



2020 Major Drainage CIP Program

City of Fayetteville

Purpose

- To seek Council concurrence in the proposed methodology to fund four of nine existing Stormwater CIP Projects
 - Projects identified through **citizen complaints** and **old models** that lacked the rigor of advanced technology
 - Recent detailed H&H modeling and cost/benefit evaluations have prioritized projects based on **effectiveness of project** and **available funding**
 - **Council** is asked to provide concurrence with funding the **top three** recommended drainage CIP projects
 - An additional project has received **first phase** approval for **HMGP grant** funds and was therefore not included in the prioritization
 - The remaining **five** projects will be prioritized with the portfolio of projects that emerge from the City **Wide Master Planning Effort** and will be removed from existing CIP budget

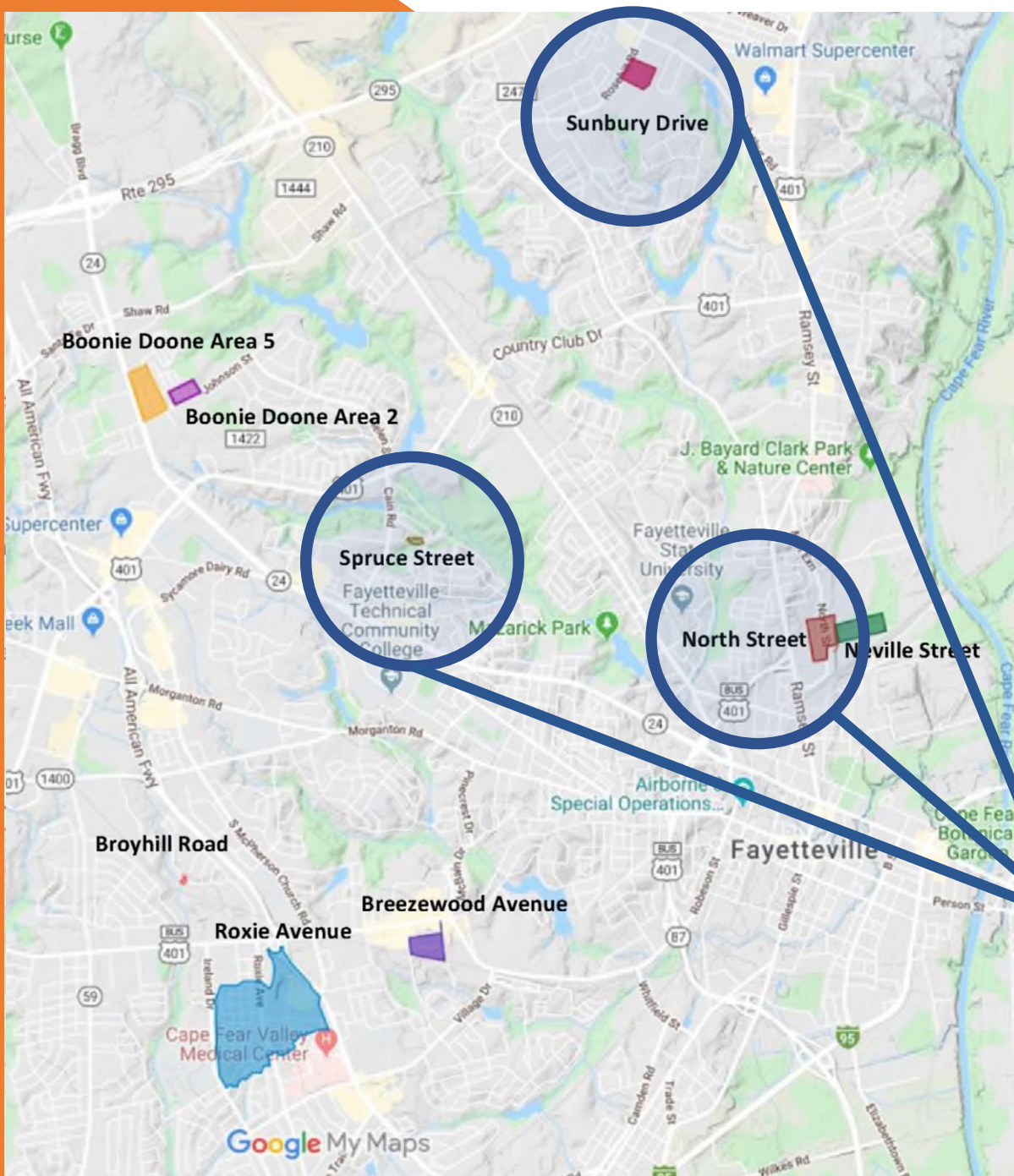
Agenda

- Current City Drainage/Flooding CIP Program
- Summary of Major CIP Projects
- Major CIP Projects Design/Analysis Overview
- Sample of Major CIP Project Details
- Recommendations



Current City Drainage/ Flooding CIP Program

- The city's current program for infrastructure improvements and maintenance includes three elements:
 - Spot Repair Program (in RoW): <\$200k
 - Drainage Assistance Program (off RoW): <\$200K
 - Major CIP Projects: >\$200k
- Projects are complaints based and scheduled by priority and funding availability
- Funding is available through the Stormwater Utility Fee, though funding is not sufficient to meet all needs



Summary of Major CIP Projects

- Projected Drainage CIP Budget = \$8.6M
- Estimated Drainage CIP Project Costs (Total) = \$21M
 - Bonnie Doone 2 = \$1,711,000
 - Bonnie Doone 5 = \$1,751,000
 - Breezewood Avenue = \$2,574,000
 - Broyhill Drive = \$619,000
 - Neville Street = \$1,749,000*
 - North Street = \$4,035,000
 - Roxie Avenue = \$4,533,000
 - Spruce Street = \$431,000
 - Sunbury Drive = \$3,724,000
- **Move forward with Spruce Street, Sunbury Drive and North Street projects = \$8.2M (\$7.2M City)**

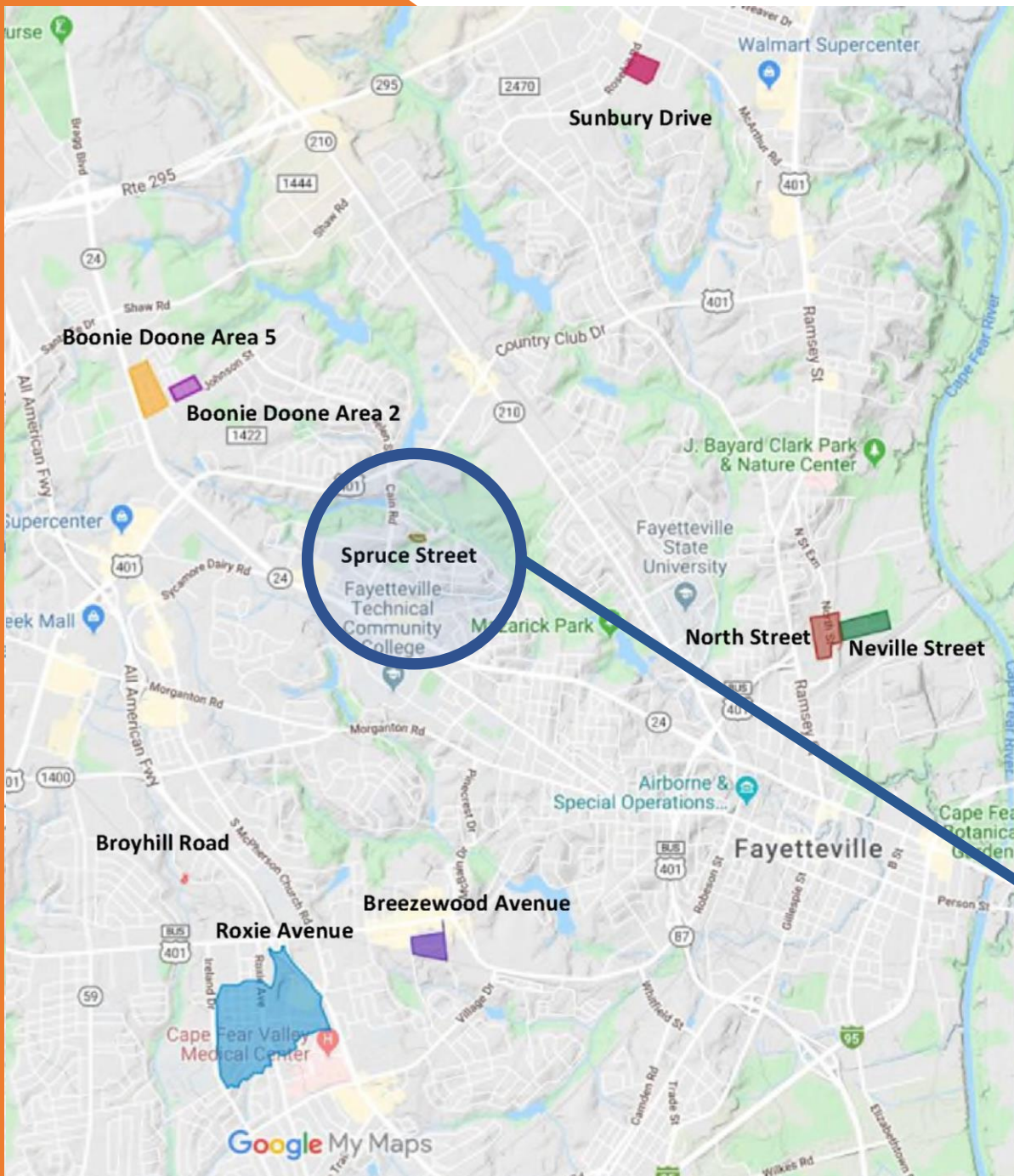
* - submitted for FEMA funding

Major CIP Projects Design/ Analysis Overview

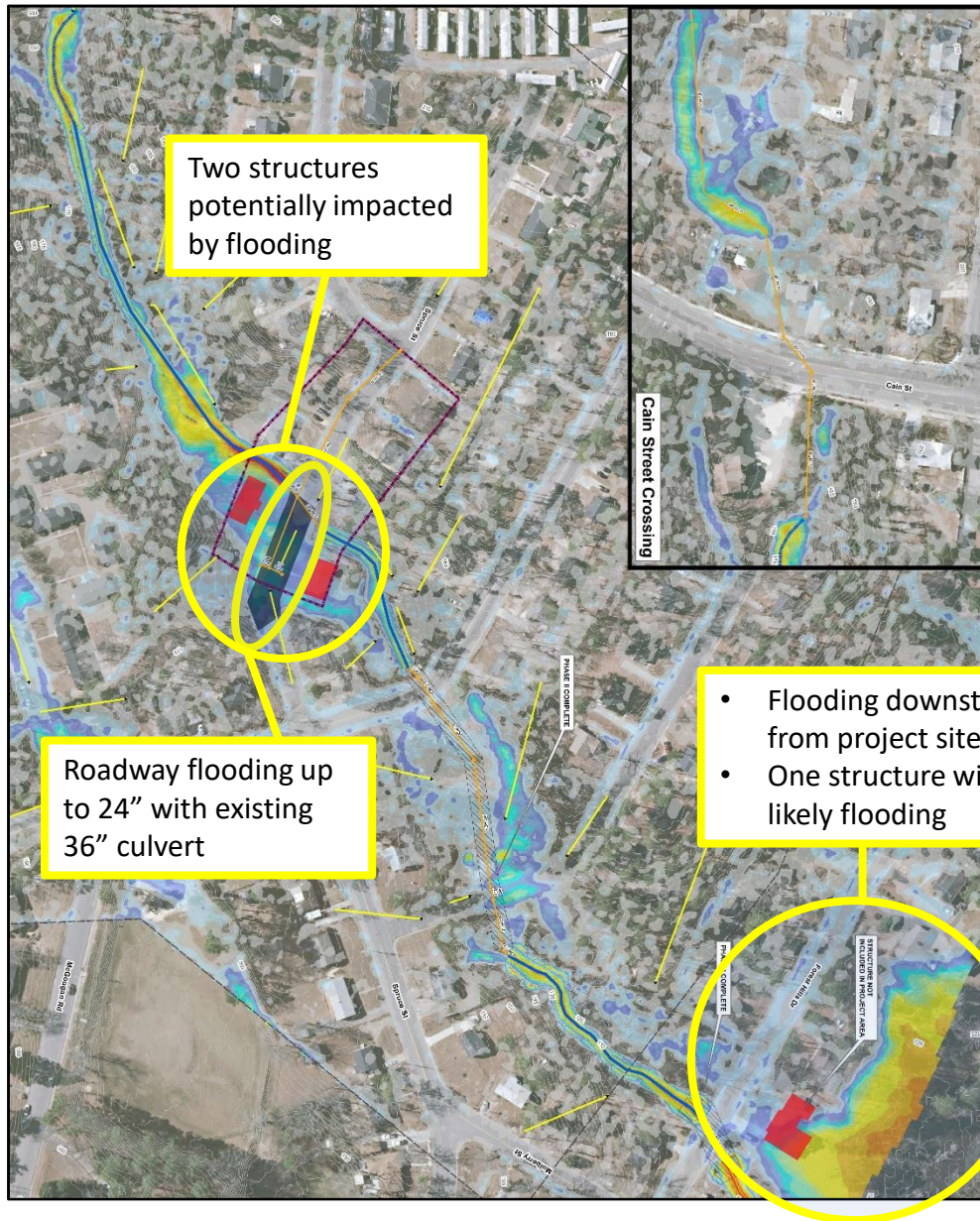
- Eight (8) legacy projects ranging from 30-70% design completion
- New paradigm to proactively review designs with more rigor and objective analysis to inform the CIP and budgeting process
- Performed additional modeling to identify flooding and help prioritize projects to move to construction
 - 2-, 10-, 25- and 100-yr/24 hr design storms
 - Existing/future conditions
 - Conditions with proposed improvements
- Improvements designed to meet City Level of Services requirements
 - Storm sewers and appurtenances (10-yr)
 - Culverts/roadway crossings (25-yr)

Spruce Street

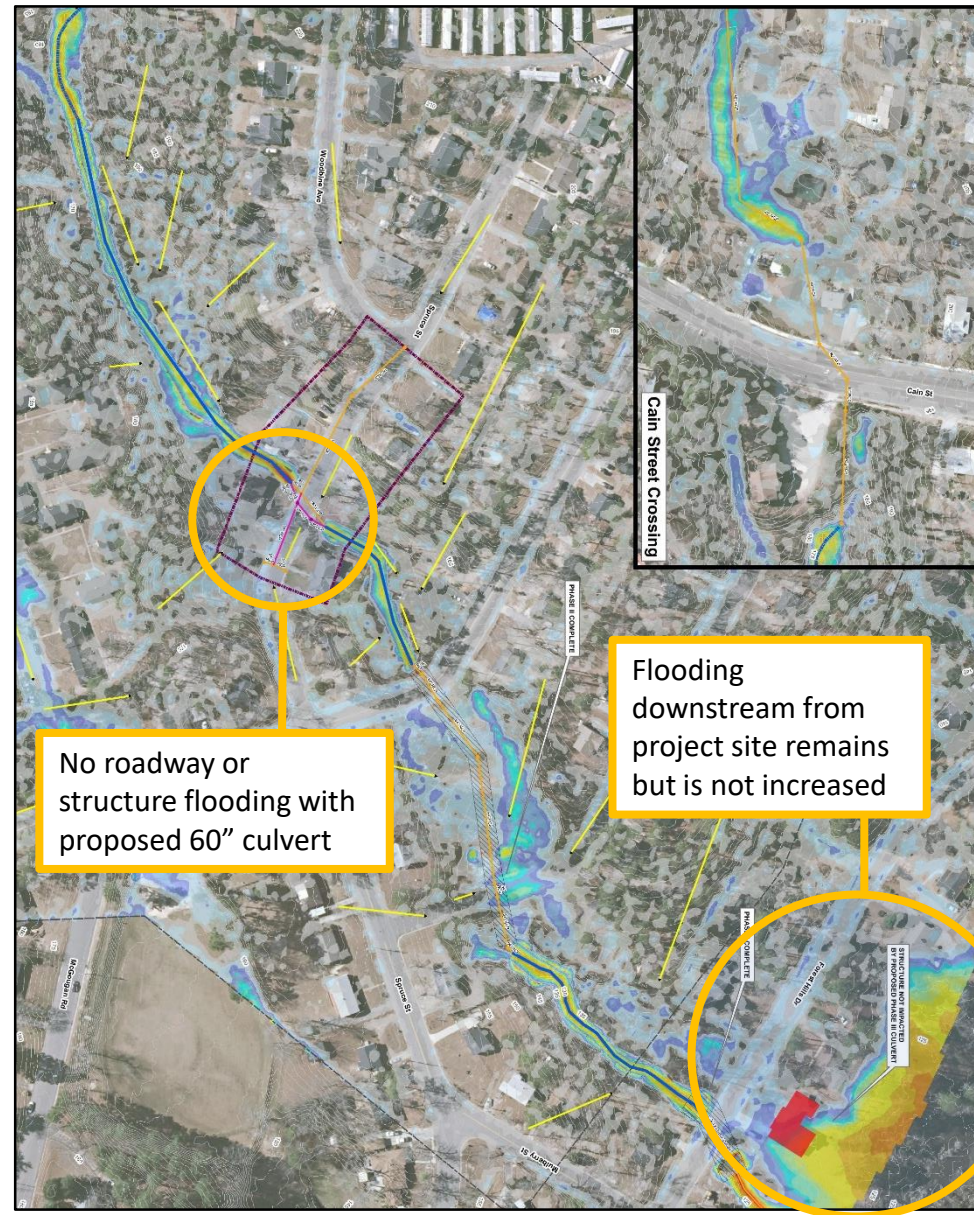
- Top scoring project
- Primarily residential area (Greenwood Homes)
- 3rd section of 3-phase improvement project
- Undersized culvert causing localized flooding
- Fatality of child from past major flooding event
- Project includes new 100' long 60" culvert
- Project cost = \$431,000



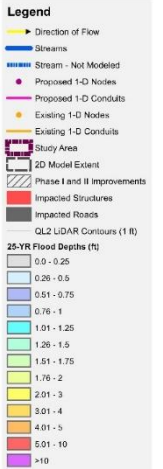
SPRUCE STREET PROJECT AREA



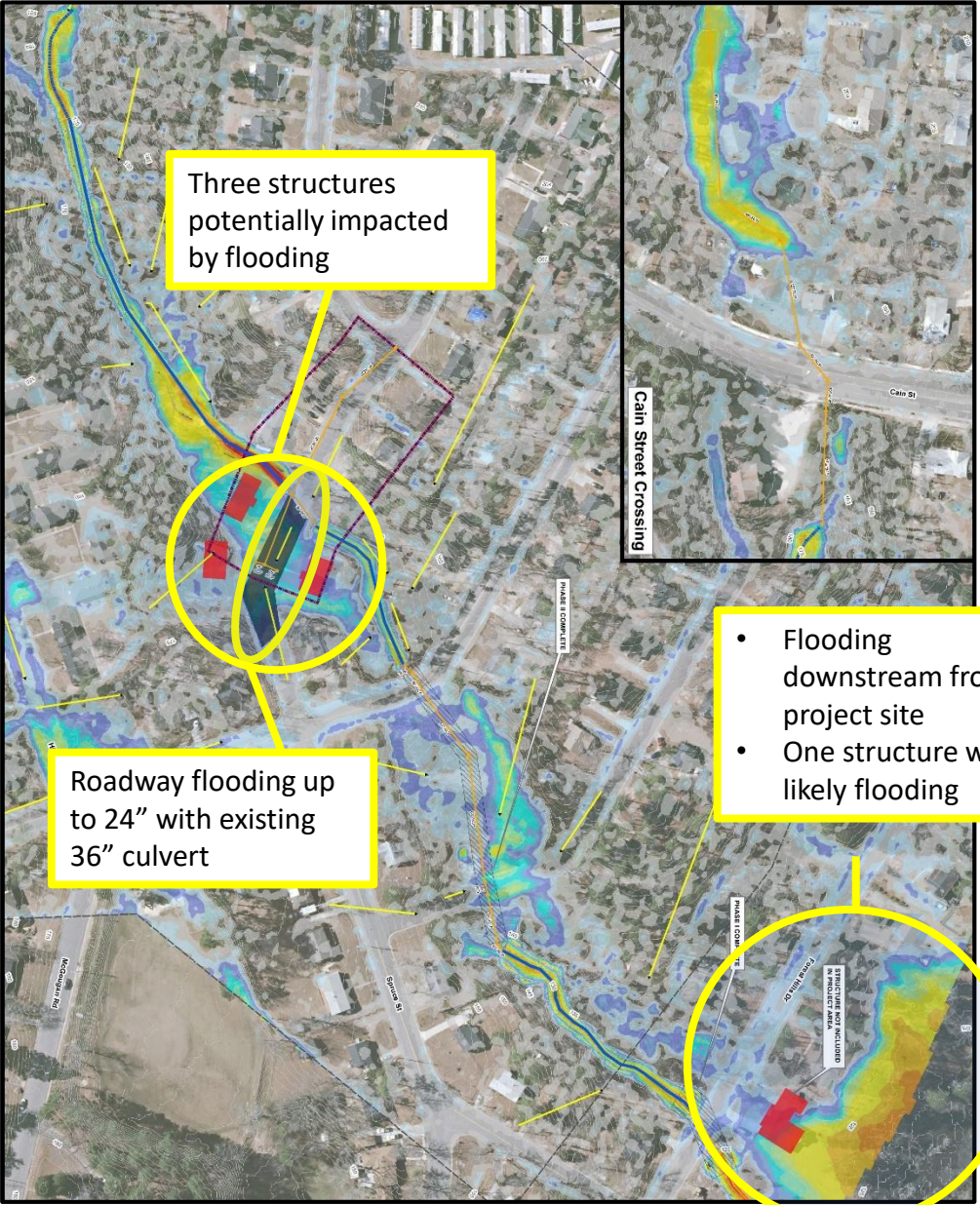
25-YR STORM EXISTING CONDITIONS



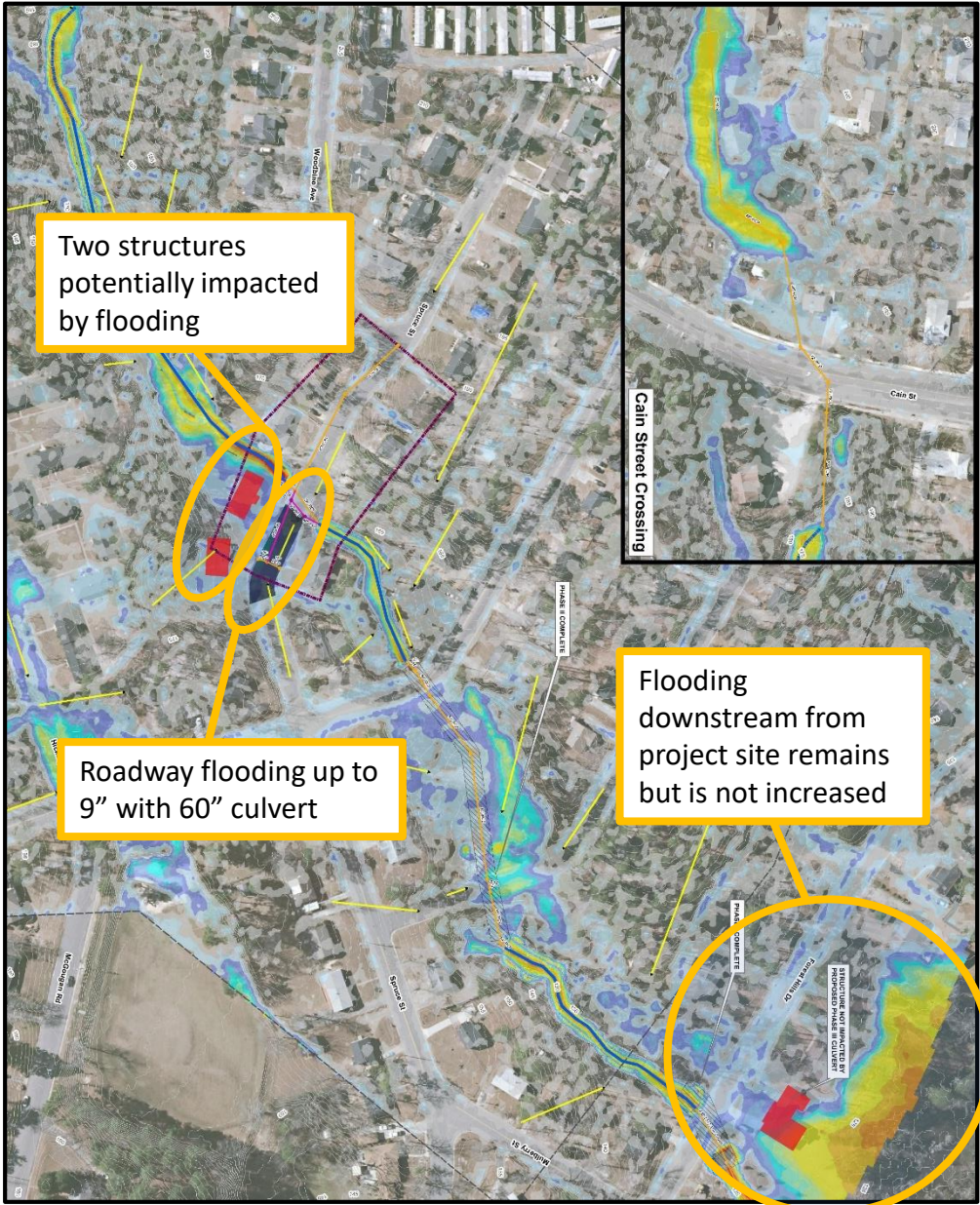
25-YR STORM PROPOSED CONDITIONS



SPRUCE STREET PROJECT AREA



100-YR STORM EXISTING CONDITIONS



100-YR STORM PROPOSED CONDITIONS



Legend

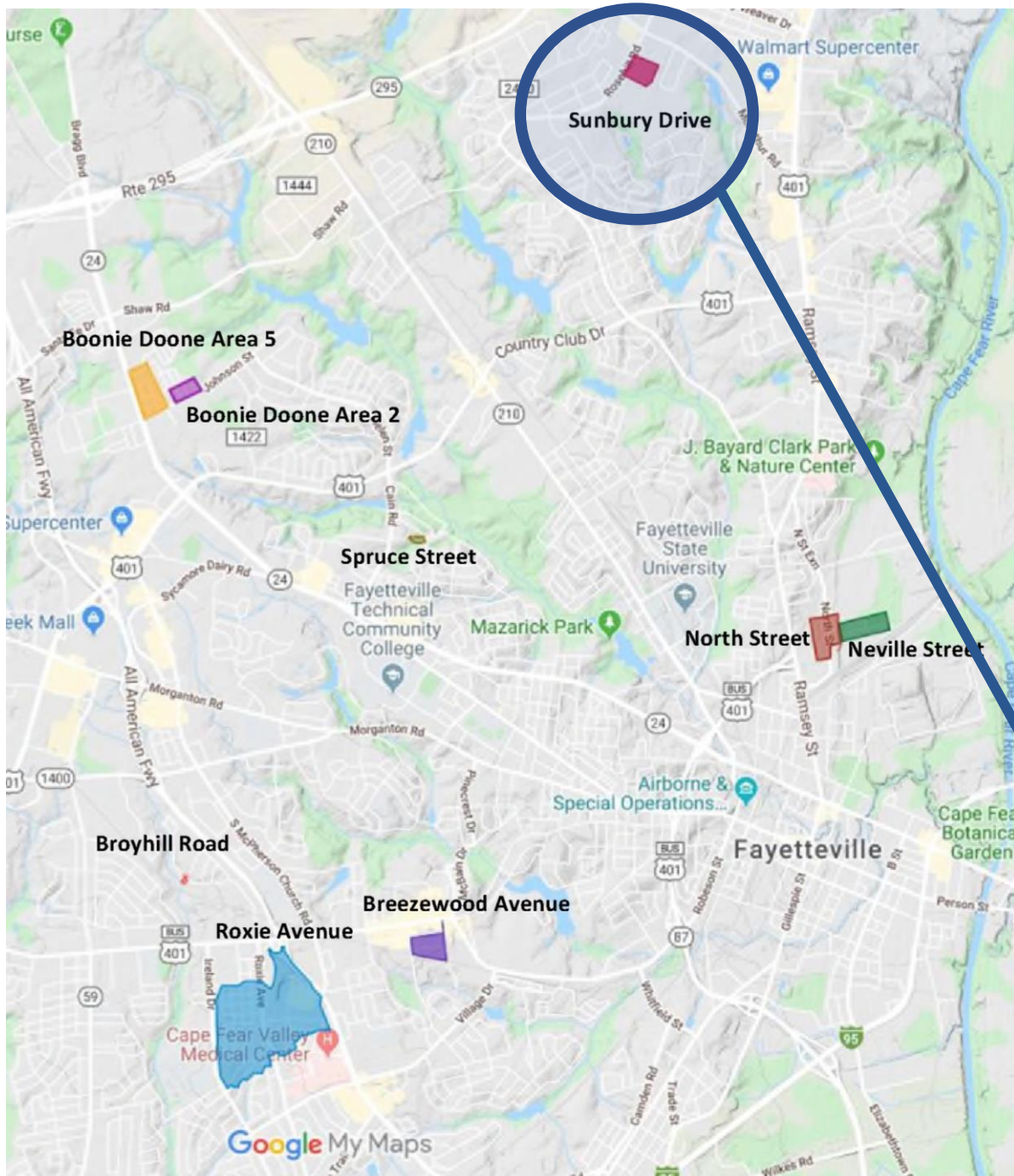
- Direction of Flow
- Streams
- Stream - Not Modeled
- Proposed 1-D Nodes
- Proposed 1-D Conduits
- Existing 1-D Nodes
- Existing 1-D Conduits
- Study Area
- 2D Model Extent
- Phase I and II Improvements
- Impacted Structures
- Impacted Floods
- QL2 LIDAR Contours (1 ft)

25-YR Flood Depths (ft)

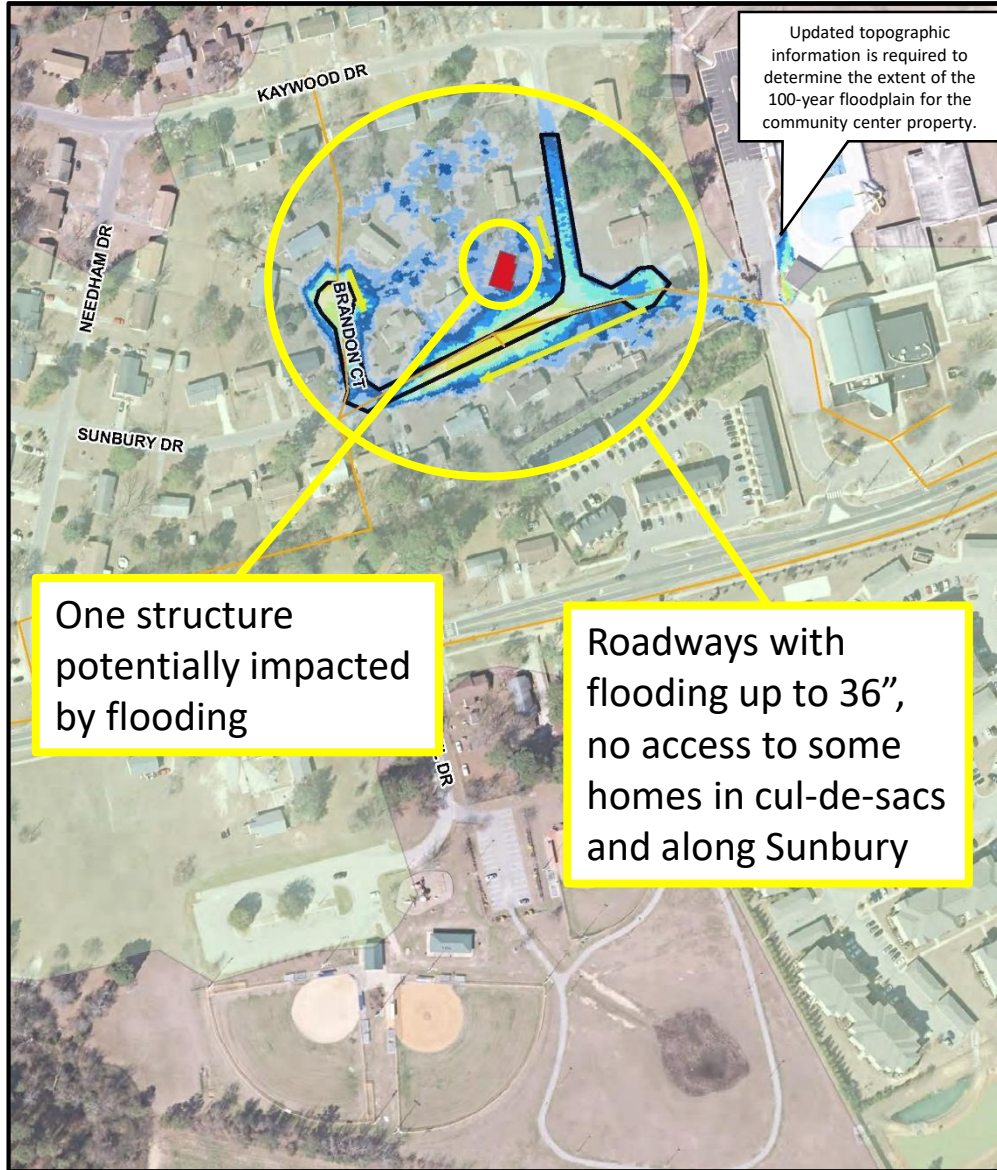
0.0 - 0.25
0.26 - 0.5
0.51 - 0.75
0.76 - 1
1.01 - 1.25
1.26 - 1.5
1.51 - 1.75
1.76 - 2
2.01 - 3
3.01 - 4
4.01 - 5
5.01 - 10
>10

Sunbury Drive

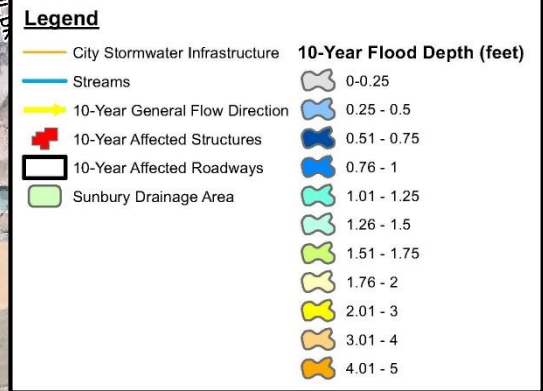
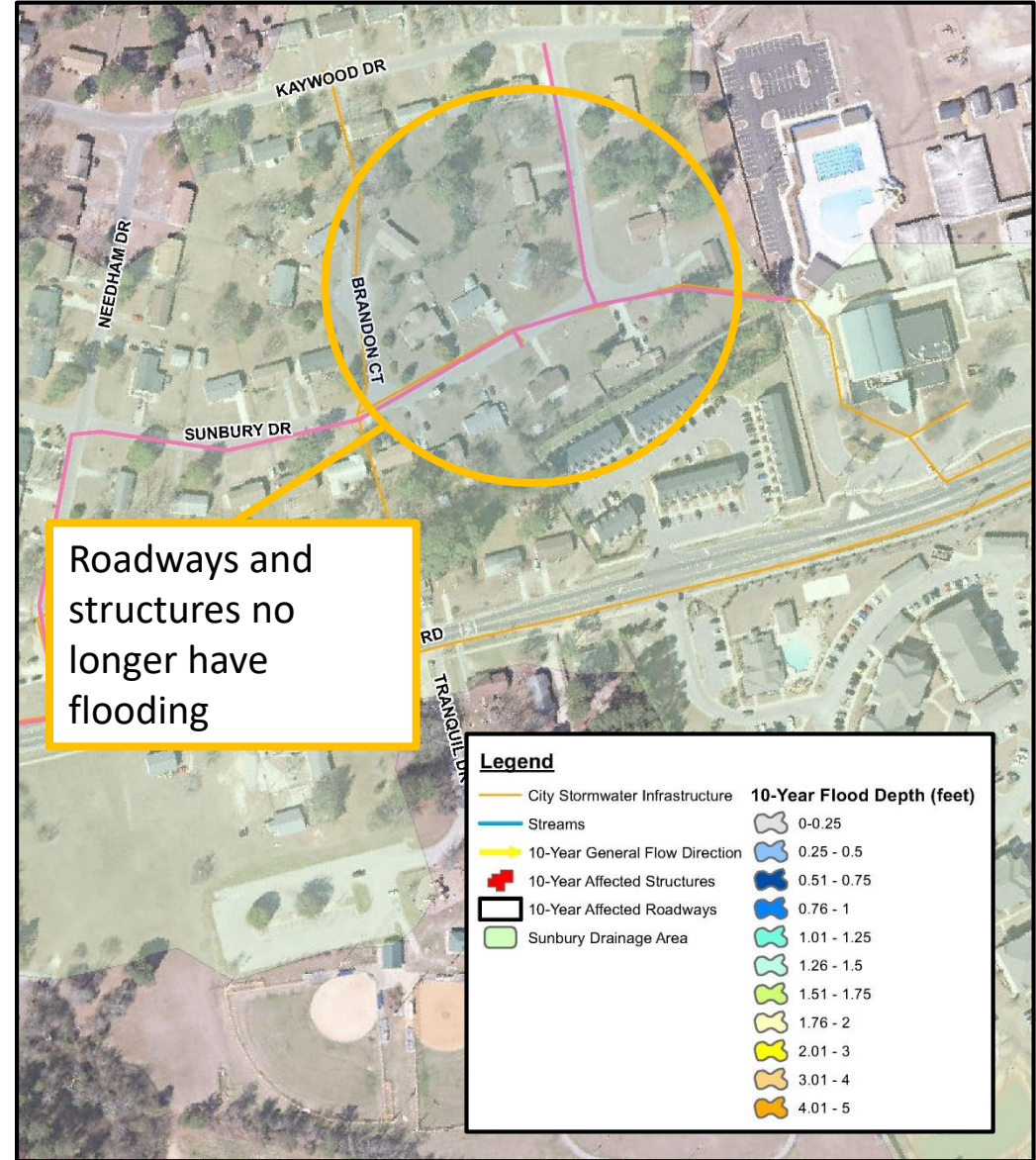
- Second highest scoring project
- Primarily residential area (Warrenwood Estates)
- Curb & gutter for drainage, but system undersized
- Significant street and yard flooding during major storm events
- Project includes 2,700 lf of new 36" to 42" storm sewers and 18 drainage structures
- Project cost = \$3,724,000



SUNBURY DRIVE PROJECT AREA

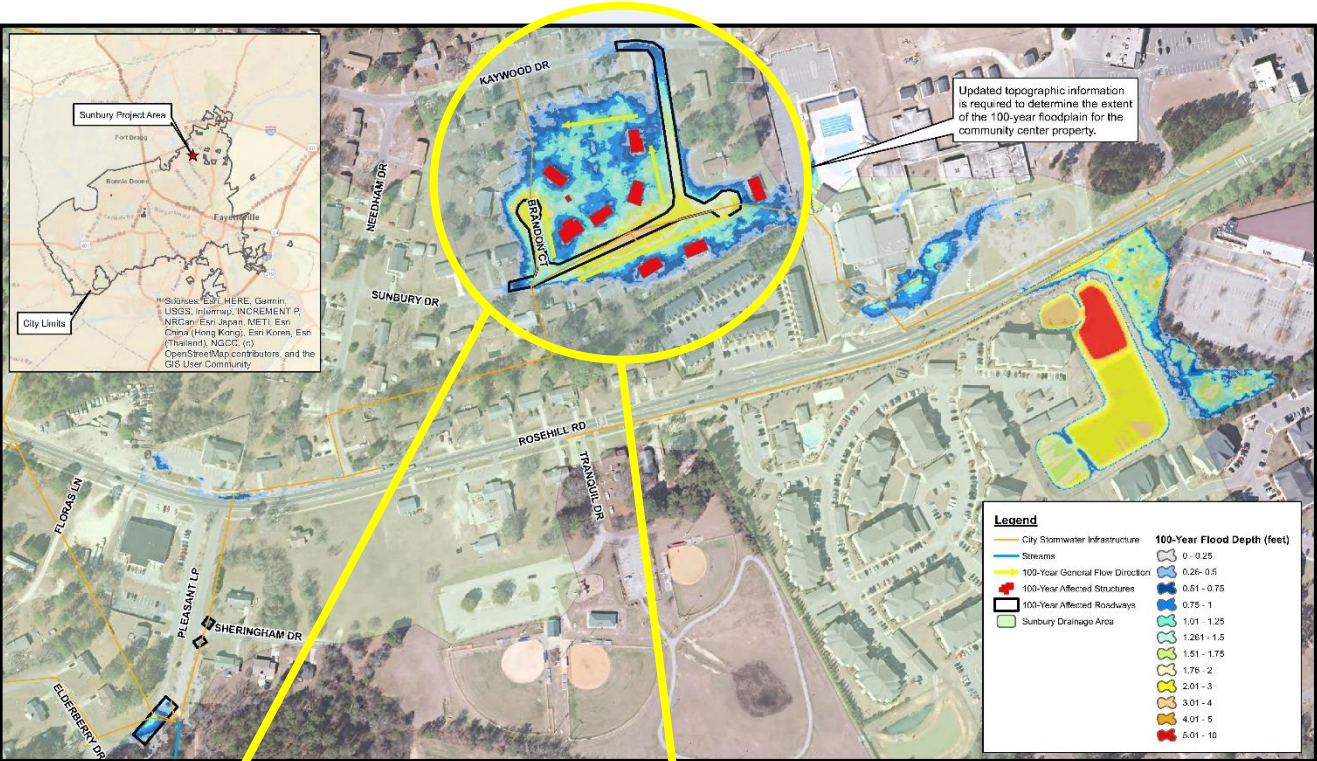


10-YR STORM EXISTING CONDITIONS



10-YR STORM PROPOSED CONDITIONS

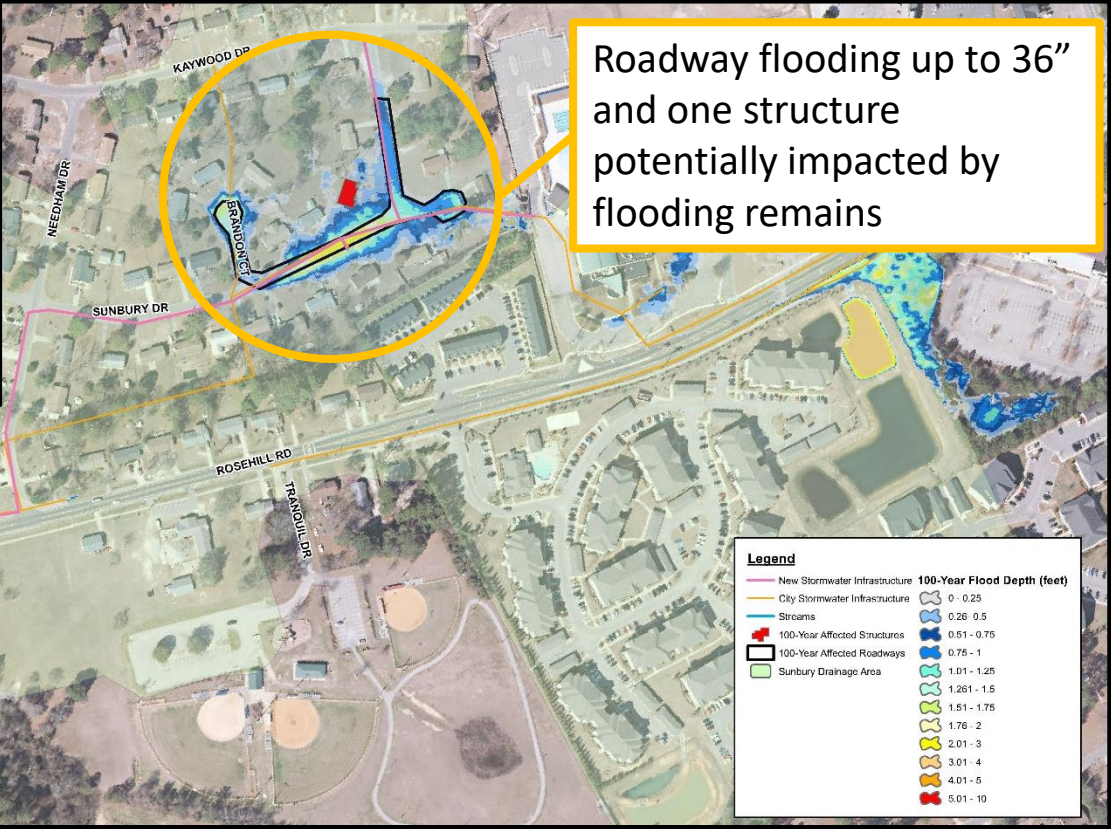
SUNBURY DRIVE PROJECT AREA



Roadway flooding up to 48"

Eight structures potentially impacted by flooding

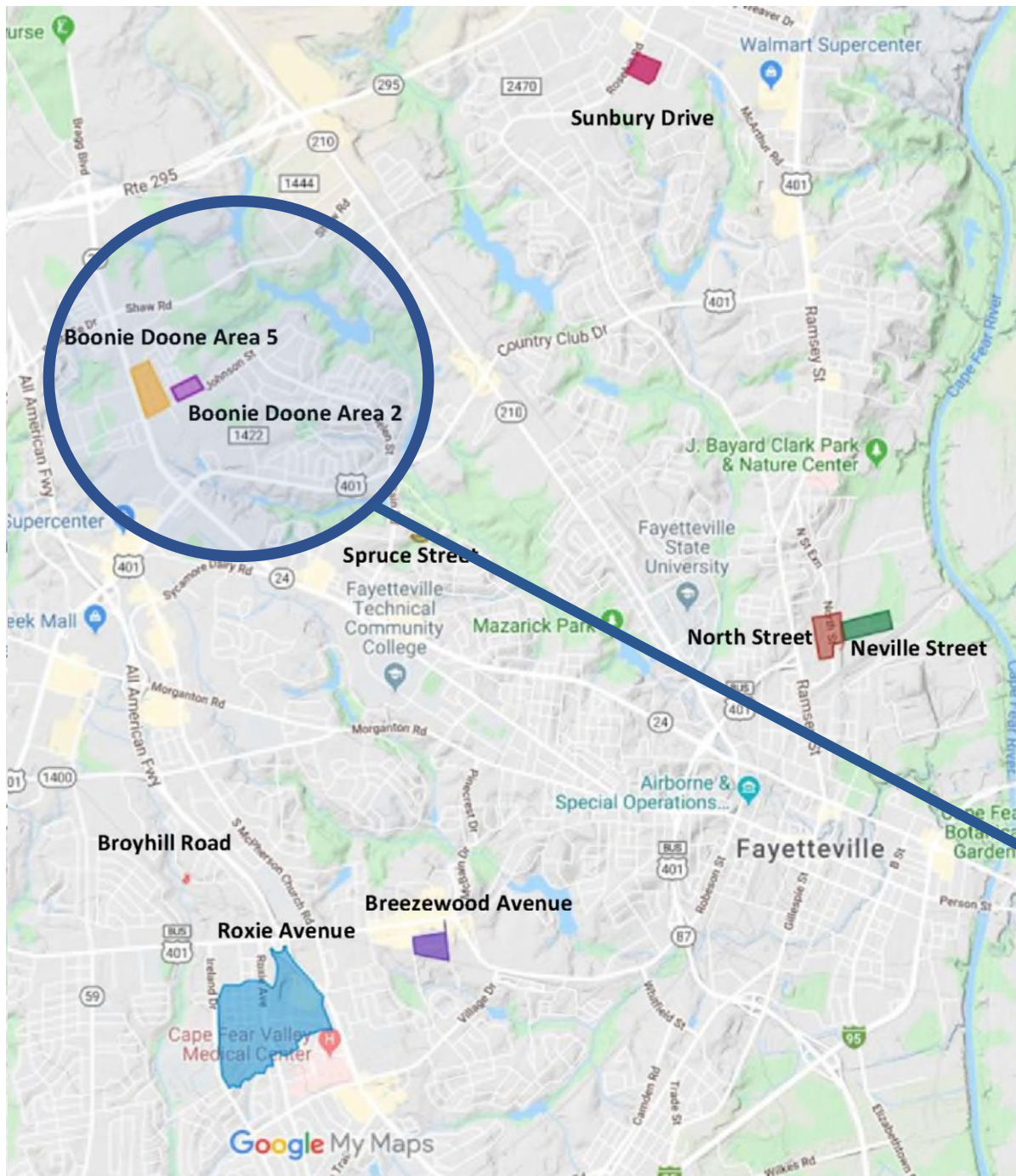
100-YR STORM EXISTING CONDITIONS



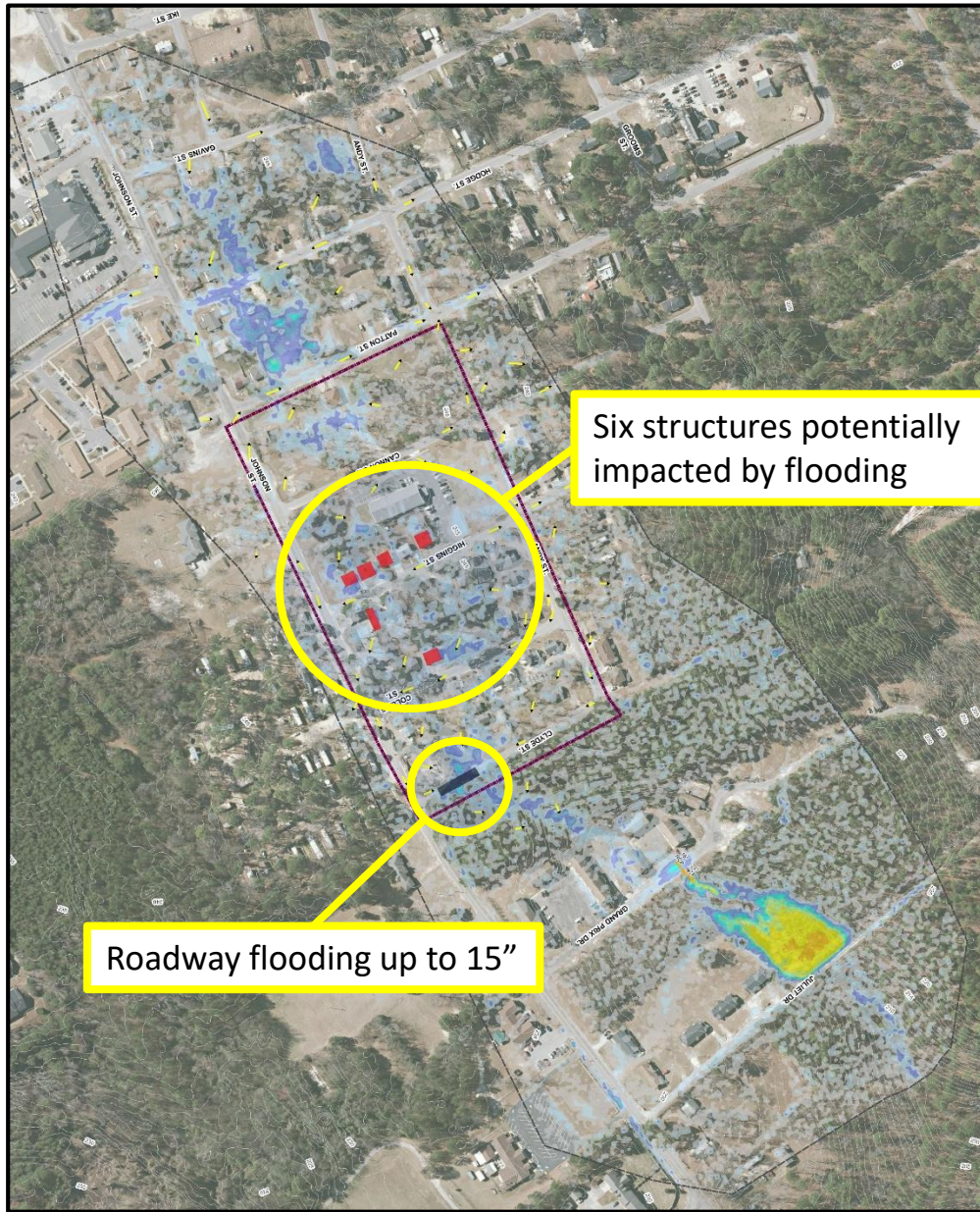
100-YR STORM PROPOSED CONDITIONS

Bonnie Doone 2

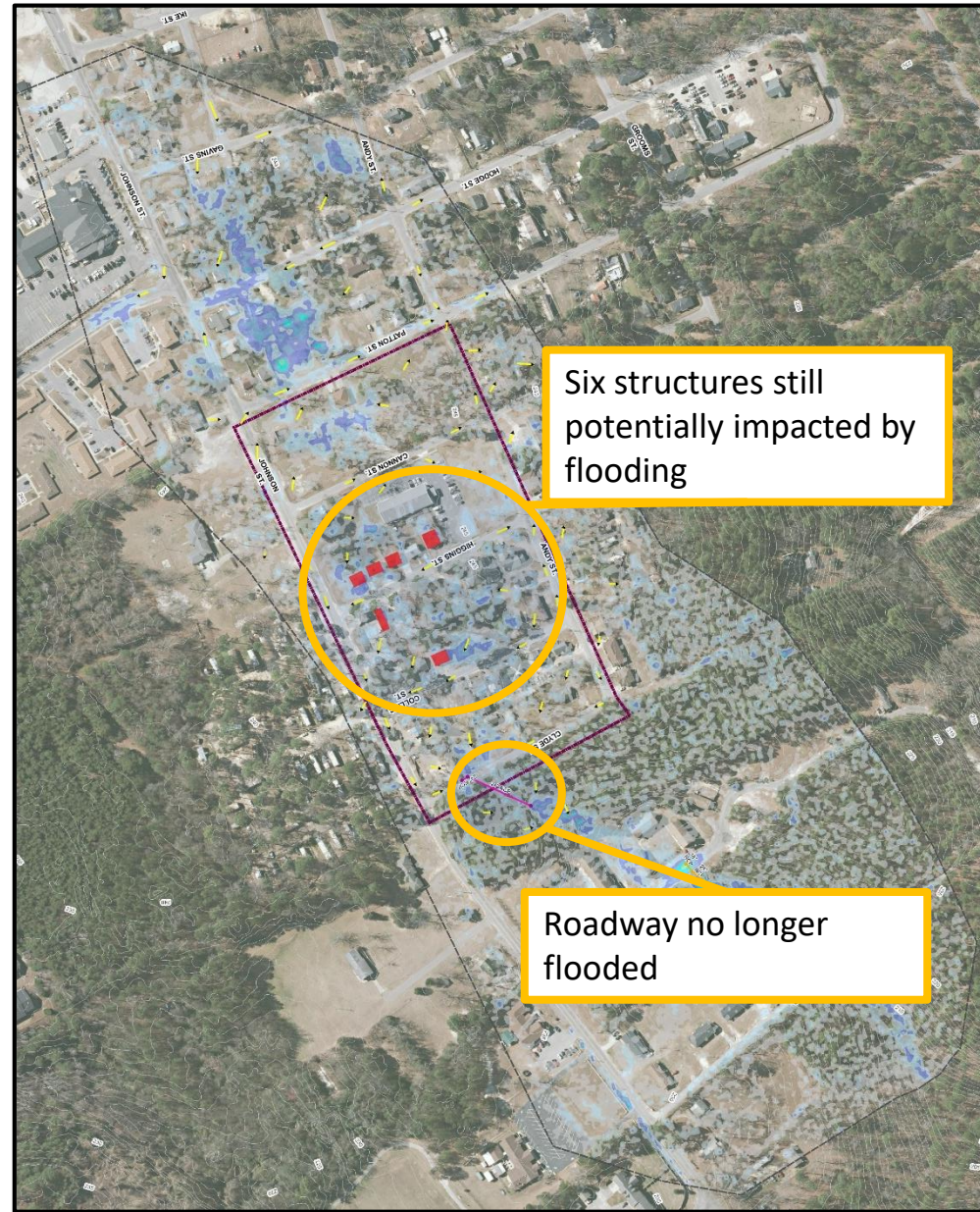
- Second lowest scoring project
- Low to moderate income residential area (Bonnie Doone)
- No curb & gutter or ditches for drainage
- Past complaints of yard flooding
- Project includes 2,000 lf of new curb/gutter and 15" to 18" storm sewers and inlets
- Project cost = \$1,711,000



BONNIE DOONE 2 PROJECT AREA



10-YR STORM EXISTING CONDITIONS



10-YR STORM PROPOSED CONDITIONS



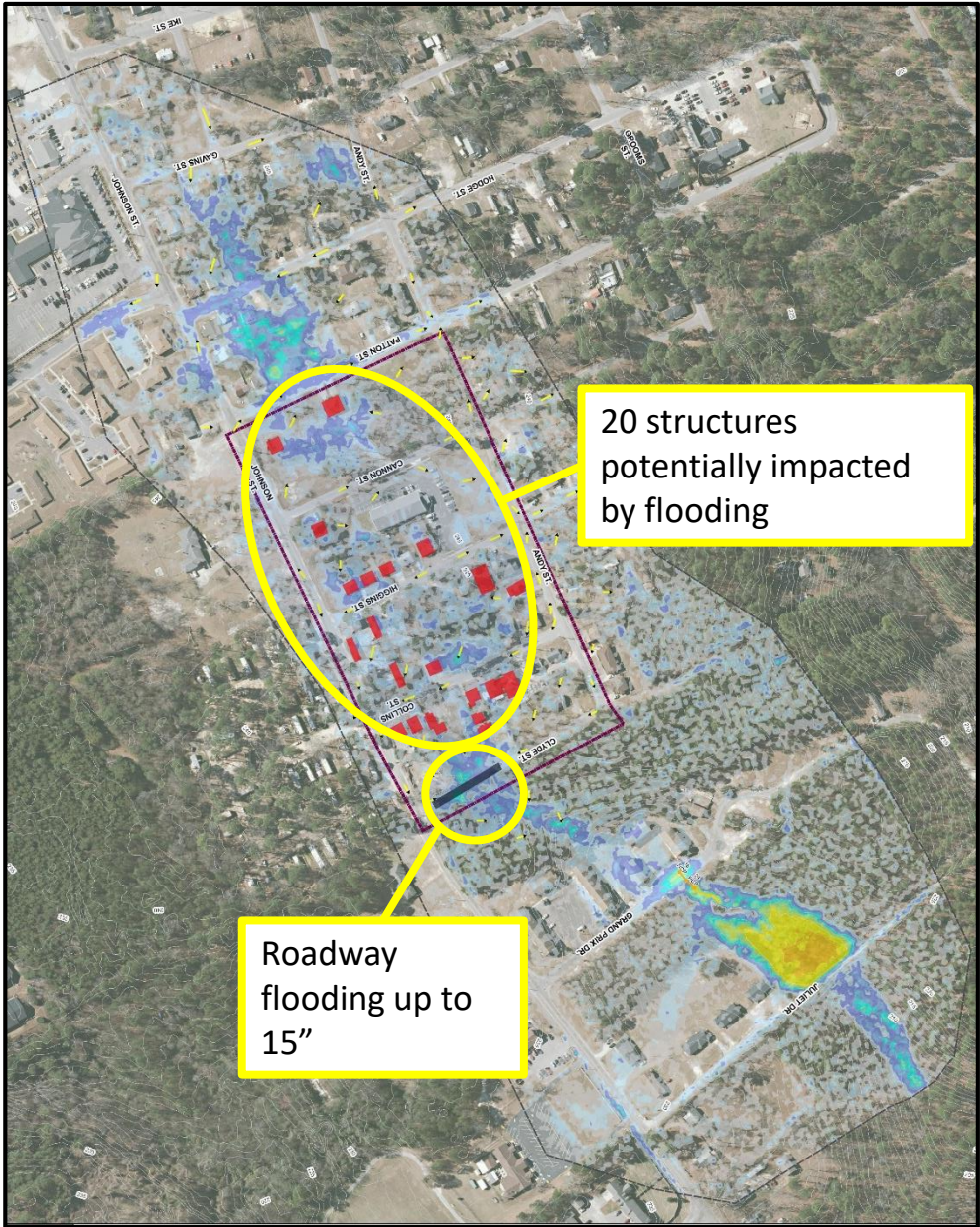
Legend

- Direction of Flow
- Existing 1-D Nodes
- Existing 1-D Conduits
- Proposed 1-D Nodes
- Proposed 1-D Conduits
- RoadNames
- Study Area
- 2D Model Extent
- Impacted Structures
- Impacted Roads
- QL2 LIDAR Contours (1 ft)

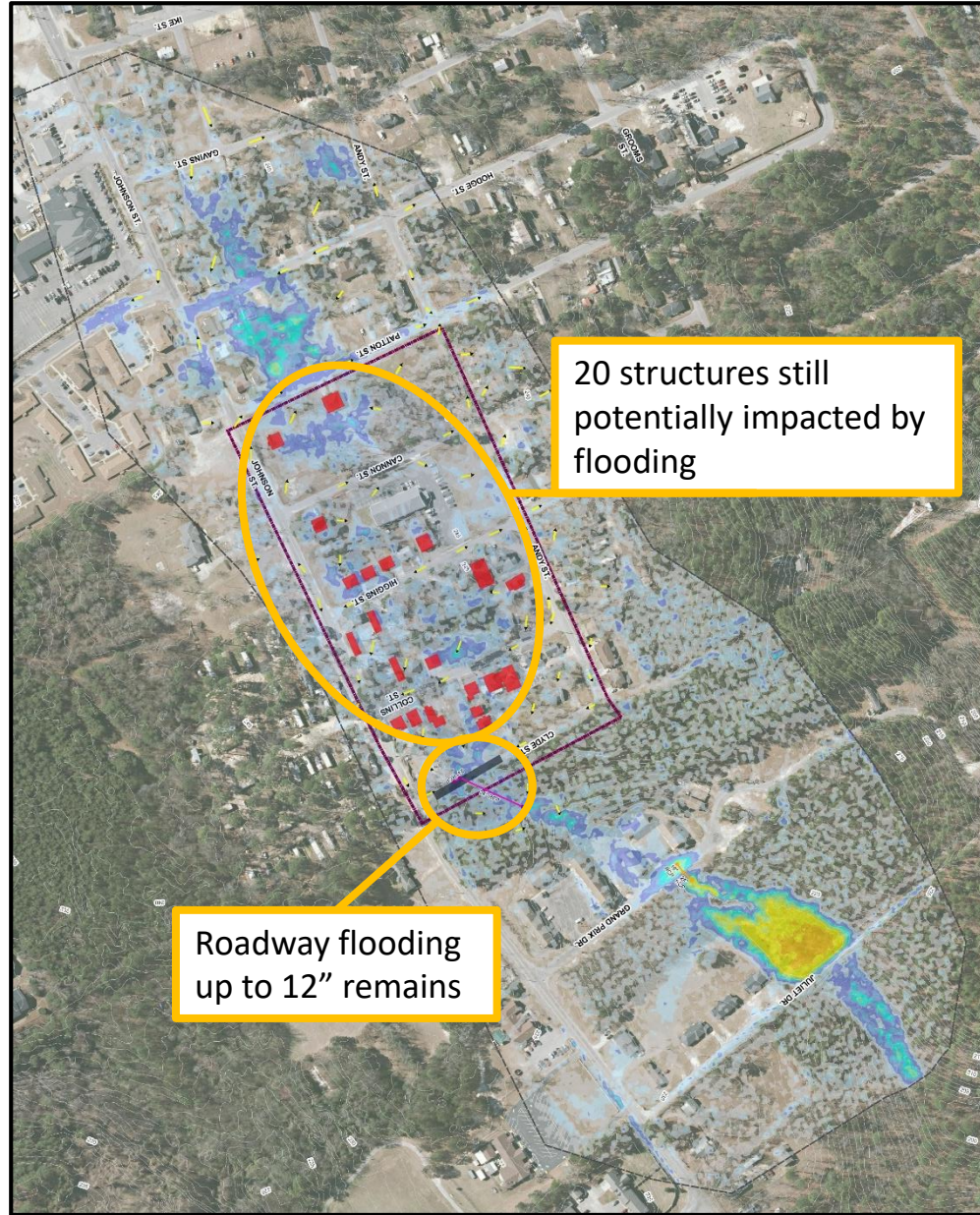
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BONNIE DOONE 2 PROJECT AREA



100-YR STORM EXISTING CONDITIONS



100-YR STORM PROPOSED CONDITIONS

Legend

- Direction of Flow
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Recommendations

- Move forward with Spruce Street, Sunbury Drive and North Street projects = \$8.2M (\$7.2M City)
 - Spruce Street = \$431,000
 - Sunbury Drive = \$3,724,000
 - North Street = \$4,035,000

	Project	Total Score	Z Score
Medium Priority	Spruce Street	75	1.97
	Sunbury Drive	65	0.66
	North Street	61	0.13
Low Priority	Bonnie Doone Area 5	59	-0.13
	Roxie	58	-0.26
	Broyhill	58	-0.26
	Bonnie Doone Area 2	55	-0.66
	Breezewood Drive	49	-1.44

Project Rankings

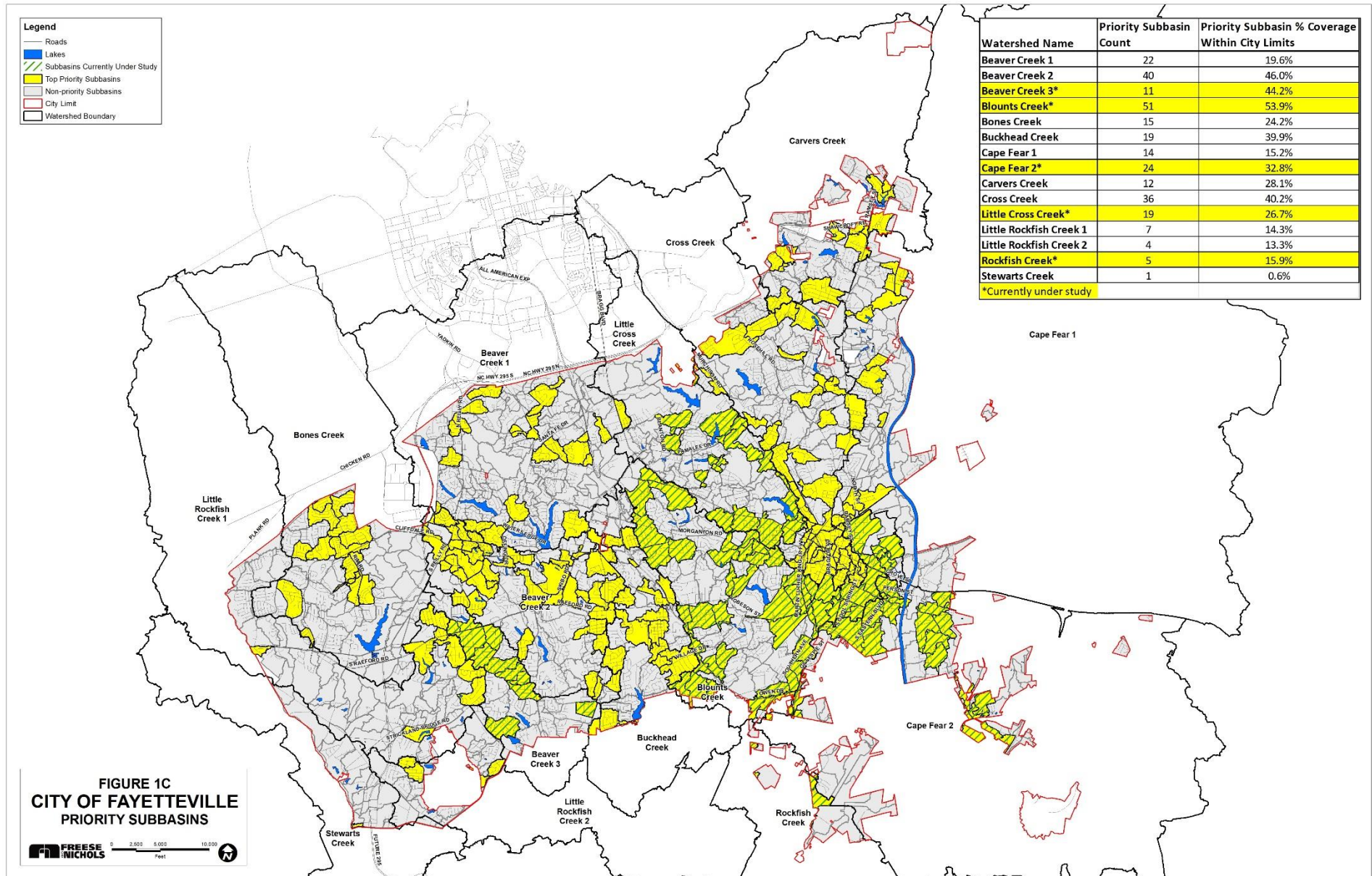


Council Direction Request – CIP Overview

		SW Est. Cost (Excludes Paid for by Others)	Appropriated Budget	Available Budget	FY21	FY22	FY23	FY24	FY25
Projects Watershed Study								\$3,000,000	\$1,000,000
Ray Avenue				\$111,373	\$332,960				
Hinsdale Rd								\$105,660	\$462,195
College Lake Dam									\$2,695,484
	Total Est. Cost	SW Est. Cost (Excludes Paid for by Others)	Appropriated Budget	Additional Funding Need	FY21	FY22	FY23	FY24	FY25
Sunbury Dr_867 CIP	\$3,723,700	\$3,452,400	\$198,519	\$3,253,881	funds used from projects below				
North St CIP	\$4,035,400	\$3,328,400	\$2,840,293	\$488,107	funds used from projects below				
Spruce Street Phase 3	\$430,700	\$370,700	\$541,330	-\$170,630	remainder to be moved to Sunbury				
Neville St CIP	\$1,749,200	\$631,190	\$613,344	\$17,846	funds used from projects below				
Higher Priority	\$9,939,000	\$7,782,690	\$4,193,486	\$3,589,204					
	Total Est. Cost	SW Est. Cost (Excludes Paid for by Others)	Appropriated Budget	Available Budget	FY21	FY22	FY23	FY24	FY25
Breezewood_2700 CIP	\$2,574,300	\$2,305,050	\$159,719	\$77,800					
Broyhill CIP	\$618,700	\$508,020	\$574,817	\$512,331					
Bonnie Doone Area 2 CIP	\$1,711,200	\$1,587,800	\$668,000	\$597,140					
Bonnie Doone Area 5 CIP	\$1,750,800	\$1,640,800	\$1,567,103	\$1,468,084					
Roxie Phase 1 CIP	\$4,532,600	\$3,835,688	\$1,481,331	\$1,099,269					
Lower Priority	\$11,187,600	\$9,877,358	\$4,450,970	\$3,754,624					
Total Cost All Projects	\$21,126,600	\$17,660,048							

Watershed Modelling Program

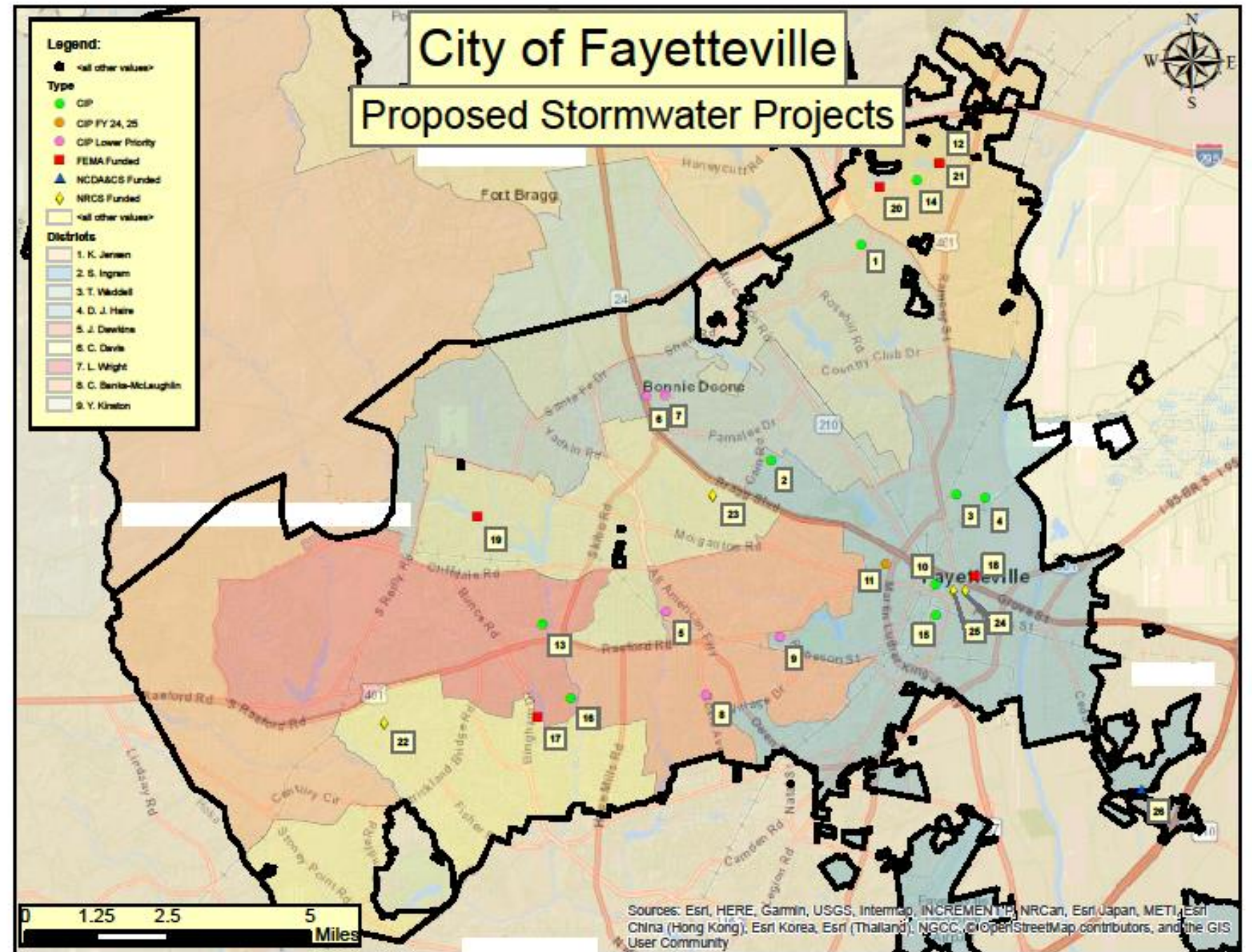
- ❖ High Priority Sub Catchments Modelled FY 20 – FY 23
- ❖ Allows for data driven analysis of highest value projects based on severity of flooding and effectiveness of project
- ❖ Catchments in hatch are being studied FY 20



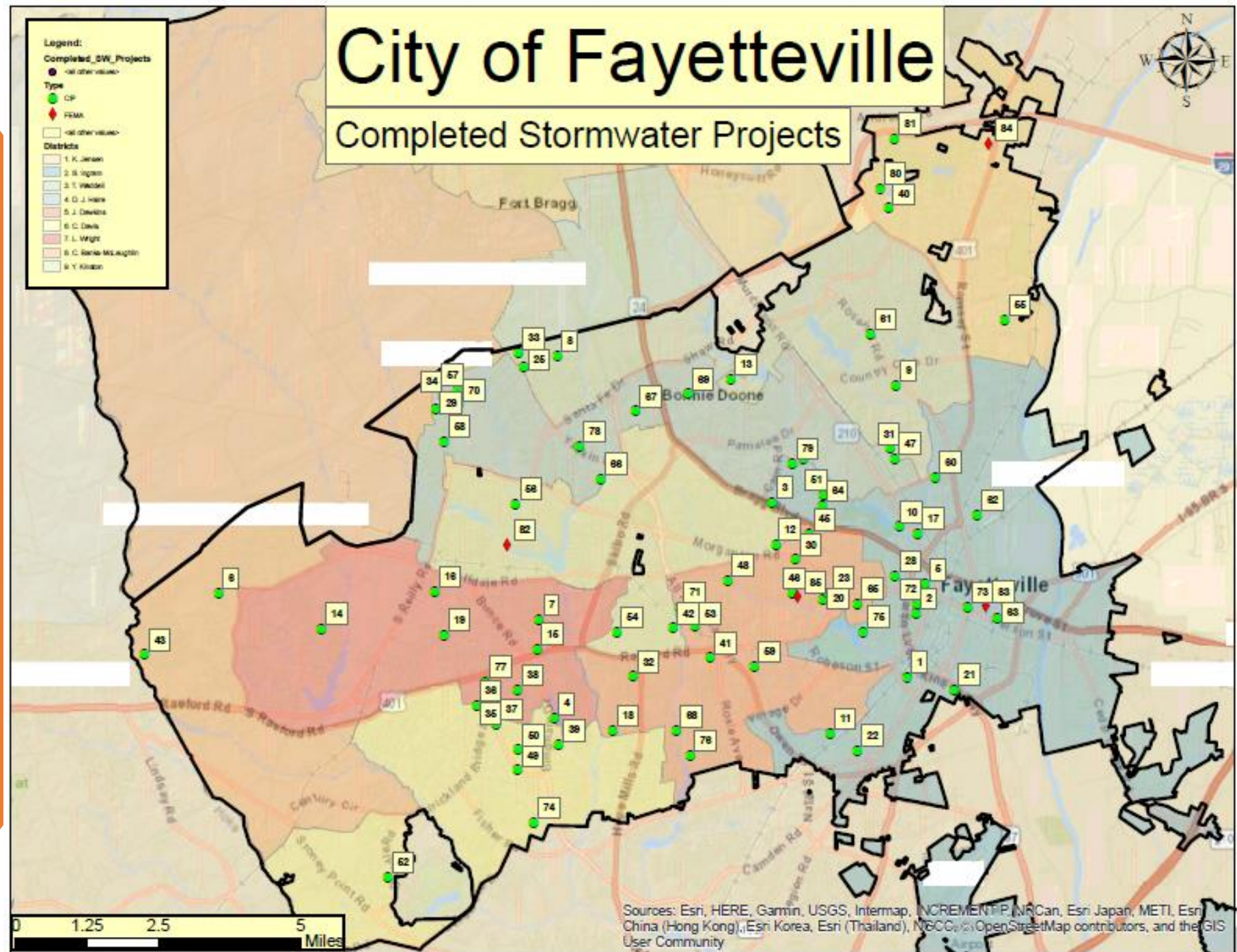
Existing/Proposed Projects:

1. Major SW CIP (\$9.9M in next 2 yrs.)
2. Spot Repair (\$446K in next 2 yrs.)
3. FEMA Obligated (\$11.7M in next 2 yrs.)
4. NRCS – Stream Erosion Grant (\$2.6M in next 2 yrs.)
5. Dept. of Agriculture Stream Clean Up Grant (450K in next 1 yrs.)

Total = ~\$25M



**Completed
Stormwater
Projects
since 2009
~\$35M**





Stormwater Completed, Proposed Projects and Drainage Assistance Projects

The below link has the Stormwater completed and proposed projects, and DAP projects by District. We have also provided Council handouts on a few items.

<https://fayettevillenc.gov/government/city-departments/public-services/projects>



Council Direction Request – CIP Overview

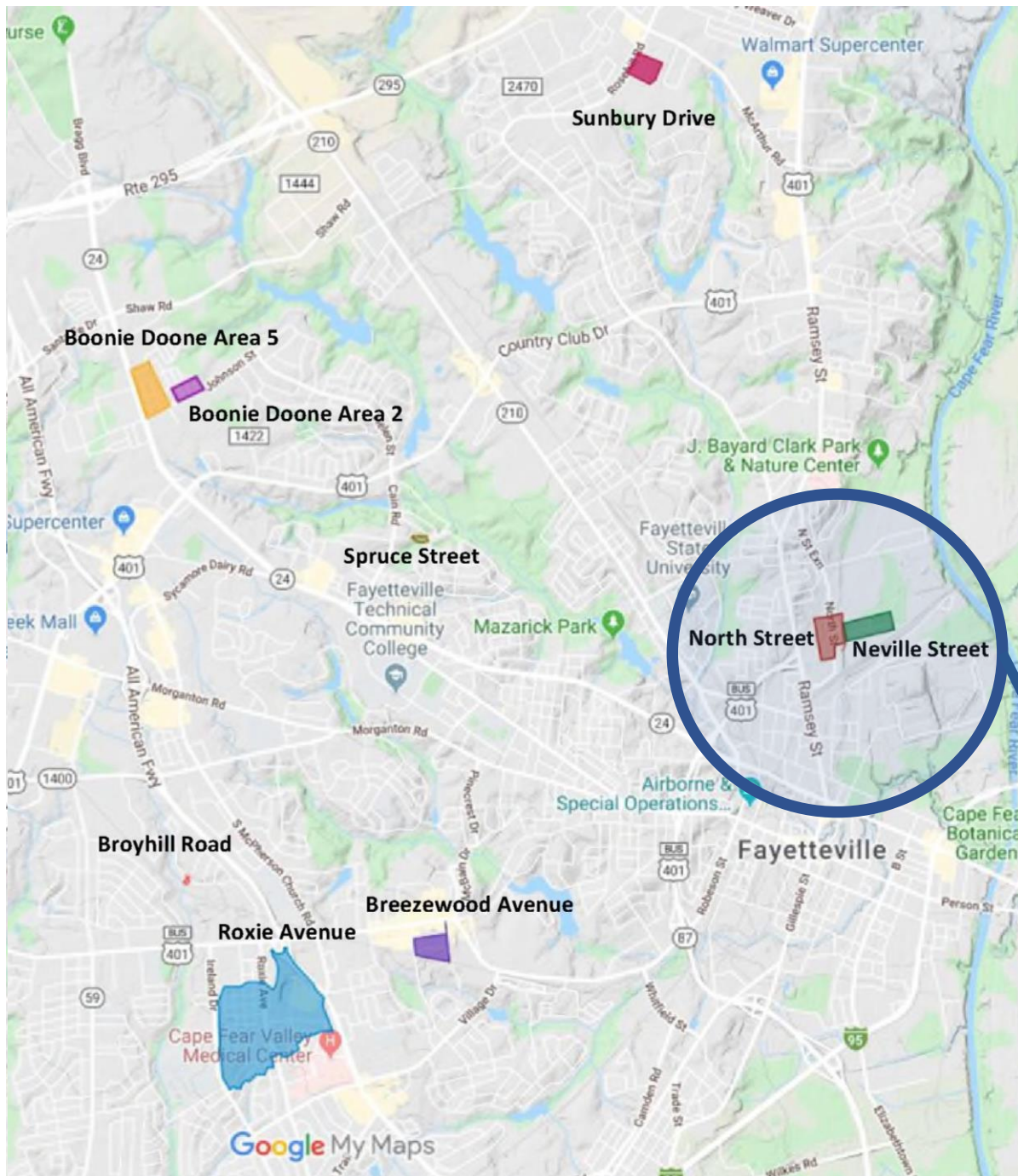
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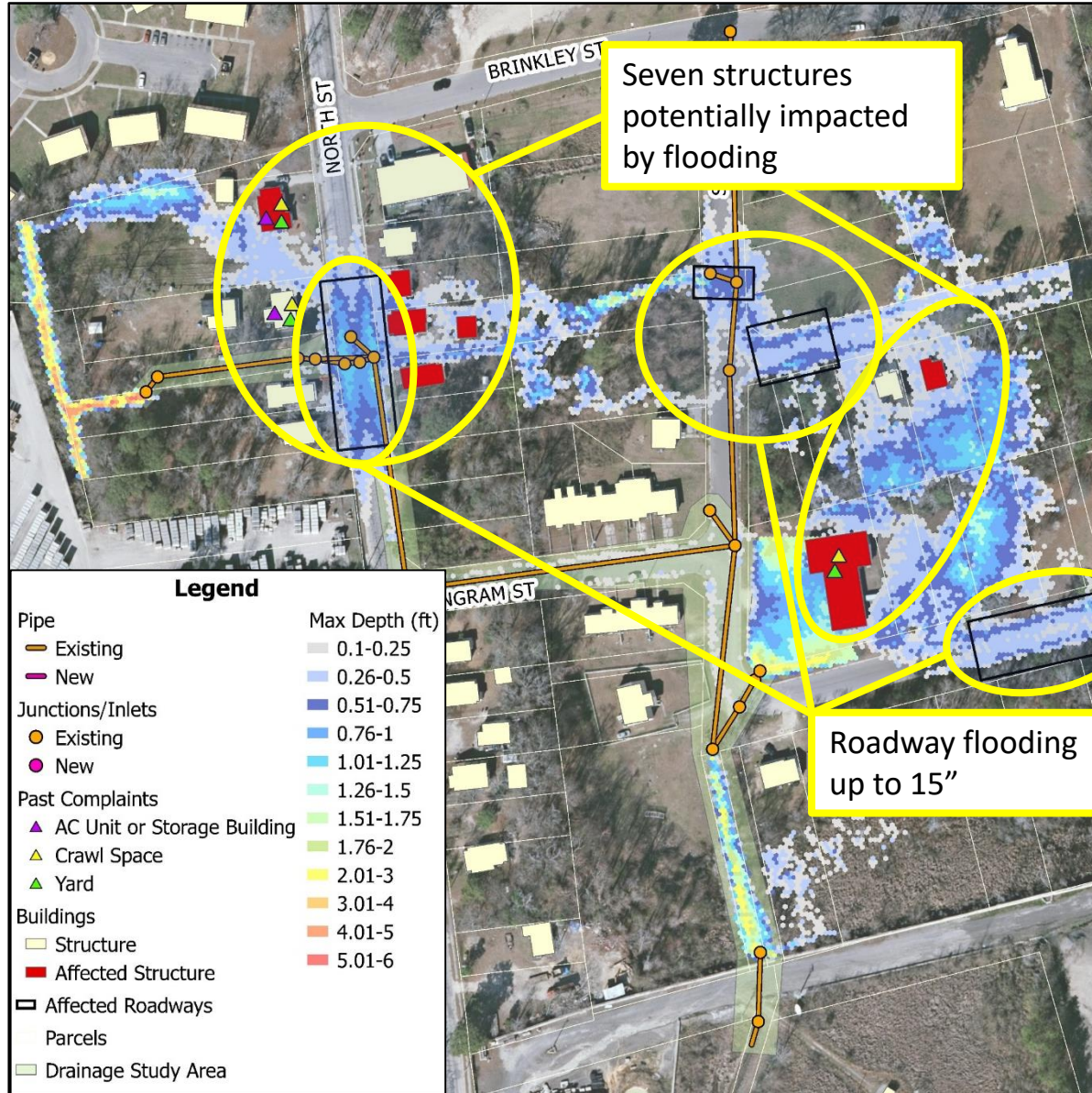
THANK YOU!

North Street

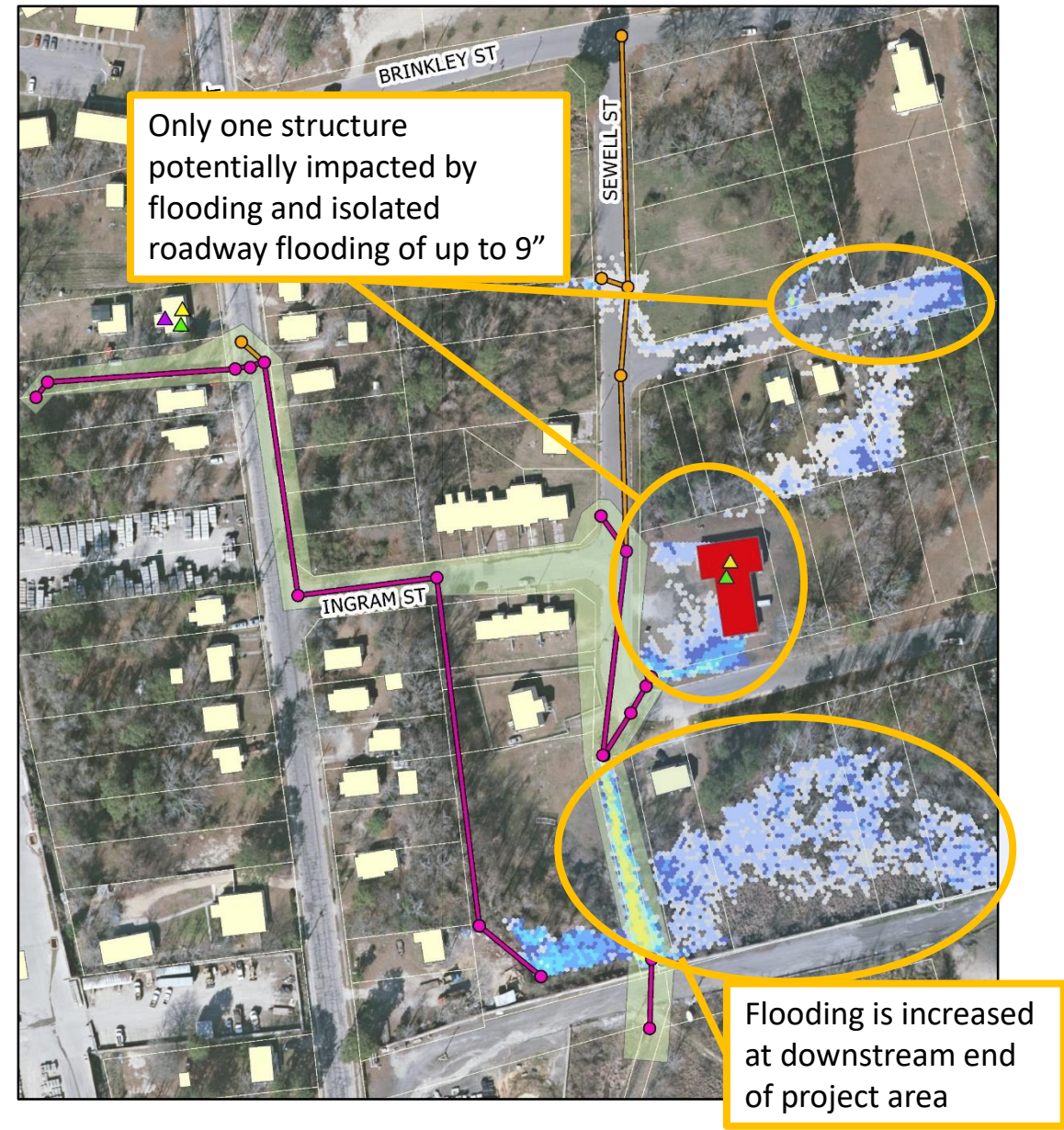
- Low to moderate income area with residential/commercial mix (Fairview)
- Curb & gutter for drainage, but system is undersized and in poor condition
- Past complaints of structure and yard flooding
- Project includes 2,000 lf of new 24" to 108" storm sewers and culverts
- Project cost = \$4,035,000



NORTH STREET PROJECT AREA

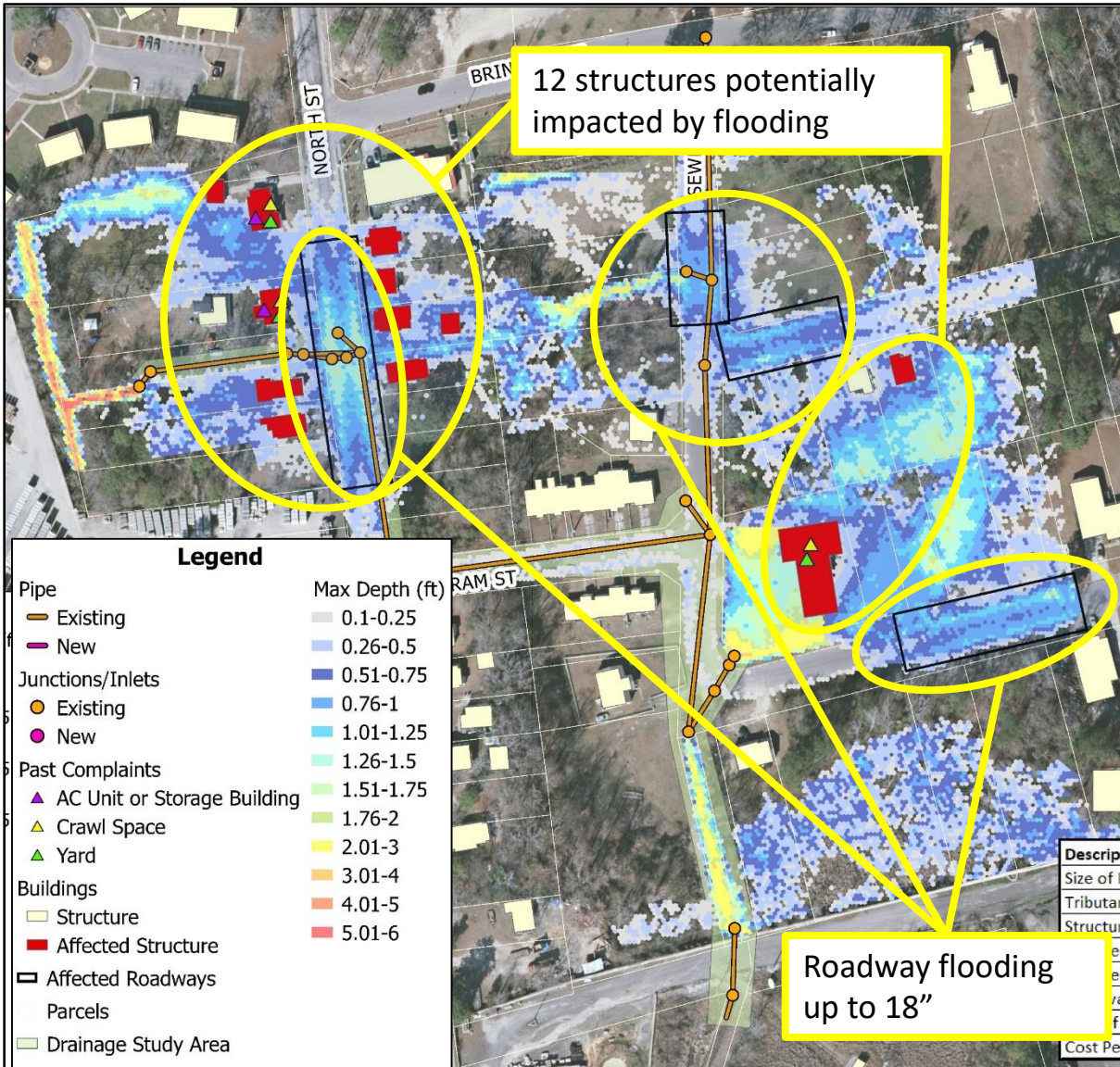


10-YR STORM EXISTING CONDITIONS

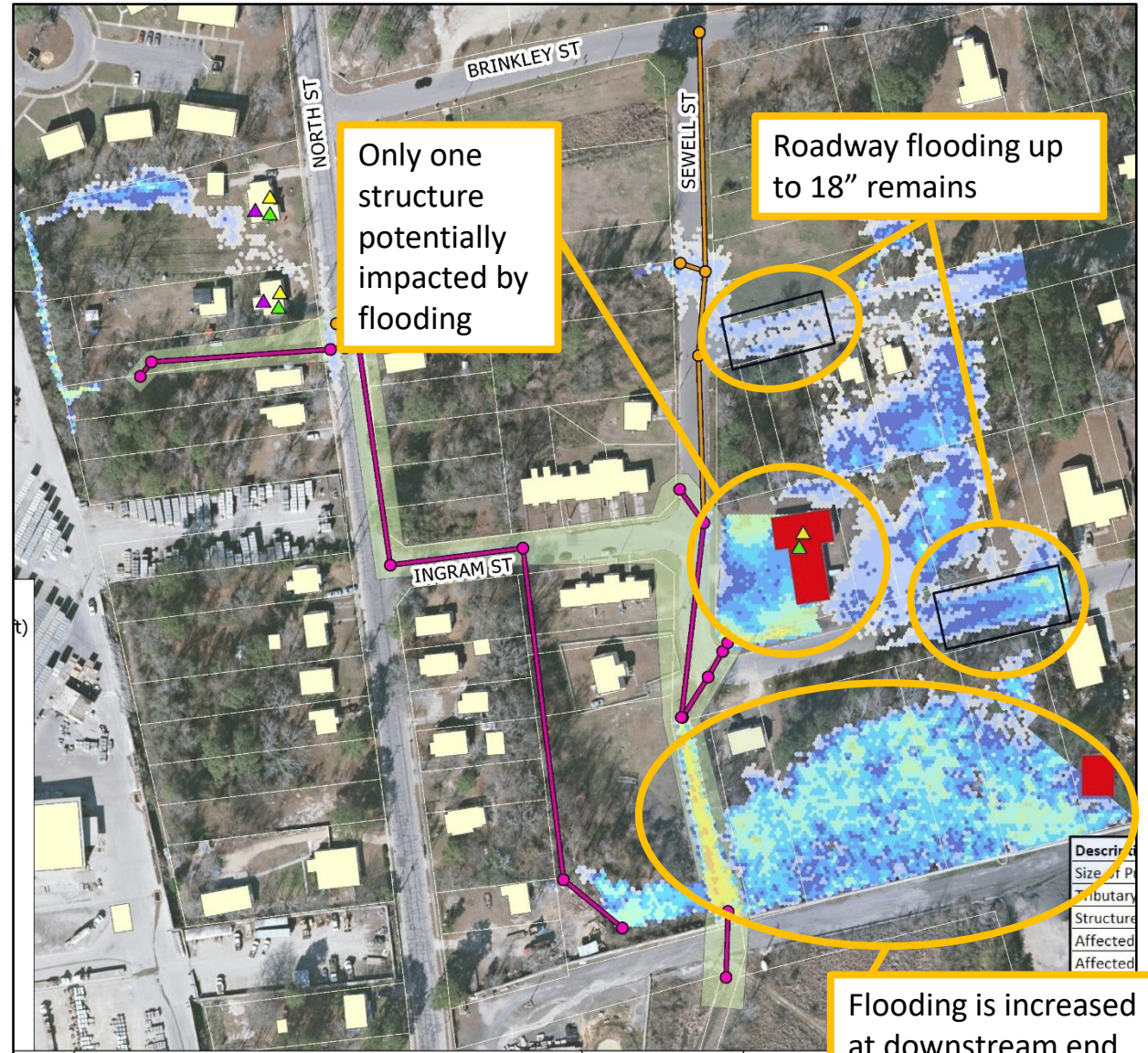


10-YR STORM PROPOSED CONDITIONS

NORTH STREET PROJECT AREA



100-YR STORM EXISTING CONDITIONS

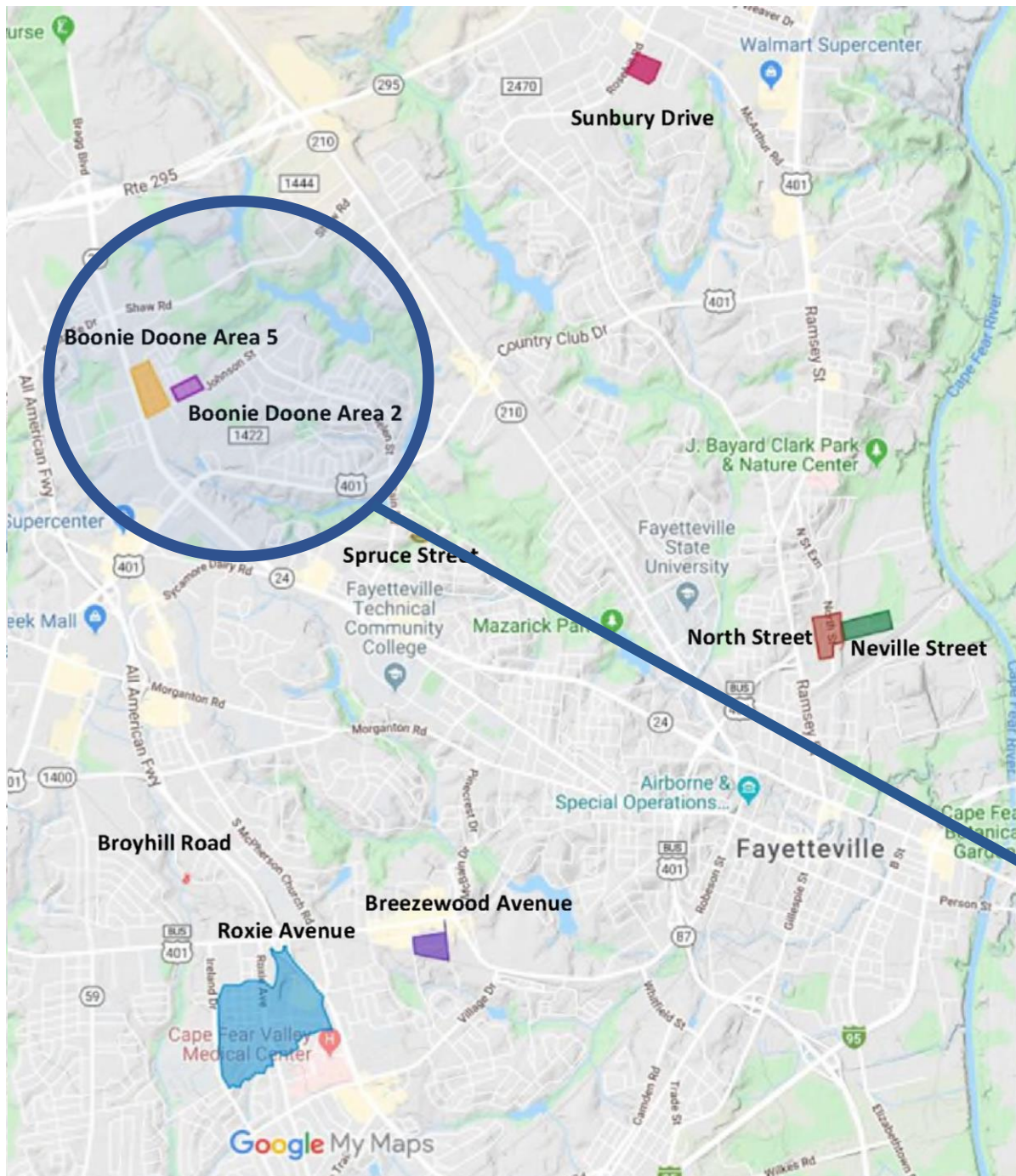


100-YR STORM PROPOSED CONDITIONS

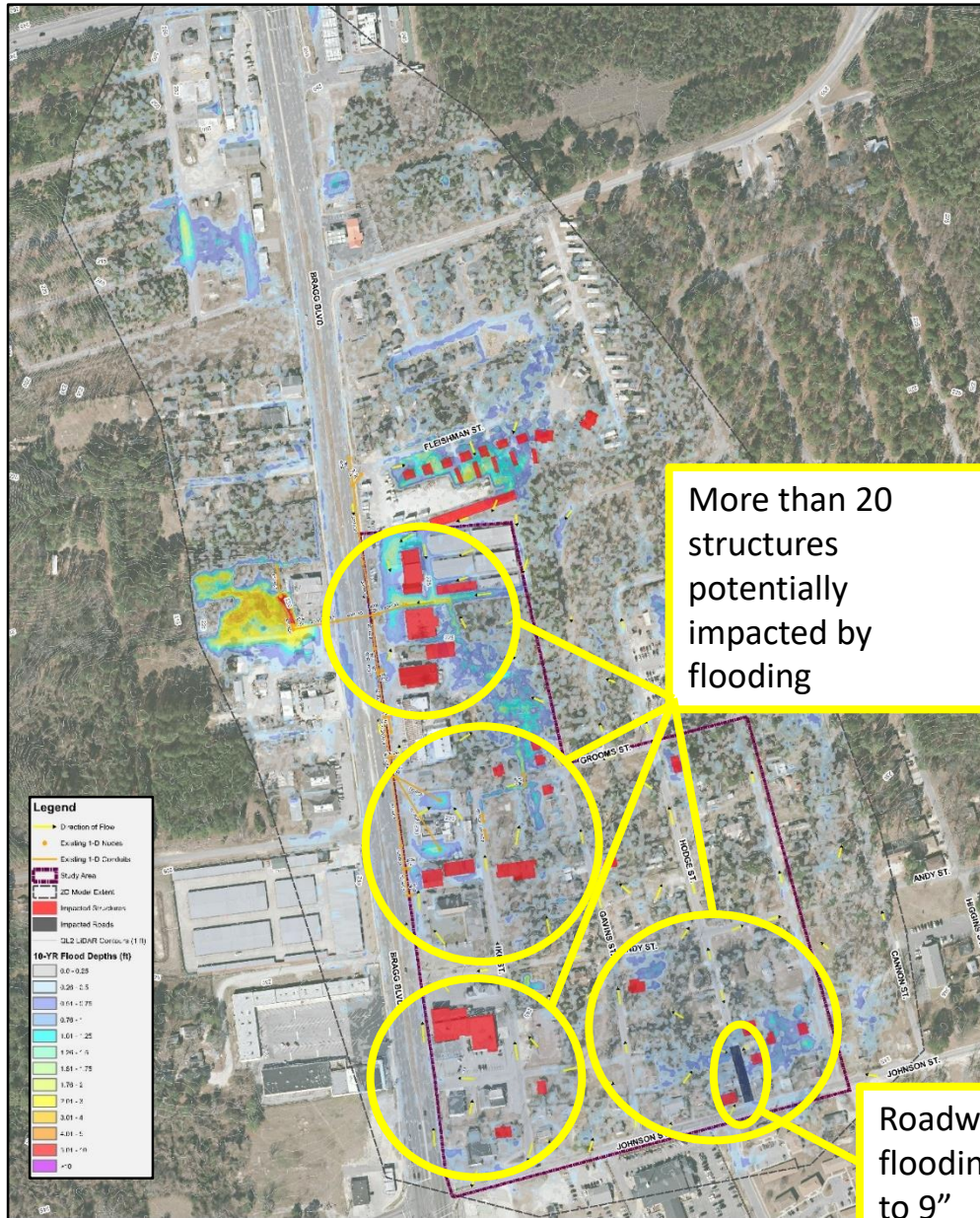
Flooding is increased at downstream end of project area

Bonnie Doone 5

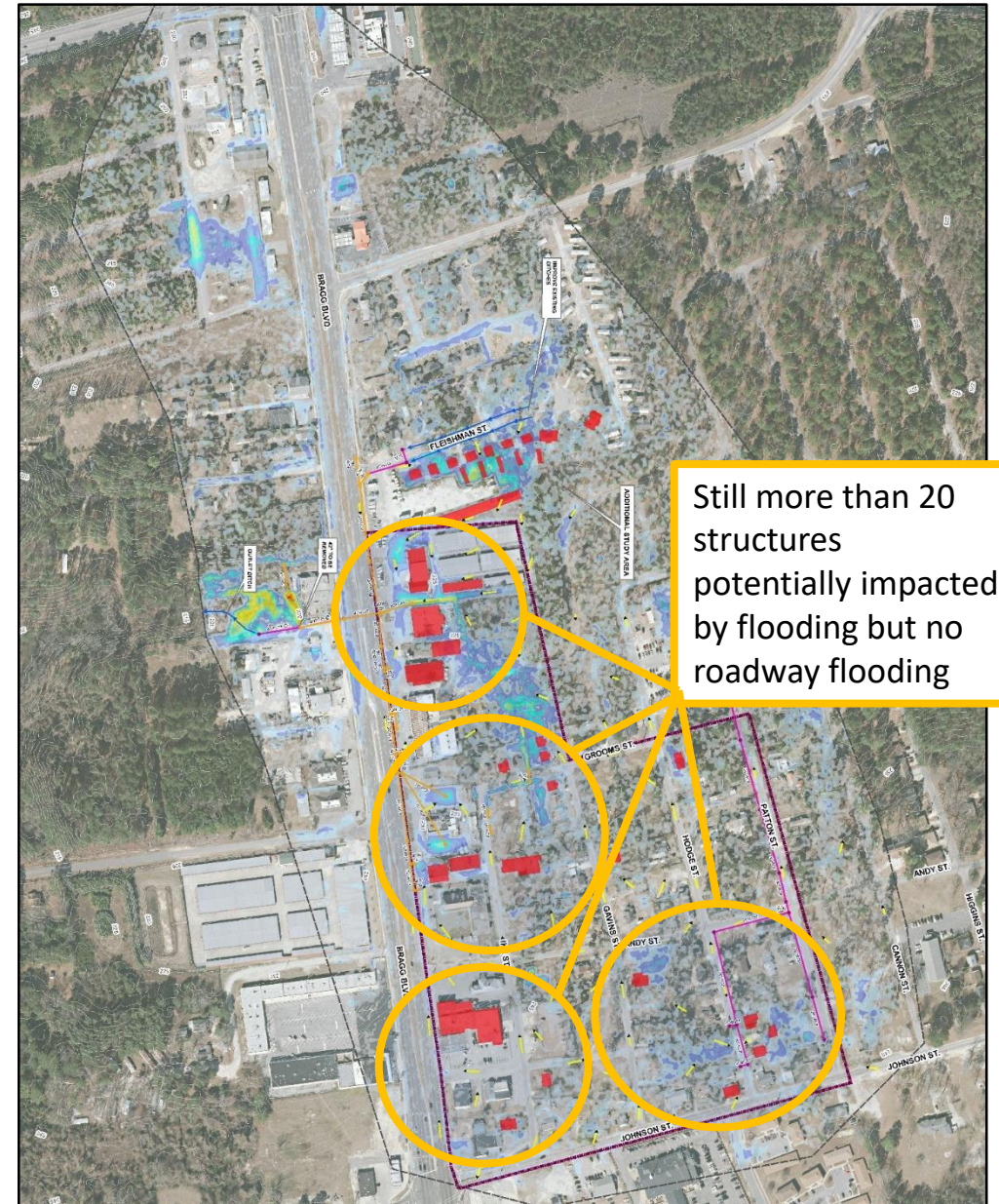
- Low to moderate income area of residential/commercial mix (Bonnie Doone)
- Limited curb & gutter or ditches for drainage
- Past complaints primarily of yard flooding
- Project includes 3,300 lf of new 15" to 30" storm sewers and inlets
- Project cost = \$1,751,000



BONNIE DOONE 5 PROJECT AREA

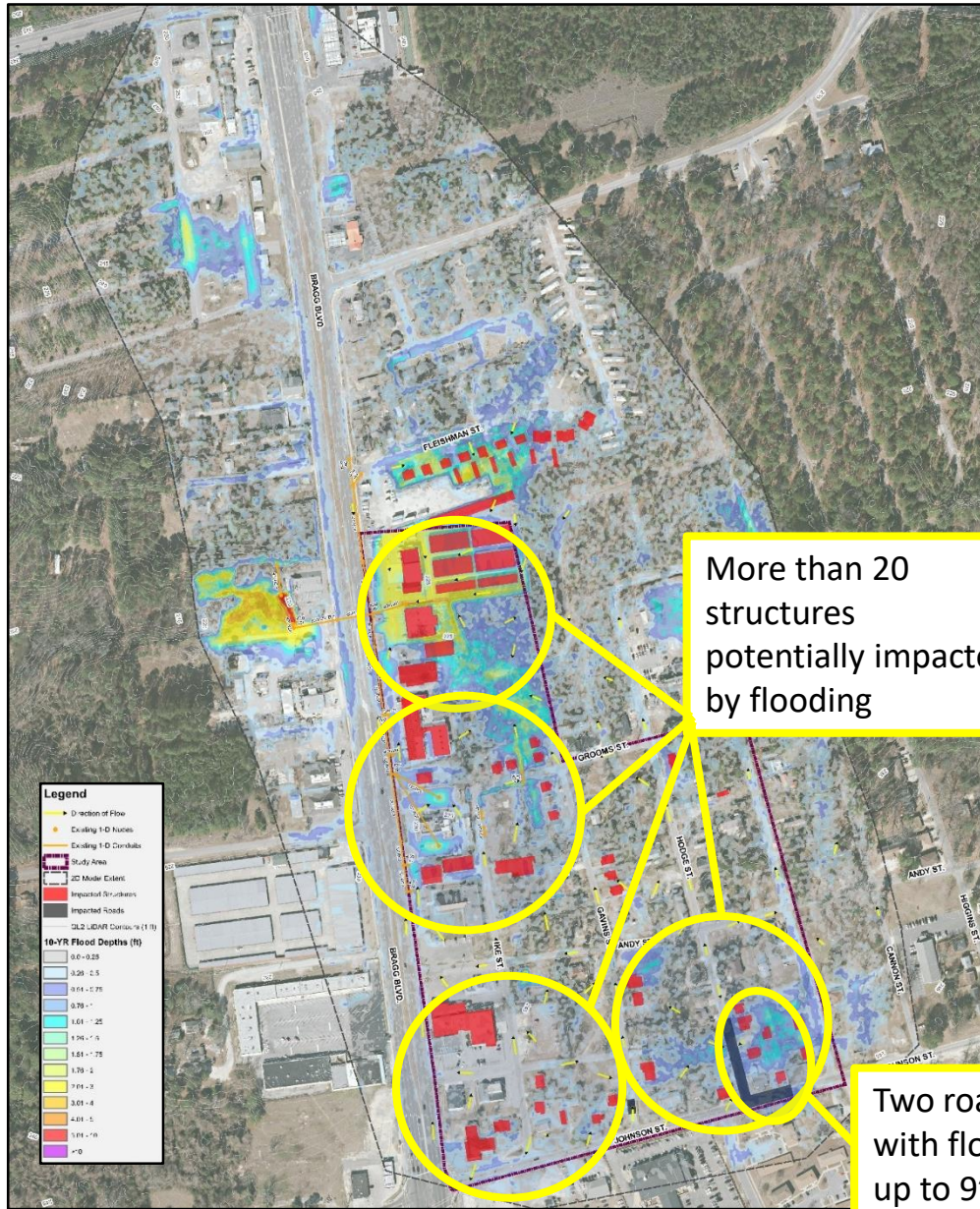


10-YR STORM EXISTING CONDITIONS

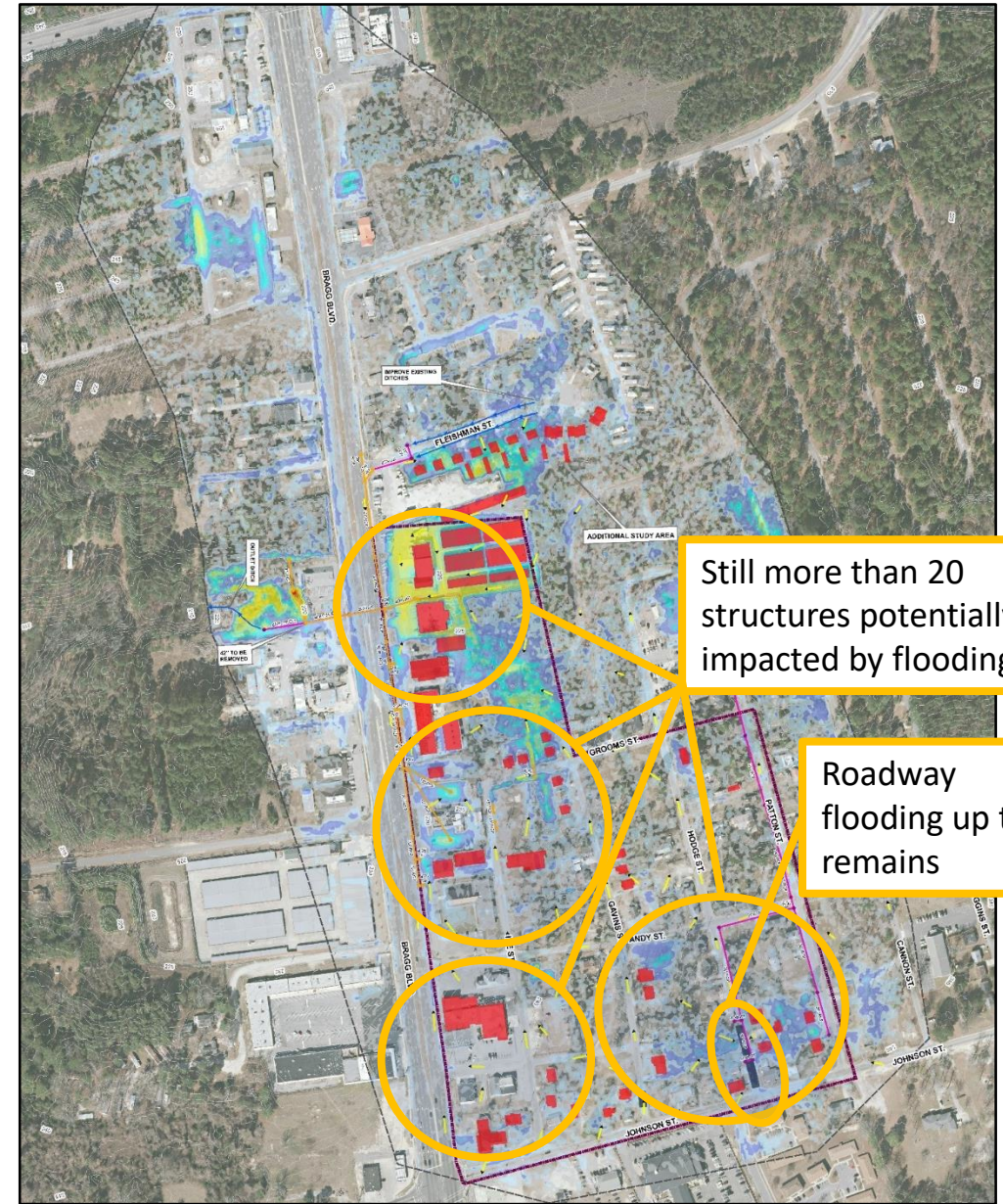


10-YR STORM PROPOSED CONDITIONS

BONNIE DOONE 5 PROJECT AREA



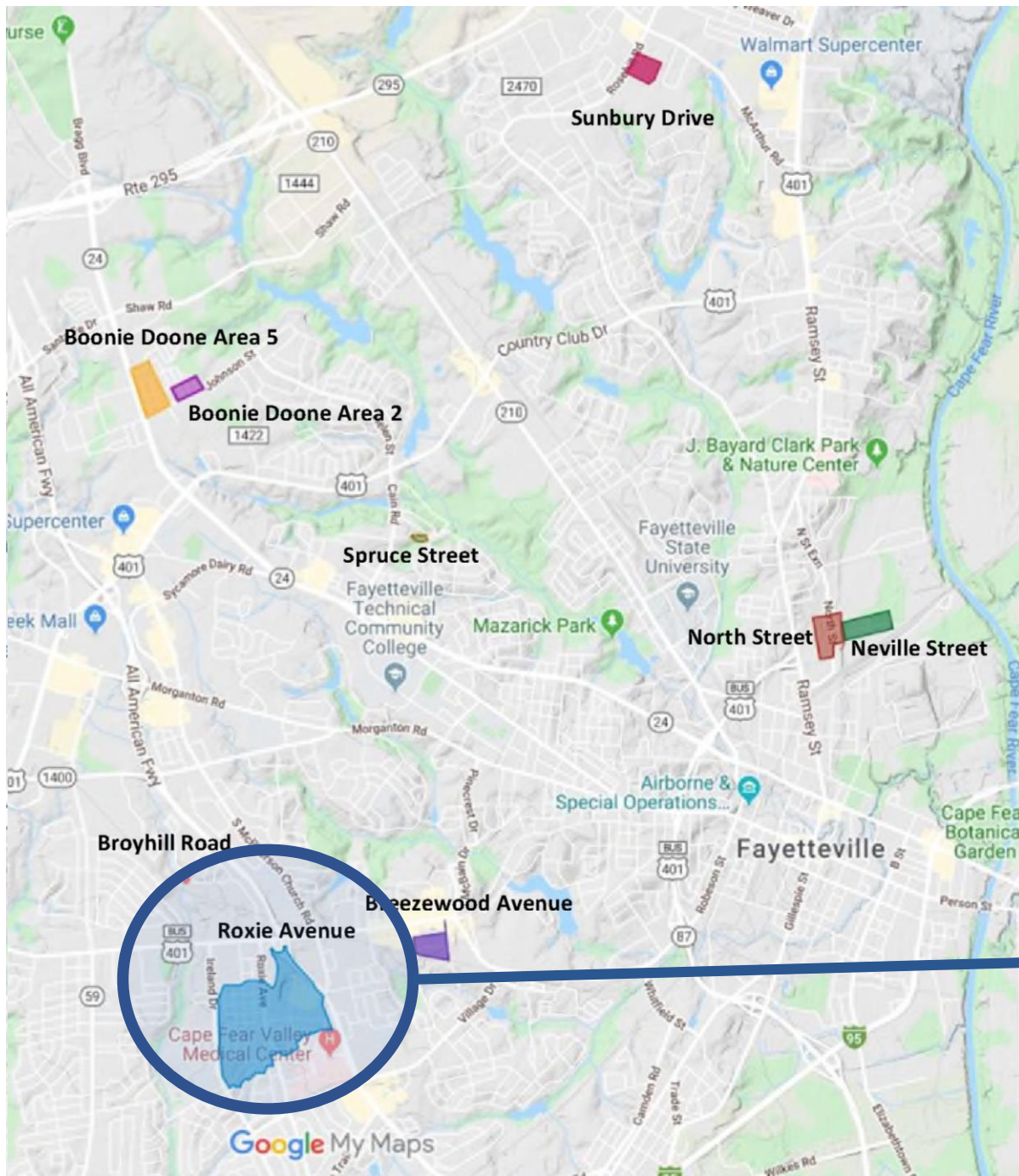
100-YR STORM EXISTING CONDITIONS



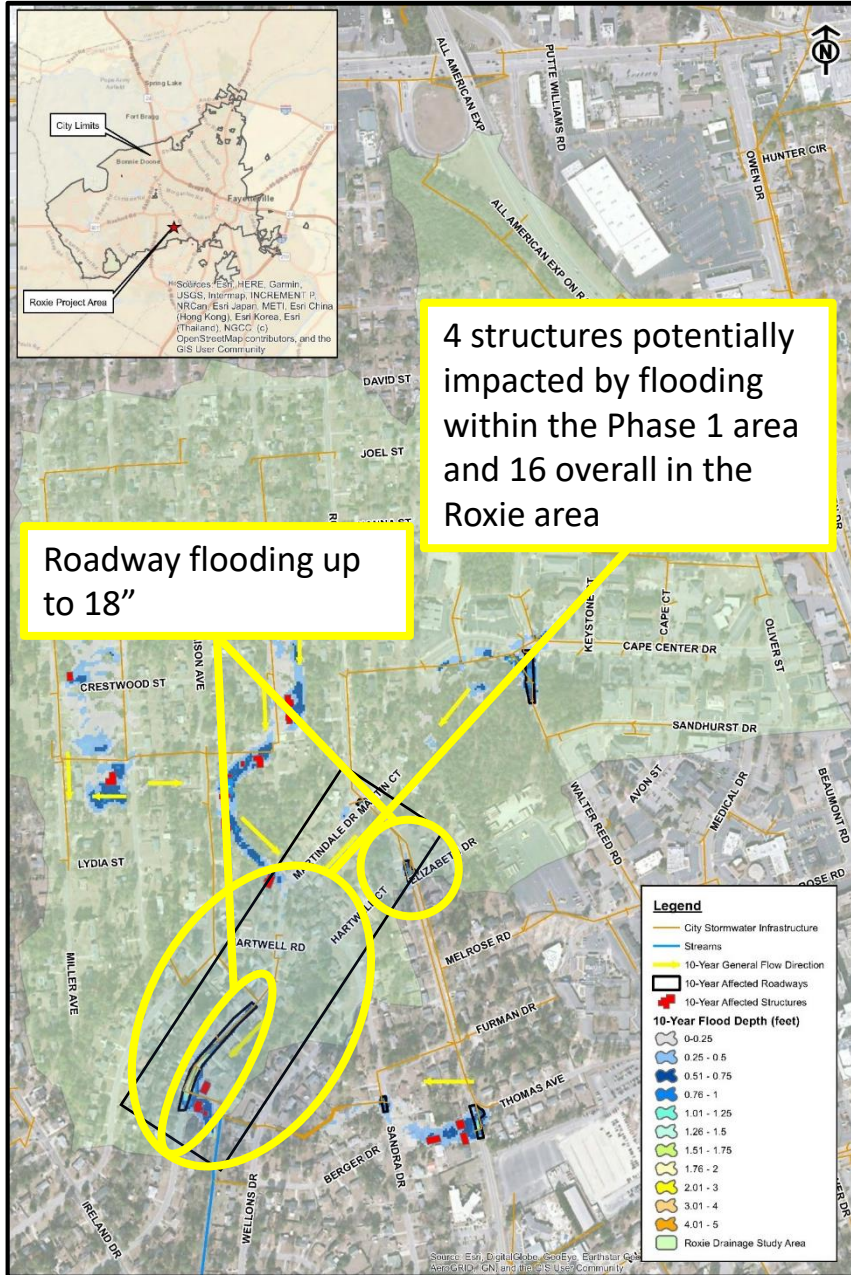
100-YR STORM PROPOSED CONDITIONS

Roxie Street

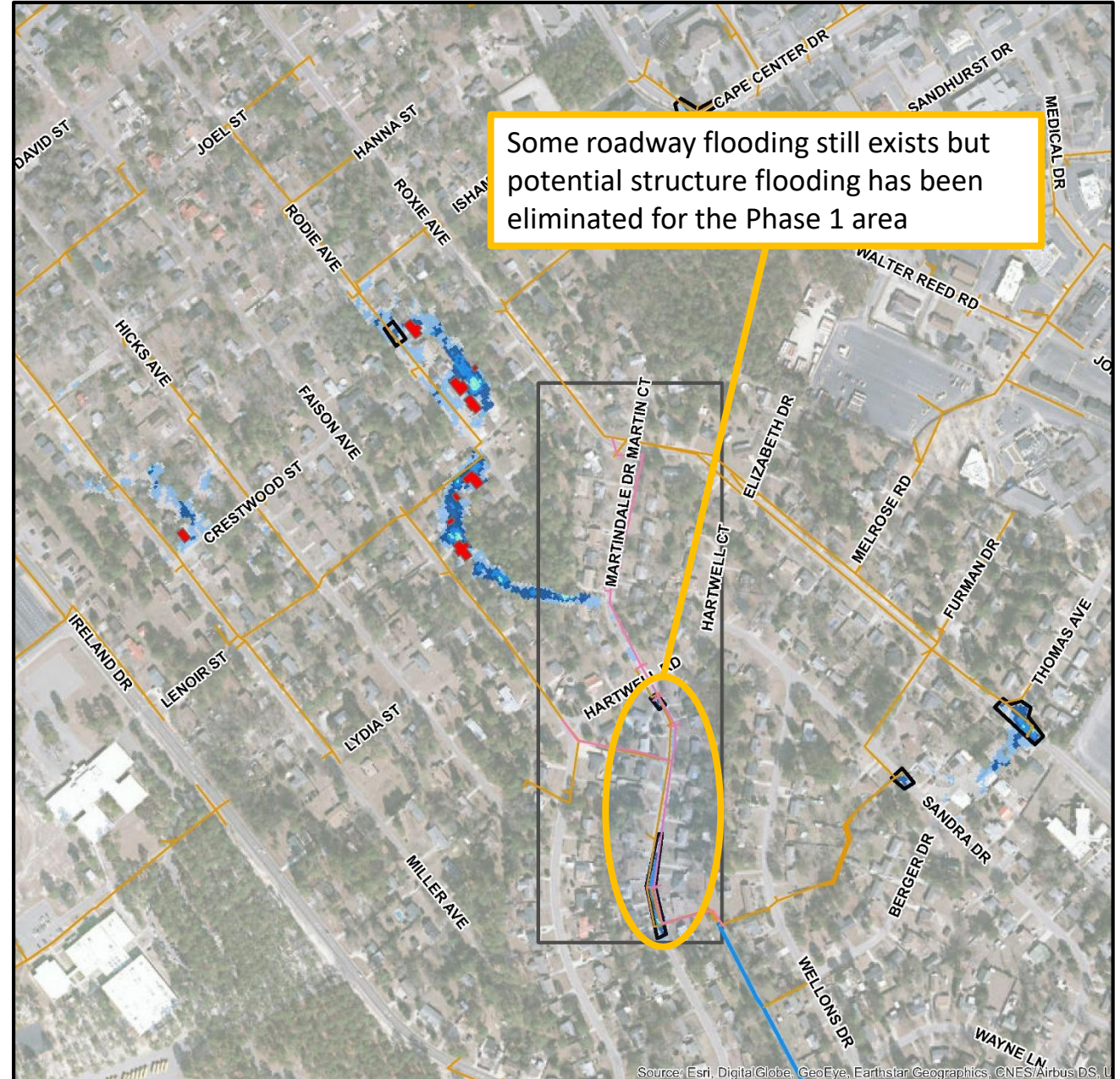
- Mix of residential and commercial areas in close proximity to medical center (Welmer Heights/Buckhead)
- First of three phases of drainage improvements proposed for area
- Past complaints primarily of road flooding
- Project includes 2,400 lf of new 18" to 48" storm sewers and 3'x5' box culverts
- Project cost = \$4,533,000



ROXIE STREET PROJECT AREA

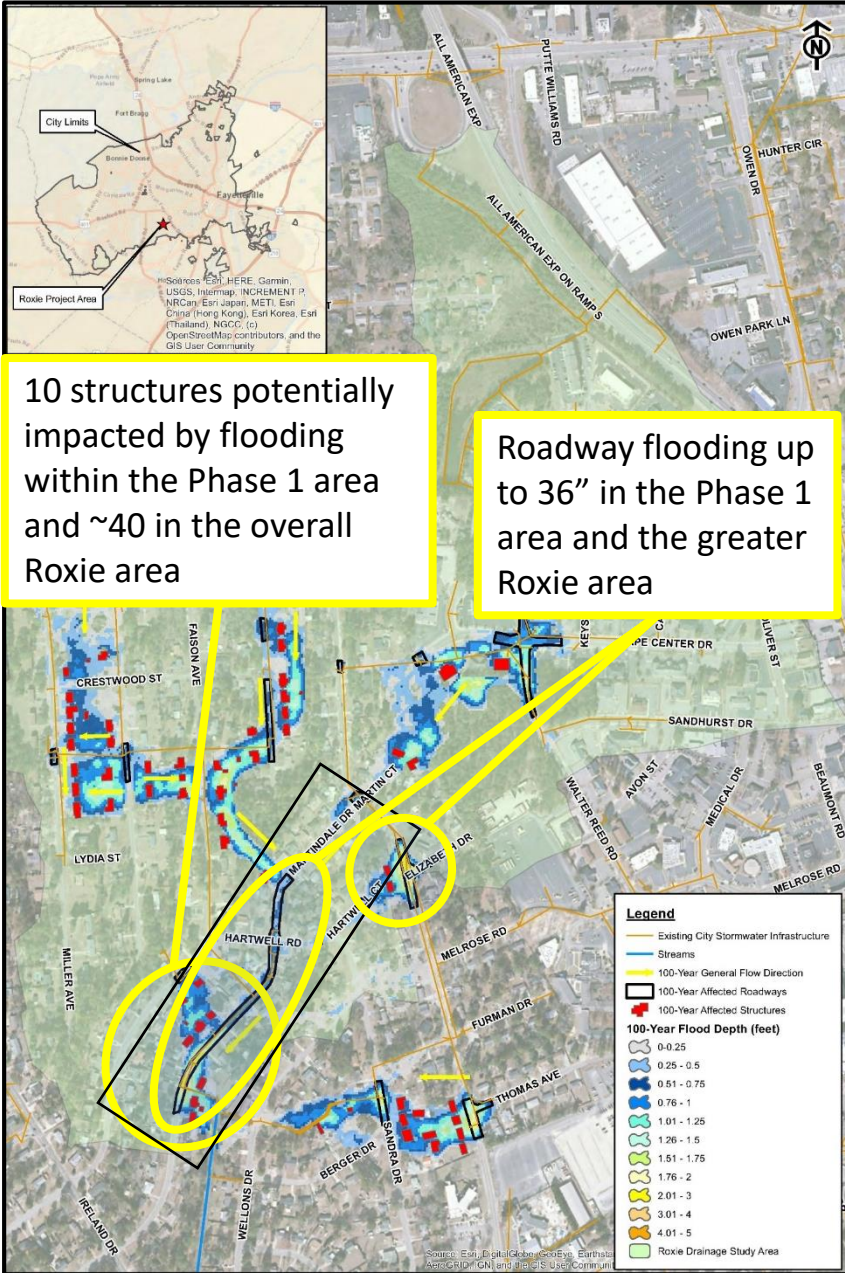


10-YR STORM EXISTING CONDITIONS

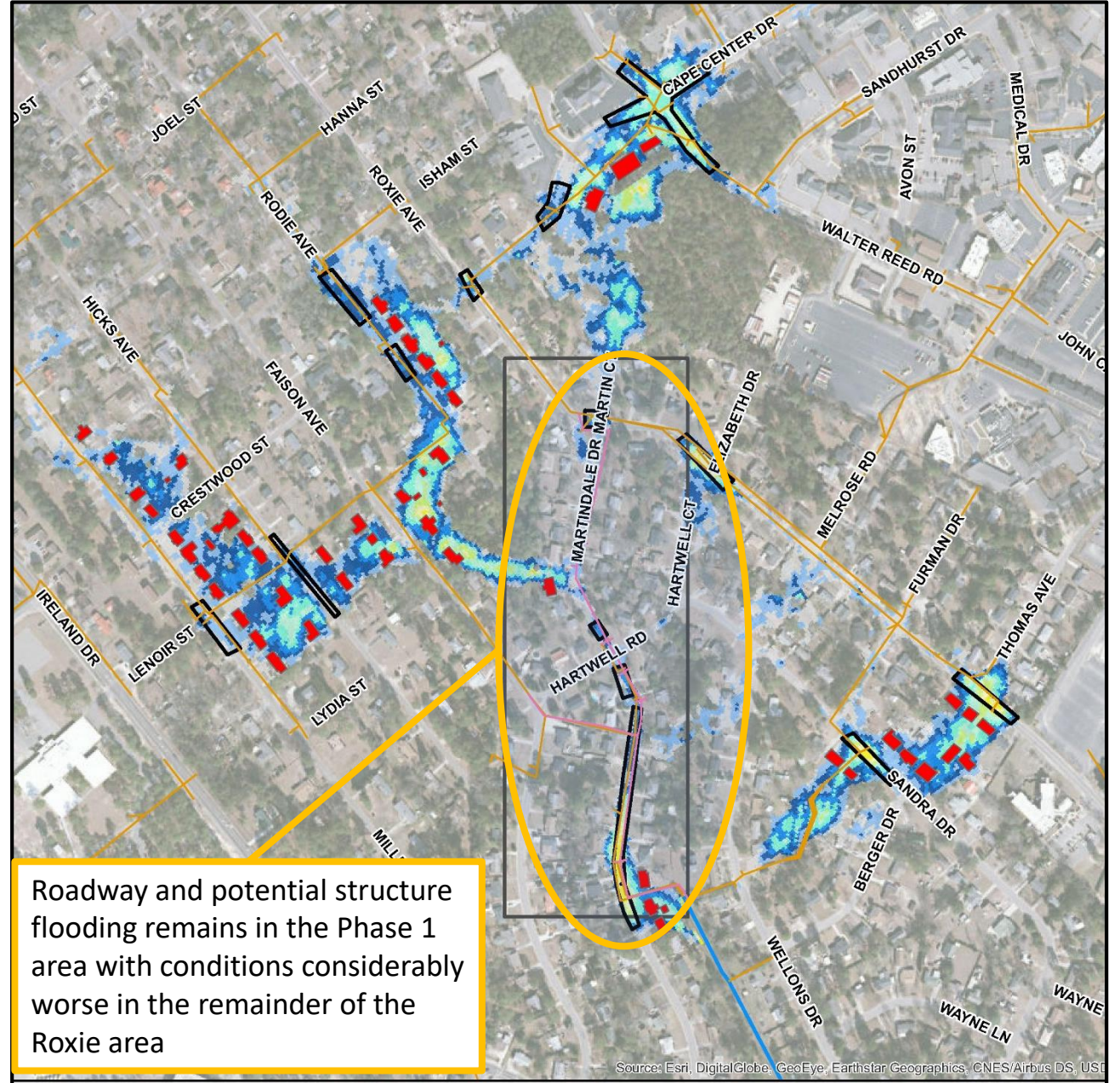


10-YR STORM PROPOSED CONDITIONS

ROXIE STREET PROJECT AREA



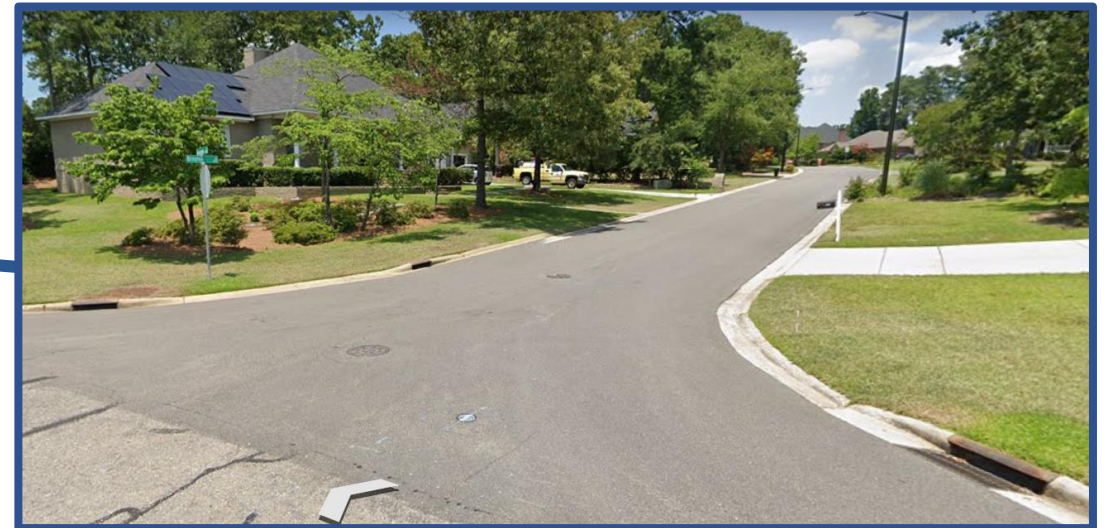
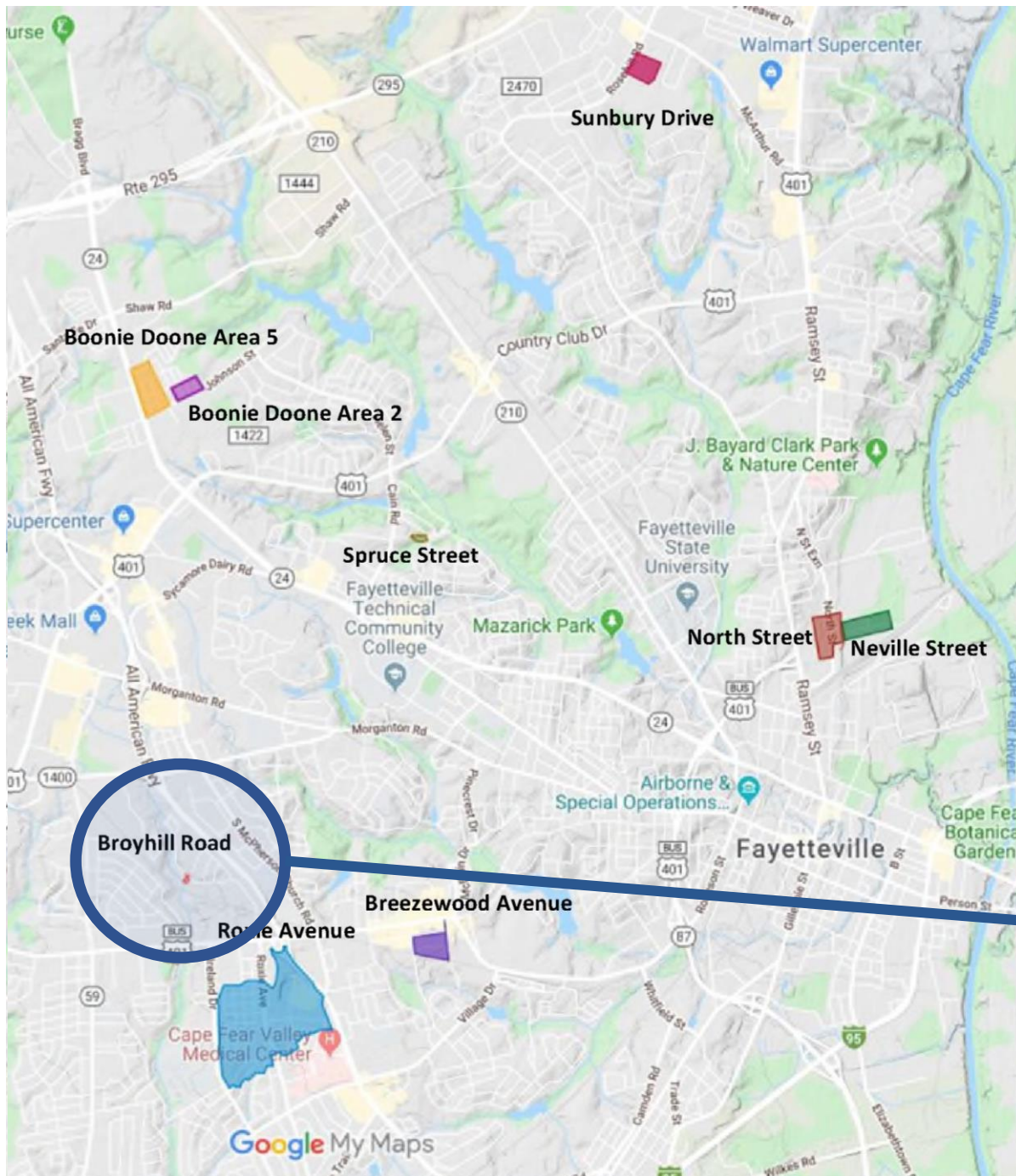
100-YR STORM EXISTING CONDITIONS



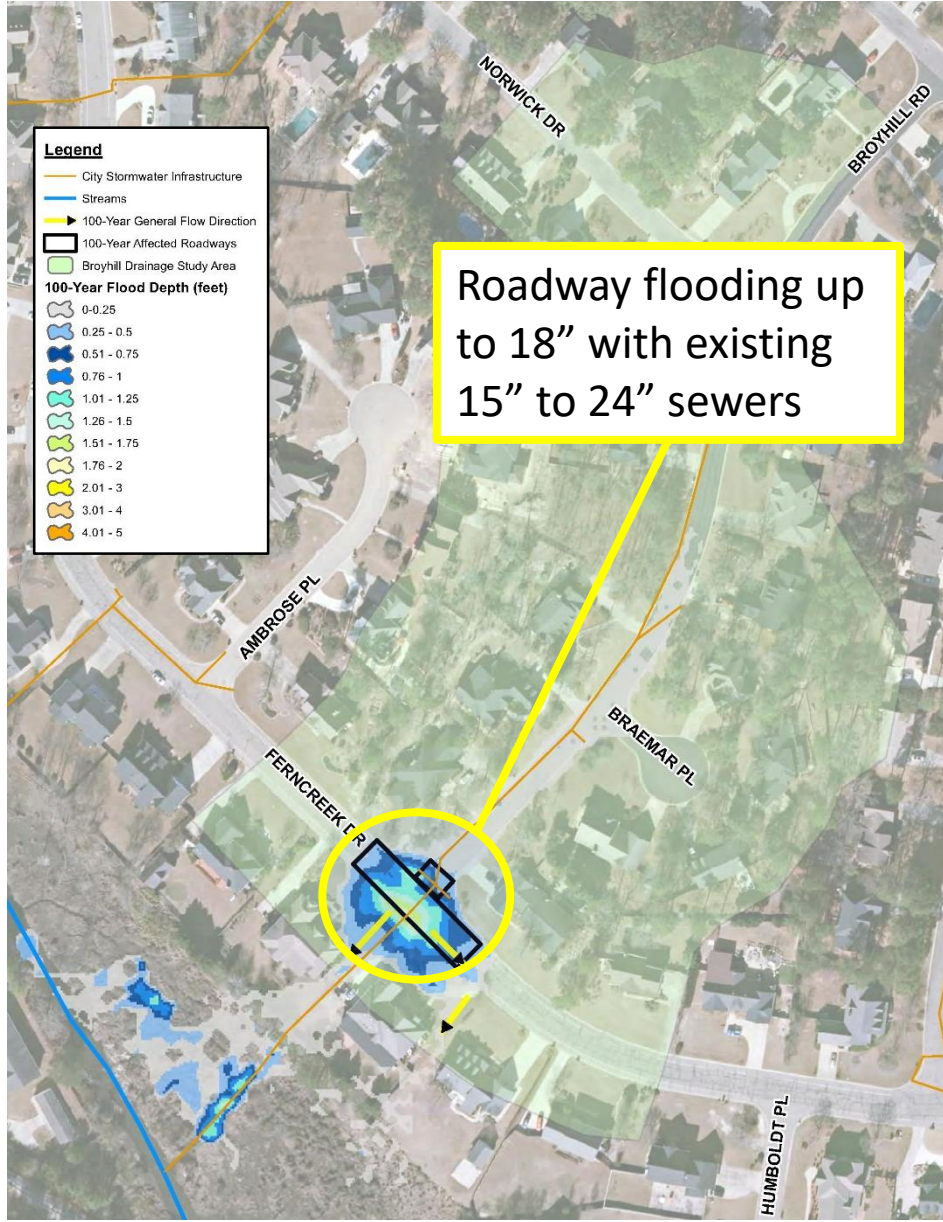
100-YR STORM PROPOSED CONDITIONS

Broyhill Road

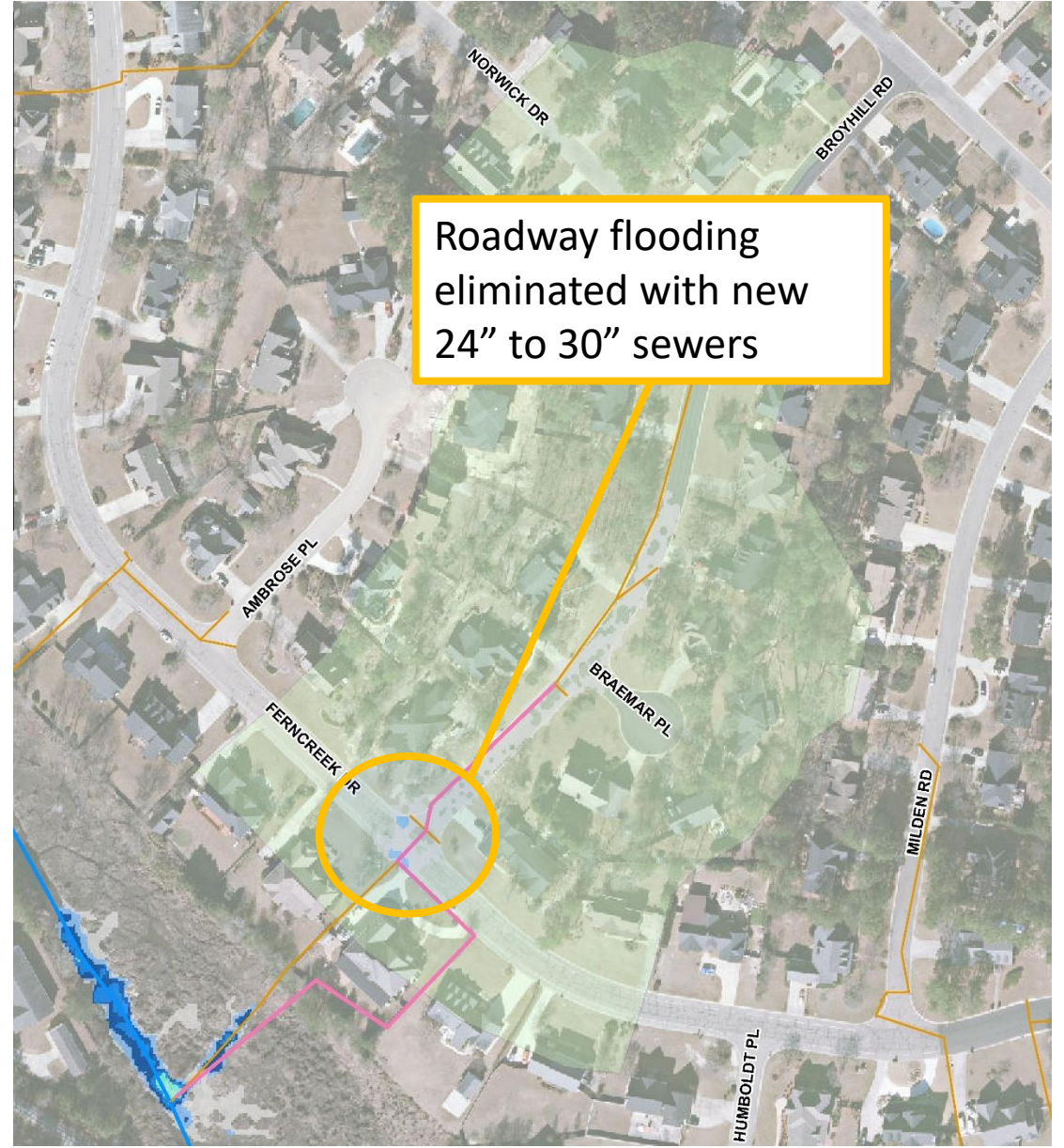
- Residential area (Buckhead)
- Curb & gutter for drainage, but system undersized
- Past complaints of flooding at one intersection only
- Project includes 700 lf of new 24" to 30" storm sewers
- Project Cost = \$619,000



BROYHILL DRIVE PROJECT AREA

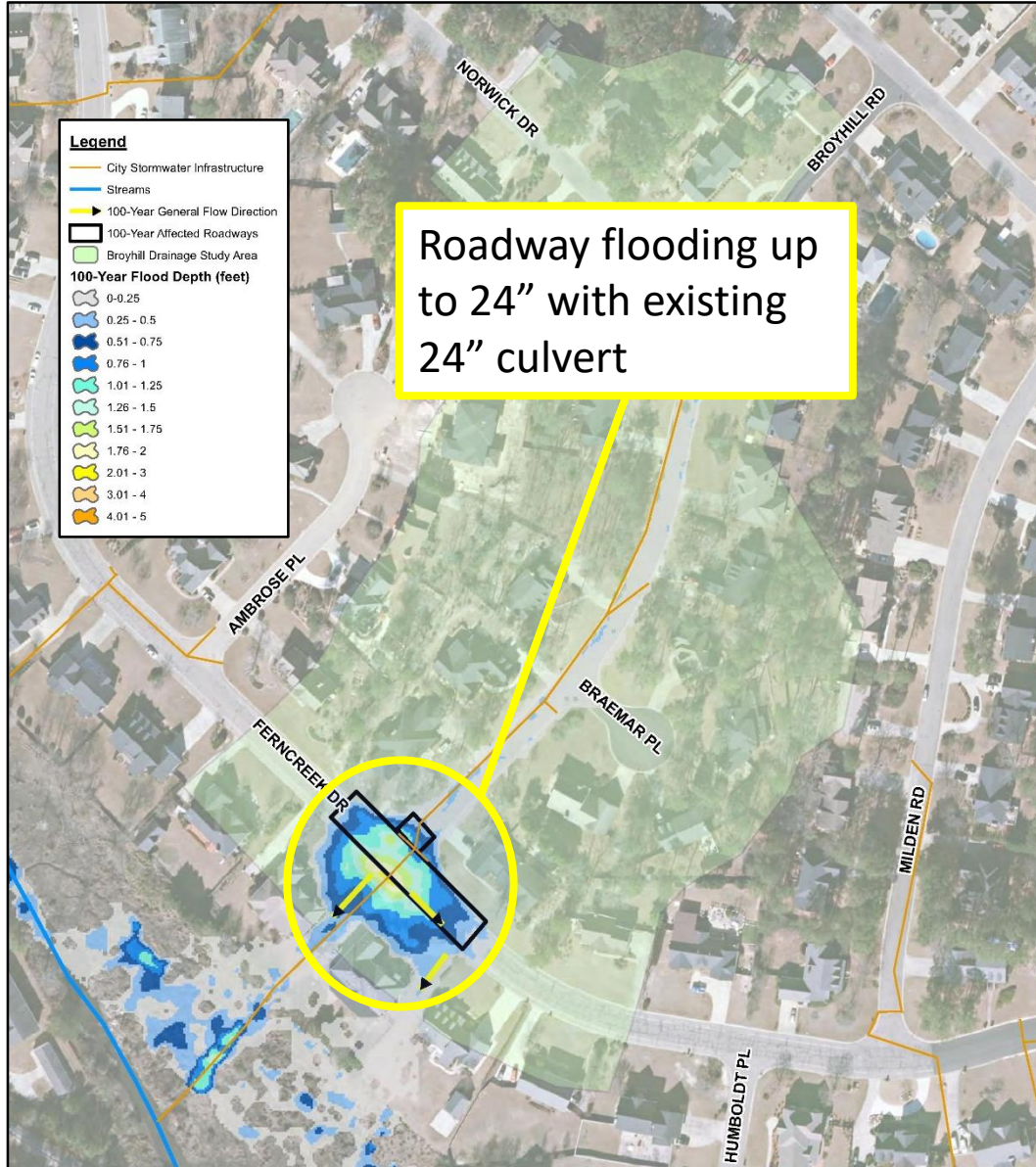


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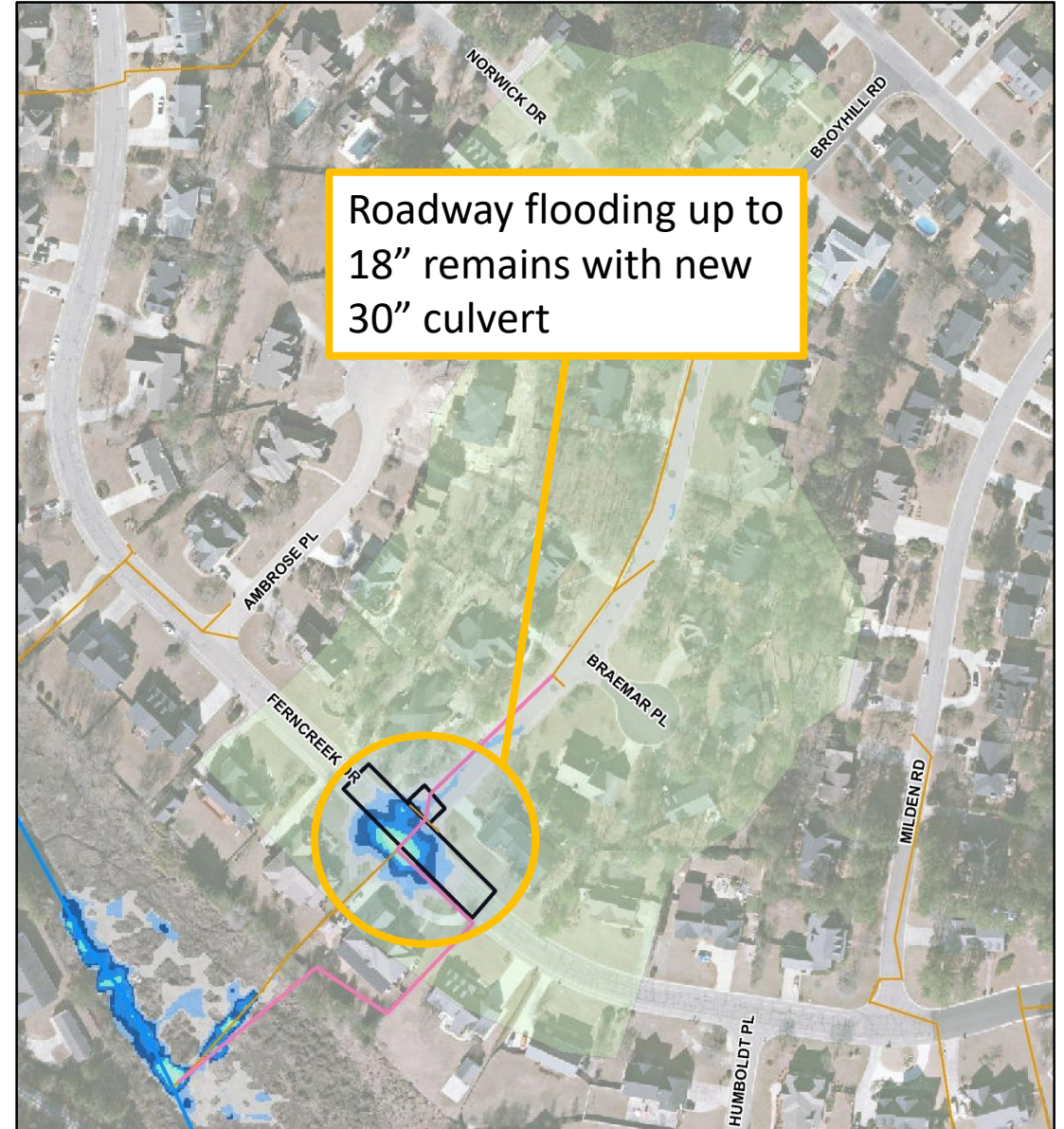


25-YR STORM PROPOSED CONDITIONS

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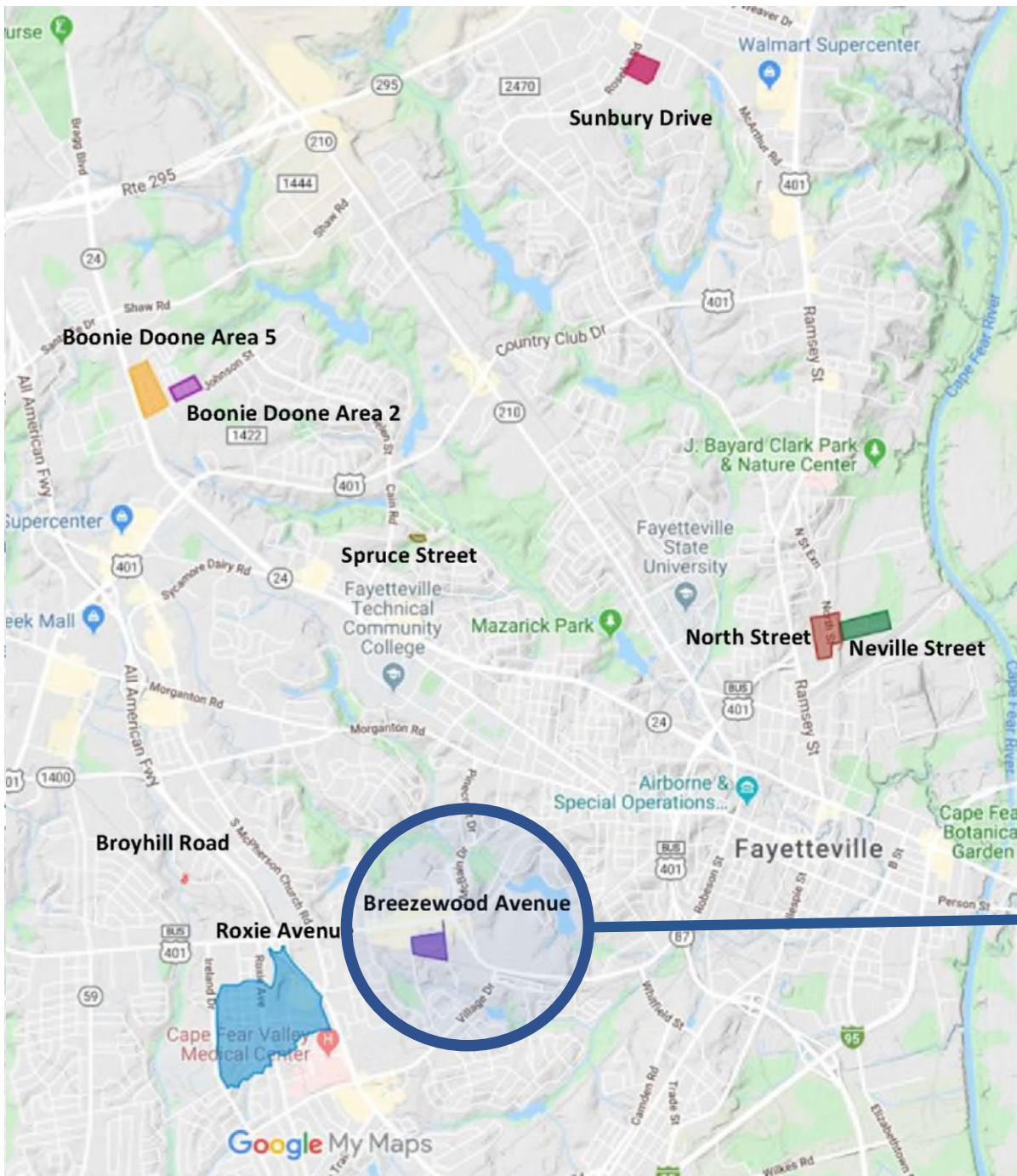
100-YR STORM EXISTING CONDITIONS



100-YR STORM PROPOSED CONDITIONS

Breezewood Ave.

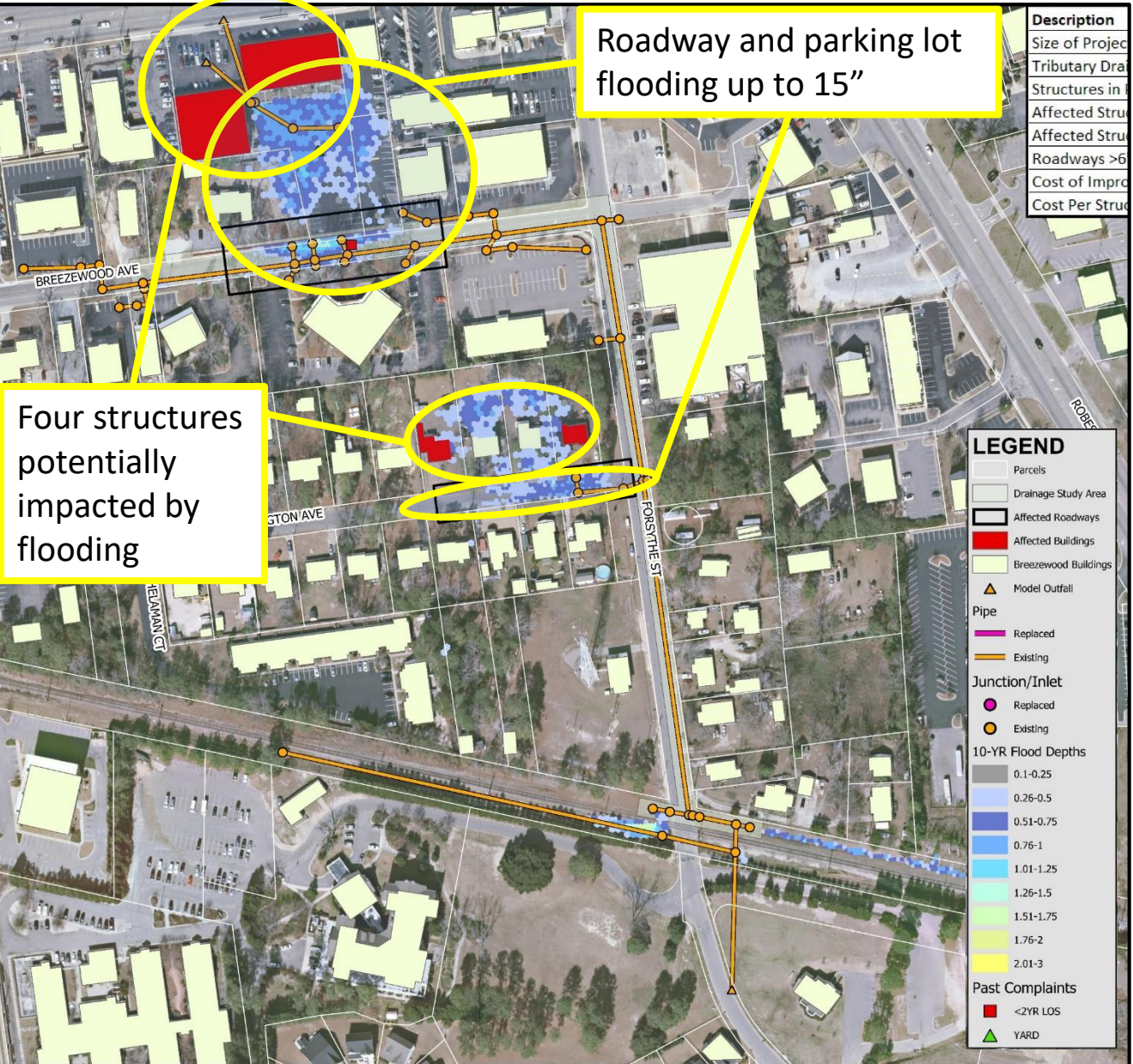
- Primarily commercial area (Lafayette Park)
- Curb & gutter for drainage, but system undersized
- Past complaints of street, parking lot and yard flooding
- Project includes 1,650 lf of new 36" to 42" storm sewers and appurtenances
- Project cost = \$2,574,000



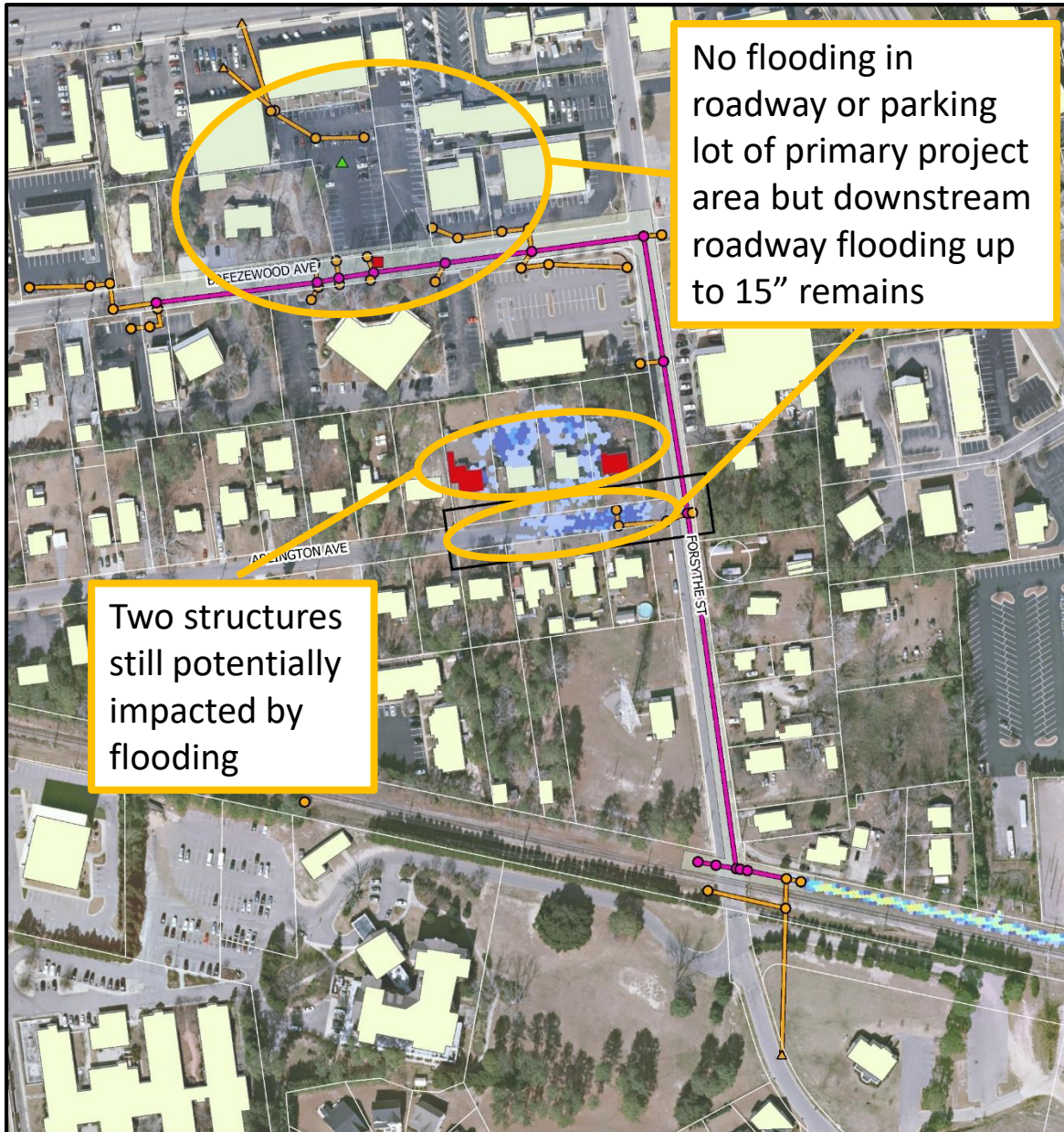
BREEZEWOOD AVE PROJECT AREA

Description	
Size of Project	
Tributary Drainage	
Structures in Flood	
Affected Structures	
Affected Structures	
Roadways >6"	
Cost of Improvement	
Cost Per Structure	

LEGEND	
	Parcels
	Drainage Study Area
	Affected Roadways
	Affected Buildings
	BreezeWood Buildings
	Model Outfall
Pipe	
	Replaced
	Existing
Junction/Inlet	
	Replaced
	Existing
10-YR Flood Depths	
	0.1-0.25
	0.26-0.5
	0.51-0.75
	0.76-1
	1.01-1.25
	1.26-1.5
	1.51-1.75
	1.76-2
	2.01-3
Past Complaints	
	<2YR LOS
	YARD

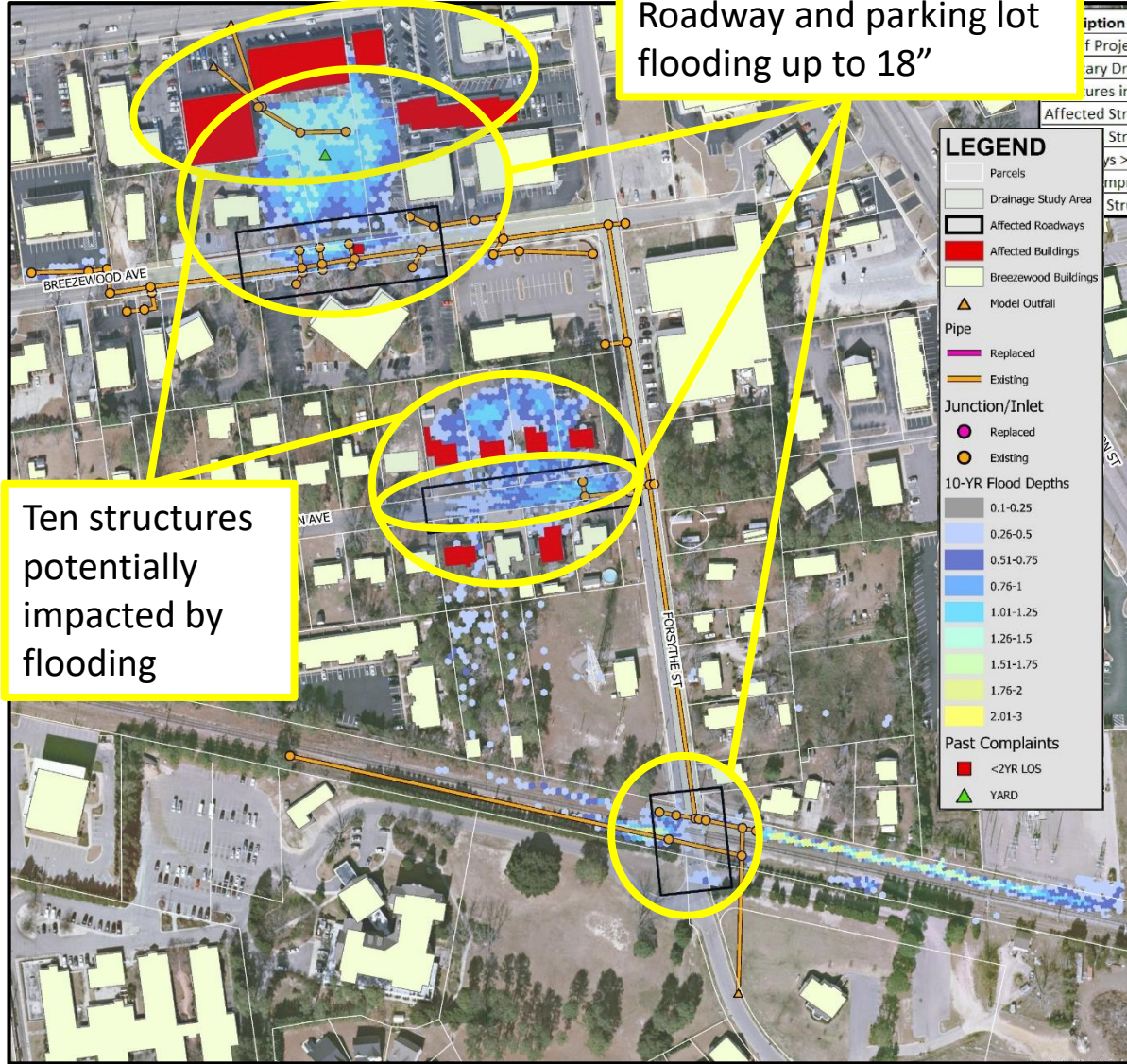


10-YR STORM EXISTING CONDITIONS

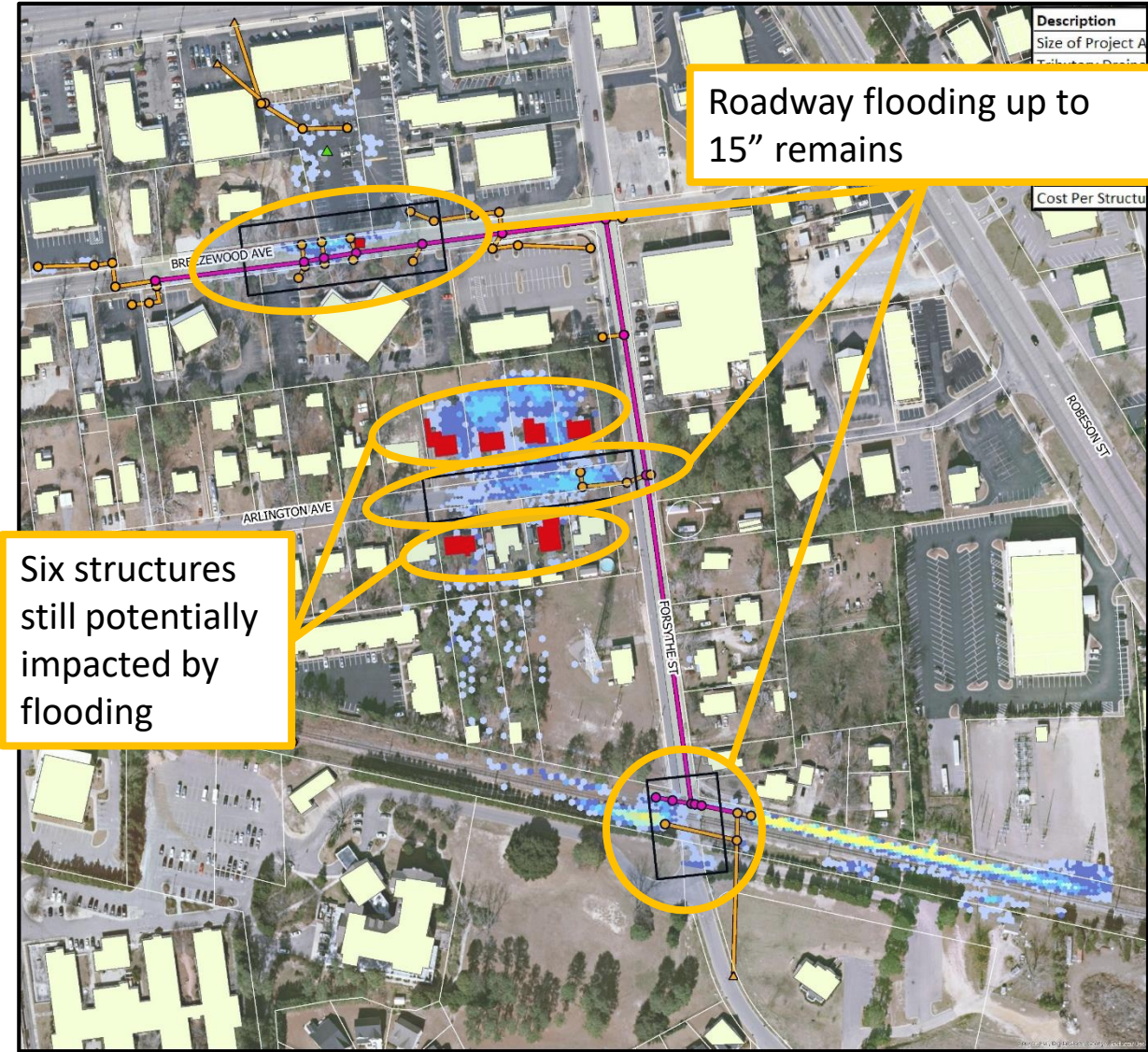


10-YR STORM PROPOSED CONDITIONS

BREEZEWOOD AVE PROJECT AREA



100-YR STORM EXISTING CONDITIONS



100-YR STORM PROPOSED CONDITIONS

A large orange circle is positioned on the left side of the slide, partially overlapping the text.

Analysis Results

Major Drainage CIP Evaluation Criteria

- Economic
 - Project cost
 - Economic impacts
 - Condition of existing infrastructure
- Social
 - Safety
 - Number of properties impacted
 - Traffic flow on public streets
 - High hazard road crossings
 - Proximity to critical facilities
 - Degree of flooding
 - Property damage
- Environmental
 - Environmental issues