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Capitalizing on Redevelopment to Reduce Flooding in Downtown Lexington

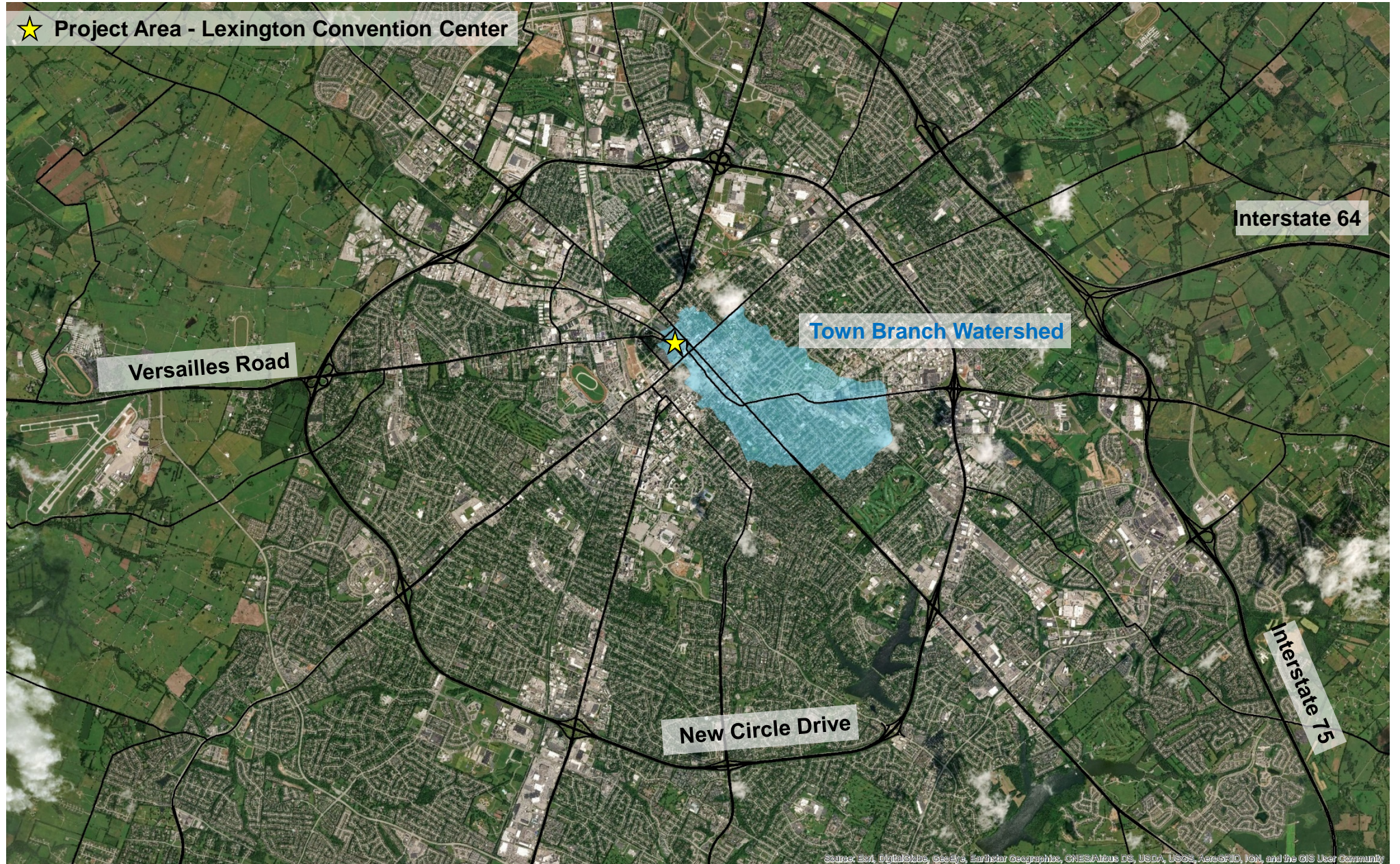
Chris Rust, P.E. – Strand Associates, Inc.

Chris.Rust@strand.com

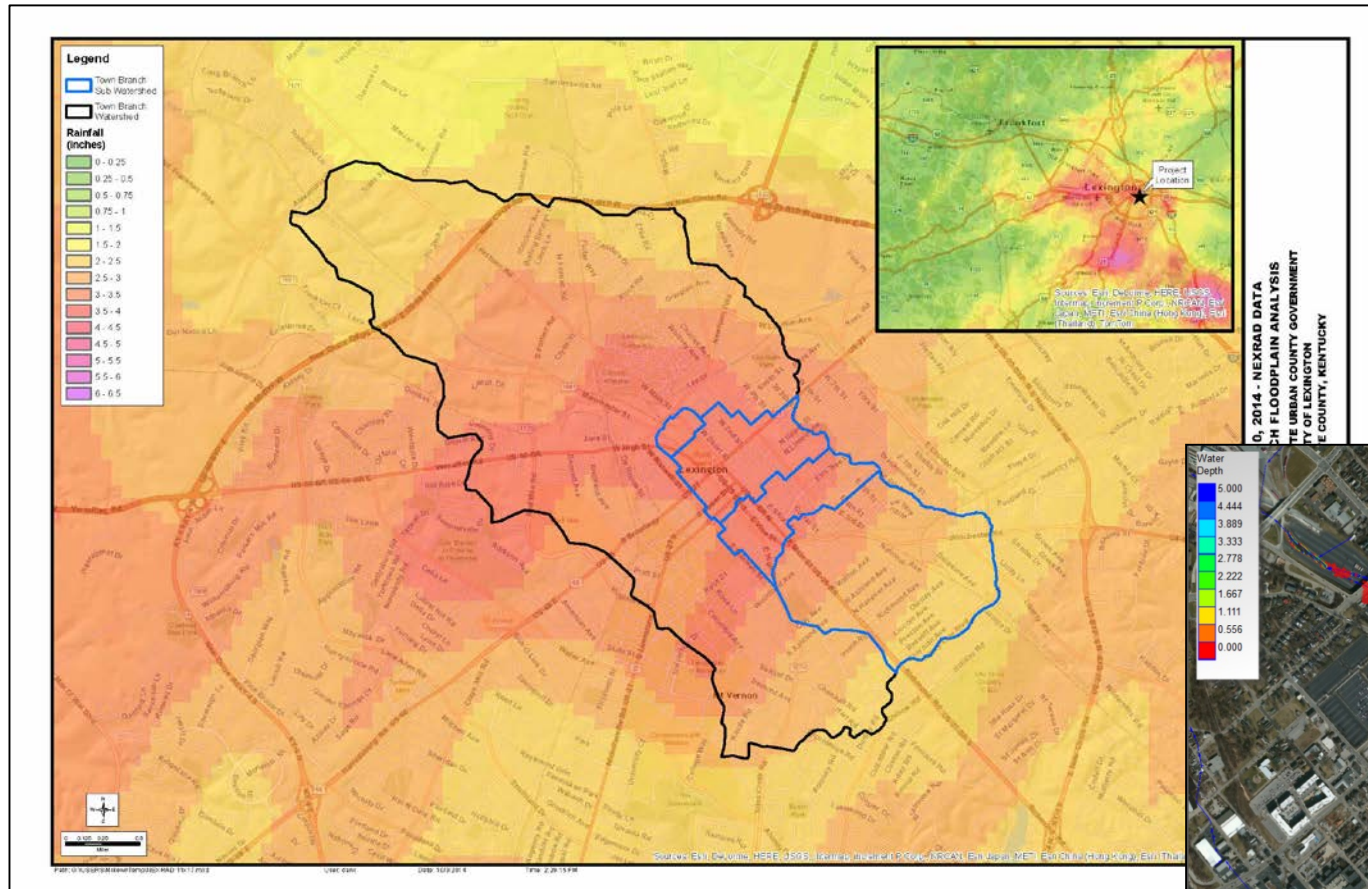
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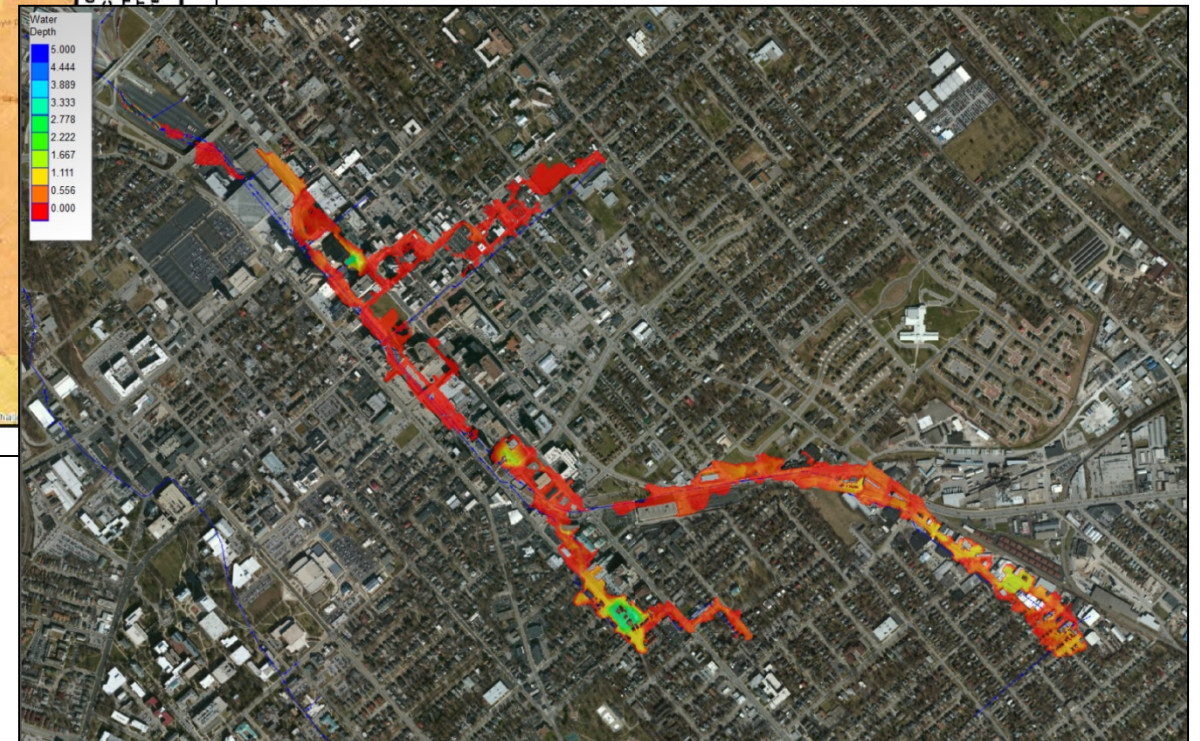
Town Branch Watershed and Project Area



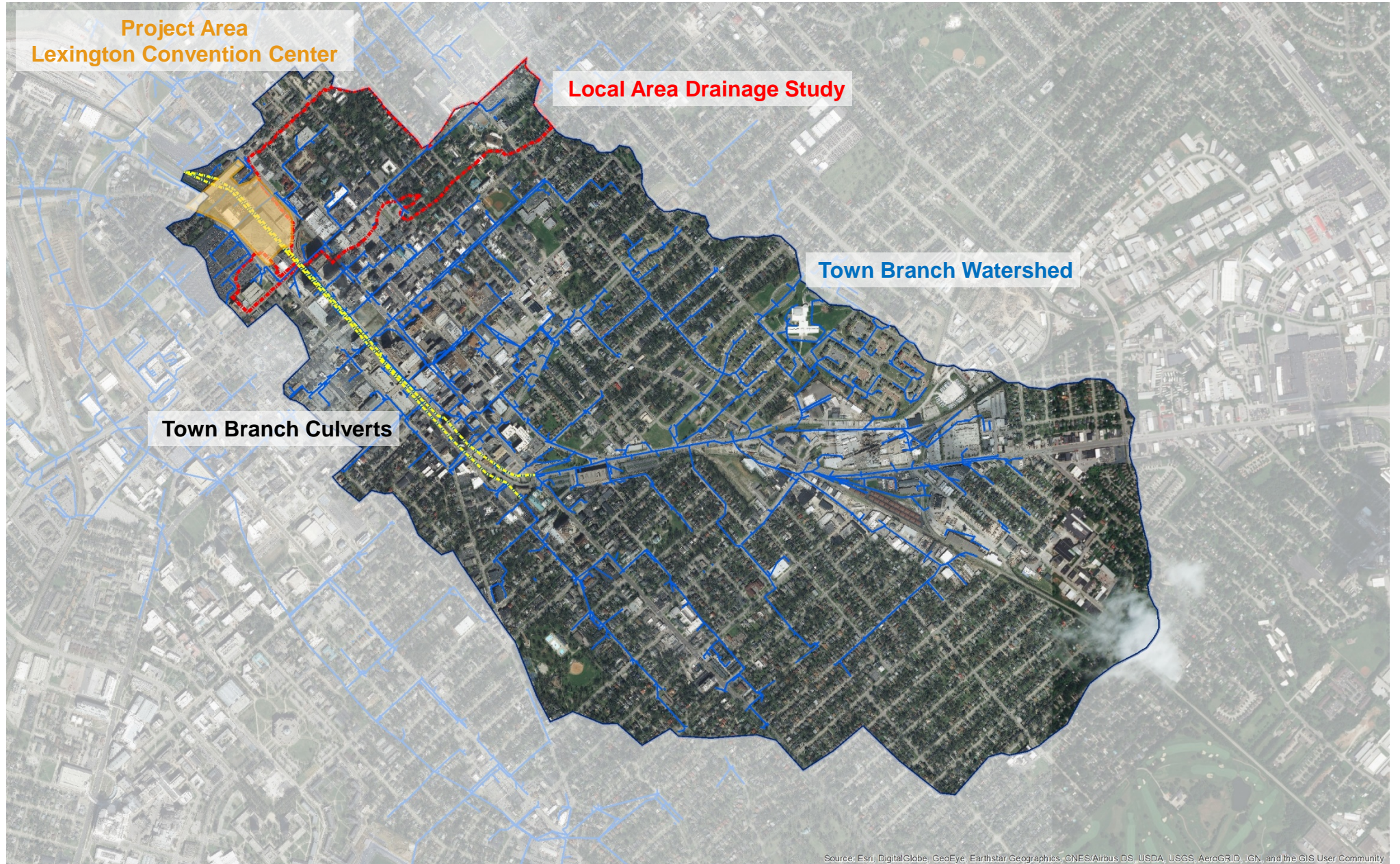
Town Branch Watershed and Project Area



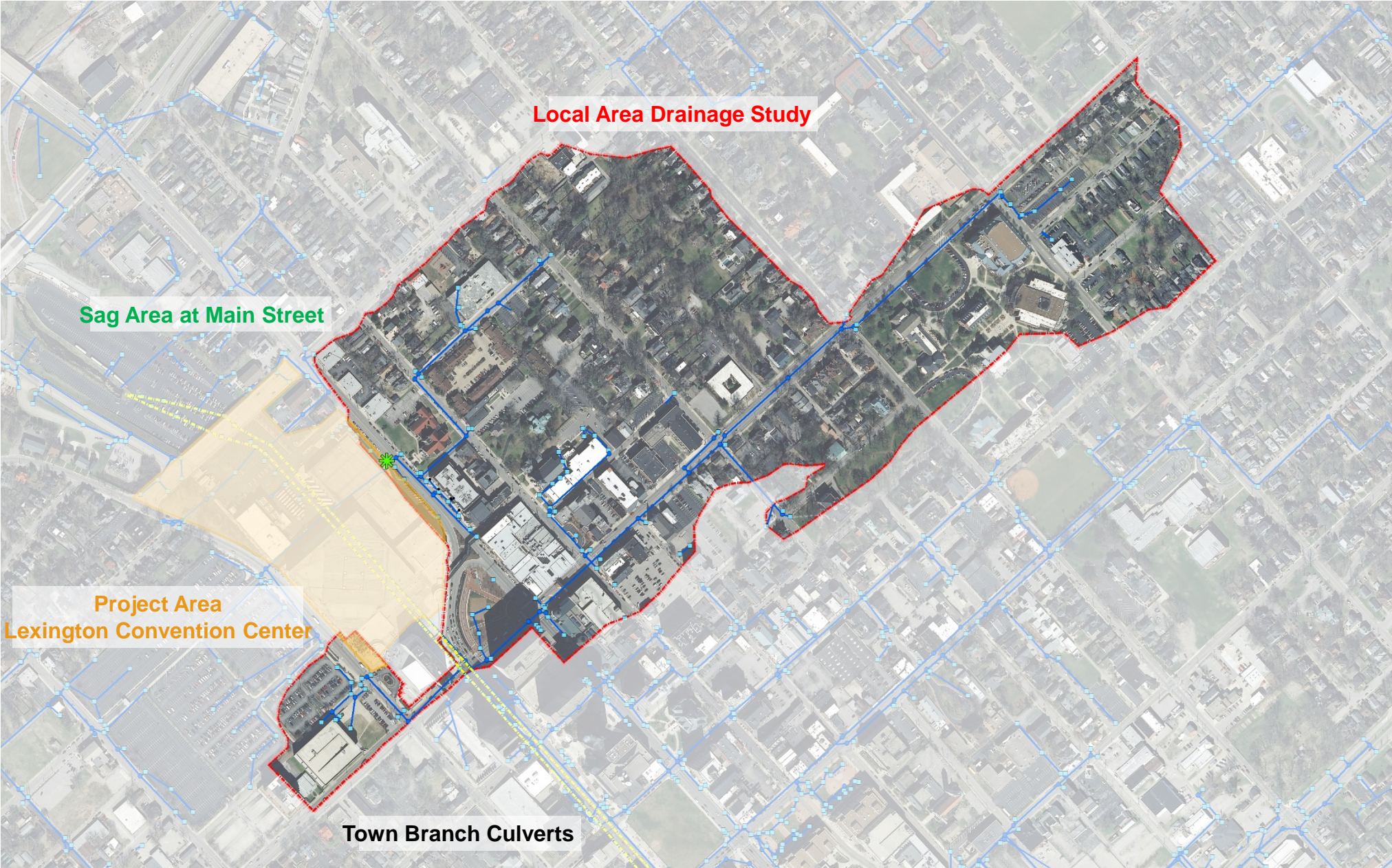
- Significant rainfall event in 2014 resulted in widespread urbanized flooding
- Highlighted need for more detailed studies within the watershed



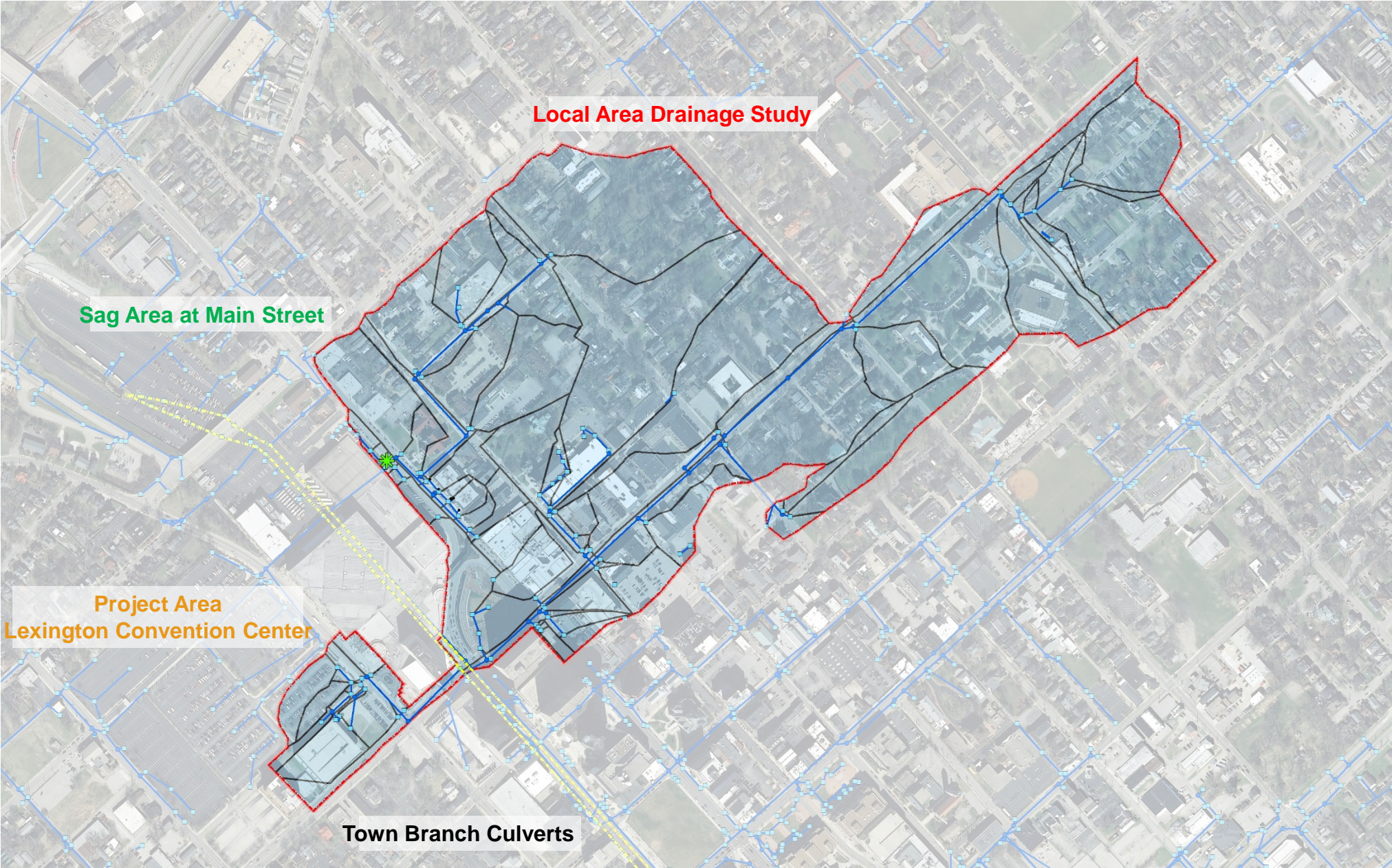
Town Branch Watershed and Project Area



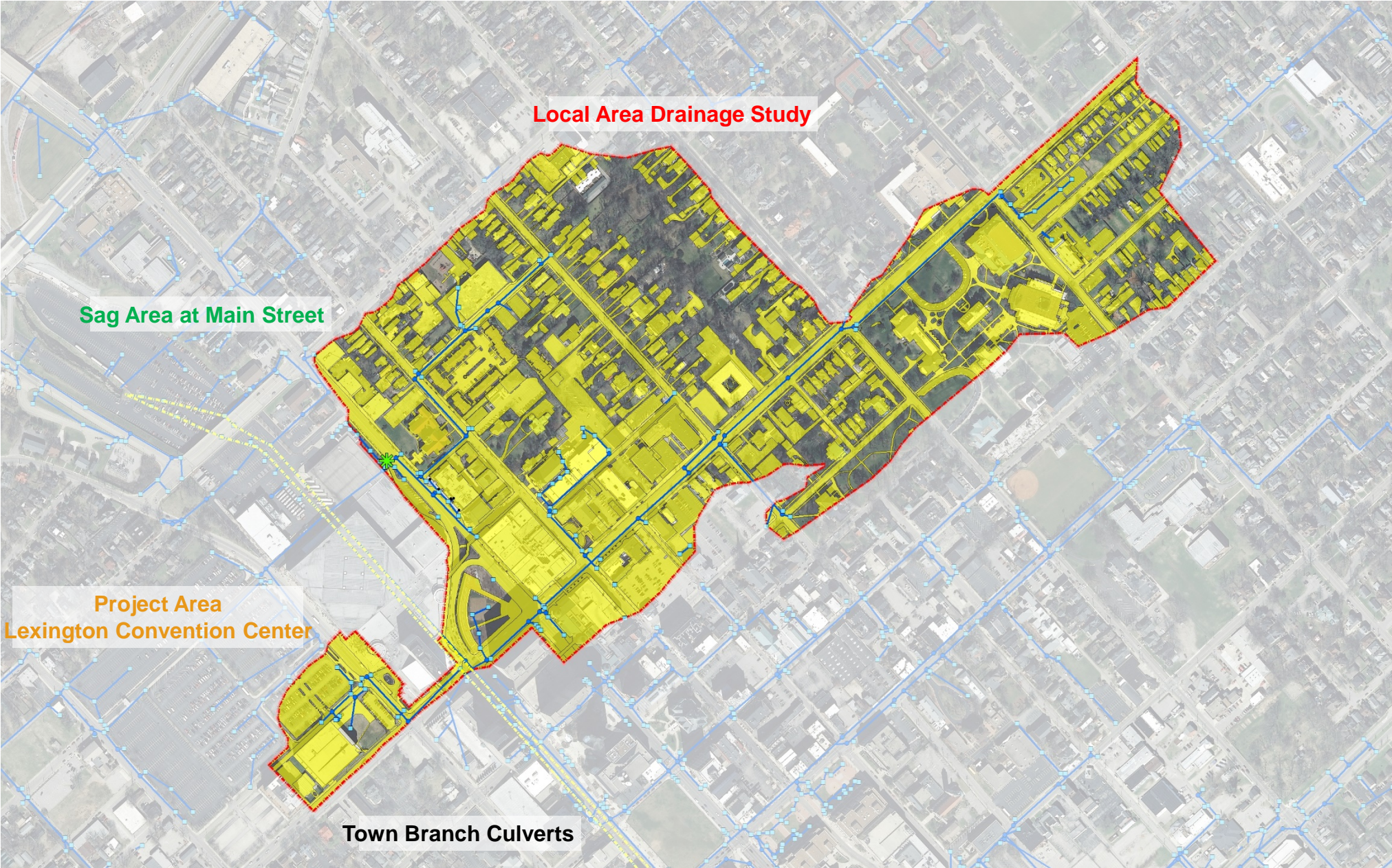
Local Area Drainage Study



Local Area Drainage Study



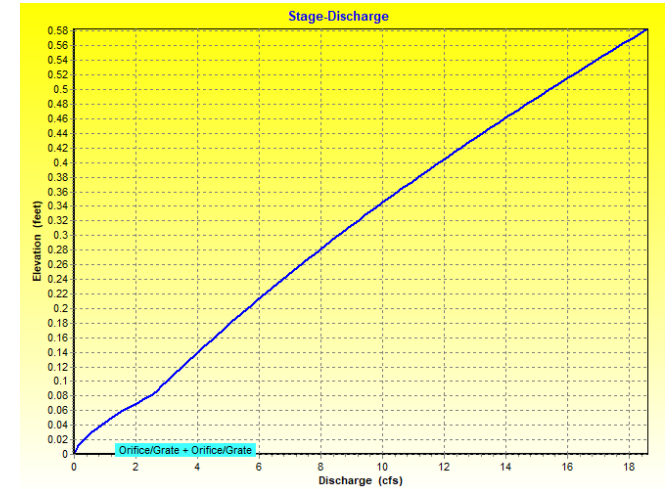
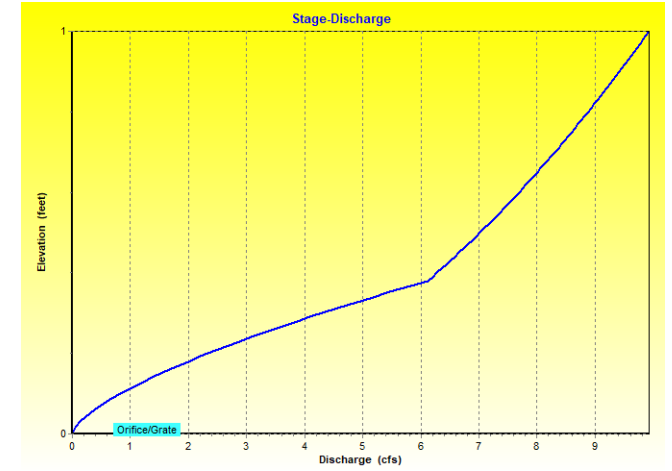
Local Area Drainage Study



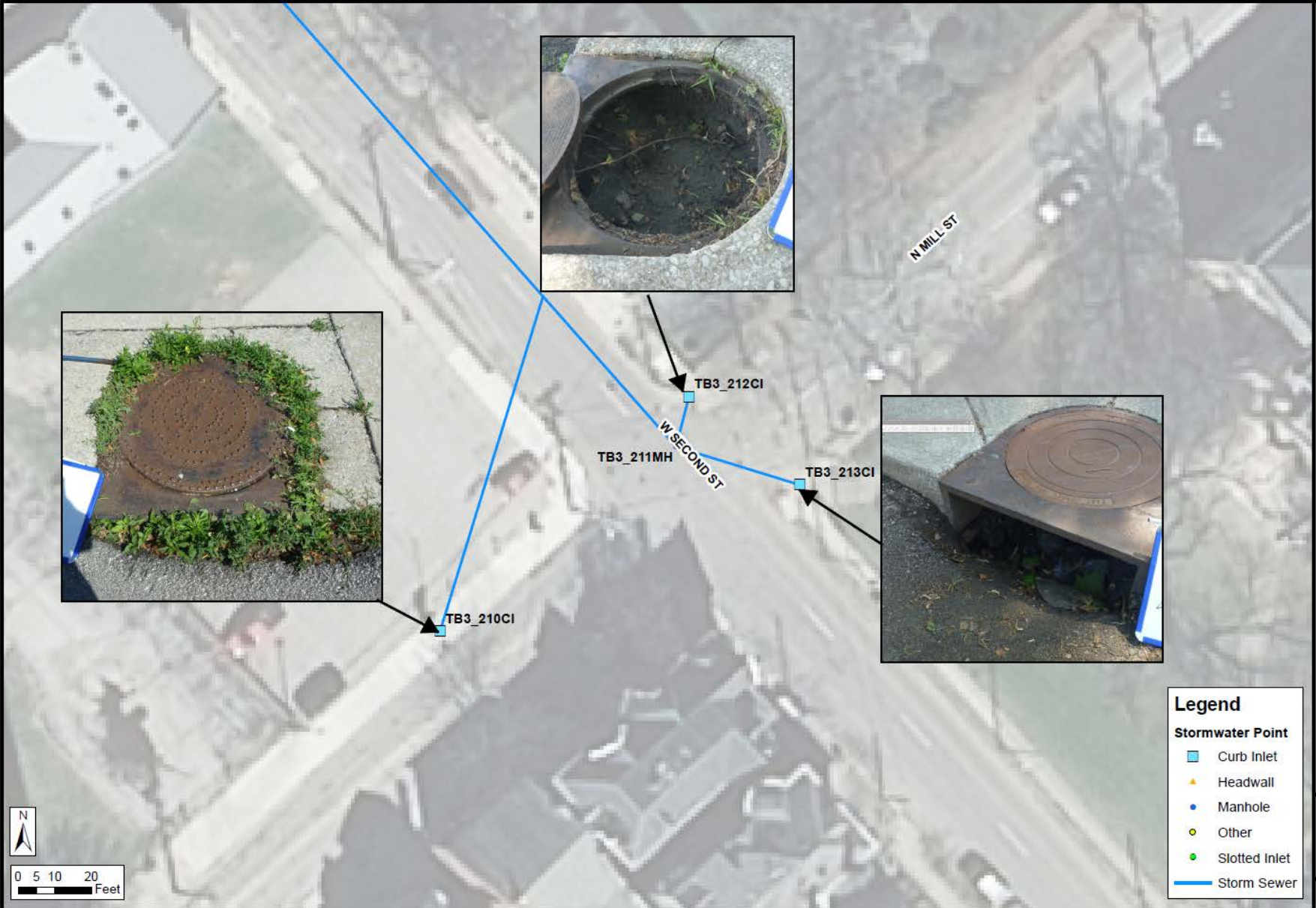
Existing Overland Spillway



Inlet Capacity Considerations



Inlet Capacity Considerations



INLETS CLOGGED WITH DEBRIS
 LEXINGTON CENTER CORPORATION
 LEXINGTON, KY

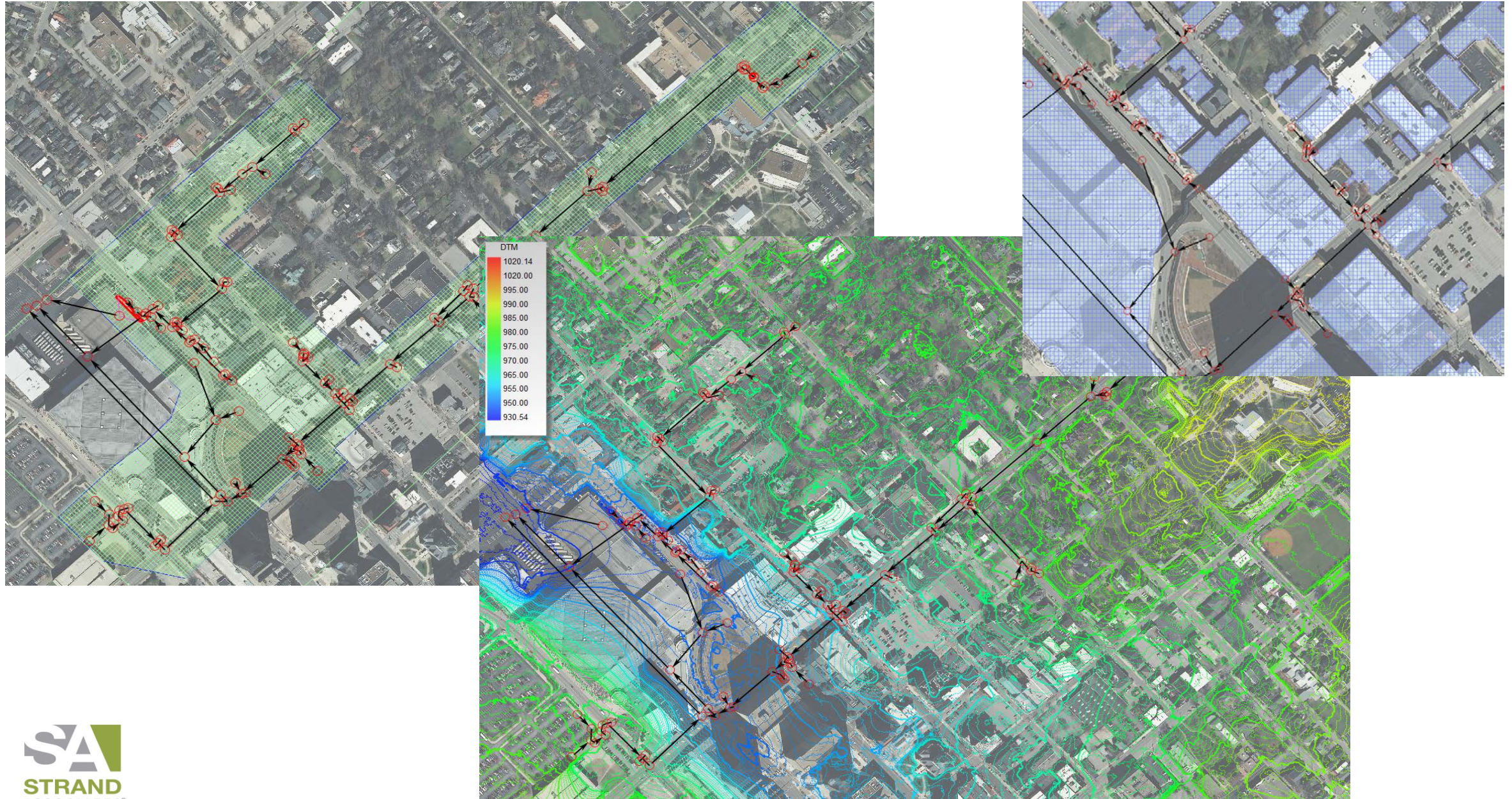
Legend

Stormwater Point

- Curb Inlet
- ▲ Headwall
- Manhole
- Other
- Slotted Inlet
- Storm Sewer



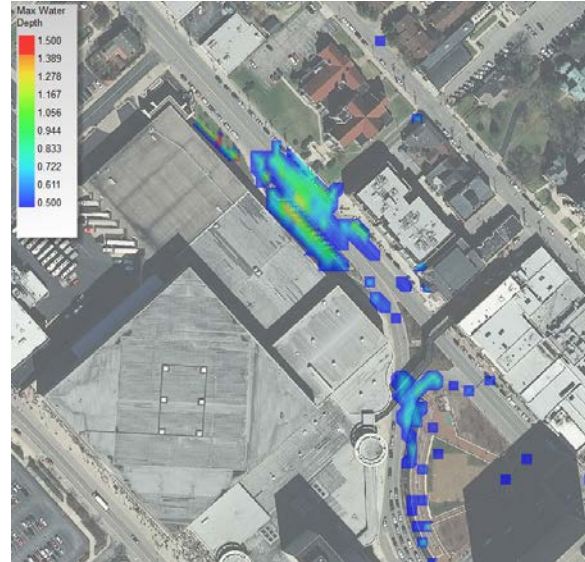
XPSWMM Model Development



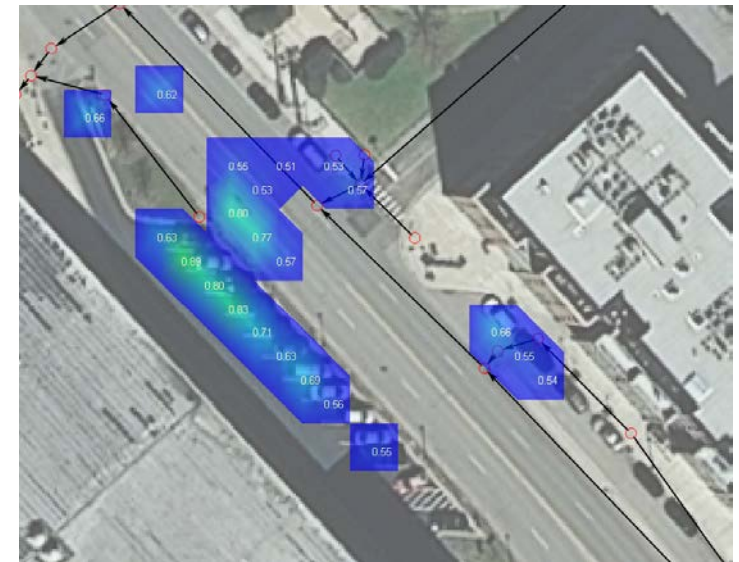
XPSWMM Model Development – Existing Conditions



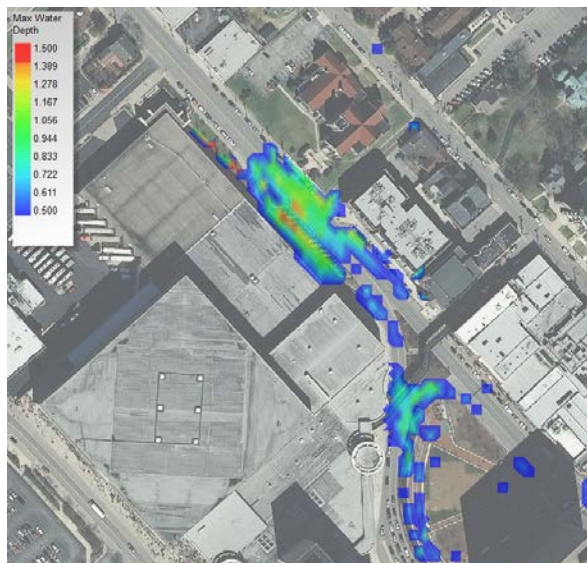
2-Year 24-Hour



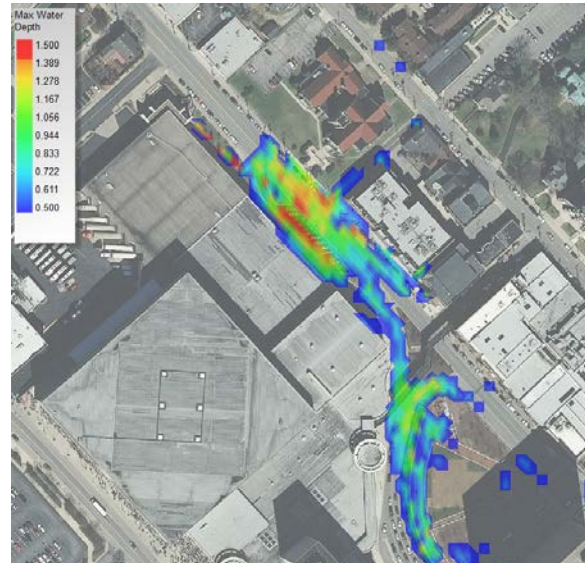
10-Year 24-Hour



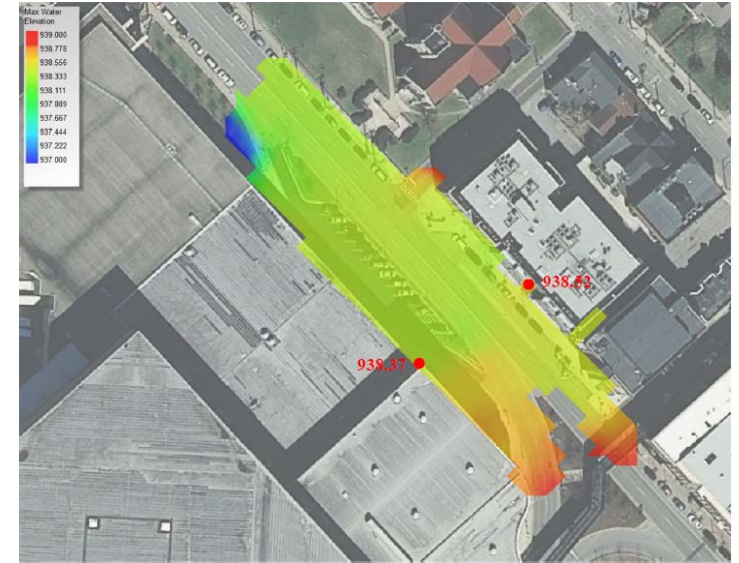
Flooding Depths (2-Year)



25-Year 24-Hour

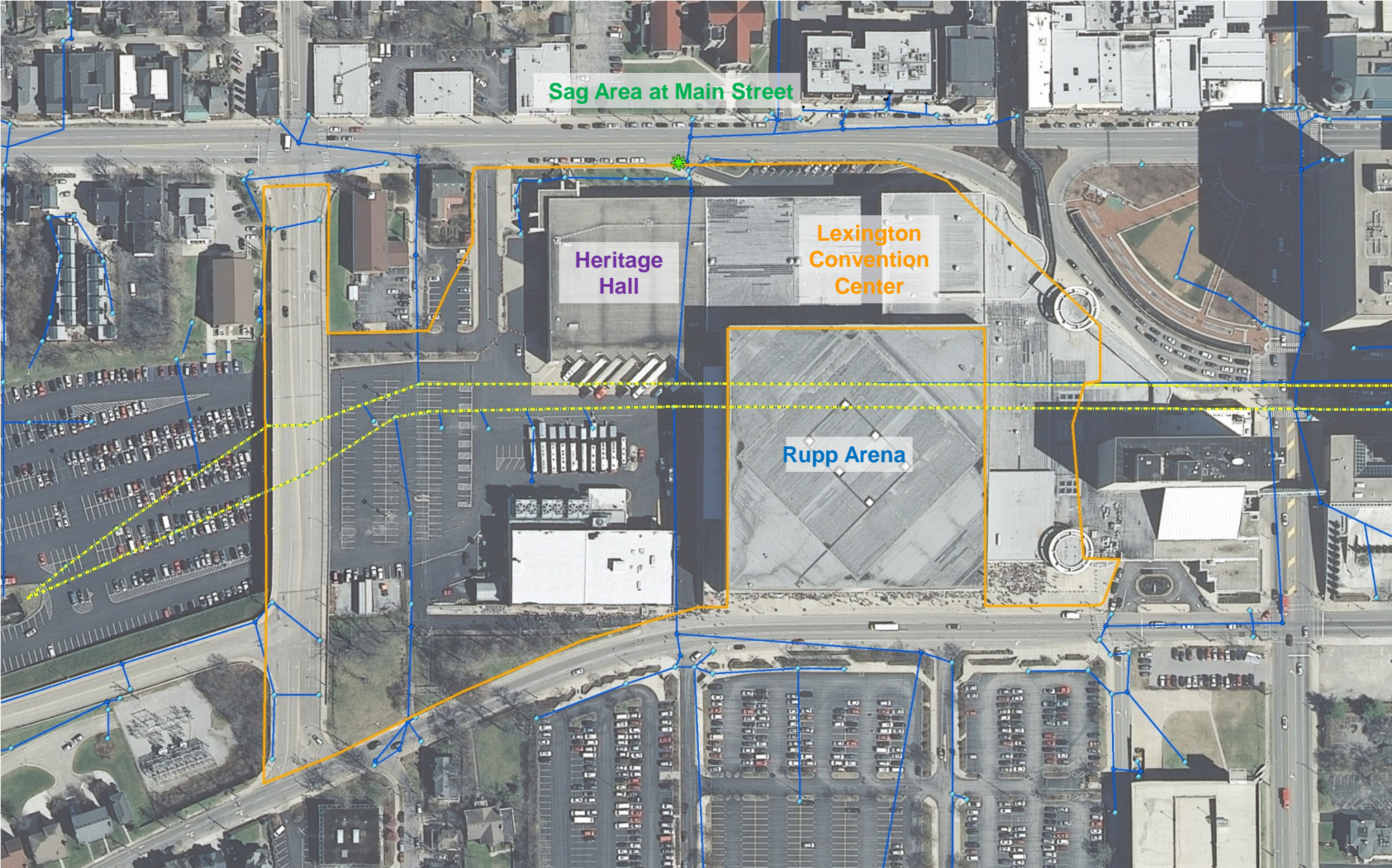


100-Year 24-Hour

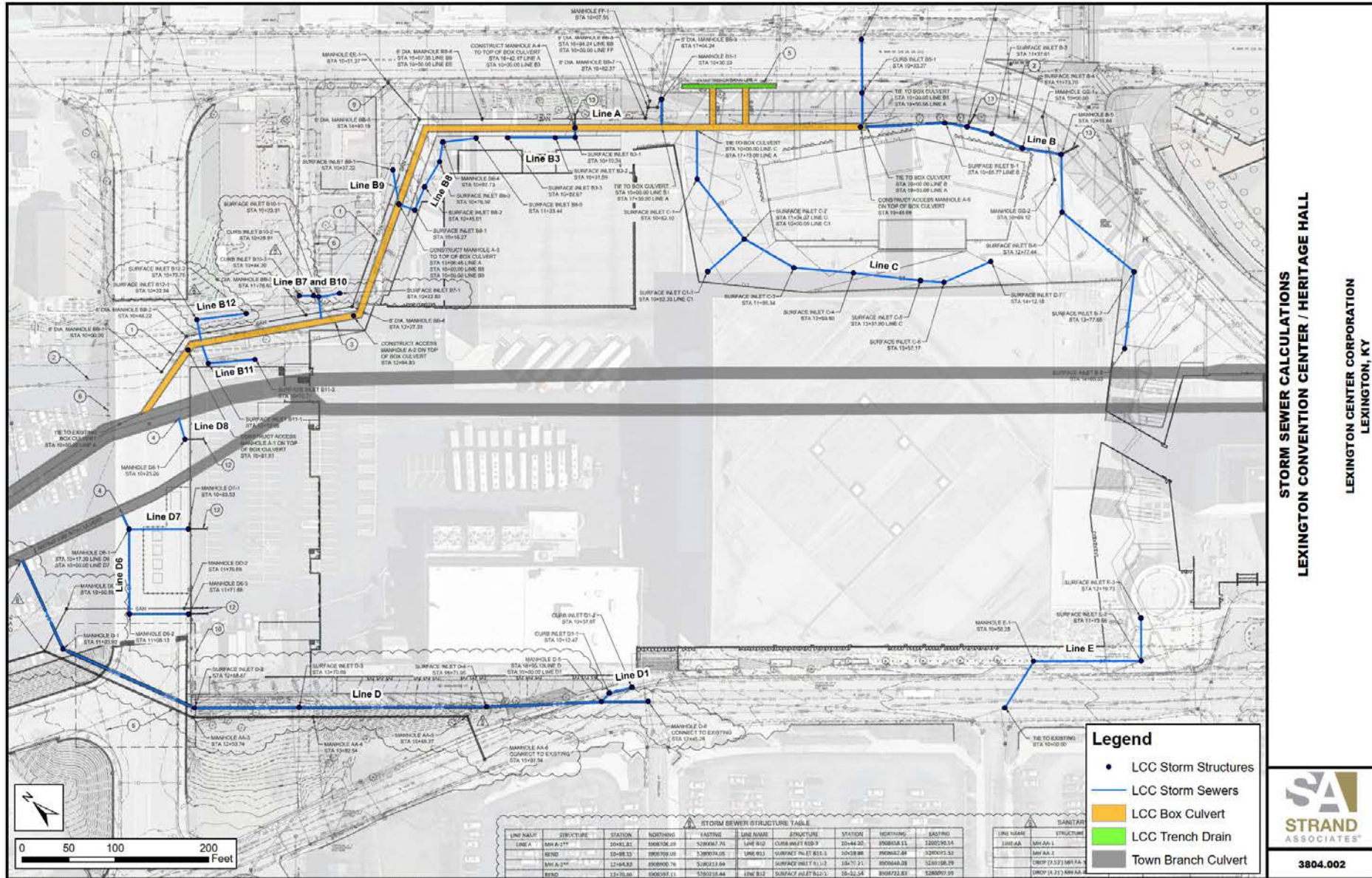


Flooding Elevations (100-Year)

Lexington Convention Center Redevelopment



Lexington Convention Center Redevelopment – Design

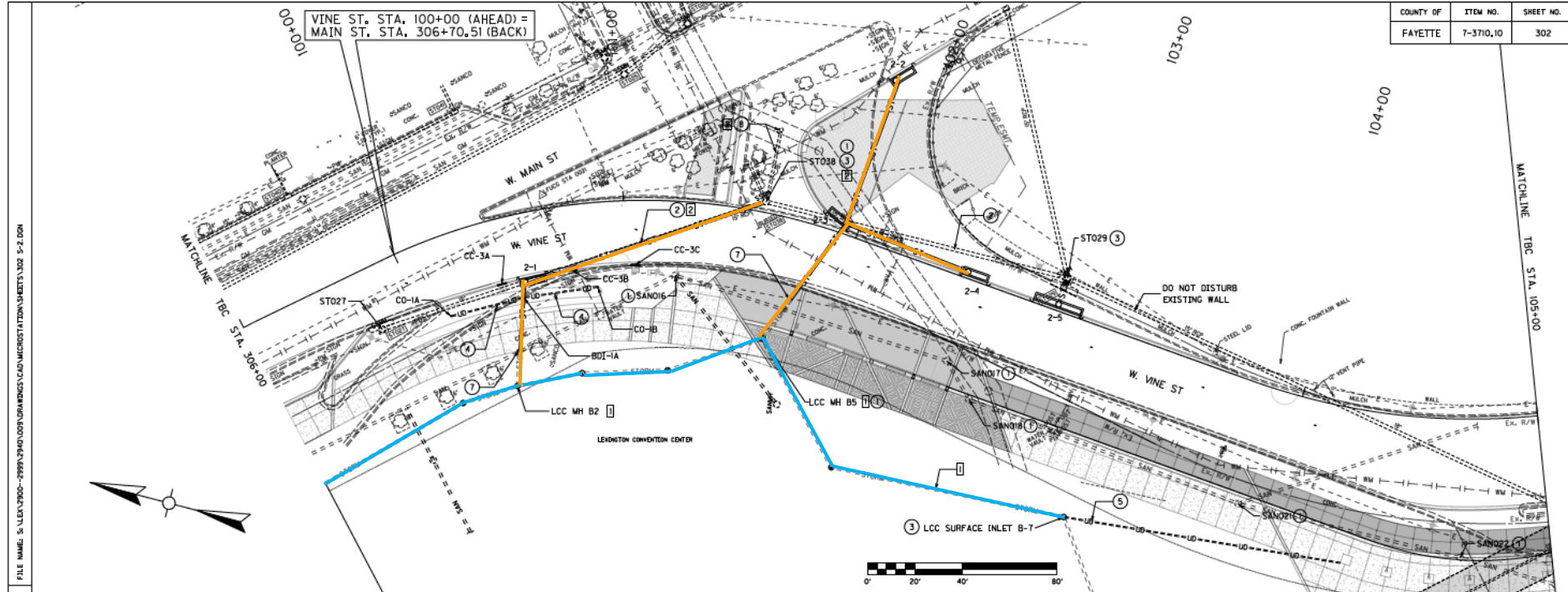


STORM SEWER CALCULATIONS
LEXINGTON CONVENTION CENTER / HERITAGE HALL
 LEXINGTON CENTER CORPORATION
 LEXINGTON, KY

3804.002



Lexington Convention Center Redevelopment – Design



COUNTY OF	ITEM NO.	SHEET NO.
FAYETTE	7-3710.10	302

FILE NAME: S:\LEX\2000-2999\2940\00\UR\AN\DCS\CAD\MICRO\STATION\SHEET\302 5-2.DWG
 USER: jbarney DATE PLOTTED: 10/20/2010 10:00:00 AM
 E-SHEET NAME: 000005PL
 POWER: 24000000 V.L.L. 1.443

NOTES

EXISTING STRUCTURE MODIFICATIONS					
STRUCTURE	STATION	OFFSET	TYPE	COMMENT	DETAIL
ST038	101+60	5.24' LT	MH	PLUG	
ST029	102+90	14.51' LT	CB	MOD. STR. TYPE 1 & CORE STR.	331/346
LCC B-7	103+22	BL'DI' RT	DBI	CORE STR.	

EXISTING PIPE MODIFICATIONS				
STR TO STR	SIZE	LENGTH	VOLUME	COMMENT
2-1 TO ST038	15"	104.5'		REMOVE
ST038 TO ST029	18"	50'		REMOVE/PLUG PIPE

DRAINAGE CONSTRUCTION						
STRUCTURE	STATION	OFFSET	TYPE	F.L. EL.	INV. EL.	REFERENCE
2-1	100+52	27.13' RT	CB1 TYPE A 11-2 (H=4.79')	937.70	933.16	330
2-2	101+93	65.51' LT	CB1 TYPE A 4-2 (H=3.20)	938.97	935.77	331
2-3	101+93	2.98' LT	CB1 TYPE A 15-2 (H=4.44')	938.89	934.45	331
2-4	102+49	1.08' LT	CB1 TYPE A 4-2 (H=5.27')	938.84	935.64	
2-5	102+90	1.08' LT	CB1 TYPE A 11-8 (H=3.85')	938.78	934.94	331

BIOSWALE STRUCTURES						
STRUCTURE	STATION	OFFSET	TYPE	RIM EL.	INV. EL.	REFERENCE
CO-1A	100+13	33.43' RT	BIOSWALE CLEANOUT			352
CC-3A	100+41	27.34' RT	CURB CUT			352
BDI-1A	100+49	35.09' RT	PVC DROP INLET-18"	937.57	933.10	330/352
CC-3B	100+75	27.08' RT	CURB CUT			352
CO-1B	100+86	35.64' RT	BIOSWALE CLEANOUT			352
CC-3C	101+05	27.34' RT	CURB CUT			352

UNDERDRAIN AND OVERFLOW PIPE			
STR TO STR	SIZE	LENGTH	TYPE
CO-1A TO BDI-1A	6"	32'	PERFORATED
CO-1B TO BDI-1A	6"	32'	PERFORATED
END TO LCC B-7	6"	118.5'	NON-PERFORATED

KEYNOTES

- ① ADJUST EXISTING FRAME & LJD TO F.G.
- ② MODIFY EXISTING PIPE, SEE TABLE
- ③ MODIFY EXISTING STRUCTURE, SEE TABLE
- ④ BIOSWALE UNDERDRAIN
- ⑤ SOIL CELL UNDERDRAIN
- ⑥ PERMEABLE PAVER UNDERDRAIN
- ⑦ CONNECT TO EXISTING PIPE SUB. VERIFY LOCATION AND ELEVATION OF PIPE PRIOR TO ORDERING MATERIALS.
- ⑧ UNCOVER AND INSPECT EXISTING PIPE AND STRUCTURE TO CONFIRM IF LINE IS STILL ACTIVE.

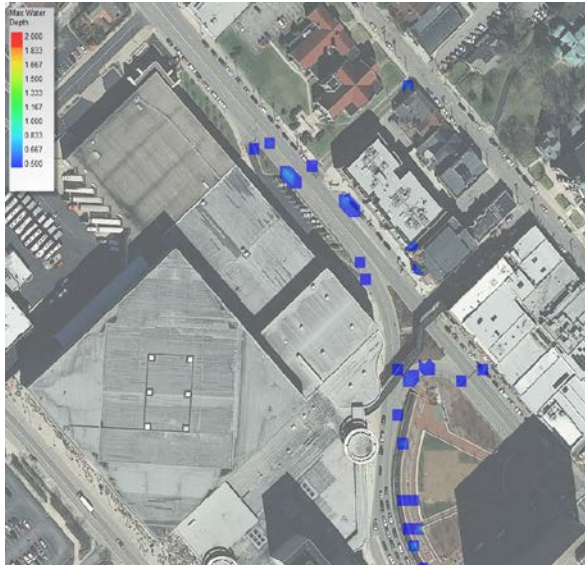
COORDINATION ITEMS

- NEW CONSTRUCTION, BY OTHERS
- IF INSPECTION OF EXISTING PIPE AND STRUCTURE DETERMINES STORM SEWER IS INACTIVE CONTRACTOR SHALL:
 - SAFELOAD BURIED STRUCTURE, PIPE AND ST038.
 - SAFELOAD EXISTING PIPE FROM ST038 TO 2-1.
 - NON-PERFORM CONSTRUCTION OF STORM SEWER FROM ST038 TO 2-1.

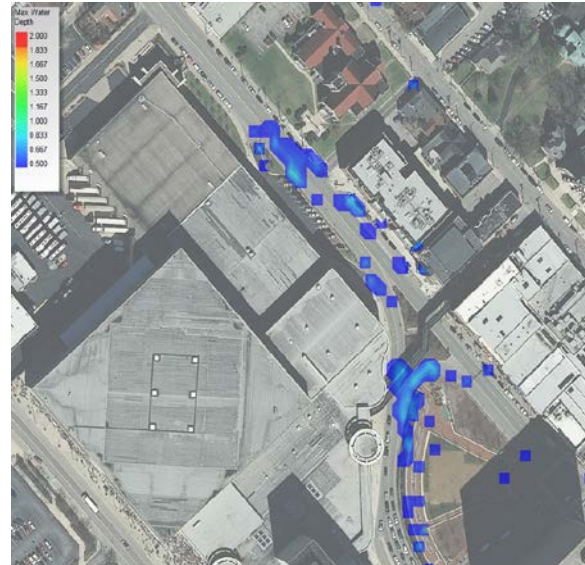


STORM DRAINAGE PLAN
 TOWN BRANCH COMMONS
 STA. 306+00 TO STA. 105+00

XPSWMM Model Development – Proposed Conditions



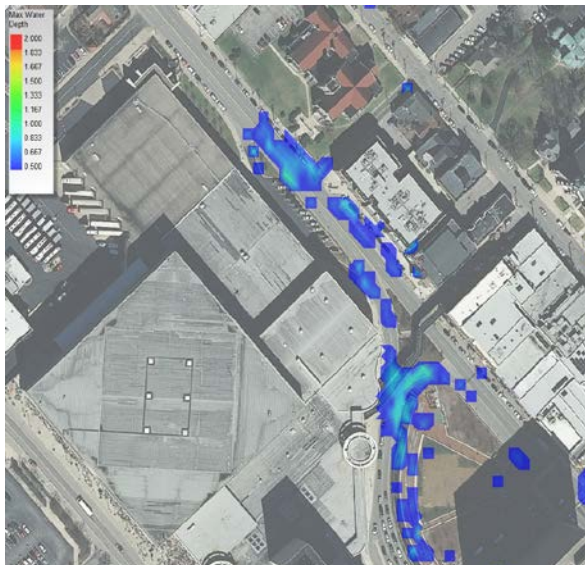
2-Year 24-Hour



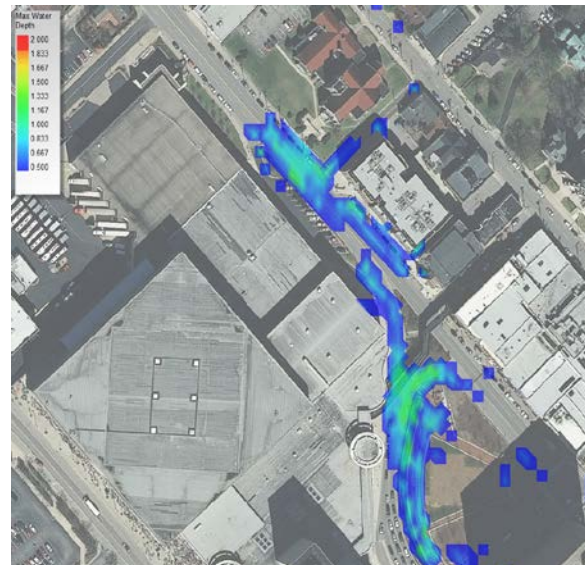
10-Year 24-Hour



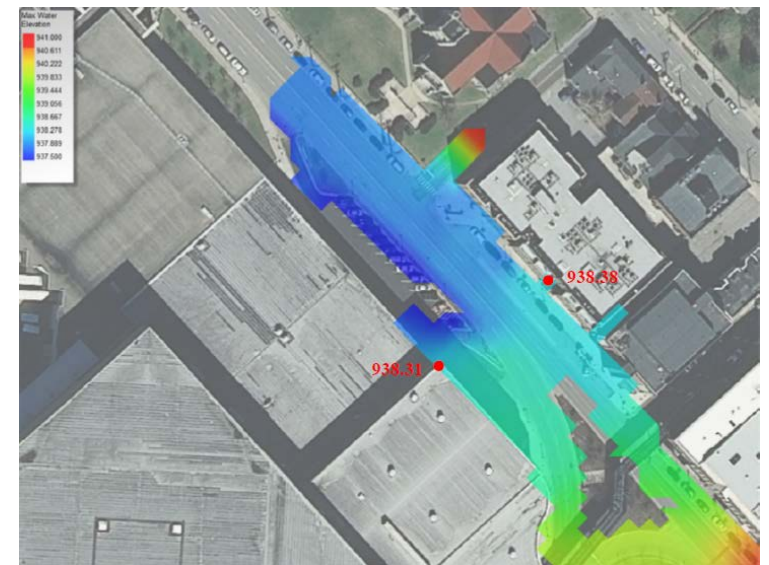
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25-Year 24-Hour

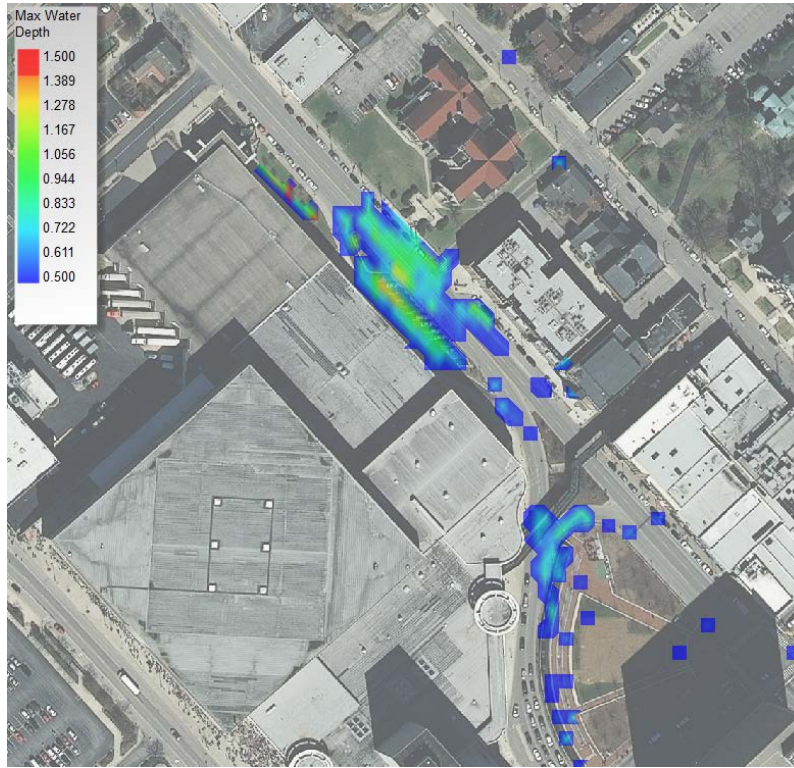


100-Year 24-Hour

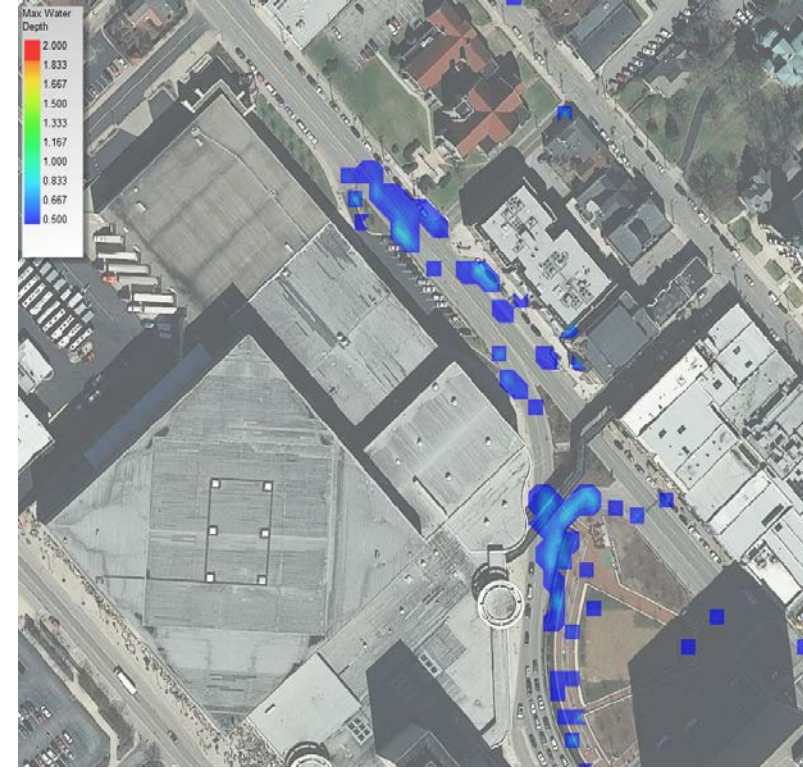


Flooding Elevations (100-Year)

XPSWMM Model Development – Proposed Conditions



Existing 10-Year 24-Hour



Proposed 10-Year 24-Hour

Lexington Convention Center Redevelopment – Construction



Lexington Convention Center Redevelopment – Construction



Lexington Convention Center Redevelopment – Construction



Questions and Discussion

Chris Rust, P.E. – Strand Associates, Inc.

Chris.Rust@strand.com



www.strand.com
(p) 513.861.5600



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Lexington Area

