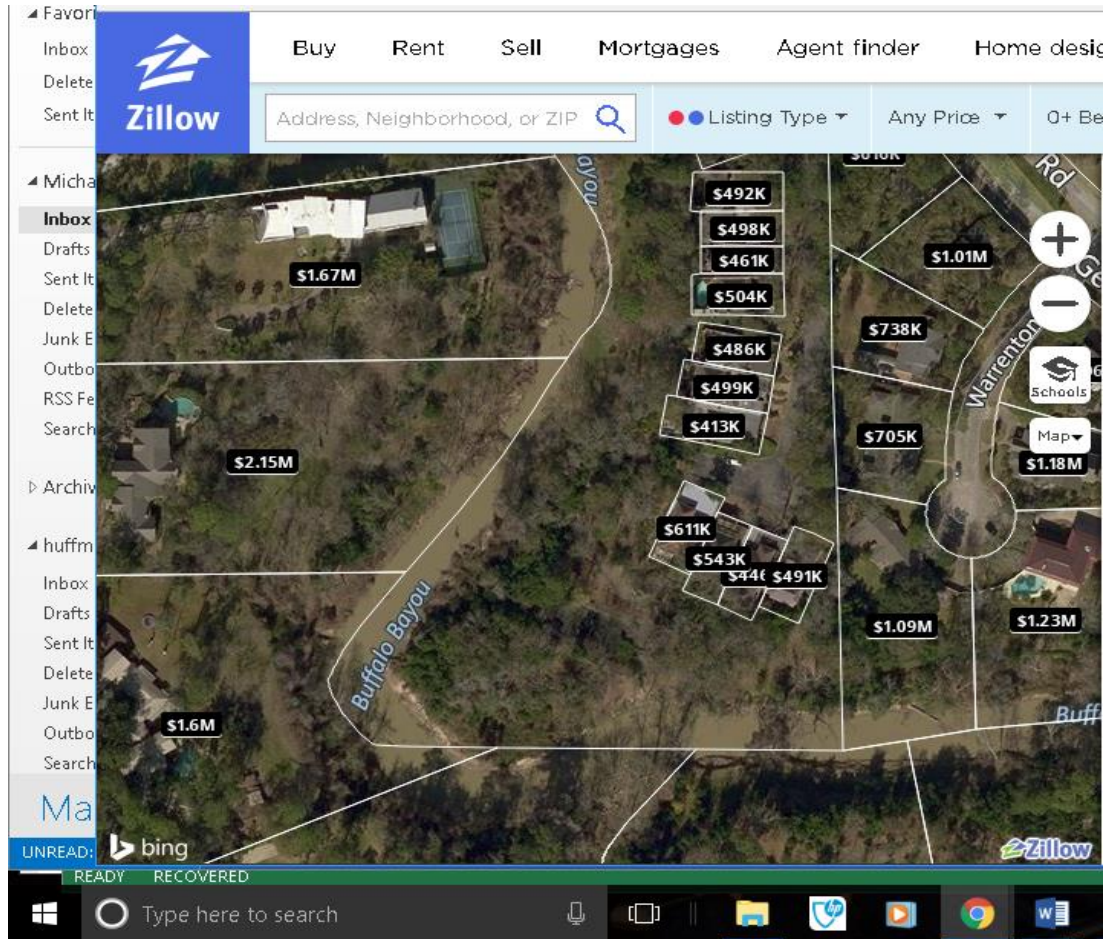
Possibility of a
high flow bench
across one property

West of Gessner

Areas not developed, not platted
Is it land public? Drainage easement?

Possibilities do exist for high flow bypass

And east of Gessner

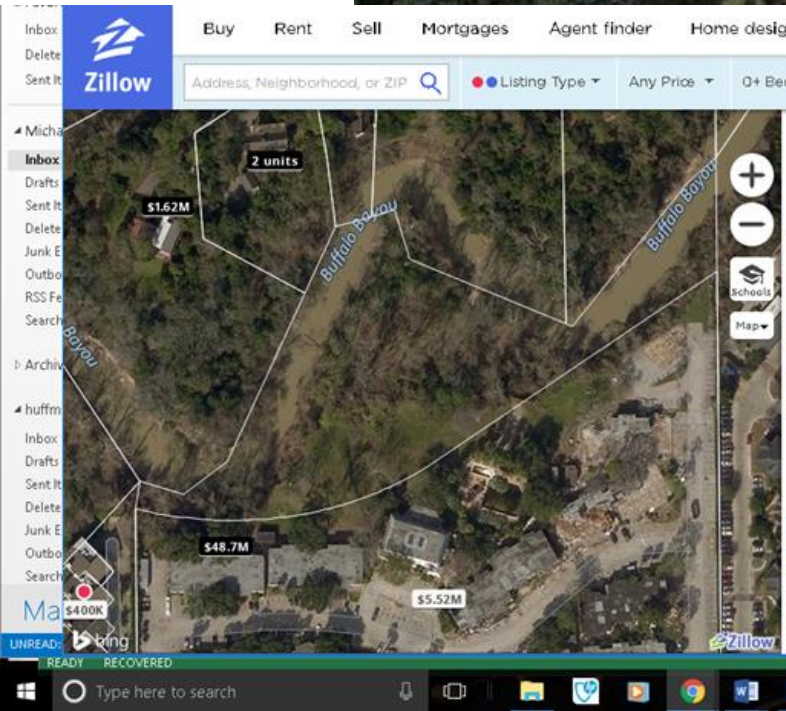
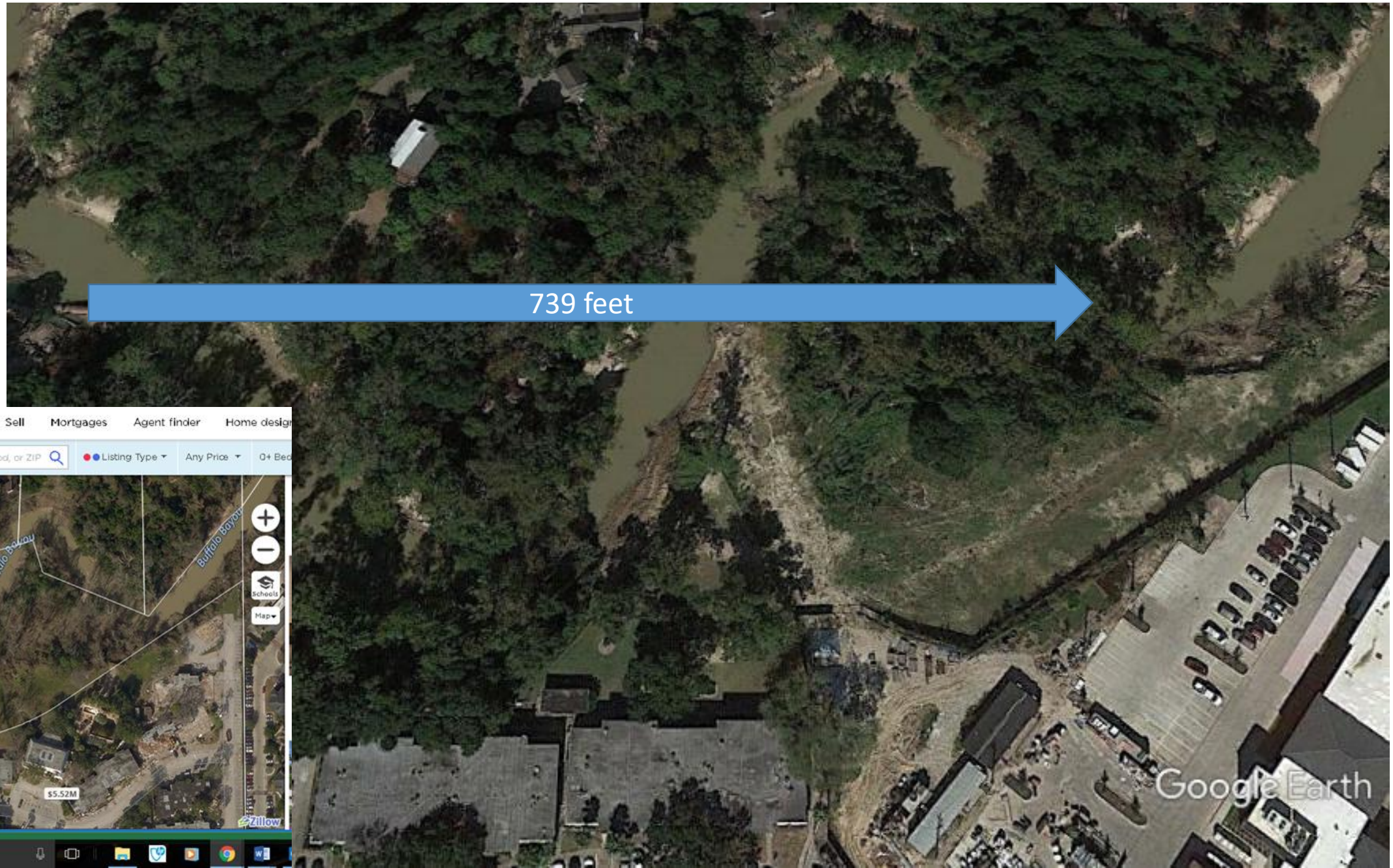


S. Piney Point at the Buffalo Bayou
October 28, 2017

633 feet

Google Earth

Just east of the old Vargo's site where S. Piney Point meets Fondren, just north of Woodway-Old Farm Road

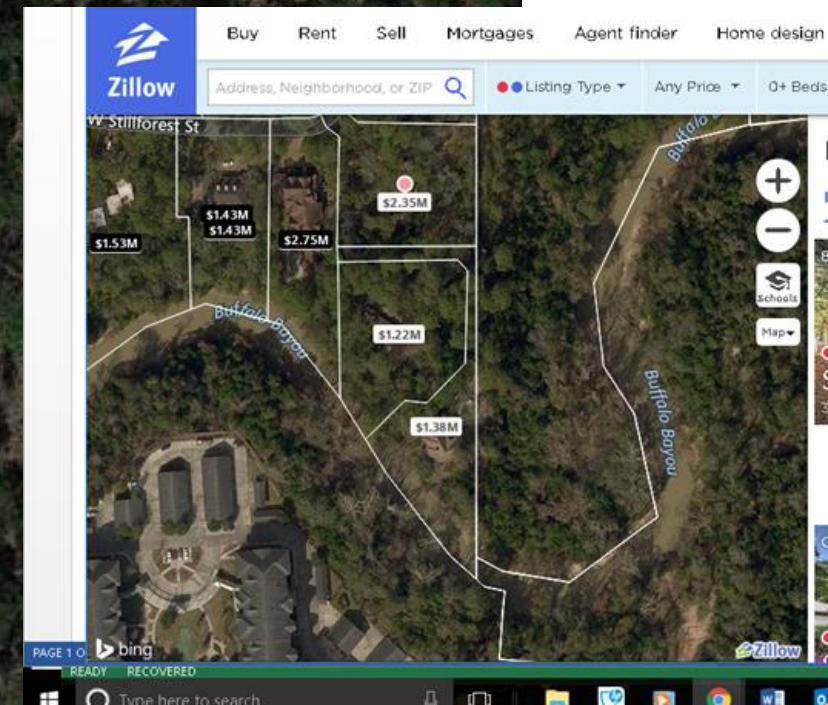


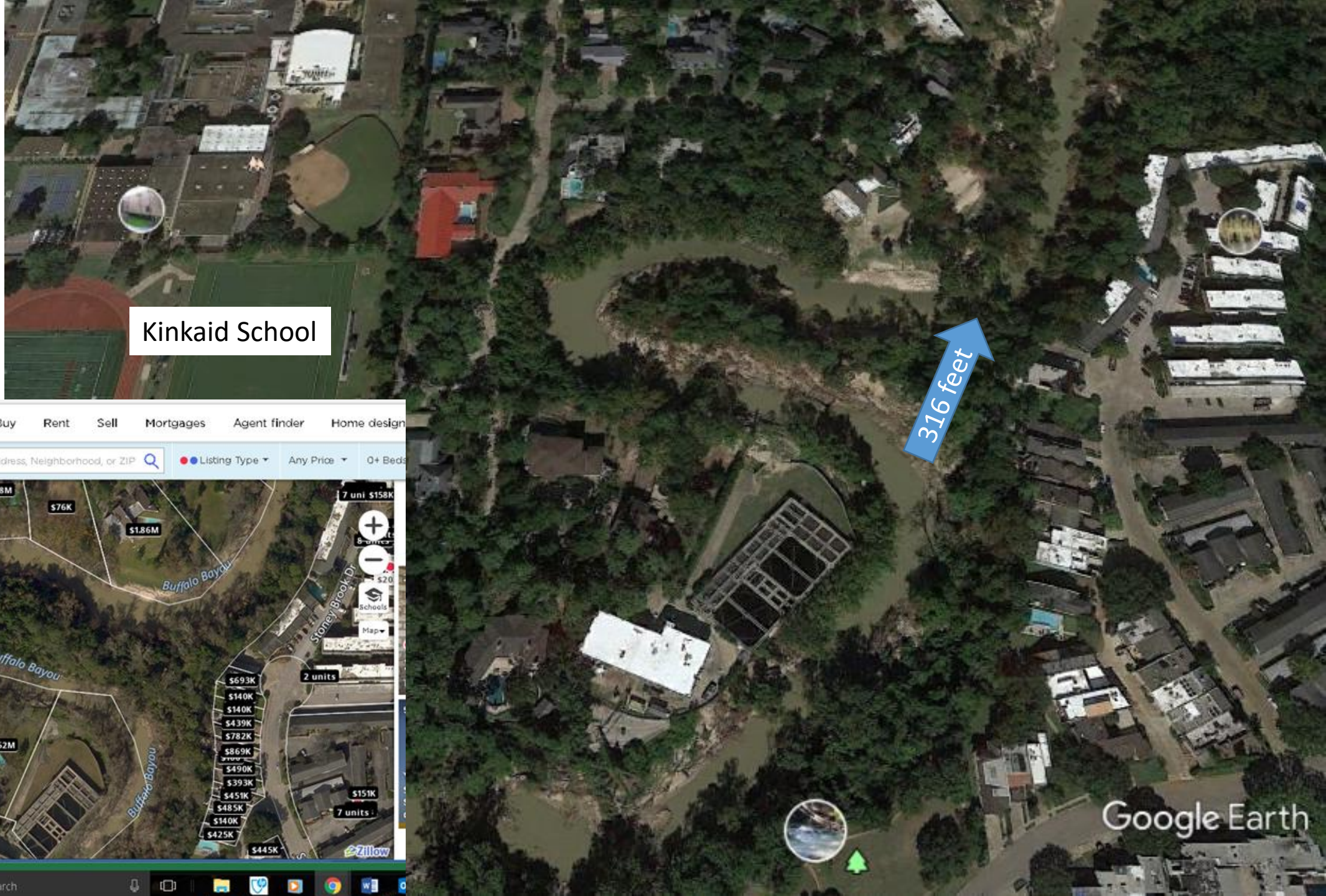
Across the Bayou from the Old Farm property

Kinkaid School

528 feet

Old Farm





Kinkaid School

316 feet

Google Earth

Zillow

Buy Rent Sell Mortgages Agent finder Home design

Address, Neighborhood, or ZIP

Listing Type Any Price 0+ Beds

Buffalo Bayou

Stoney Brook Dr

7 uni \$158K

2 units

7 units

\$1.38M

\$2.3M

\$76K

\$1.86M

\$2.14M

\$1.52M

\$69.3K

\$140K

\$140K

\$439K

\$782K

\$869K

\$490K

\$393K

\$451K

\$485K

\$140K

\$425K

\$445K

\$151K

READY RECOVERED

Type here to search

Memorial Drive

Across Voss from Second Baptist

264 feet

370 feet

Hunters Creek Village

Shorter Alternate in Hunters Village

250 feet

250 feet

369 feet

369 feet

475 feet

1,000 feet

Houston Country Club

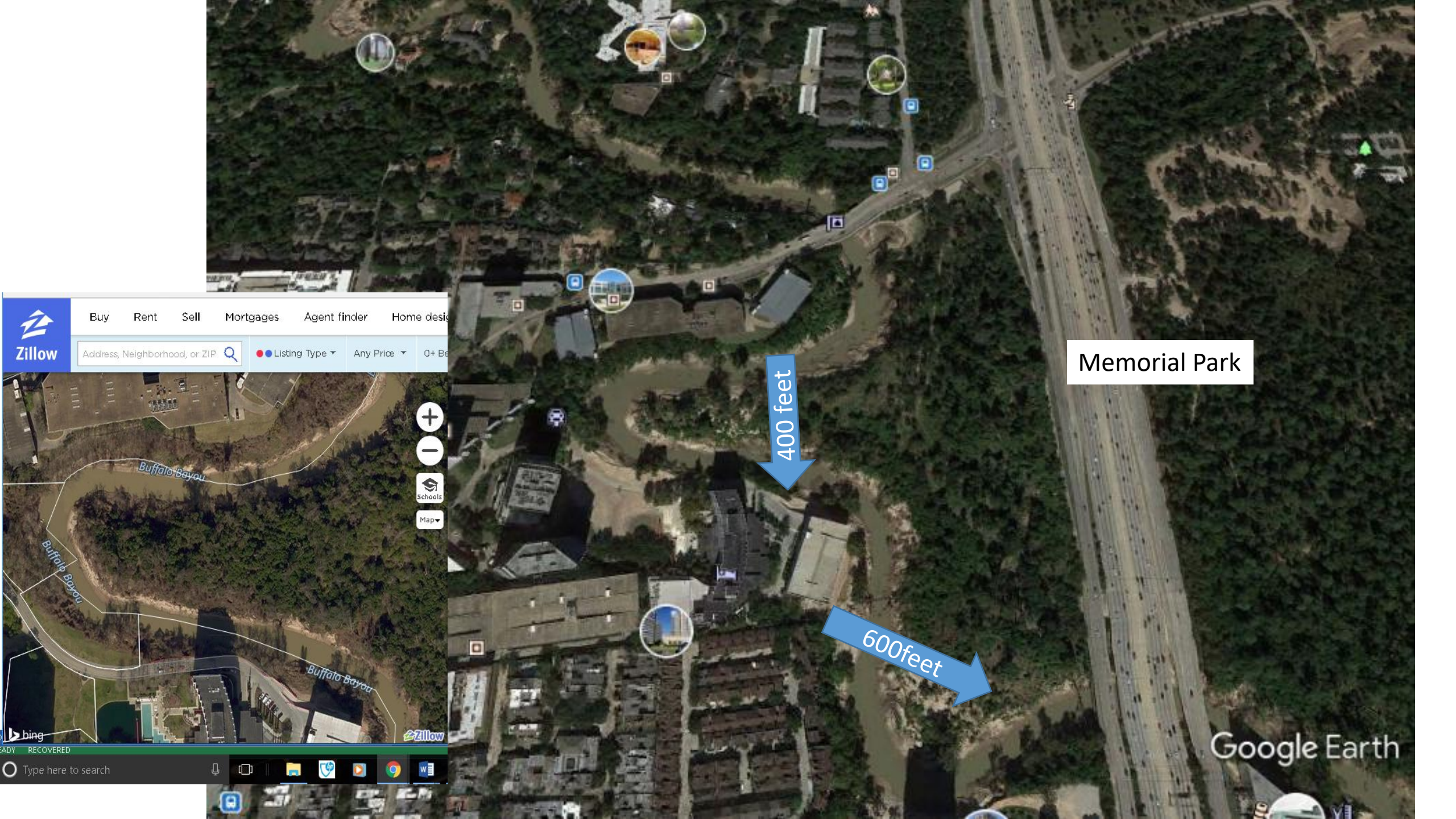
Google Earth



Chimney Rock Rd

~500 feet

Google Earth



Buy Rent Sell Mortgages Agent finder Home design

Zillow

Address, Neighborhood, or ZIP

Listing Type Any Price 0+ Beds

Buffalo Bayou

Buffalo Bayou

Buffalo Bayou

bing

READY RECOVERED

Type here to search

Memorial Park

400 feet

600 feet

Google Earth



500 feet

500 feet

400 feet

River Oaks Country Club

Google Earth

Oxbow Bypass Benefits -

Relieve constraints in Buffalo Bayou east of Beltway 8

- Reduce water backup several feet, flow accommodation demonstrated during Harvey, intentional release
- Lower 100 yr flood plain WSE along Buffalo Bayou – 1 to 2 feet
accommodate more flow at present 100 flood plain WSE
- Cost effective
avoids repeated flooding west of Beltway 8
voluntary basis – avoids litigation
reduces erosion on cut banks
- Incremental execution
one (or a few) ox-bow at a time
avoids massive construction disruption
- Preserve natural character of bayou channel
- Work together, benefit all communities and neighborhoods,
begin with North Canal, work west through oxbows and bridges, to Wilcrest

Buffalo Bayou – Improve Conveyance

Improve Conveyance on Buffalo Bayou

- Achievable: Bypass oxbows, Raise bridges
Benefits - Protect thousands of homes west of Gessner
- Aesthetic: Keep natural features along Buffalo Bayou, reduce flooding risk
- Affordable: No litigation, no condemnation, selected ROW and purchase

Our community must speak with a strong, coherent voice to HCFCD
improve conveyance
add detention at stormwater sources