

UCT 2018



Houston Water Challenges, Wastewater System Assets

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Houston at a Glance

Houston Area:
669 Square Miles

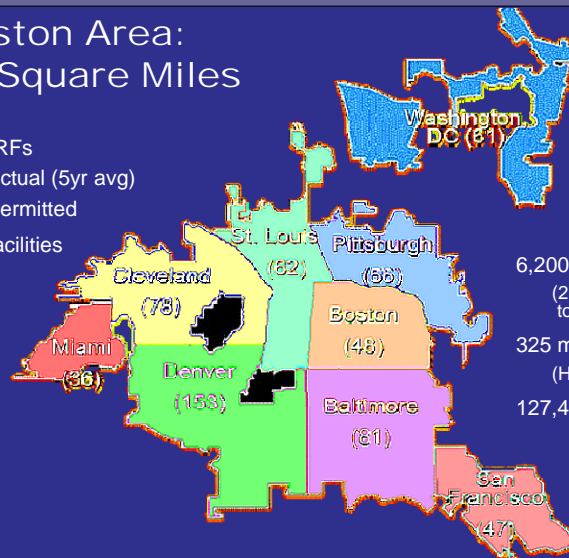
40 Permitted WRRFs

239 MGD actual (5yr avg)

565 MGD permitted

3 Wet Weather Facilities

383 Lift Stations



6,200 mi. Collection Lines
(2 round trips: Houston to Los Angeles)

325 mi. LF Force Mains
(Houston to Wichita Falls)

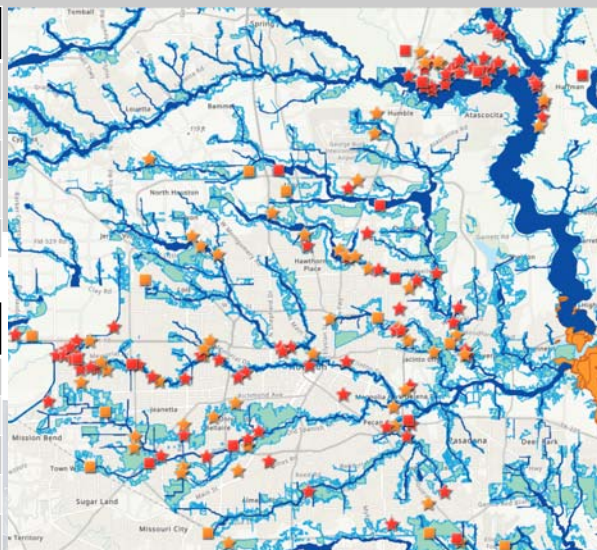
127,400 Manholes

The land area of all these cities COMBINED would fit within Houston's land area.

Wastewater Facilities, Floodplain and Harvey Impact

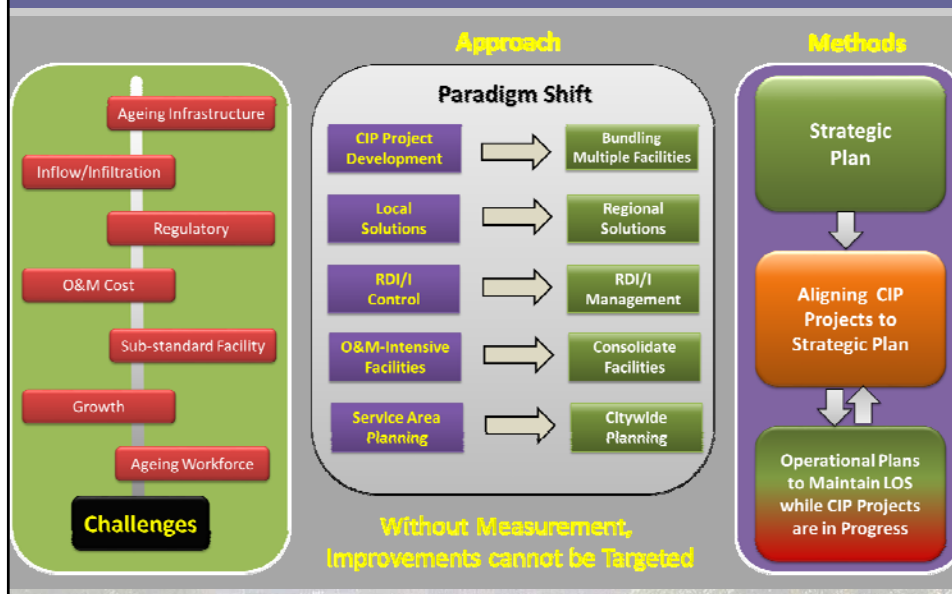
Flood Hazard Zone	Citywide WWTP	Harvey Impacted WWTP	% WWTP Impacted
Floodway	4	3	75%
100-yr Floodplain	23	12	52%
500-yr Floodplain	7	5	71%
Flood Zone X	6	4	67%
Overall	40	24	60%

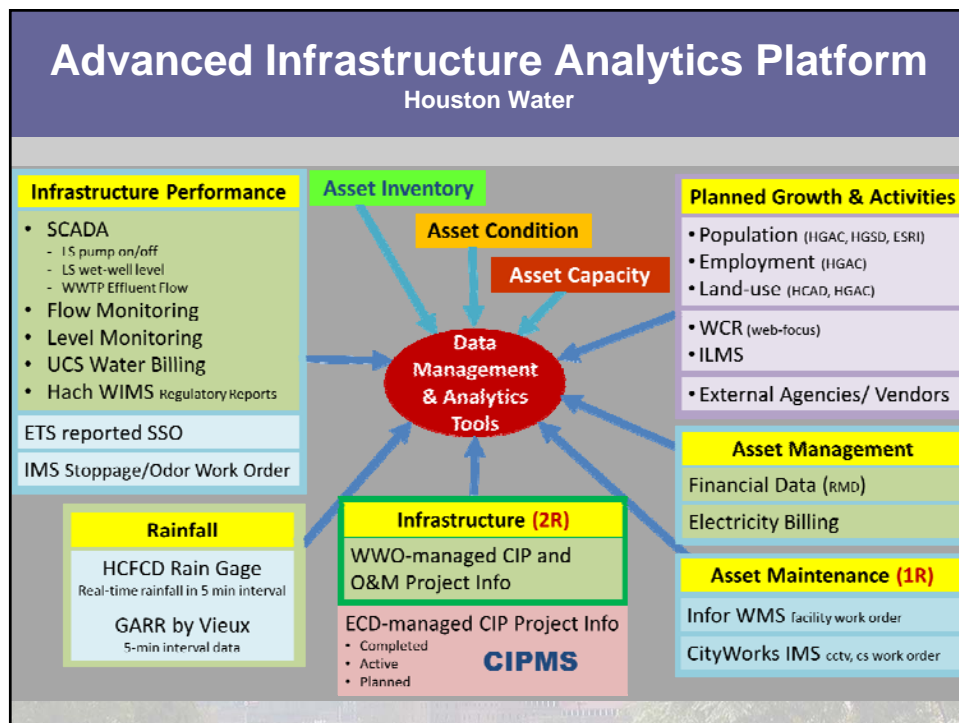
Flood Hazard Zone	Citywide Lift Station	Harvey Impacted Lift Station	% Lift Station Impacted
Floodway	24	11	46%
100-yr Floodplain	97	46	47%
500-yr Floodplain	71	29	41%
Flood Zone X	193	48	25%
Overall	385	134	35%



Strategic Planning Framework

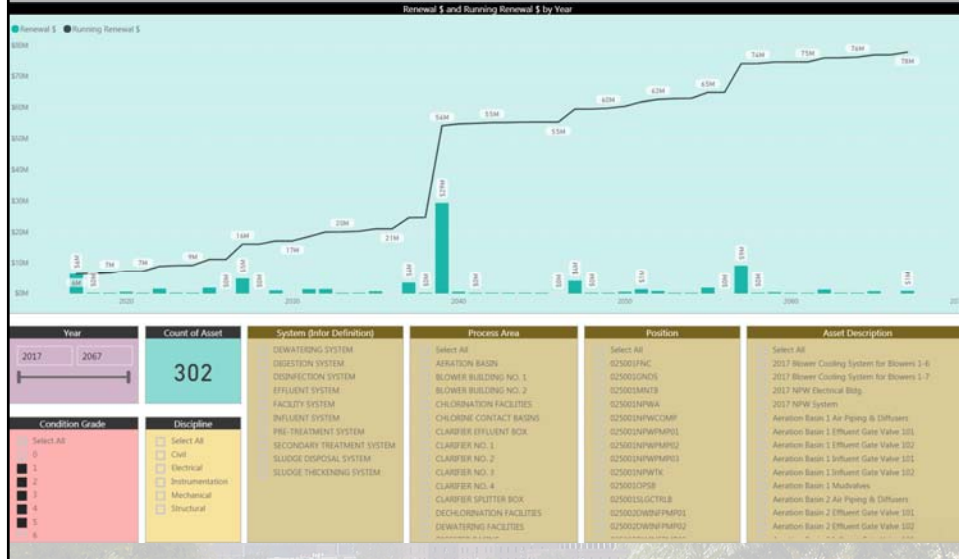
Houston's Wastewater Infrastructure





Decision-making Tool

Strategic Asset Management Planning (Facilities)



Decision-making Tool

Strategic Asset Management Planning (Gravity Sewer)

Regulatory					Level of Service				
60%					40%				
RSO	ETS Public SSO	ETS Private SSO	Model SSO	Model 3ft Surch	Almost SSO	Repeat Stoppage	IMS Stoppage	Repeat Odor	IMS Odor
50%	40%	10%			40%	30%	15%	10%	5%

Regulatory					Level of Service					Sub-standard Sewer			Ageing	
60%					40%									
RSO	ETS Public SSO	ETS Private SSO	Model SSO	Model 3ft Surch	Almost SSO	Repeat Stoppage	IMS Stoppage	Repeat Odor	IMS Odor	Backlog	Slope	Material	Actual Built	Rebuilt
50%	40%	10%			40%	30%	15%	10%	5%					

Asset ID	Priority Rank	Alt Rehab Yr	Ageing Score (1-10)	SSO (ft)	SSO (ft)	SSO (ft)	SSO (ft)	SSO (ft)	SSO (ft)	SSO (ft)	SSO (ft)	SSO (ft)	SSO (ft)	SSO (ft)	SSO (ft)
00001	1	75	11,400	9	4.78	3	5	3	3	3	3	3	3	3	3
00004	2	202	4,852	10	4.78	3	5	3	3	3	3	3	3	3	3
00006	3	200	16,251	10	4.78	3	5	3	3	3	3	3	3	3	3
00007	4	200	10,158	10	4.78	3	5	3	3	3	3	3	3	3	3
00008	5	200	18,254	10	4.78	3	5	3	3	3	3	3	3	3	3
00011	6	201	12,124	10	4.78	3	5	3	3	3	3	3	3	3	3
00015	7	200	17,120	9	4.78	3	5	3	3	3	3	3	3	3	3
00017	8	201	11,147	9	4.78	3	5	3	3	3	3	3	3	3	3
00019	9	201	11,147	10	4.78	3	5	3	3	3	3	3	3	3	3
00021	10	201	11,147	10	4.78	3	5	3	3	3	3	3	3	3	3
00022	11	200	11,147	10	4.78	3	5	3	3	3	3	3	3	3	3
00023	12	200	11,147	10	4.78	3	5	3	3	3	3	3	3	3	3
00024	13	200	11,147	10	4.78	3	5	3	3	3	3	3	3	3	3
00025	14	201	11,147	10	4.78	3	5	3	3	3	3	3	3	3	3
00026	15	200	11,147	10	4.78	3	5	3	3	3	3	3	3	3	3
00027	16	200	11,147	10	4.78	3	5	3	3	3	3	3	3	3	3
00028	17	200	11,147	10	4.78	3	5	3	3	3	3	3	3	3	3
00029	18	200	11,147	10	4.78	3	5	3	3	3	3	3	3	3	3
00030	19	200	11,147	10	4.78	3	5	3	3	3	3	3	3	3	3
00031	20	200	11,147	10	4.78	3	5	3	3	3	3	3	3	3	3
00032	21	200	11,147	10	4.78	3	5	3	3	3	3	3	3	3	3
00033	22	200	11,147	10	4.78	3	5	3	3	3	3	3	3	3	3
00034	23	200	11,147	10	4.78	3	5	3	3	3	3	3	3	3	3
00035	24	200	11,147	10	4.78	3	5	3	3	3	3	3	3	3	3
00036	25	200	11,147	10	4.78	3	5	3	3	3	3	3	3	3	3
00037	26	200	11,147	10	4.78	3	5	3	3	3	3	3	3	3	3
00038	27	200	11,147	10	4.78	3	5	3	3	3	3	3	3	3	3
00039	28	200	11,147	10	4.78	3	5	3	3	3	3	3	3	3	3
00040	29	200	11,147	10	4.78	3	5	3	3	3	3	3	3	3	3
00041	30	200	11,147	10	4.78	3	5	3	3	3	3	3	3	3	3
00042	31	200	11,147	10	4.78	3	5	3	3	3	3	3	3	3	3
00043	32	200	11,147	10	4.78	3	5	3	3	3	3	3	3	3	3
00044	33	200	11,147	10	4.78	3	5	3	3	3	3	3	3	3	3
00045	34	200	11,147	10	4.78	3	5	3	3	3	3	3	3	3	3
00046	35	200	11,147	10	4.78	3	5	3	3	3	3	3	3	3	3
00047	36	200	11,147	10	4.78	3	5	3	3	3	3	3	3	3	3
00048	37	200	11,147	10	4.78	3	5	3	3	3	3	3	3	3	3
00049	38	200	11,147	10	4.78	3	5	3	3	3	3	3	3	3	3
00050	39	200	11,147	10	4.78	3	5	3	3	3	3	3	3	3	3
00051	40	200	11,147	10	4.78	3	5	3	3	3	3	3	3	3	3
00052	41	200	11,147	10	4.78	3	5	3	3	3	3	3	3	3	3
00053	42	200	11,147	10	4.78	3	5	3	3	3	3	3	3	3	3
00054	43	200	11,147	10	4.78	3	5	3	3	3	3	3	3	3	3
00055	44	200	11,147	10	4.78	3	5	3	3	3	3	3	3	3	3
00056	45	200	11,147	10	4.78	3	5	3	3	3	3	3	3	3	3
00057	46	200	11,147	10	4.78	3	5	3	3	3	3	3	3	3	3
00058	47	200	11,147	10	4.78	3	5	3	3	3	3	3	3	3	3
00059	48	200	11,147	10	4.78	3	5	3	3	3	3	3	3	3	3
00060	49	200	11,147	10	4.78	3	5	3	3	3	3	3	3	3	3
00061	50	200	11,147	10	4.78	3	5	3	3	3	3	3	3	3	3
00062	51	200	11,147	10	4.78	3	5	3	3	3	3	3	3	3	3
00063	52	200	11,147	10	4.78	3	5	3	3	3	3	3	3	3	3
00064	53	200	11,147	10	4.78	3	5	3	3	3	3	3	3	3	3
00065	54	200	11,147	10	4.78	3	5	3	3	3	3	3	3	3	3
00066	55	200	11,147	10	4.78	3	5	3	3	3	3	3	3	3	3
00067	56	200	11,147	10	4.78	3	5	3	3	3	3	3	3	3	3
00068	57	200	11,147	10	4.78	3	5	3	3	3	3	3	3	3	3
00069	58	200	11,147	10	4.78	3	5	3	3	3	3	3	3	3	3
00070	59	200	11,147	10	4.78	3	5	3	3	3	3	3	3	3	3
00071	60	200	11,147	10	4.78	3	5	3	3	3	3	3	3	3	3

Conceptual Consolidation Plan

Citywide Wastewater Facilities

Eliminates:
28 WWTPs
230 Lift Stations (incl. 90/134 Harvey Impacted)

