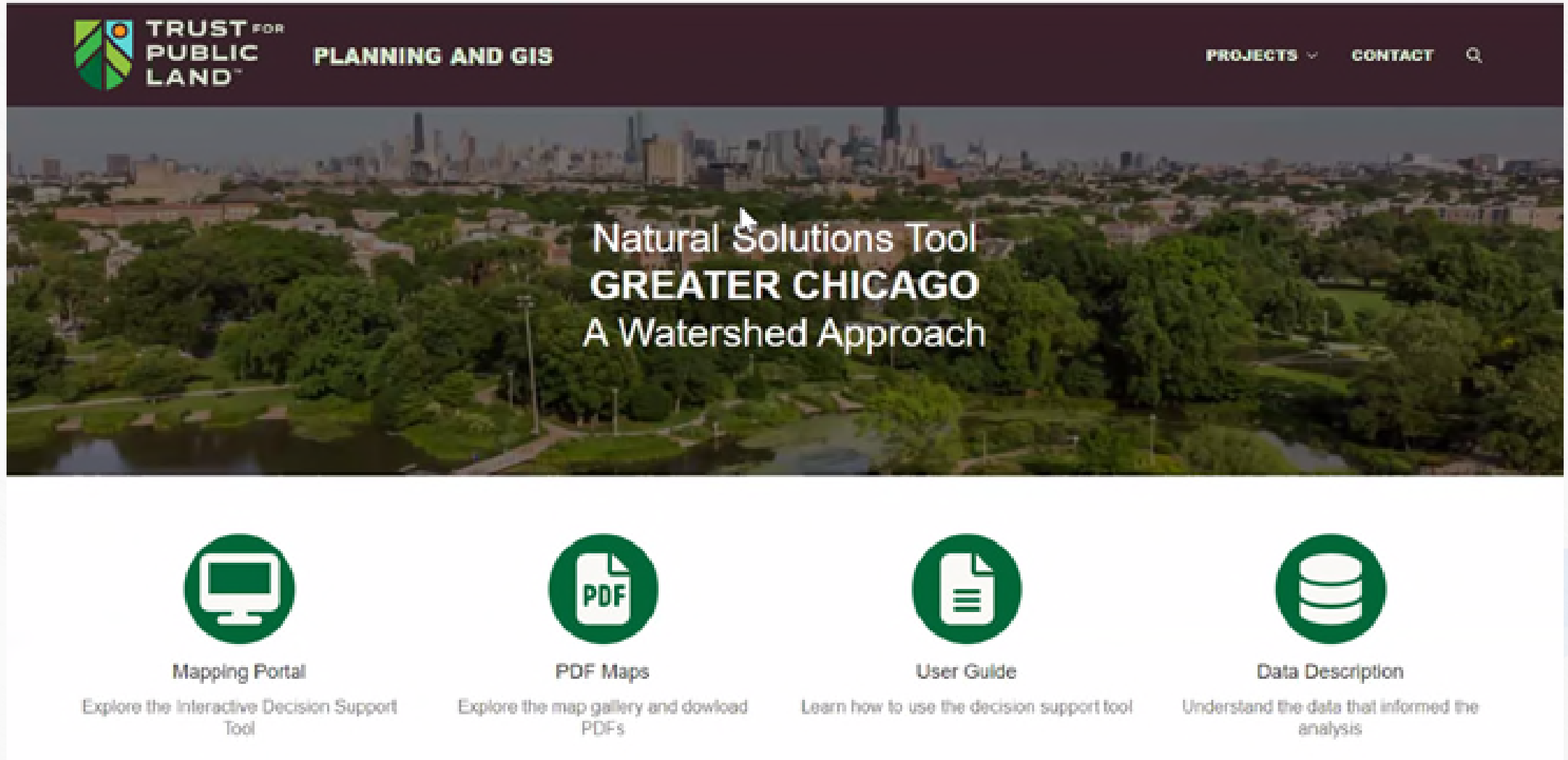




Providing Holistic Flooding Solutions in Urban Areas




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TRUST FOR PUBLIC LAND **PLANNING AND GIS** [PROJECTS](#) [CONTACT](#)

Natural Solutions Tool GREATER CHICAGO A Watershed Approach

- 
Mapping Portal
Explore the Interactive Decision Support Tool
- 
PDF Maps
Explore the map gallery and download PDFs
- 
User Guide
Learn how to use the decision support tool
- 
Data Description
Understand the data that informed the analysis

Potential use of GCWA Natural Solutions Tool to identify potential locations for GI in 27 historically disadvantaged areas in Cook County

All Point Opportunities

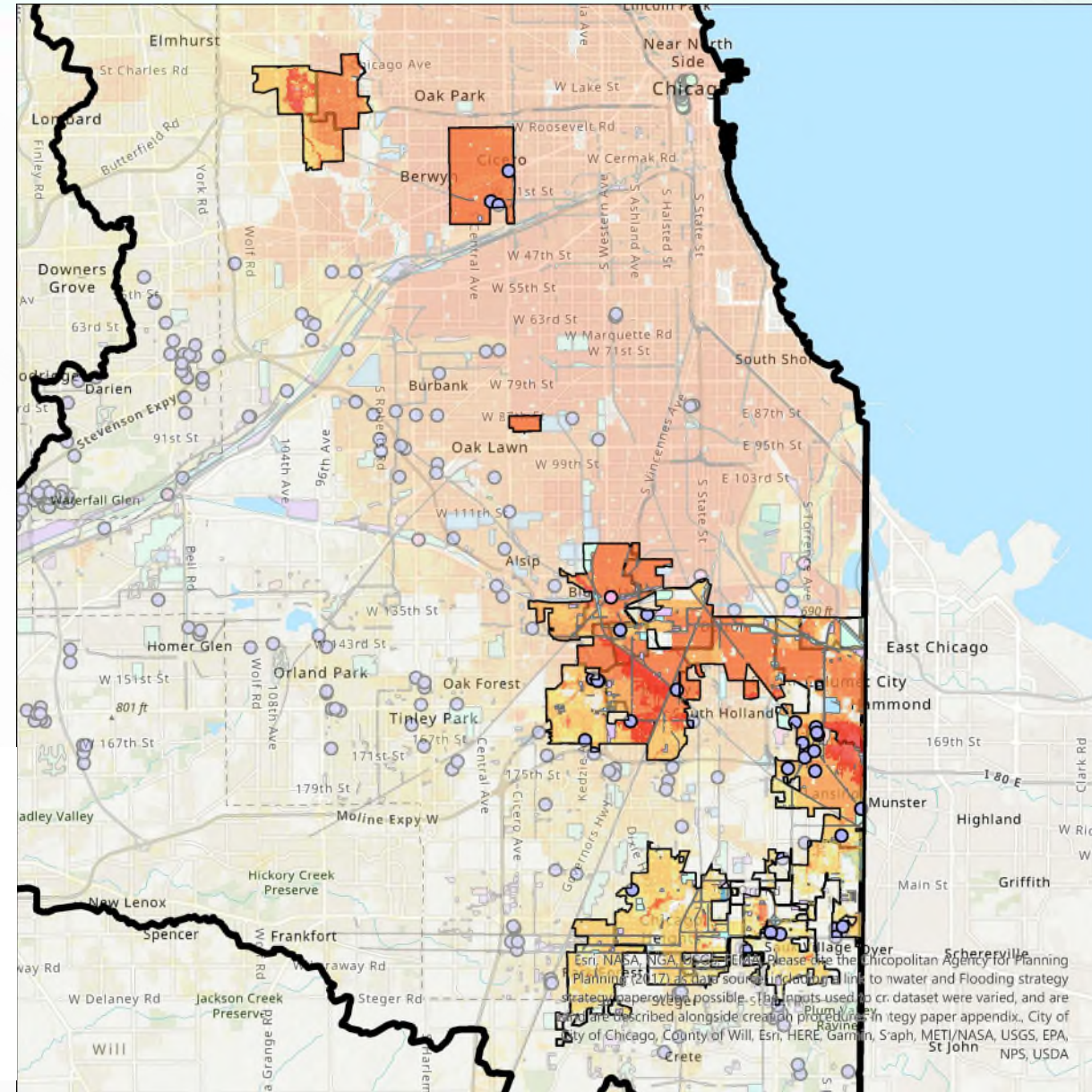
- Detention Basins (29)
- SEPA Stations (1)

Area Opportunities

- Cemetery (9)
- General River (3)
- Golf Course (13)
- MWRD Vacant Parcels (5)
- Open Space (11)
- Right-of-way (129)
- Tributaries (1)
- Vacant Open Space (144)

Urban FSI (CMAP 2017)

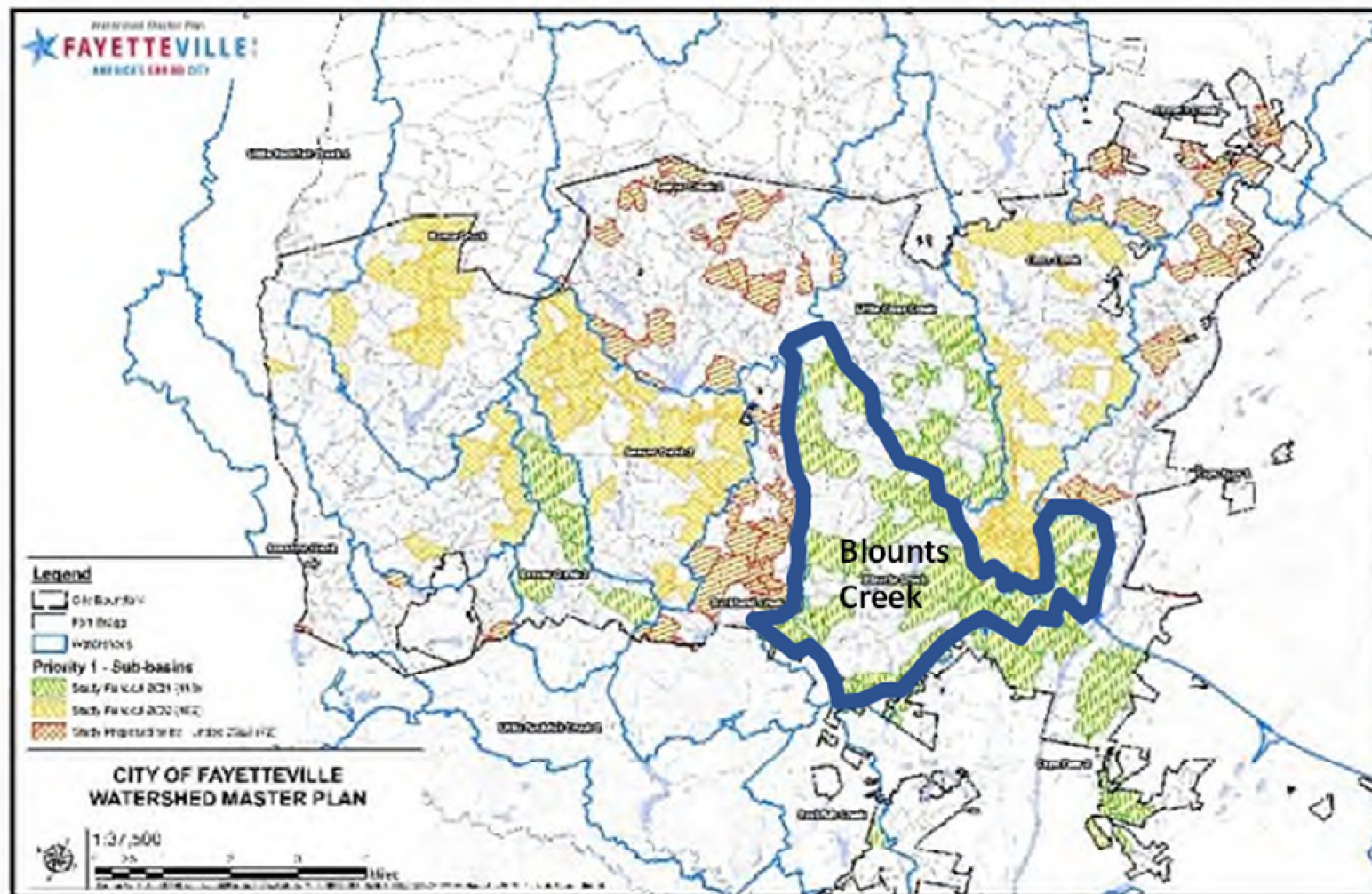
- 1.001 - 5
 - 5.001 - 6
 - 6.001 - 7
 - 7.001 - 8
 - 8.001 - 9
 - 9.001 - 10
- Riverine FSI (CMAP 2017)**
- 1
 - 2
 - 3
 - 4
 - 5
 - 6
 - 7
 - 8
 - 9
 - 10



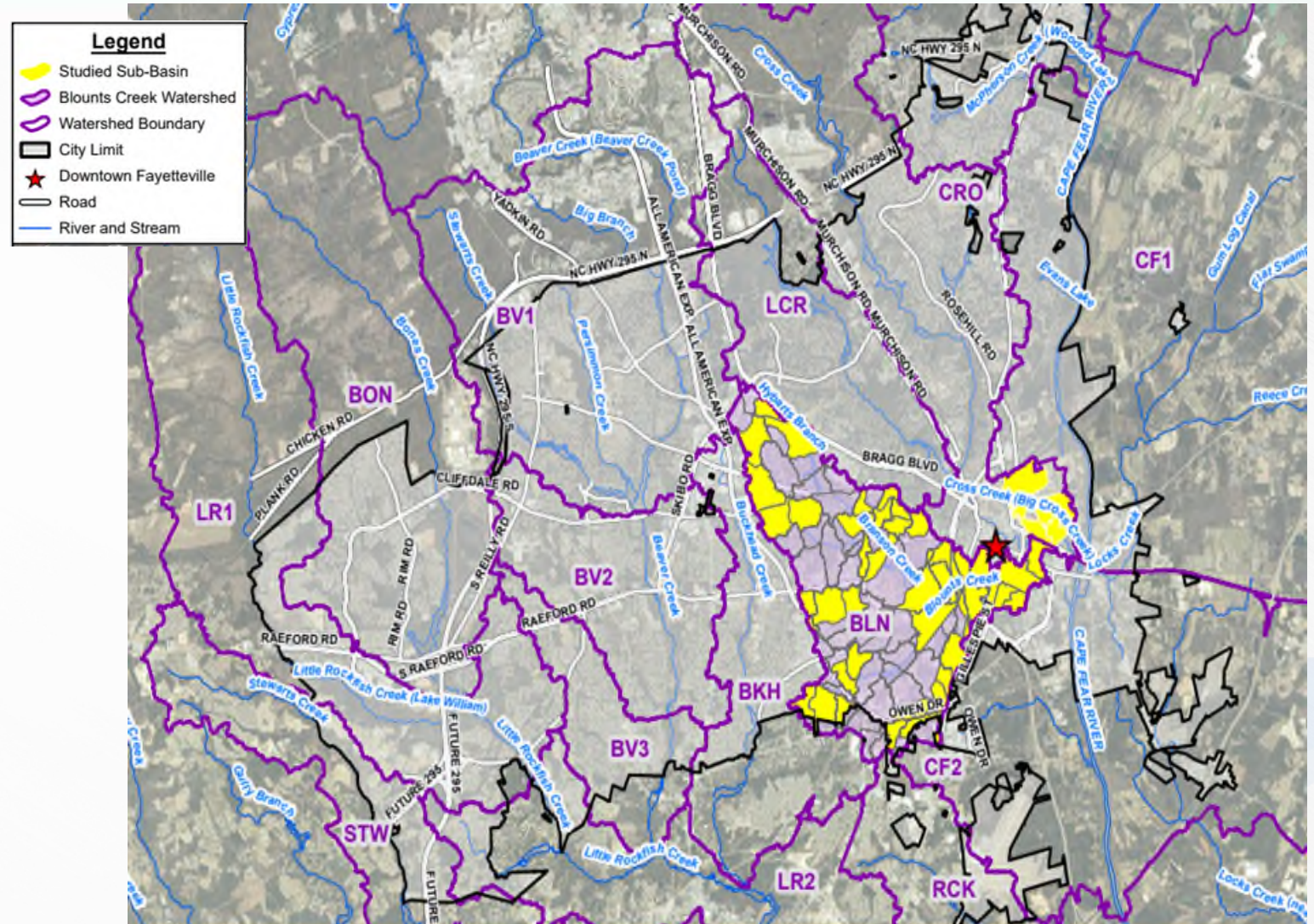
Esri, NASA, NGA, NOAA, FEMA, USGS, and the Chicago Metropolitan Agency for Planning (2017) are data sources used to create this map. The map is a strategic planning tool and does not represent a final design. The map is for informational purposes only and is not intended to be used for any other purpose. The map is not a warranty, representation, or endorsement by the City of Chicago, County of Will, Esri, HERE, Garmin, Swatch, METI/NASA, USGS, EPA, NPS, USDA.

Agenda

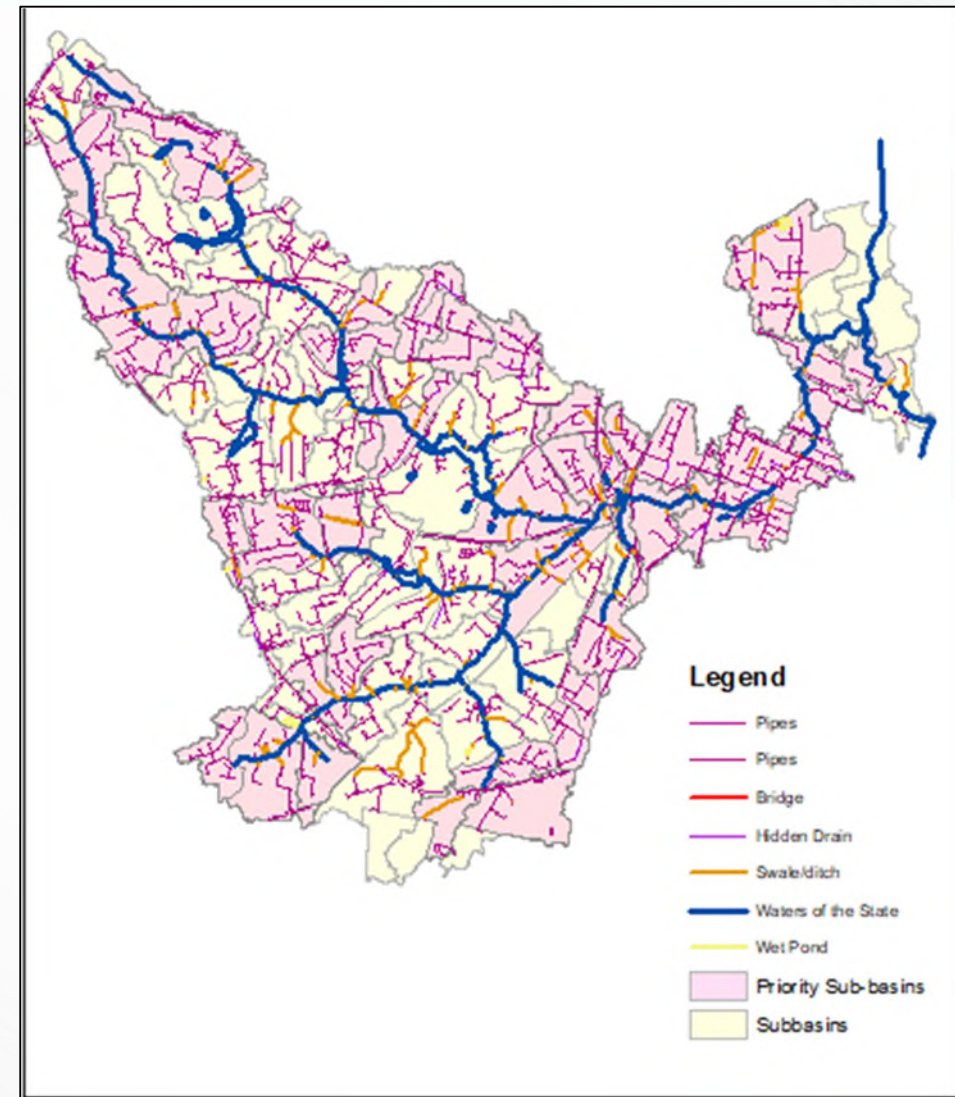
- Program Overview
- Watershed Description
- Project Details
- Prioritized Solution
- Next Steps

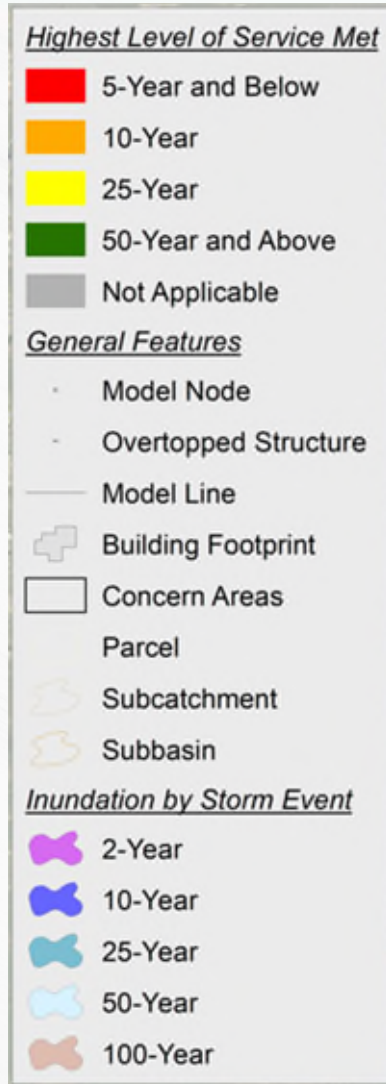


- Goal to reduce flooding and make City more resilient
- 15 watersheds to be analyzed
- Two phase approach to each Detailed Watershed Study
- 1D and 2D modeling used



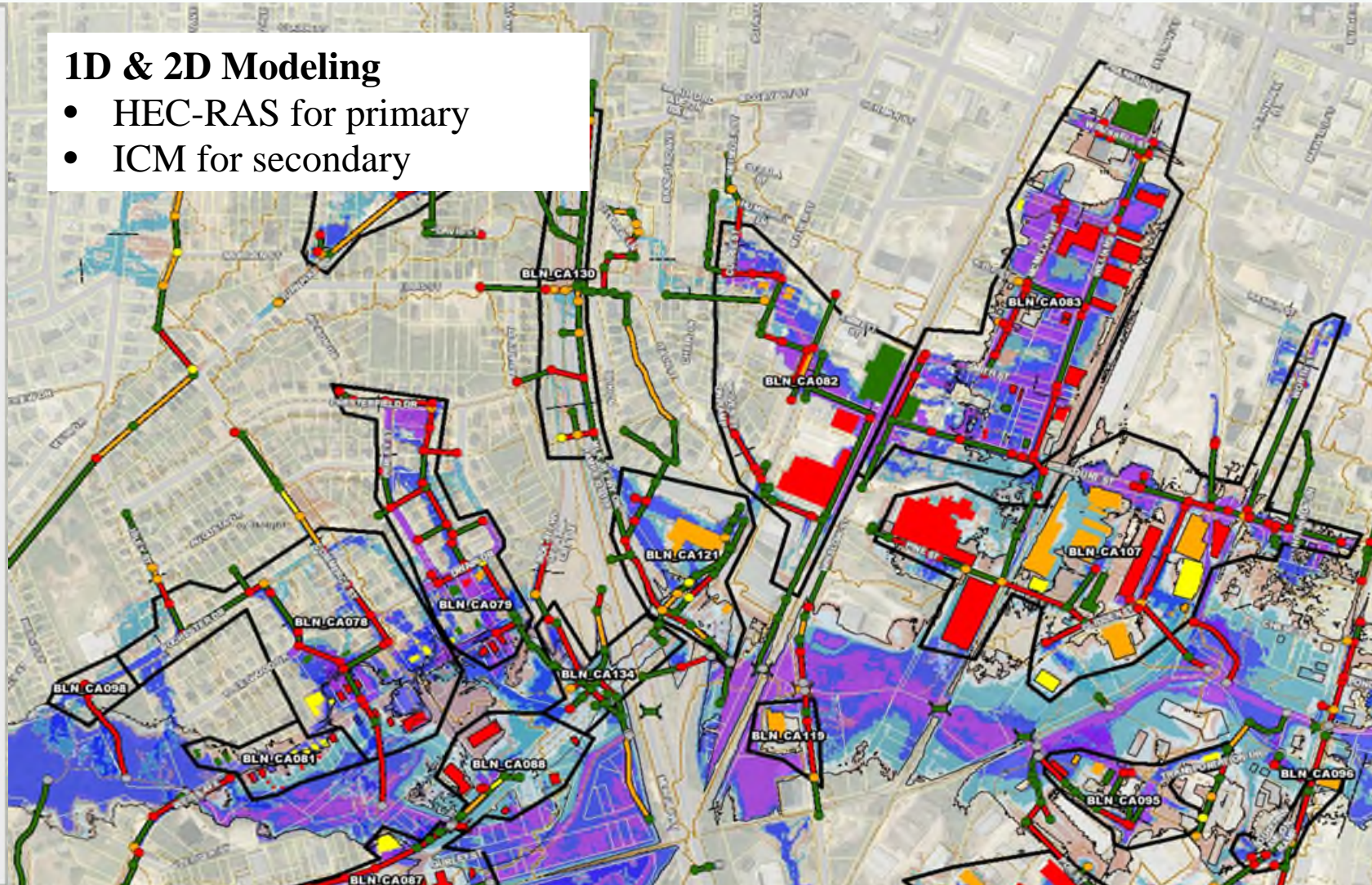
- Blount's Creek Watershed is the largest and most developed watershed in the City
- Large scale hydrological analysis was performed using:
 - HEC-HMS (riverine)
 - ICM Rain on Mesh Analysis (collection)
- Identified 49 priority sub-basins within watershed
- Developed 1D & 2D hydraulic models of primary and secondary systems
- Performed desktop and in-field stream inspection





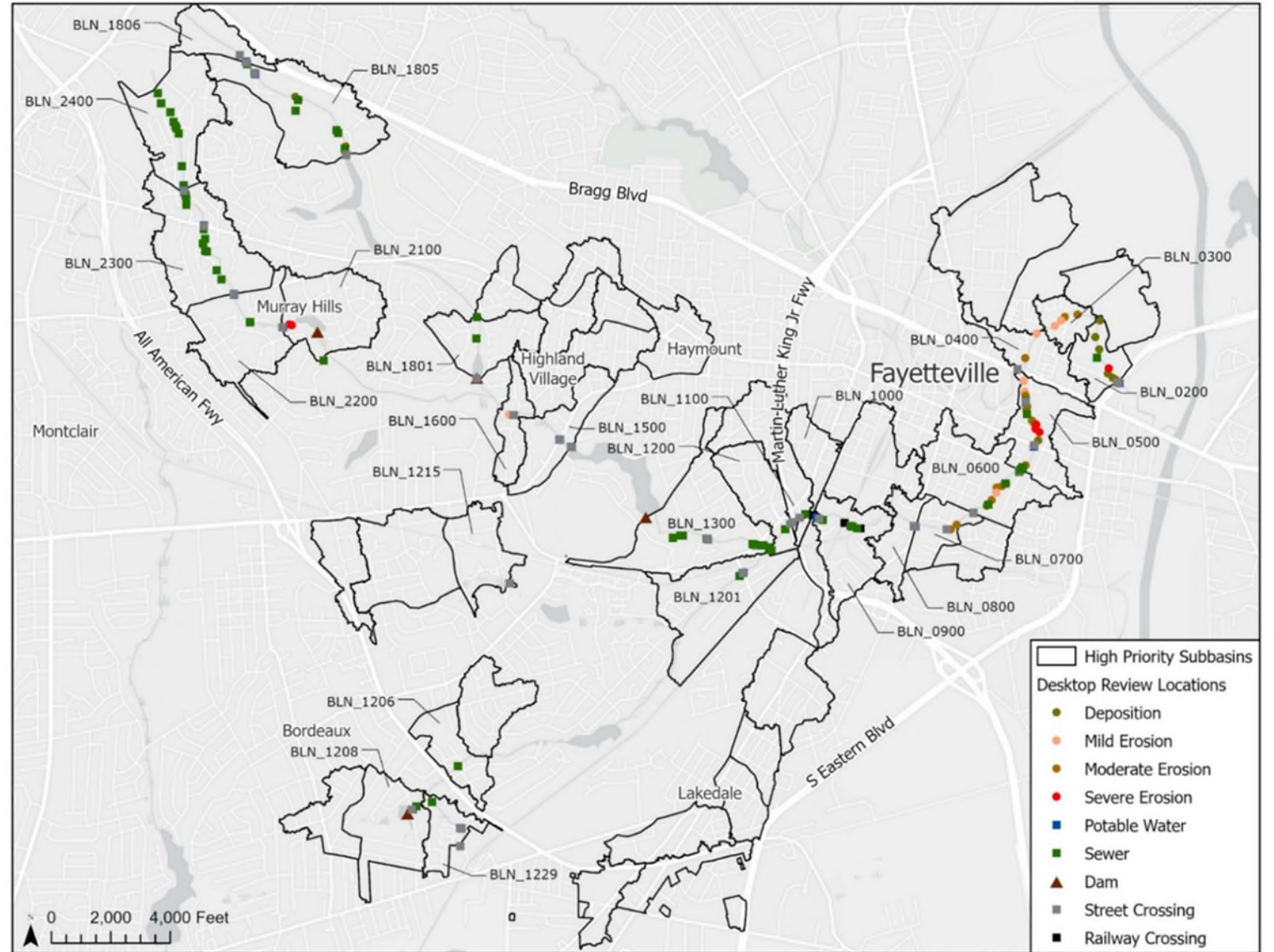
1D & 2D Modeling

- HEC-RAS for primary
- ICM for secondary



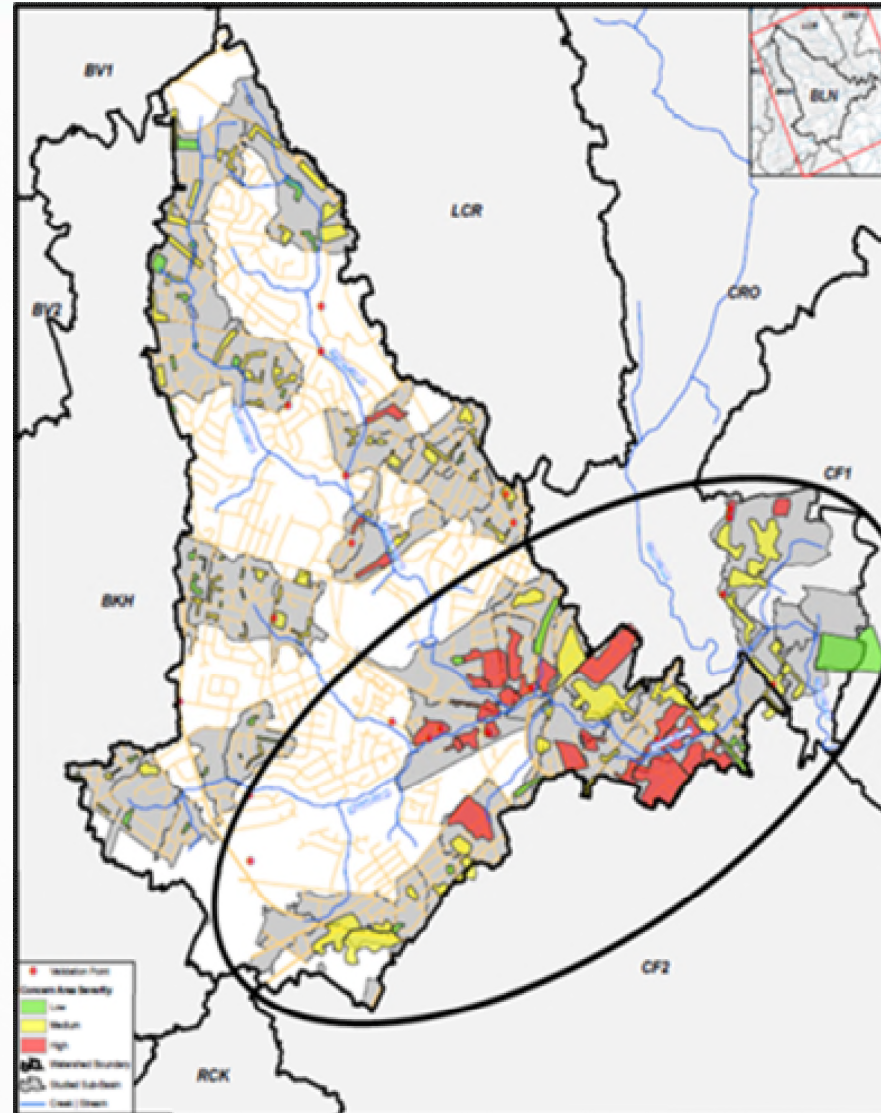
Stream Inspection

- 9.8 miles physically inspected
- Wolman Representative Pebble Count
- Bank Erosion Hazard Index (BEHI) Analyses





- More than 130 concern areas identified overall
- 100 proposed solutions analyzed
- Almost half in downtown area
- Proposed solutions evaluated using weighted scoring system for impacts to roadways and structures



Study Area

92 – Total Subbasins
 50 – Priority I Subbasins
 6.21 – Sq. Miles

Study Identified

58 – Concern Areas (CAs)
 45 – CAs Selected
 39 – Proposed Solutions

Miles of Impacted Lane Length
 Identified – 6.9 | Resolved – 3.3

Number of Traverse Road Crossing
 Identified – 10 | Resolved - 3

Number of Disconnected Structures
 Identified – 135 | Resolved - 125

Number of Impacted Structures
 10-yr | 25-yr | 50-yr

Identified – 94 | 151 | 187

Resolved - 77 | 130 | 144

- Concern Areas ranked by score
- High and Medium Scores Selected for Proposed Solutions

Concern Area ID	Type(s) of Concern Area (1, 2, 3, and/or 4)	Criteria Scores					Final Outcomes			
		Impacted Lane Length (10%)	Summary AEP for Impacted Structures (10%)	Number of Essential Facilities (30%)	Number of Disconnected Dwelling Units and Other Structures (3%)	Traverse Road Crossing Risk Rating (20%)	Total Score	Weighted Score	Severity	Flowchart Recommendations
BLN_CA078	1, 2, 3	5	5	5	3	0	18	34	High	Evaluation for Potential Projects
BLN_CA079	1, 2, 3	5	5	0	3	0	13	19	High	Evaluation for Potential Projects
BLN_CA080	1, 2	5	1	0	0	0	6	6	Med	Evaluation for Potential Projects
BLN_CA081	2, 4	3	5	0	0	5	13	18	High	Evaluation for Potential Projects
BLN_CA082	1, 2	5	3	0	0	0	8	8	Med	Evaluation for Potential Projects
BLN_CA083	1, 2	5	5	0	3	0	13	19	High	Evaluation for Potential Projects
BLN_CA084	1, 3	5	5	0	5	0	15	25	High	Evaluation for Potential Projects
BLN_CA085	1, 3	5	5	0	3	0	13	19	High	Evaluation for Potential Projects
BLN_CA086	1, 2, 3	5	5	0	3	0	13	19	High	Evaluation for Potential Projects
BLN_CA087	1, 3	5	5	0	1	3	14	19	High	Evaluation for Potential Projects

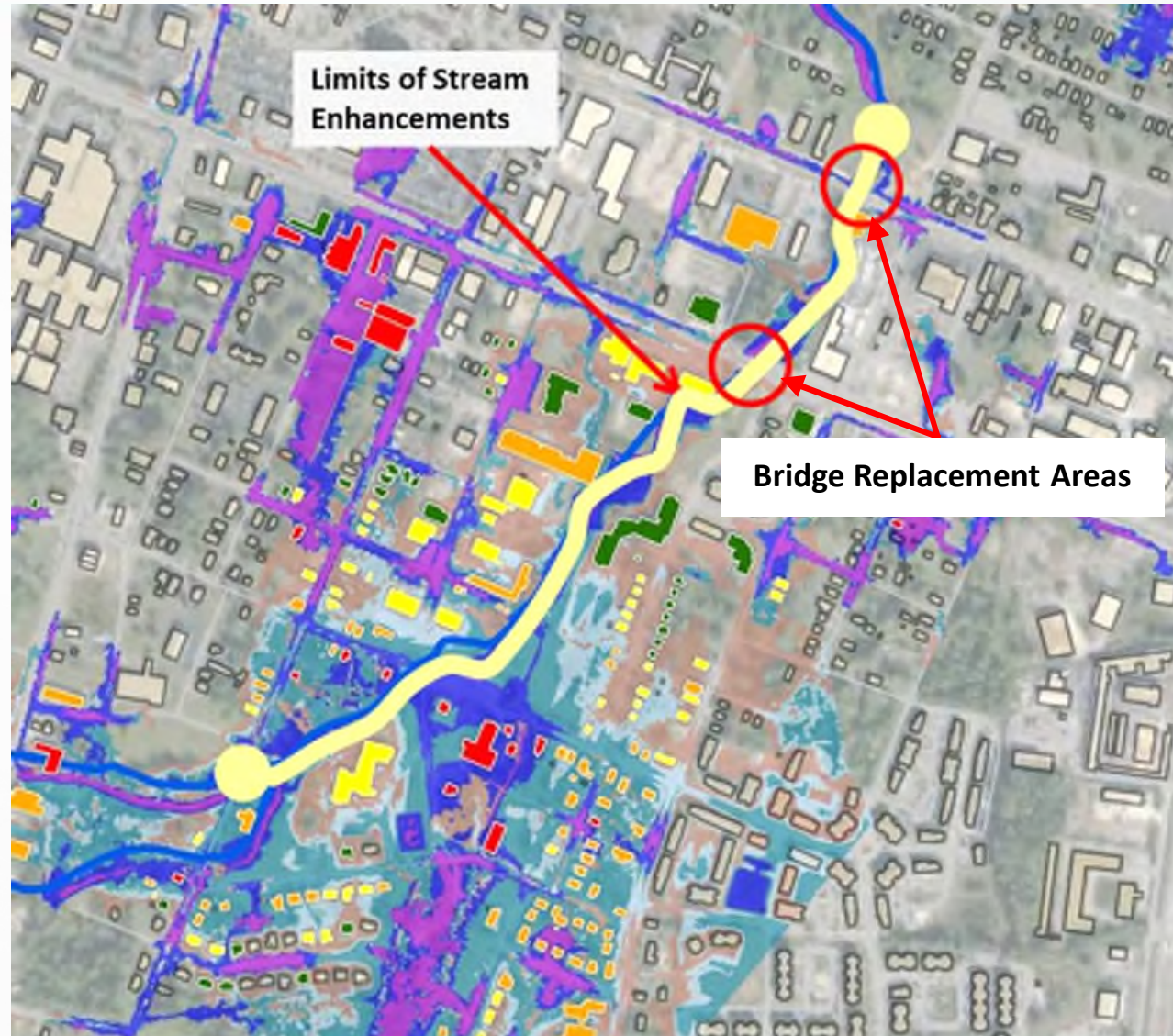
Project Types

- Increase Capacity
- Stormwater Detention
- Stormwater Diversion
- Buyouts/Floodproofing
- Stream Restoration
- Small Projects (in ROW)
- Small Projects (outside ROW)
- Do Nothing

Prioritized Solution

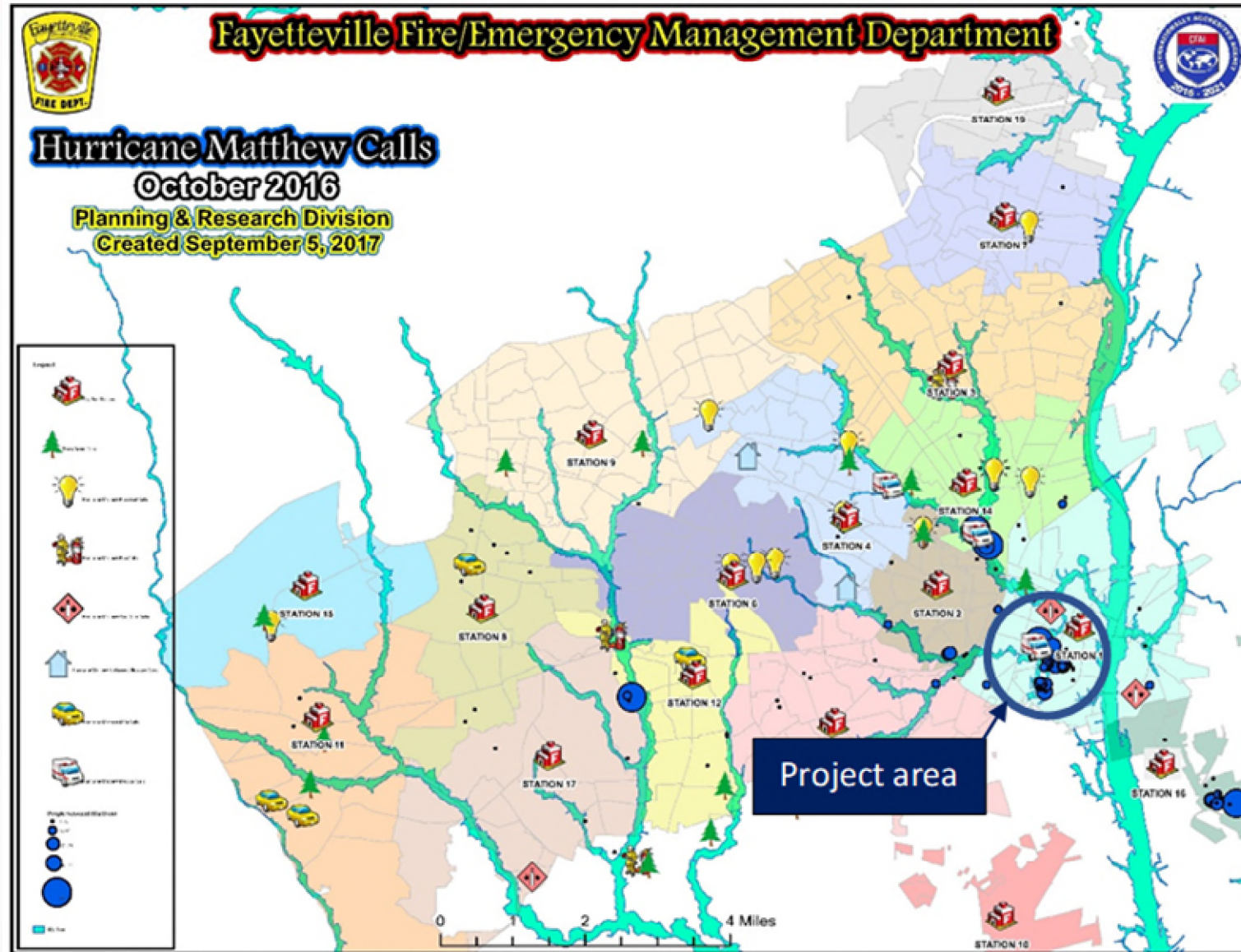
Russell-Person St Bridges and Stream Improvements

- Person St – upgrade bridge from 50' to 70' in length
- Russell St – upgrade 3 span bridge structure from 100' to 120'
- Stabilize, expand and restore floodplain for 4,000 lf of Blounts Creek

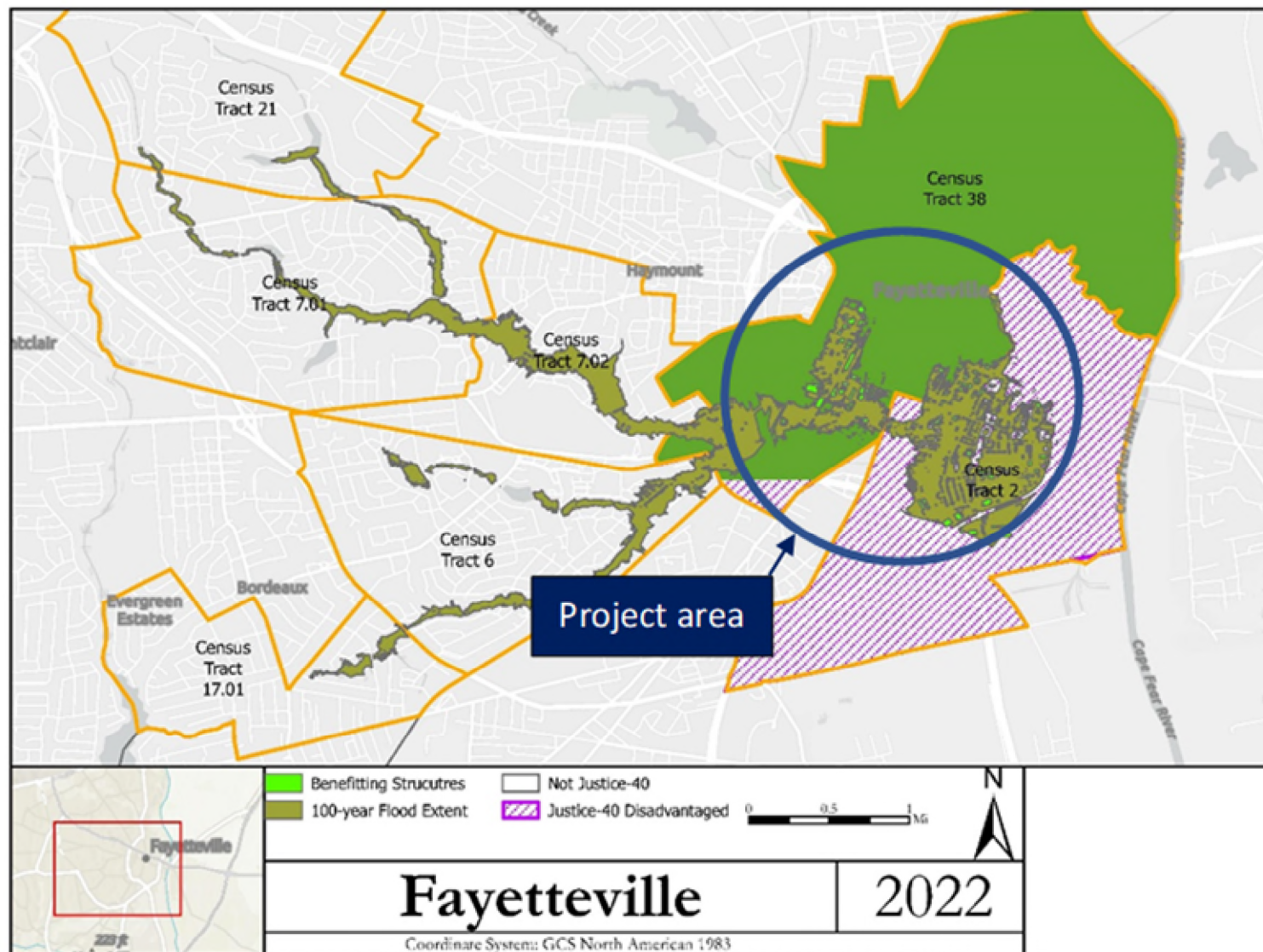


*Historical
flooding
(circa 1945)*

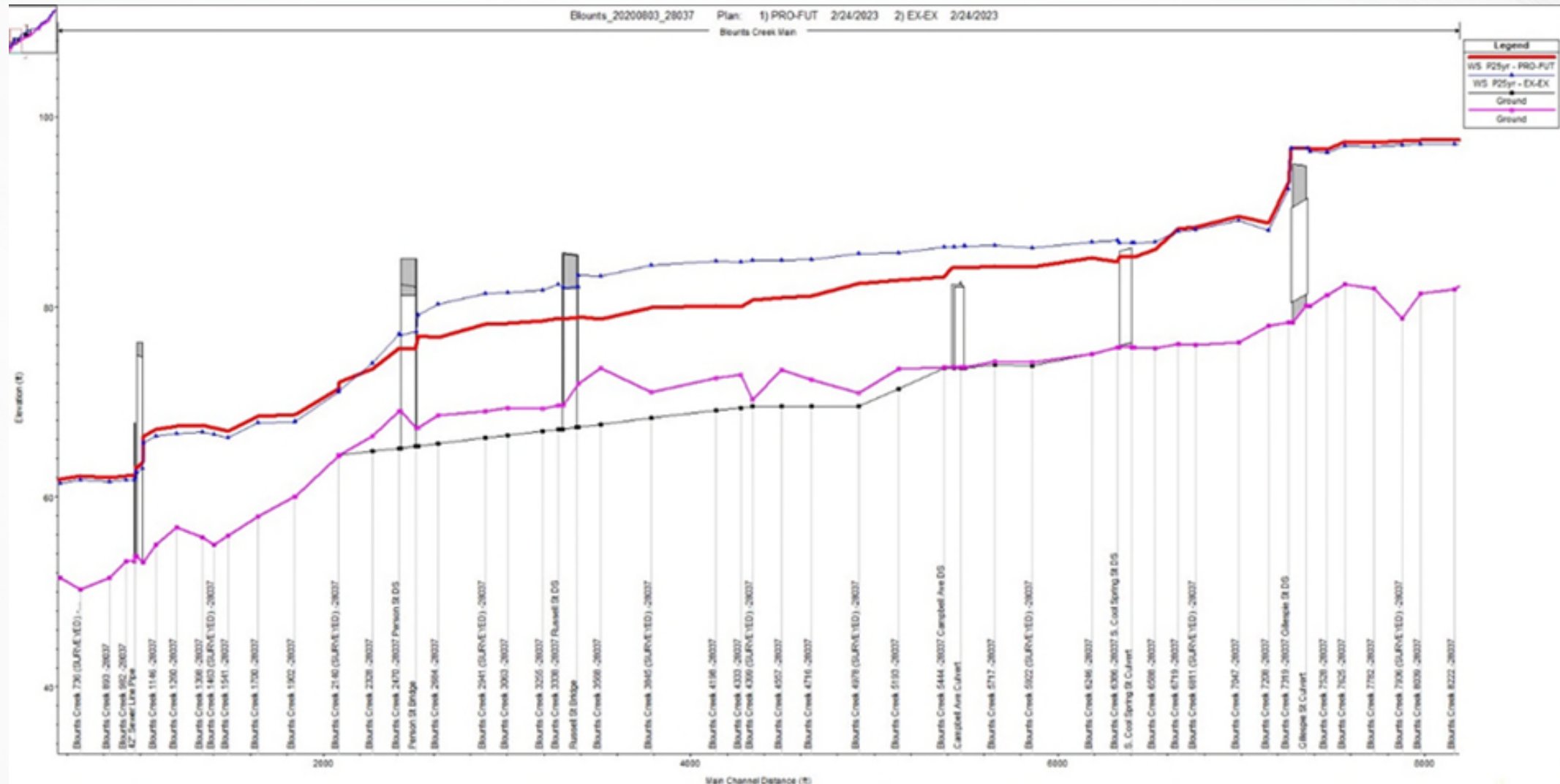




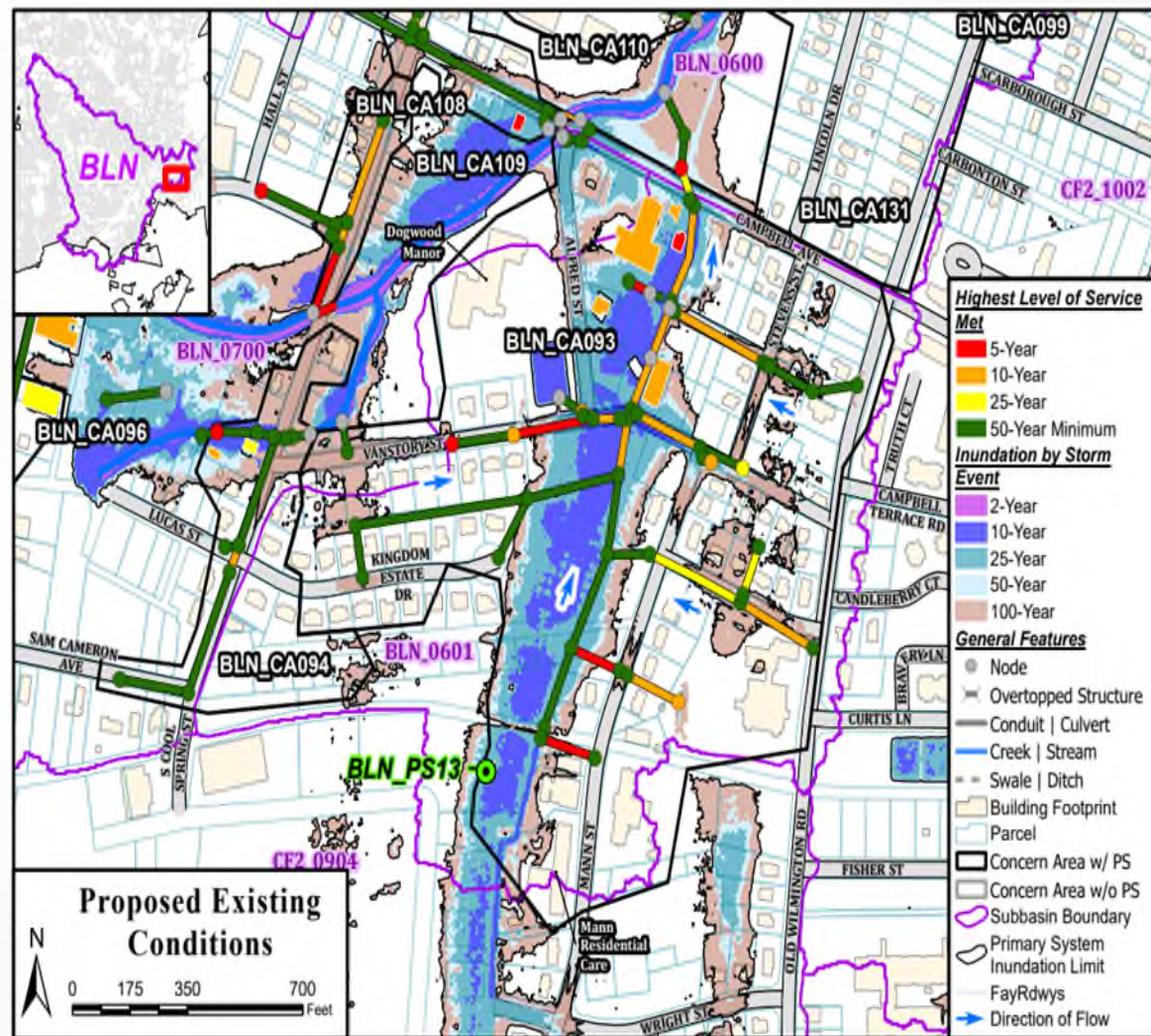
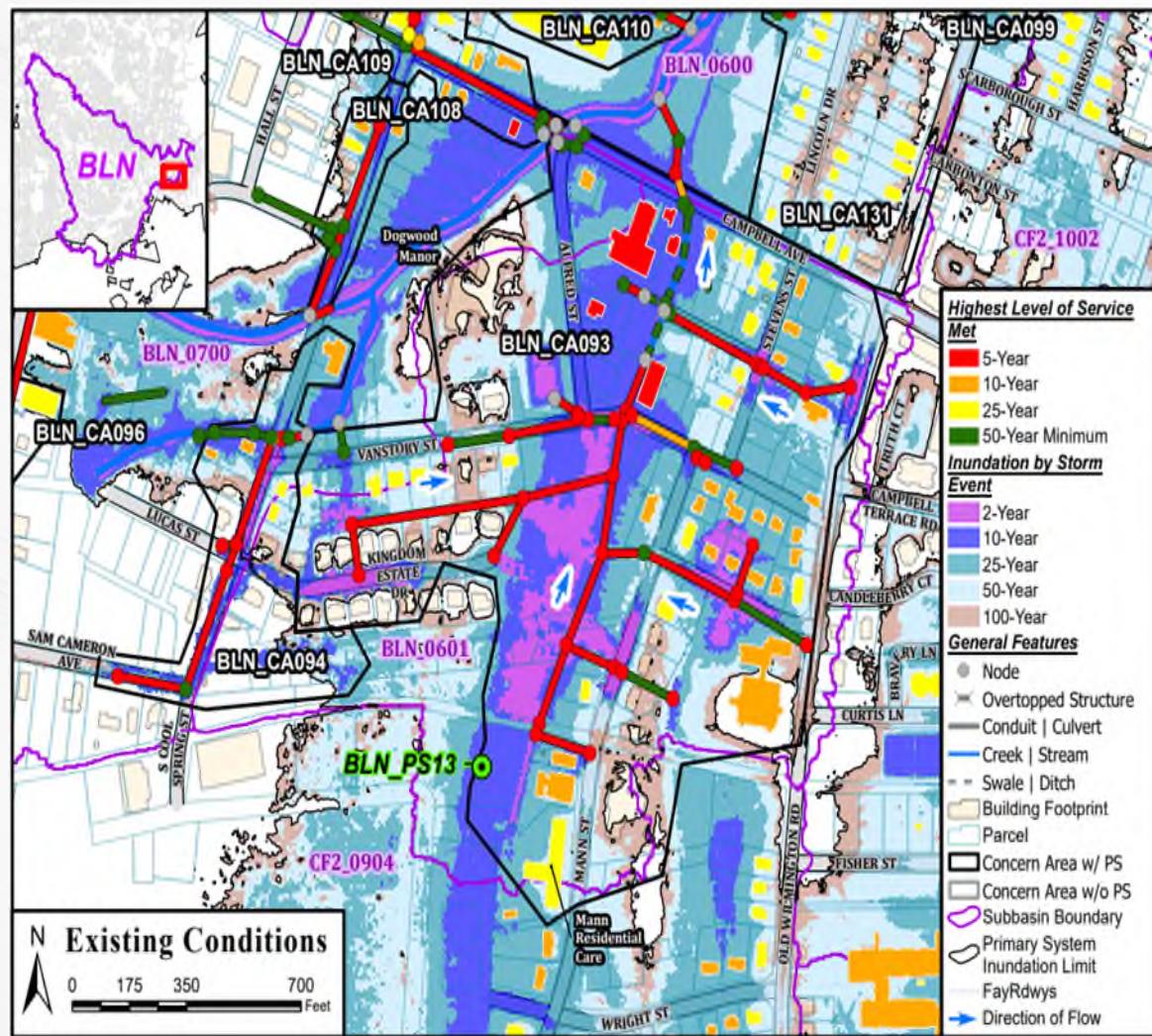
All benefitting Census Tracts of the project meet Justice-40 criteria and all but one have CDC Social Vulnerability Index (SVI) scores above 0.93

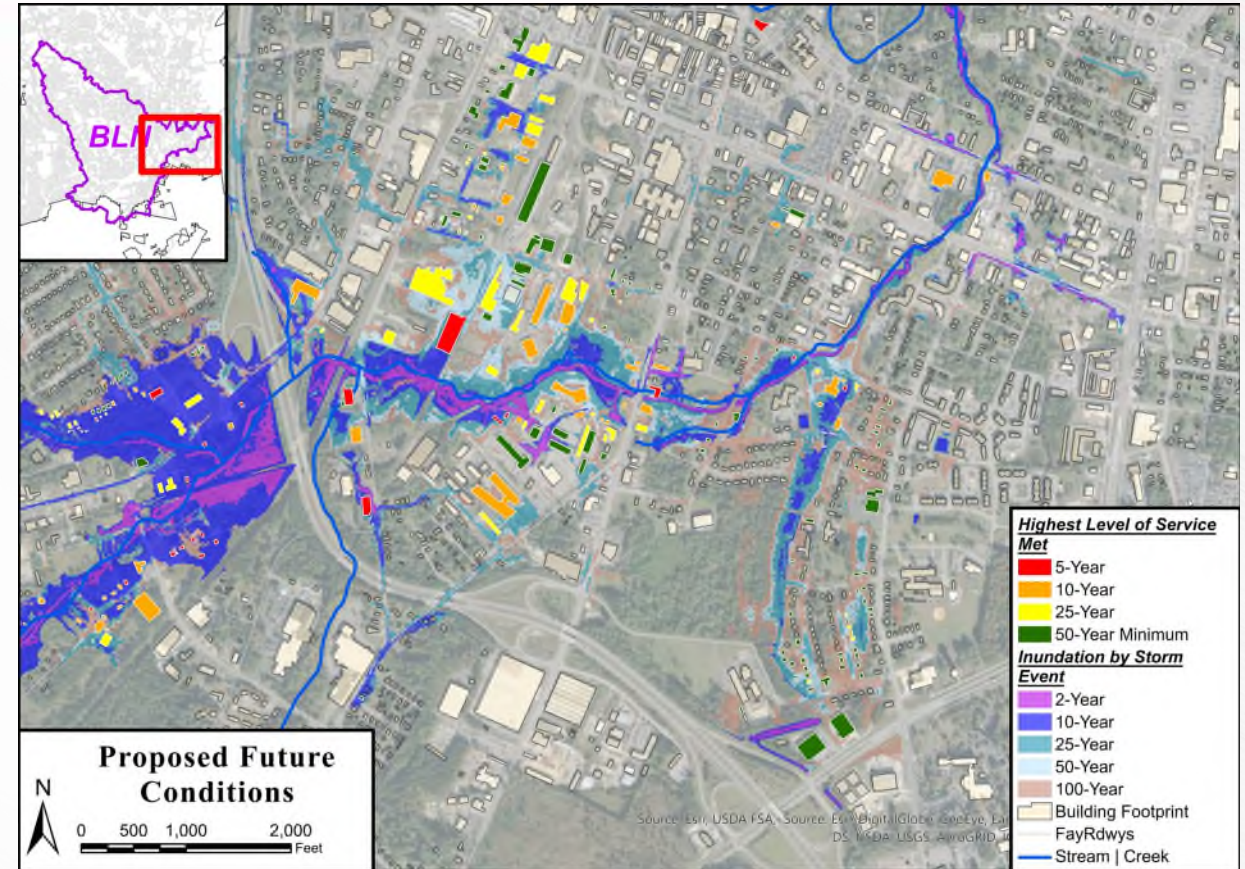
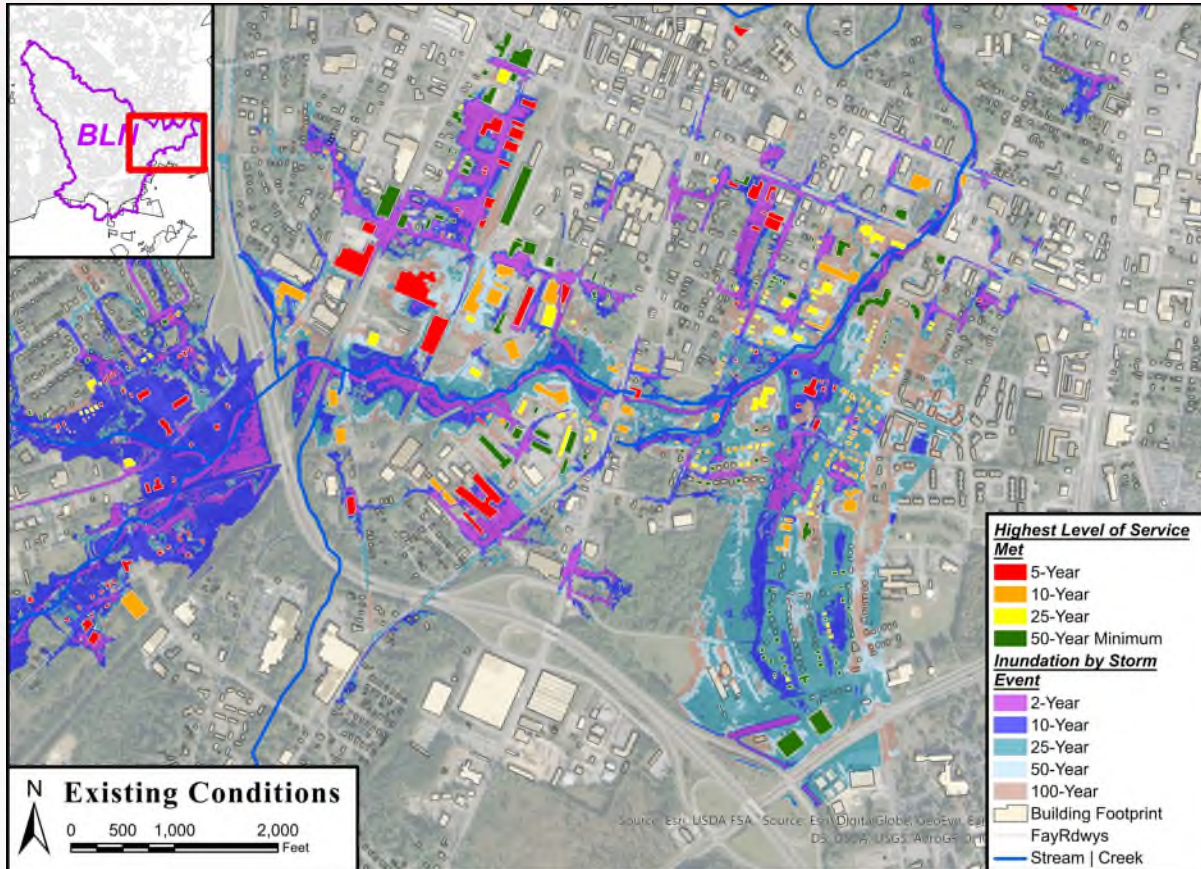


Prioritized solution reduces water level in Blounts Creek by 5' for 25-yr design event



Prioritized Solution





Floodplain Area Reduced:

- 10-year (23.3) acres
- 25-Year (97.1) acres
- 50-Year (126.5) acres
- 100-year (136.3) acres

- This solution intersects with 10 concern areas and will reduce flood impacts for each.
- Will provide a \$24.7 million dollar benefit over 10 years in flood risk reduction and property damage from the primary system solution.
- Stream enhancements will provide an environmental and public benefit contributing to a resilient watershed.

Watershed	Road Name	2-yr	5-yr	10-yr	25-yr	50-yr	100-yr
Blounts Creek	Winslow St	✓	✓	✓	✗	✗	✗
	Russell St	✓	✓	✓	✓	✓	✗
	Person St	✓	✓	✓	✓	✓	✓
	Fargo Dr	✓	✓	✓	✓	✓	✓
	Owen Dr	✓	✓	✓	✓	✗	✗
	Whitfield St	✓	✓	✗	✗	✗	✗
	Gillespie St	✓	✓	✓	✗	✗	✗
	S. Cool Spring St	✗	✗	✗	✗	✗	✗
	Campbell Ave	✓	✓	✗	✗	✗	✗

Existing conditions road overtopping

Road overtopping with prioritized solution

Watershed	Road Name	2-yr	5-yr	10-yr	25-yr	50-yr	100-yr
Blounts Creek	Winslow St	✓	✓	✓	✗	✗	✗
	Russell St	✓	✓	✓	✓	✓	✓
	Person St	✓	✓	✓	✓	✓	✓
	Fargo Dr	✓	✓	✓	✓	✓	✓
	Owen Dr	✓	✓	✓	✓	✓	✓
	Whitfield St	✓	✓	✗	✗	✗	✗
	Gillespie St	✓	✓	✓	✓	✓	✓
	S. Cool Spring St	✓	✓	✓	✓	✗	✗
	Campbell Ave	✓	✓	✓	✗	✗	✗

Key Project Elements

- Community Amenity
 - Project aligns with plans for a potential Blounts Creek Greenway extension
- Downstream Impacts
 - Small increase in WSEL downstream of the improvement ($<0.04'$ for the 25-year storm)
 - Small increase in velocity downstream (0.03 fps for the 25-year storm)
- Project Partners
 - Frequent coordination with NC DOT and CSX R/R
- Environmental/Permitting
 - Consult and coordinate with NCDOT, ACOE, FEMA, NCDEQ (DEMLR, DWR), U.S. Fish & Wildlife

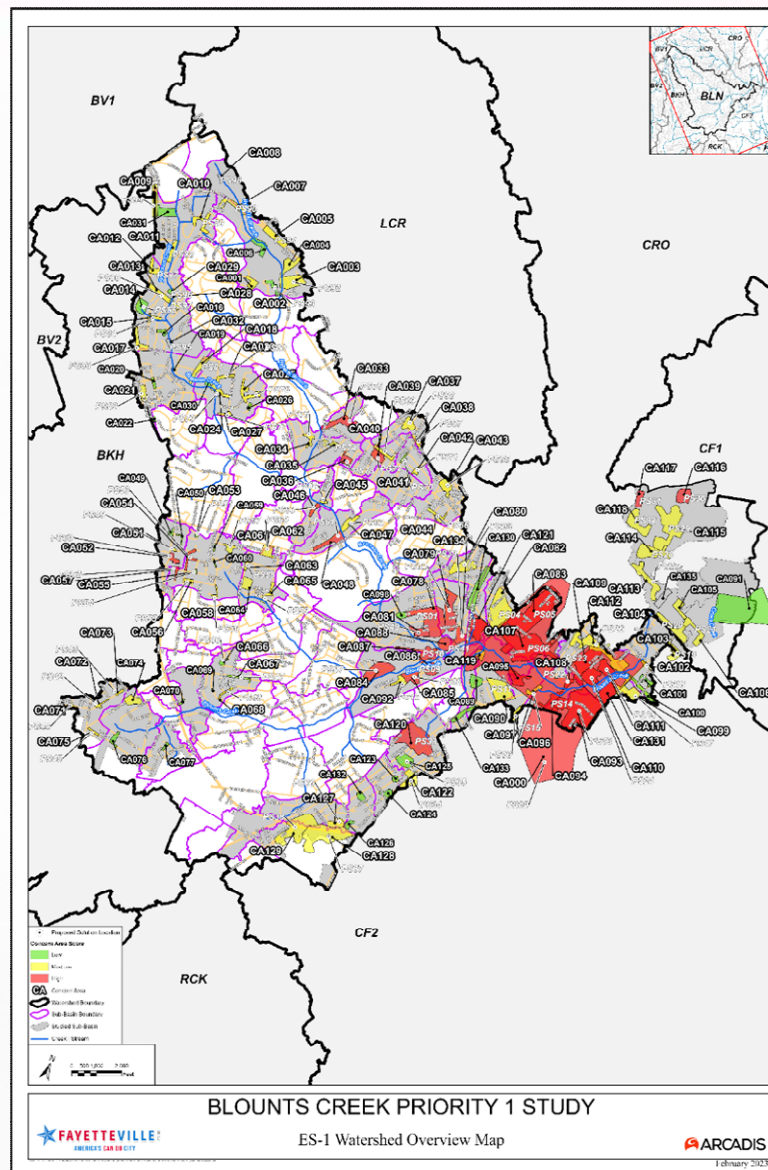


Primary System Solution

- Person Street Improvements = \$3.73 million
- Russell Street and R/R Improvements = \$12.07 million
- Stream Enhancements = \$4.74 million
- Total Cost = \$20.54 million

Secondary System Solutions

- \$300+ million

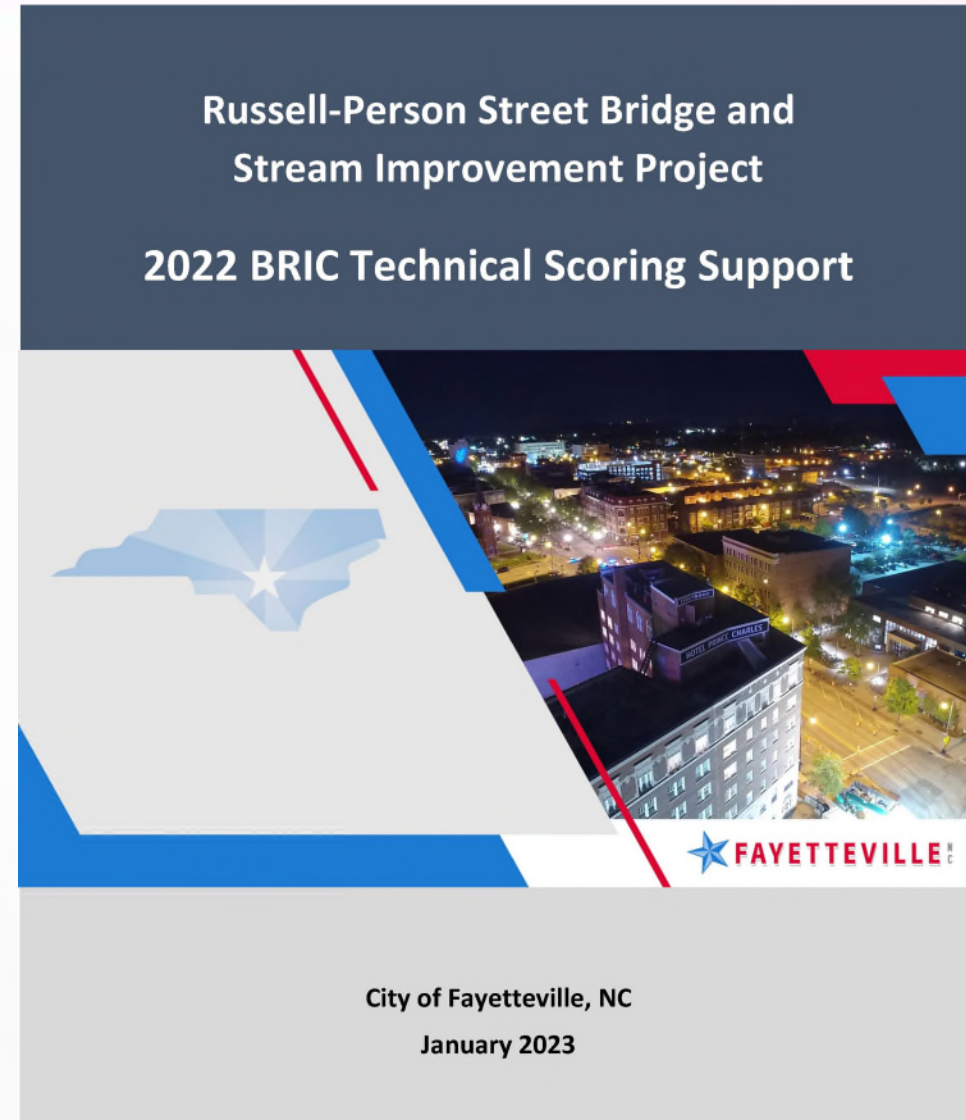


Benefit Cost Analysis

- Standard Mitigation Benefit (Residential) = \$13,087,478
- Social Benefit = \$4,963,616
- Standard Mitigation Benefit (Non-Residential) = \$6,653,574
- Total Benefit = \$24,704,668
- B/C Ratio = 1.20

Funding Solutions

- 2022 BRIC Funding (\$16M)
- 2023 Golden LEAF (\$200k)



- Russell-Person solution approved by City Council in June 2022
- Several different grants secured for Russell-Person project
- Bond for prioritized improvements across all watersheds recently approved



Person St – upgrade
bridge from 50' to
70' in length



Russell St – upgrade 3 span bridge structure from 100' to 120'

- Two NC DOT bridges
- One CSX bridge



Stream Enhancement – stabilize, expand and restore floodplain for 4,000 lf of Blounts Creek



Design to be performed in three phases

- Functional design
- Detailed design
- Final design

DRAFT Arcadis Task Order & Overall Engineering Progress Matrix	TO 1	TO 2	TO 3	Totals for all Phase
Duration Estimate	6 mo	9 mo	9 mo	24 mo
Project Administration	Milestone A	Milestone B	Milestone C	
Estimated Overall Project % Complete	25%	50%	90% - 100%	
Project Administration	\$ 57,965	\$ 75,000	\$ 75,000	\$ 207,965
Establish Purpose & Need	\$ 101,200	\$ -	\$ -	\$ -
Conceptual Design	\$ 227,572	\$ -	\$ -	\$ 227,572
Planning & Environmental (Single CE Document for all projects)	\$ -	\$ 100,000	\$ -	\$ 100,000
Field Survey Services	\$ 100,000	\$ -	\$ -	\$ 100,000
Utility Coordination	\$ 21,195	\$ 125,000	\$ 50,000	\$ 196,195
Geotechnical Investigations & Subsurface Utility Engineering	\$ -	\$ 300,000	\$ -	\$ 300,000
Stream Stabilization, Enhancement and Restoration Design	\$ 104,068	\$ 200,000	\$ 200,000	\$ 504,068
Functional Design Engineering (Russell St, CSX & Person St Bridges including track)	\$ 80,000	\$ -	\$ -	\$ 80,000
Final Design Engineering (Russell St, CSX & Person St Bridges including track)	\$ -	\$ -	\$ 1,000,000	\$ 1,000,000
Permitting	\$ -	\$ -	\$ 100,000	\$ 100,000
Contract Preparation and Bid Phase Services	\$ -	\$ -	\$ 75,000	\$ 75,000
Estimated Totals by Task Order	\$ 692,000	\$ 800,000	\$ 1,500,000	\$ 2,890,800
10% Contingency				\$ 289,080
Total Estimate				\$ 3,179,880

- Eastbound bridge at Russell St. caught on fire on 12/24/23 due to gas main break
- Bridge is scheduled to be demolished by NCDOT
- Arcadis and City are working to expedite funding from FEMA and fast-track design of the bridge



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