WK DICKSON

AN ARDURRA COMPANY



TOWN OF BLACK MOUNTAIN

BLACK MOUNTAIN STORMWATER MASTER PLAN

Executive Summary | December 2025









DRAFT

TOWN OF BLACK MOUNTAIN

STORMWATER MASTER PLAN

EXECUTIVE SUMMARY

WK Dickson/Ardurra Project No. 20230691.00.GV

December 2025

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EXECUTIVE SUMMARY

The Town of Black Mountain (Town) Stormwater Master Plan (SWMP) is funded by a Local Assistance for Stormwater Infrastructure Investments (LASII) from the American Rescue Plan Act (ARPA). The purpose of the SWMP is to develop a GIS map of the Town's stormwater system, identify flooding issues, assess the existing conveyance system capacity and infrastructure condition, develop and prioritize flood reduction projects, and establish an implementation strategy for the recommended capital infrastructure projects.

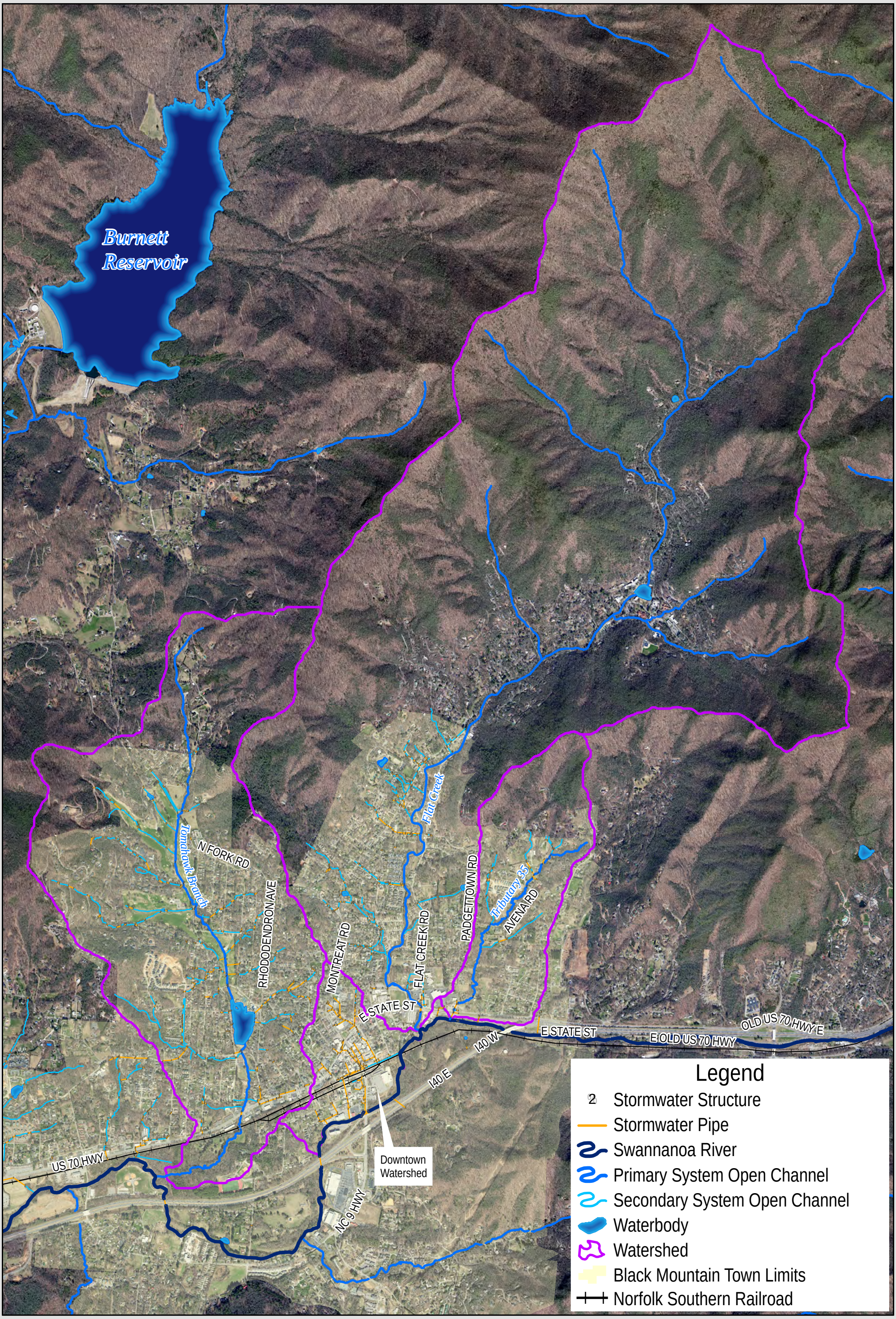
The Study Area for the SWMP includes the following:

- Secondary stormwater conveyance system in the Downtown corridor,
- Tomahawk Branch watershed, both the primary system culvert crossings and the secondary stormwater conveyance system located in the surrounding residential areas of Lake Tomahawk,
- Flat Creek Tributary 1 primary system culvert crossings in the vicinity of Portmanvilla, Sixth, and Seventh Street roads, and
- Tributary 35 (of the Swannanoa River) primary system culvert crossings in the vicinity of Avena and Padgettown roads.

The watersheds within the Town are all tributary to the Swannanoa River. In some cases, the closed system stormwater outfalls are located very closely to or directly into the Swannanoa River.

Based on historical records obtained from the National Oceanic and Atmospheric Administration (NOAA) online national climate data service[1], Hurricane Helene brought over 14 inches of rainfall in a span of three days to the mountains in September 2024, resulting in catastrophic flooding along the Swannanoa River corridor. Many roadways and bridges within the Town of Black Mountain were impacted. As a result, the Town desired to develop projects that would meet the 50-year level of service (LOS) where feasible. All proposed projects were evaluated and developed with this goal. However, there are a few areas where downstream hydraulic conditions and/or available cover prevent this level of flood reduction.

The Study Area for the Town's SWMP is shown in Figure ES-1.



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Figure ES-1: Project Location
TOWN OF BLACK MOUNTAIN, NC
Town of Black Mountain Stormwater Master Plan

0 1,000 2,000
Feet
1 in = 2,000 ft

ES.1 Existing Stormwater Infrastructure

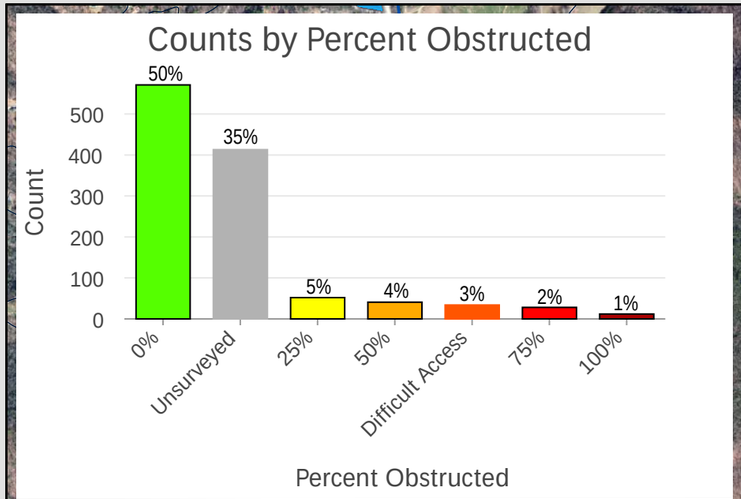
The Town manages an extensive stormwater conveyance system, including streams, roadside ditches and swales, and nearly nine (9) miles of closed pipe conveyance. Privately-owned stormwater infrastructure and private ponds also impact the Town's stormwater system. This SWMP includes assessment of the Town's stormwater conveyance system and includes multiple objectives: (1) reduce street and property flooding, (2) develop solutions to remove pipes presently located underneath commercial and government structures, (3) evaluate stormwater assets for maintenance and criticality, and (4) provide options to achieve a high level of service for roadways.

The stormwater inventory conducted for this SWMP determined that approximately 13 percent of the Town's evaluated structures are partially obstructed at 50% or less and require maintenance/debris removal. Approximately six (6) percent of the evaluated structures were severely obstructed (over 75 percent) at the time of assessment. The remaining 81 percent of evaluated structures were found to be clear of debris. Based on the results of the field assessments, four high-priority maintenance areas were identified and are shown in Figure ES-2. Beyond these four areas, it is recommended that the Town begin a systematic maintenance program to clear obstructions, beginning with the stormwater assets located in the Tomahawk Branch Watershed.

ES.2 Infrastructure Criticality Analysis

As part of the Town of Black Mountain Stormwater Master Plan, a preliminary condition assessment was completed to identify high-priority areas for detailed CCTV and/or maintenance needs. Prioritization is based on the likelihood of asset failure, as well as the consequence of asset failure. By evaluating the likelihood of asset failure in relation to the consequence of asset failure, a combined criticality score is then developed for each asset. This criticality score can enable the Town to more strategically evaluate which assets to focus capital improvement resources on for repair, rehabilitation, or further condition assessments. Of the pipes evaluated, 20% scored in Level 4 or 5, indicating the highest need for stormwater rehabilitation efforts. Within the structures evaluated, 21% scored in Level 4 or 5, indicating the highest need for stormwater structure rehabilitation efforts.

Because the data in the GIS database are dynamic, the results of the prioritization tool are a static representation based upon when the tool is run. As data are updated in the database, the tool can be utilized, and the results of the prioritization process can be updated easily. Typically, a jurisdiction may use a prioritization tool such as this on an annual or semi-annual basis as budgets are developed and capital plans and O&M plans are revised. A valuable component of this dynamic prioritization tool is the ability to quickly perform different scenario analyses to determine the relative benefit of capital and operation and maintenance (O&M) projects. The Town can determine if the at-risk score of a particular component can be dramatically reduced by improvement. In some cases, the consequence of failure score is so high that an improved asset will always remain in the high-risk category. These assets can be monitored on a frequent basis to consistently check their condition and proactively work to prevent a failure. Conversely, assets with the greatest likelihood of failure scores are often the target of initial condition assessment and rehabilitation programs. Town staff can perform scenario analyses to determine where condition assessment and rehabilitation programs can most reduce the at-risk scores of critical assets. The criticality of the Town's stormwater pipes are shown in Figure ES-3.



**The location of unknown/unsurveyed structures are not exact.
Unknown structure locations are assumed based upon pipe size and material changes between upstream and downstream surveyed structures. It is inferred from the results of the stormwater inventory and survey that there are many buried structures or underground junction boxes.

There are a few concentrated areas where obstructions and debris need to be removed.
Most of the obstructions are spread out across the Town's system.
It is recommended that the Town start with the four high priority areas identified and then move to systematic cleaning/maintenance beginning with the Tomahawk Branch watershed.

Legend

Stormwater Structures
Percent Obstructed
- 0%
- 25%
- 50%
- 75%
- 100%
- # Difficult Access Structure
- 2 Unsurveyed Structure

- Waterbody
- Stormwater Pipe
- Minor Channel
- Major Channel
- Road
- Watershed
- High Priority Maintenance Area

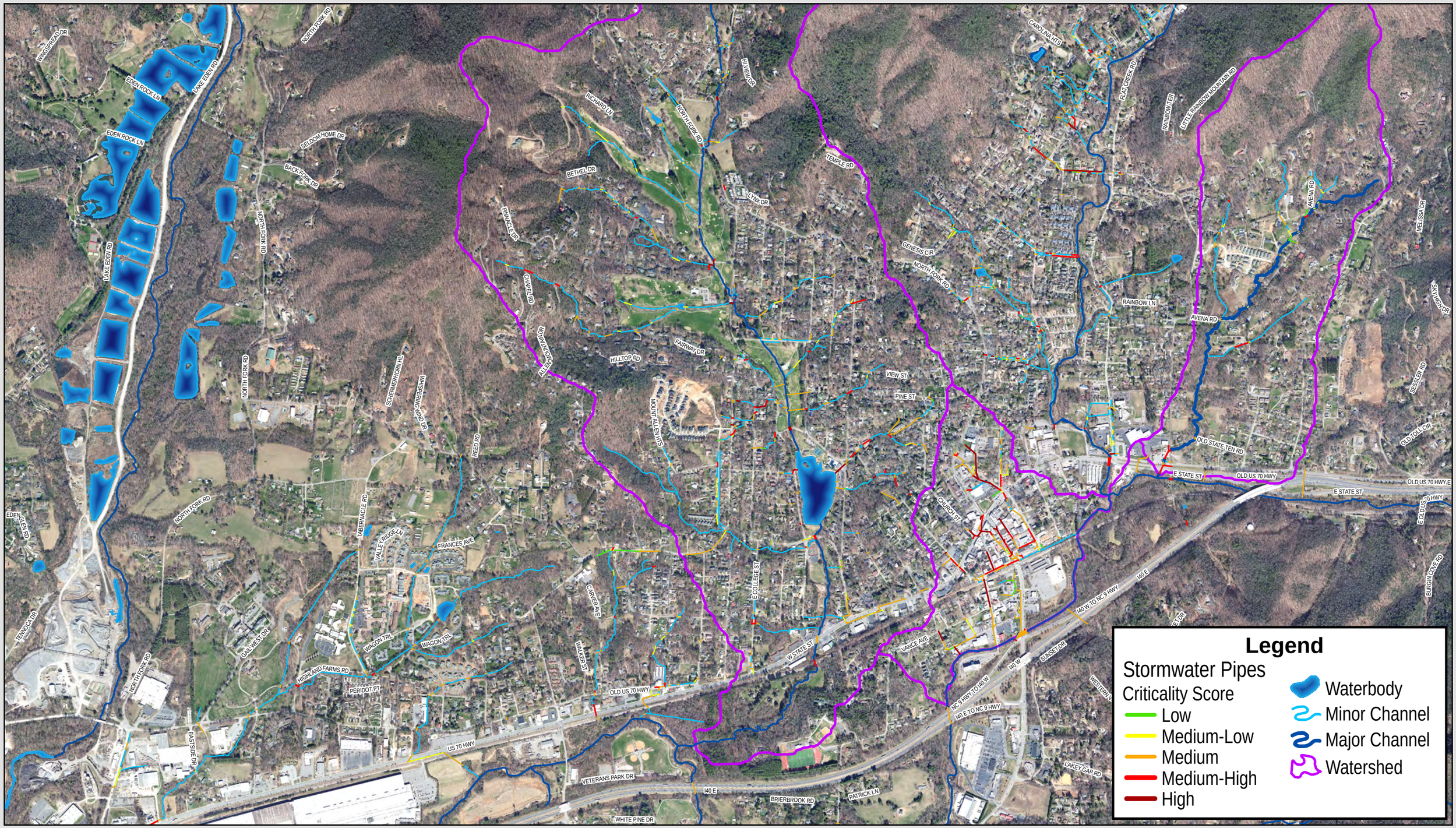
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TOWN OF BLACK MOUNTAIN NORTH CAROLINA 1893

Figure ES-2: High Priority Maintenance Areas
TOWN OF BLACK MOUNTAIN, NC
Town of Black Mountain Stormwater Master Plan

0 1,250 2,500 Feet

1 in = 1,250 ft



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TOWN OF BLACK MOUNTAIN NORTH CAROLINA 1893

Figure ES-3: Criticality Analysis Results - Stormwater Pipes
TOWN OF BLACK MOUNTAIN, NC
Town of Black Mountain Stormwater Master Plan

0 1,250 2,500 Feet

1 in = 1,250 ft

N

ES.3 Stormwater Capital Improvement Projects

Developing flood mitigation alternatives in an urban environment is a complex process based on limitations imposed by the constraints within the environment, such as floodplain encroachments, increased peak flows due to impervious areas, public and private utilities, and private property. Improvements in this portion of the study were identified through an iterative process of infrastructure improvements, open channel improvements, floodplain benching, and detention options where feasible. As previously noted, the Town desired to focus the stormwater capital projects towards achieving a goal of a 50-YR LOS. In some cases, existing conditions limit options to plan for the desired LOS. Options for providing a high LOS are presented herein.

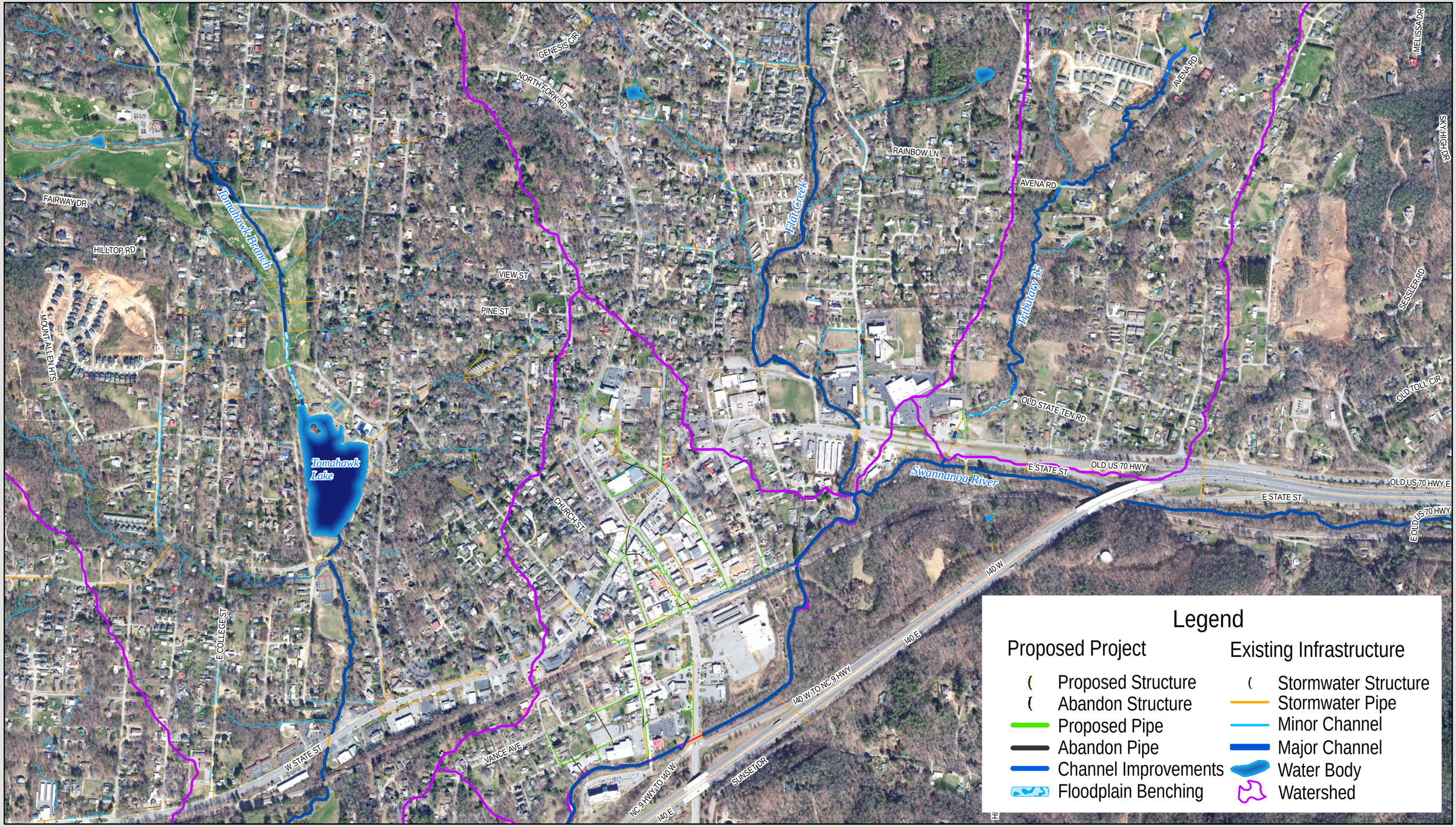
1D PCSWMM models were developed to analysis the Town's existing stormwater system, including the downtown secondary system and the culvert crossings along the three major tributaries to the Swannanoa River running through Town: Tomahawk Branch, Flat Creek, and Tributary 35. The results of the existing system capacity analysis indicated that much of the Town's stormwater system does meet a 10-year LOS and in the downtown area does not meet a 2-year LOS. The models were then used to develop planning level capital improvement projects to meet the Town's desired 50-year LOS. Twenty-nine (29) stormwater improvement capital projects were identified in phases to address the Town's goals within the SWMP. Each stormwater project is identified by watershed and a project ID. Downtown projects are additionally designated by the outfall locations for Sutton Avenue, Black Mountain Avenue, Terry Estates Drive, and NC9. The proposed projects are shown in Figure ES-4.

ES.4 Prioritization and Recommendations

To appropriately allocate Town resources, the flood reduction projects listed above were prioritized based on the following categories:

- Utility Conflicts
- Severity of Street Flooding
- Land or Right-of-Way Ownership
- Effect of Improvements
- Cost Effectiveness
- Bonus Points for Grant Funding Eligibility
- Bonus Points for Criticality Analysis

In some instances, project prioritization will be impacted by the required sequencing to provide the highest possible flood reduction benefits and to reduce or negate any downstream impacts for the proposed projects. Table ES.1 shows the proposed prioritizations and planning level cost estimates for the proposed capital stormwater improvement projects. The total cost for stormwater improvements in the Downtown corridor is approximately $27 Million, and the total cost to provide improvements along primary stream culvert crossings in Tomahawk Branch, Flat Creek, and Tributary 35 (Avena Rd area) is approximately $8 Million. Proposed project sheet summaries and planning level cost estimates are provided following Table ES.1.



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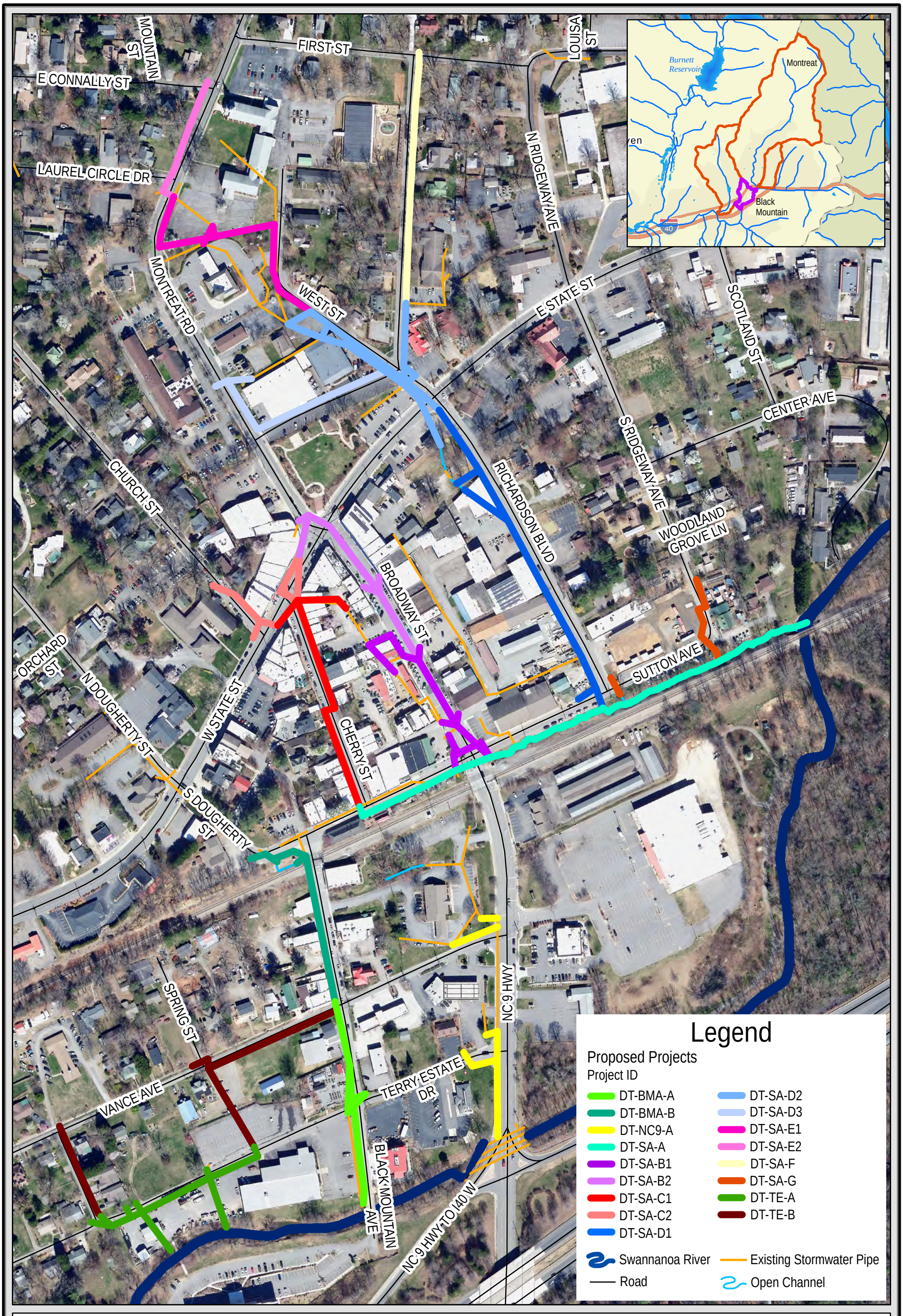
Figure ES-4: Proposed Projects
TOWN OF BLACK MOUNTAIN, NC
Town of Black Mountain Stormwater Master Plan

0 700 1,400 Feet
1 in = 700 ft

N

TABLE ES.1. PROPOSED CIP PLANNING COST AND PRIORITIZATION SUMMARY

PROPOSED STORMWATER IMPROVEMENT PROJECT		PROJECT PLANNING LEVEL OPINION OF COST	PRIORITIZATION SCORE
DOWNTOWN SYSTEM			
DT-SA-A	Sutton Ave	$ 2,250,000	88
DT-SA-B1	Broadway St Phase I	$ 2,029,000	83
DT-SA-B2	Broadway St Phase II	$ 1,292,000	88
DT-SA-C1	Cherry St Phase I	$ 1,510,000	75
DT-SA-C2	Cherry St Phase II	$ 1,021,000	88
DT-SA-D1	Police Station/Post Office Phase I	$ 4,303,000	71
DT-SA-D2	Police Station/Post Office Phase II	$ 1,932,000	87
DT-SA-D3	Police Station/Post Office Phase III	$ 923,000	81
DT-SA-E1	West St to Montreat Rd	$ 1,228,000	76
DT-SA-E2	Montreat Rd at Laurel Circle Dr	$ 797,000	49
DT-SA-F	Midland Ave	$ 1,121,000	82
DT-SA-G	S. Ridgeway Ave	$ 827,000	76
DT-BMA-A	Black Mountain Ave Phase I	$ 1,880,000	82
DT-BMA-B	Black Mountain Ave Phase II	$ 1,308,000	88
DT-TE-A	Terry Estate Dr Phase I	$ 1,963,000	61
DT-TE-B	Terry Estate Dr Phase II	$ 1,380,000	78
DT-NC9-A	NC 9	$ 1,335,000	68
TOMAHAWK BRANCH PRIMARY SYSTEM			
TB-A1	Laurel Circle Culvert Replacement	$ 760,000	58
TB-A2	Golf Course Floodplain Benching	$ 690,000	53
TB-B	Swannanoa Ave Culvert	$ 430,000	77
FLAT CREEK PRIMARY SYSTEM			
FC-TRIB1-A	Portmanvilla Rd	$ 900,000	87
FC-TRIB1-B	6th St	$ 633,000	78
FC-TRIB1-C	7th St	$ 405,000	87
FC-TRIB1-D	Montreat Rd	$ 546,000	88
TRIBUTARY 35 PRIMARY SYSTEM			
TR35-A	Padgettown Rd	$ 1,422,000	62
TR35-B1	Old State 10 Rd	$ 608,000	77
TR35-B2	Tributary 35 Floodplain Benching	$ 425,000	66
TR35-C	Avena Rd	$ 438,000	85
TR35-D	Bellgrove Rd / Avena Rd	$ 824,000	83



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Figure ES-5: Proposed Stormwater Improvement Projects
DOWNTOWN DRAINAGE SYSTEM
Town of Black Mountain Stormwater Master Plan

0 100 200
Feet
1 in = 200 ft

PROJECT NAME: **Sutton Ave and Open Channel Stormwater Improvements** PROJECT ID: **DT-SA-A**

PROJECT INFORMATION

LOCATION: Sutton Ave: Cherry St to Broadway St outfall
WATERSHED: Downtown
STORMWATER PROJECT TYPE: Stormwater Drainage
DRAINAGE IMPROVEMENTS (LF): 1360

PROJECT DESCRIPTION

To improve level of service for surrounding roadways and reduce flood risk to nearby property owners:

- Install 25 LF of new 42" RCP across Sutton Ave at Cherry St.
- Replace existing pipe on south side of Sutton Ave with 280 LF of 42" RCP.
- Replace existing pipe in the Broadway St/SuttonAve intersection with 100 LF of 48" RCP.
- Replace exising outfall pipe with 20 LF of 60" RCP.
- Install 940 LF of channel improvements from the outfall to the confluence with the Swannanoa River.*

PROJECT PRIORITIZATION and LEVEL OF SERVICE

CRITERIA	TOTAL SCORE
Utility Conflict	8
Street Flooding	32
Public or Privately-Owned Land	8
Effect of Improvements	20
Cost Effectiveness	15
Grant Bonus	3
Criticality Bonus	2
FINAL PROJECT SCORE:	**88**

KEY CROSSING	LEVEL OF SERVICE EXISTING	LEVEL OF SERVICE PROPOSED	% REDUCTION 50 YR
Sutton Ave at Cherry St	< 2-YR	50-YR	100
Sutton Ave at Broadway St	< 2-YR	50-YR	100
Future Outfall Projects*	< 2-YR	50-YR	100

**Open Channel improvements along existing roadside channel from outfall at Broadway St to the confluence with the Swannanoa River provide capacity for future outfall improvements at Richardson Blvd and S. Ridgeway Ave.*

PLANNING LEVEL OPINION OF COST

Construction estimate includes 30% contingency for planning. Design and permitting includes environmental permitting estimates. Proposed project footprints are based on GIS and modeling analyses. Detailed planning level costs are provided separately.

ITEM	COST OPINION
Construction	$ 1,394,000
Design and Permitting	$ 493,800
Other Project Costs	$ 362,200
Total Project	**$ 2,250,000**

PROJECT AREA MAP



PROJECT NAME **Sutton Ave and Open Channel Stormwater Improvements** PROJECT ID: **DT-SA-A**

PROJECT TYPE: Stormwater Drainage WATERSHED: Downtown

PLANNING LEVEL COST ESTIMATE

Construction cost includes 30% contingency for planning.
Proposed project footprints are based on GIS and modeling analyses.
Real estate, if privately-owned land, is estimated based on property value.

Improvements (LF): 420

CONSTRUCTION COST:

ITEM DESCRIPTION	QUANTITY	UNIT	UNIT COST	AMOUNT
Mobilization	1	LS	$ 51,060.00	$ 51,100.00
Erosion Control	1	LS	$ 41,850.00	$ 41,900.00
Traffic Control	1	LS	$ 16,740.00	$ 16,700.00
Moderate Utility Conflict	1	LS	$ 125,550.00	$ 125,600.00
Unclassified Excavation/Hauling	500	CY	$ 72.00	$ 36,000.00
Infrastructure Removal and Disposal	400	LF	$ 115.00	$ 46,000.00
Structure Removal and Disposal	6	EA	$ 6,800.00	$ 40,800.00
Standard Structure	-	EA	$ 8,600.00	-
Large Structure or Headwall	6	EA	$ 12,000.00	$ 72,000.00
New Pipe: 18-inch to 24-inch	-	LF	$ 390.00	-
New Pipe: 30-inch to 36-inch	-	LF	$ 535.00	-
New Pipe: 42-inch to 54-inch	400	LF	$ 670.00	$ 268,000.00
New Pipe: 60-inch	20	LF	$ 875.00	$ 17,500.00
Arch Pipe (22.5" - 31.3")	-	LF	$ 500.00	-
Large RCBC	-	LF	$ 1,700.00	-
Rip Rap	25	TN	$ 50.00	$ 1,300.00
Open Channel Improvements	940	LF	$ 350.00	$ 329,000.00
Roadway/Sidewalk Replacement	240	SY	$ 110.00	$ 26,400.00
New Concrete Curb and Gutter	-	LF	$ 110.00	-
Replace Driveway Culvert Pipe	-	LF	$ 300.00	-
Replace Existing Concrete Driveway	-	SY	$ 120.00	-
			Construction Contingency (30%):	$ 322,000.00
			PLANNING LEVEL OPINION OF CONSTRUCTION COST:	**$ 1,394,000.00**

PROJECT COST:

PROJECT BUDGET ITEM	% of CONSTRUCTION	AMOUNT
Survey	5%	$ 69,700.00
Design and Permitting	20%	$ 278,800.00
Environmental Permitting	-	$ 65,000.00
Railroad Permitting/Coordination	-	$ 150,000.00
Geotechnical Investigation	1%	$ 13,900.00
Structural Evaluation	1%	$ 13,900.00
Real Estate	2%	$ 27,900.00
Utility Relocation	2%	$ 27,900.00
Project Maintenance (3yr)	5%	$ 69,700.00
Construction Inspections	10%	$ 139,400.00
Construction	100%	$ 1,394,000.00
PLANNING LEVEL OPINION OF TOTAL PROJECT COST:		$ 2,250,000.00

PROJECT NAME: **Broadway St Stormwater Improvements Phase I** PROJECT ID: **DT-SA-B1**

PROJECT INFORMATION

LOCATION: Broadway St in Downtown Business District
WATERSHED: Downtown
STORMWATER PROJECT TYPE: Stormwater Drainage
DRAINAGE IMPROVEMENTS (LF): 700

PROJECT DESCRIPTION

To improve level of service for surrounding roadways and reduce flood risk to nearby property owners:

- Replace existing 24" pipe in Broadway St with 325 LF of 42-inch RCP.
- Replace existing catch basins and connecting pipes along Broadway with larger pipes.
- Re-route private system to proposed Broadway system and remove pipe under structure.
- Install upsized and new crossings and connections at Montreat Rd and Sutton Ave.

PROJECT PRIORITIZATION and LEVEL OF SERVICE

CRITERIA	TOTAL SCORE
Utility Conflict	4
Street Flooding	32
Public or Privately-Owned Land	8
Effect of Improvements	20
Cost Effectiveness	15
Grant Bonus	2
Criticality Bonus	2
FINAL PROJECT SCORE:	**83**

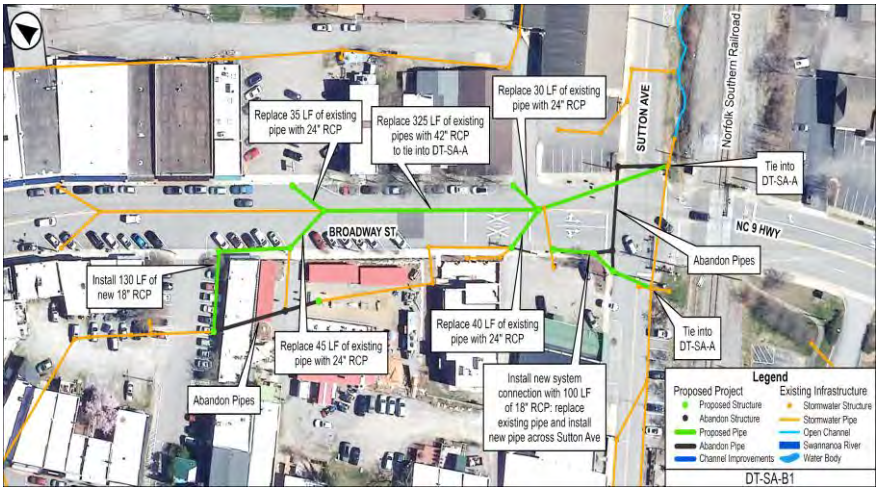
KEY CROSSING	LEVEL OF SERVICE EXISTING	LEVEL OF SERVICE PROPOSED	% REDUCTION 50 YR
Broadway St at Sutton Ave	< 2-YR	50-YR	100
Side system along Broadway	< 2-YR	50-YR	100

PLANNING LEVEL OPINION OF COST

Construction estimate includes 30% contingency for planning. Design and permitting includes environmental permitting estimates. Proposed project footprints are based on GIS and modeling analyses. Detailed planning level costs are provided separately.

ITEM	COST OPINION
Construction	$ 1,390,000
Design and Permitting	$ 278,000
Other Project Costs	$ 361,000
Total Project	**$ 2,029,000**

PROJECT AREA MAP



PROJECT NAME **Broadway St Stormwater Improvements Phase I** PROJECT ID: **DT-SA-B1**

PROJECT TYPE: Stormwater Drainage WATERSHED: Downtown

PLANNING LEVEL COST ESTIMATE

Construction cost includes 30% contingency for planning. Improvements (LF): 700
Proposed project footprints are based on GIS and modeling analyses.
Real estate, if privately-owned land, is estimated based on property value.

CONSTRUCTION COST:

ITEM DESCRIPTION	QUANTITY	UNIT	UNIT COST	AMOUNT
Mobilization	1	LS	$ 50,915.00	$ 50,900.00
Erosion Control	1	LS	$ 37,160.00	$ 37,200.00
Traffic Control	1	LS	$ 14,864.00	$ 14,900.00
Major Utility Conflict	1	LS	$ 222,960.00	$ 223,000.00
Unclassified Excavation/Hauling	500	CY	$ 72.00	$ 36,000.00
Infrastructure Removal and Disposal	720	LF	$ 115.00	$ 82,800.00
Structure Removal and Disposal	15	EA	$ 6,800.00	$ 102,000.00
Standard Structure	9	EA	$ 8,600.00	$ 77,400.00
Large Structure or Headwall	2	EA	$ 12,000.00	$ 24,000.00
New Pipe: 18-inch to 24-inch	375	LF	$ 390.00	$ 146,300.00
New Pipe: 30-inch to 36-inch	-	LF	$ 535.00	-
New Pipe: 42-inch to 54-inch	325	LF	$ 670.00	$ 217,800.00
New Pipe: 60-inch	-	LF	$ 875.00	-
Arch Pipe (22.5" - 31.3")	-	LF	$ 500.00	-
Large RCBC	-	LF	$ 1,700.00	-
Rip Rap	25	TN	$ 50.00	$ 1,300.00
Open Channel Improvements	-	LF	$ 350.00	-
Roadway/Sidewalk Replacement	380	SY	$ 110.00	$ 41,800.00
New Concrete Curb and Gutter	125	LF	$ 110.00	$ 13,800.00
Replace Driveway Culvert Pipe	-	LF	$ 300.00	-
Replace Existing Concrete Driveway	-	SY	$ 120.00	-
			Construction Contingency (30%):	$ 321,000.00
			PLANNING LEVEL OPINION OF CONSTRUCTION COST:	**$ 1,390,000.00**

PROJECT COST:

PROJECT BUDGET ITEM	% of CONSTRUCTION	AMOUNT
Survey	5%	$ 69,500.00
Design and Permitting	20%	$ 278,000.00
Environmental Permitting	-	$ -
Railroad Permitting/Coordination	-	$ -
Geotechnical Investigation	1%	$ 13,900.00
Structural Evaluation	1%	$ 13,900.00
Real Estate	2%	$ 27,800.00
Utility Relocation	2%	$ 27,800.00
Project Maintenance (3yr)	5%	$ 69,500.00
Construction Inspections	10%	$ 139,000.00
Construction	100%	$ 1,390,000.00
PLANNING LEVEL OPINION OF TOTAL PROJECT COST:		$ 2,029,000.00

PROJECT NAME: **Broadway St Stormwater Improvements Phase II** PROJECT ID: **DT-SA-B2**

PROJECT INFORMATION

LOCATION: Broadway St north to Montreat Rd
WATERSHED: Downtown
STORMWATER PROJECT TYPE: Stormwater Drainage
DRAINAGE IMPROVEMENTS (LF): 615

PROJECT DESCRIPTION

To improve level of service for surrounding roadways and reduce flood risk to nearby property owners:

- Replace existing 24" pipe in Broadway St with 210 LF of 36-inch RCP.
- Install 285 LF of new 30-inch RCP from 36-inch RCP in Broadway St across E State St.
- Replace 30 LF of existing pipe across Montreat Rd at E State St with 30-inch RCP.
- Remove pipe across Montreat flowing to first catch basin on W. State St.

PROJECT PRIORITIZATION and LEVEL OF SERVICE

CRITERIA	TOTAL SCORE
Utility Conflict	8
Street Flooding	32
Public or Privately-Owned Land	4
Effect of Improvements	20
Cost Effectiveness	20
Grant Bonus	2
Criticality Bonus	2
FINAL PROJECT SCORE:	**88**

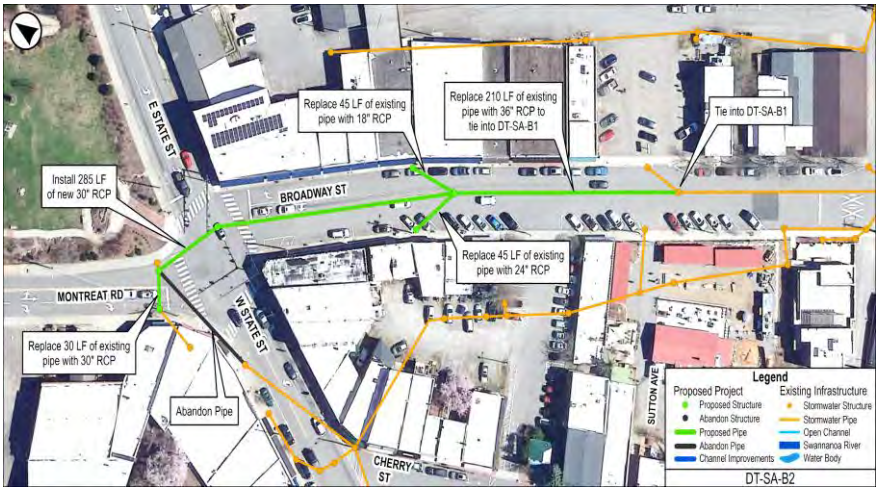
KEY CROSSING	LEVEL OF SERVICE EXISTING	LEVEL OF SERVICE PROPOSED	% REDUCTION 50 YR
E State St at Broadway St	NA	50-YR	New Crossing
Montreat Rd at E State St	< 2-YR	50-YR	100

PLANNING LEVEL OPINION OF COST

Construction estimate includes 30% contingency for planning. Design and permitting includes environmental permitting estimates. Proposed project footprints are based on GIS and modeling analyses. Detailed planning level costs are provided separately.

ITEM	COST OPINION
Construction	$ 885,000
Design and Permitting	$ 177,000
Other Project Costs	$ 230,000
Total Project	**$ 1,292,000**

PROJECT AREA MAP



PROJECT NAME **Broadway St Stormwater Improvements Phase II** PROJECT ID: **DT-SA-B2**

PROJECT TYPE: Stormwater Drainage WATERSHED: Downtown

PLANNING LEVEL COST ESTIMATE

Construction cost includes 30% contingency for planning. Improvements (LF): 615
Proposed project footprints are based on GIS and modeling analyses.
Real estate, if privately-owned land, is estimated based on property value.

CONSTRUCTION COST:

ITEM DESCRIPTION	QUANTITY	UNIT	UNIT COST	AMOUNT
Mobilization	1	LS	$ 32,425.00	$ 32,400.00
Erosion Control	1	LS	$ 26,580.00	$ 26,600.00
Traffic Control	1	LS	$ 10,632.00	$ 10,600.00
Moderate Utility Conflict	1	LS	$ 79,740.00	$ 79,700.00
Unclassified Excavation/Hauling	620	CY	$ 72.00	$ 44,600.00
Infrastructure Removal and Disposal	435	LF	$ 115.00	$ 50,000.00
Structure Removal and Disposal	5	EA	$ 6,800.00	$ 34,000.00
Standard Structure	6	EA	$ 8,600.00	$ 51,600.00
Large Structure or Headwall	-	EA	$ 12,000.00	-
New Pipe: 18-inch to 24-inch	90	LF	$ 390.00	$ 35,100.00
New Pipe: 30-inch to 36-inch	525	LF	$ 535.00	$ 280,900.00
New Pipe: 42-inch to 54-inch	-	LF	$ 670.00	-
New Pipe: 60-inch	-	LF	$ 875.00	-
Arch Pipe (22.5" - 31.3")	-	LF	$ 500.00	-
Large RCBC	-	LF	$ 1,700.00	-
Rip Rap	25	TN	$ 50.00	$ 1,300.00
Open Channel Improvements	-	LF	$ 350.00	-
Roadway/Sidewalk Replacement	310	SY	$ 110.00	$ 34,100.00
New Concrete Curb and Gutter	-	LF	$ 110.00	-
Replace Driveway Culvert Pipe	-	LF	$ 300.00	-
Replace Existing Concrete Driveway	-	SY	$ 120.00	-
			Construction Contingency (30%):	$ 204,000.00
			PLANNING LEVEL OPINION OF CONSTRUCTION COST:	**$ 885,000.00**

PROJECT COST:

PROJECT BUDGET ITEM	% of CONSTRUCTION	AMOUNT
Survey	5%	$ 44,300.00
Design and Permitting	20%	$ 177,000.00
Environmental Permitting	-	$ -
Railroad Permitting/Coordination	-	$ -
Geotechnical Investigation	1%	$ 8,900.00
Structural Evaluation	1%	$ 8,900.00
Real Estate	2%	$ 17,700.00
Utility Relocation	2%	$ 17,700.00
Project Maintenance (3yr)	5%	$ 44,300.00
Construction Inspections	10%	$ 88,500.00
Construction	100%	$ 885,000.00
PLANNING LEVEL OPINION OF TOTAL PROJECT COST:		$ 1,292,000.00

PROJECT NAME: **Cherry St Stormwater Improvements Phase I** PROJECT ID: **DT-SA-C1**

PROJECT INFORMATION

LOCATION: Cherry St from W State St to Sutton Ave
WATERSHED: Downtown
STORMWATER PROJECT TYPE: Stormwater Drainage
DRAINAGE IMPROVEMENTS (LF): 690

PROJECT DESCRIPTION

To improve level of service for surrounding roadways and reduce flood risk to nearby property owners:

- Replace existing pipe on Cherry St with 270 LF of 36-inch RCP and tie into 42-inch RCP at Sutton Ave.
- Install 330 LF of new 36-inch RCP along Cherry St. from W. State St.
- Replace existing pipe crossing Cherry St at W State St with 85 LF of 36-inch RCP.
- Remove pipe under structure at corner of W State St and Cherry St. to re-route flow to right-of-way.

PROJECT PRIORITIZATION and LEVEL OF SERVICE

CRITERIA	TOTAL SCORE
Utility Conflict	8
Street Flooding	24
Public or Privately-Owned Land	4
Effect of Improvements	20
Cost Effectiveness	15
Grant Bonus	2
Criticality Bonus	2
FINAL PROJECT SCORE:	**75**

KEY CROSSING	LEVEL OF SERVICE EXISTING	LEVEL OF SERVICE PROPOSED	% REDUCTION 50 YR
Cherry St at W State St	< 2-YR	50-YR	100
Cherry St at Sutton Ave	< 2-YR	50-YR	100

PLANNING LEVEL OPINION OF COST

Construction estimate includes 30% contingency for planning. Design and permitting includes environmental permitting estimates. Proposed project footprints are based on GIS and modeling analyses. Detailed planning level costs are provided separately.

ITEM	COST OPINION
Construction	$ 1,034,000
Design and Permitting	$ 206,800
Other Project Costs	$ 269,200
Total Project	**$ 1,510,000**

PROJECT AREA MAP



PROJECT NAME **Cherry St Stormwater Improvements Phase I** PROJECT ID: **DT-SA-C1**

PROJECT TYPE: Stormwater Drainage WATERSHED: Downtown

PLANNING LEVEL COST ESTIMATE

Construction cost includes 30% contingency for planning. Improvements (LF): 690
Proposed project footprints are based on GIS and modeling analyses.
Real estate, if privately-owned land, is estimated based on property value.

CONSTRUCTION COST:

ITEM DESCRIPTION	QUANTITY	UNIT	UNIT COST	AMOUNT
Mobilization	1	LS	$ 37,855.00	$ 37,900.00
Erosion Control	1	LS	$ 31,030.00	$ 31,000.00
Traffic Control	1	LS	$ 12,412.00	$ 12,400.00
Moderate Utility Conflict	1	LS	$ 93,090.00	$ 93,100.00
Unclassified Excavation/Hauling	860	CY	$ 72.00	$ 61,900.00
Infrastructure Removal and Disposal	500	LF	$ 115.00	$ 57,500.00
Structure Removal and Disposal	3	EA	$ 6,800.00	$ 20,400.00
Standard Structure	4	EA	$ 8,600.00	$ 34,400.00
Large Structure or Headwall	-	EA	$ 12,000.00	-
New Pipe: 18-inch to 24-inch	-	LF	$ 390.00	-
New Pipe: 30-inch to 36-inch	690	LF	$ 535.00	$ 369,200.00
New Pipe: 42-inch to 54-inch	-	LF	$ 670.00	-
New Pipe: 60-inch	-	LF	$ 875.00	-
Arch Pipe (22.5" - 31.3")	-	LF	$ 500.00	-
Large RCBC	-	LF	$ 1,700.00	-
Rip Rap	25	TN	$ 50.00	$ 1,300.00
Open Channel Improvements	-	LF	$ 350.00	-
Roadway/Sidewalk Replacement	390	SY	$ 110.00	$ 42,900.00
New Concrete Curb and Gutter	300	LF	$ 110.00	$ 33,000.00
Replace Driveway Culvert Pipe	-	LF	$ 300.00	-
Replace Existing Concrete Driveway	-	SY	$ 120.00	-
			Construction Contingency (30%):	$ 239,000.00
			PLANNING LEVEL OPINION OF CONSTRUCTION COST:	**$ 1,034,000.00**

PROJECT COST:

PROJECT BUDGET ITEM	% of CONSTRUCTION	AMOUNT
Survey	5%	$ 51,700.00
Design and Permitting	20%	$ 206,800.00
Environmental Permitting	-	$ -
Railroad Permitting/Coordination	-	$ -
Geotechnical Investigation	1%	$ 10,300.00
Structural Evaluation	1%	$ 10,300.00
Real Estate	2%	$ 20,700.00
Utility Relocation	2%	$ 20,700.00
Project Maintenance (3yr)	5%	$ 51,700.00
Construction Inspections	10%	$ 103,400.00
Construction	100%	$ 1,034,000.00
PLANNING LEVEL OPINION OF TOTAL PROJECT COST:		$ 1,510,000.00

PROJECT NAME: **Cherry St Stormwater Improvements Phase II** PROJECT ID: **DT-SA-C2**

PROJECT INFORMATION

LOCATION: Church St and W State St
WATERSHED: Downtown
STORMWATER PROJECT TYPE: Stormwater Drainage
DRAINAGE IMPROVEMENTS (LF): 420

PROJECT DESCRIPTION

To improve level of service for surrounding roadways and reduce flood risk to nearby property owners:

- Replace existing crossings at Church St and W State St with 50 LF of 30-inch RCP and 50 LF of 36-inch RCP.
- Replace existing pipe along Church St with 24-inch RCP and connect to new system at W. State St/Cherry St.
- Install 160 LF of 18-inch RCP along W. State St to redirect flow to proposed Cherry St system.
- Remove remaining connection between Montreat Rd and Cherry St.

PROJECT PRIORITIZATION and LEVEL OF SERVICE

CRITERIA	TOTAL SCORE
Utility Conflict	8
Street Flooding	32
Public or Privately-Owned Land	4
Effect of Improvements	20
Cost Effectiveness	20
Grant Bonus	2
Criticality Bonus	2
FINAL PROJECT SCORE:	**88**

KEY CROSSING	LEVEL OF SERVICE EXISTING	LEVEL OF SERVICE PROPOSED	% REDUCTION 50 YR
W State St at Church St	< 2-YR	50-YR	100
W State St east of Cherry St	2-YR	50-YR	100
Church St at W State St	< 2-YR	50-YR	100

PLANNING LEVEL OPINION OF COST

Construction estimate includes 30% contingency for planning. Design and permitting includes environmental permitting estimates. Proposed project footprints are based on GIS and modeling analyses. Detailed planning level costs are provided separately.

ITEM	COST OPINION
Construction	$ 699,000
Design and Permitting	$ 139,800
Other Project Costs	$ 182,200
Total Project	**$ 1,021,000**

PROJECT AREA MAP



PROJECT NAME **Cherry St Stormwater Improvements Phase II** PROJECT ID: **DT-SA-C2**

PROJECT TYPE: Stormwater Drainage WATERSHED: Downtown

PLANNING LEVEL COST ESTIMATE

Construction cost includes 30% contingency for planning. Improvements (LF): 420
Proposed project footprints are based on GIS and modeling analyses.
Real estate, if privately-owned land, is estimated based on property value.

CONSTRUCTION COST:

ITEM DESCRIPTION	QUANTITY	UNIT	UNIT COST	AMOUNT
Mobilization	1	LS	$ 25,635.00	$ 25,600.00
Erosion Control	1	LS	$ 21,015.00	$ 21,000.00
Traffic Control	1	LS	$ 8,406.00	$ 8,400.00
Moderate Utility Conflict	1	LS	$ 63,045.00	$ 63,000.00
Unclassified Excavation/Hauling	340	CY	$ 72.00	$ 24,500.00
Infrastructure Removal and Disposal	440	LF	$ 115.00	$ 50,600.00
Structure Removal and Disposal	8	EA	$ 6,800.00	$ 54,400.00
Standard Structure	7	EA	$ 8,600.00	$ 60,200.00
Large Structure or Headwall	-	EA	$ 12,000.00	-
New Pipe: 18-inch to 24-inch	325	LF	$ 390.00	$ 126,800.00
New Pipe: 30-inch to 36-inch	95	LF	$ 535.00	$ 50,800.00
New Pipe: 42-inch to 54-inch	-	LF	$ 670.00	-
New Pipe: 60-inch	-	LF	$ 875.00	-
Arch Pipe (22.5" - 31.3")	-	LF	$ 500.00	-
Large RCBC	-	LF	$ 1,700.00	-
Rip Rap	25	TN	$ 50.00	$ 1,300.00
Open Channel Improvements	-	LF	$ 350.00	-
Roadway/Sidewalk Replacement	260	SY	$ 110.00	$ 28,600.00
New Concrete Curb and Gutter	210	LF	$ 110.00	$ 23,100.00
Replace Driveway Culvert Pipe	-	LF	$ 300.00	-
Replace Existing Concrete Driveway	-	SY	$ 120.00	-
			Construction Contingency (30%):	$ 161,000.00
			PLANNING LEVEL OPINION OF CONSTRUCTION COST:	**$ 699,000.00**

PROJECT COST:

PROJECT BUDGET ITEM	% of CONSTRUCTION	AMOUNT
Survey	5%	$ 35,000.00
Design and Permitting	20%	$ 139,800.00
Environmental Permitting	-	$ -
Railroad Permitting/Coordination	-	$ -
Geotechnical Investigation	1%	$ 7,000.00
Structural Evaluation	1%	$ 7,000.00
Real Estate	2%	$ 14,000.00
Utility Relocation	2%	$ 14,000.00
Project Maintenance (3yr)	5%	$ 35,000.00
Construction Inspections	10%	$ 69,900.00
Construction	100%	$ 699,000.00
PLANNING LEVEL OPINION OF TOTAL PROJECT COST:		$ 1,021,000.00

PROJECT NAME: **Police Station / Post Office Stormwater Improvements Phase I** PROJECT ID: **DT-SA-D1**

PROJECT INFORMATION

LOCATION: Richardson Blvd / Post Office
WATERSHED: Downtown
STORMWATER PROJECT TYPE: Stormwater Drainage
DRAINAGE IMPROVEMENTS (LF): 1600

PROJECT DESCRIPTION

To improve level of service for surrounding roadways and reduce flood risk to nearby property owners:

- Install 150 LF of 3' x 7' RCBC along Richardson Blvd to the outfall in the open channel along Sutton Ave.
- Install 570 LF of twin 42-inch RCP north along Richardson Blvd to the post office.
- Install 190 LF of 42-inch pipe to the intersection with E State St.
- Install 70 LF of new 36-inch RCP adjacent to the post office to reroute flow to the right-of-way.
- Project allows for stormwater improvements upstream at Police Station.

PROJECT PRIORITIZATION and LEVEL OF SERVICE

CRITERIA	TOTAL SCORE
Utility Conflict	8
Street Flooding	32
Public or Privately-Owned Land	8
Effect of Improvements	20
Cost Effectiveness	0
Grant Bonus	2
Criticality Bonus	1
FINAL PROJECT SCORE:	**71**

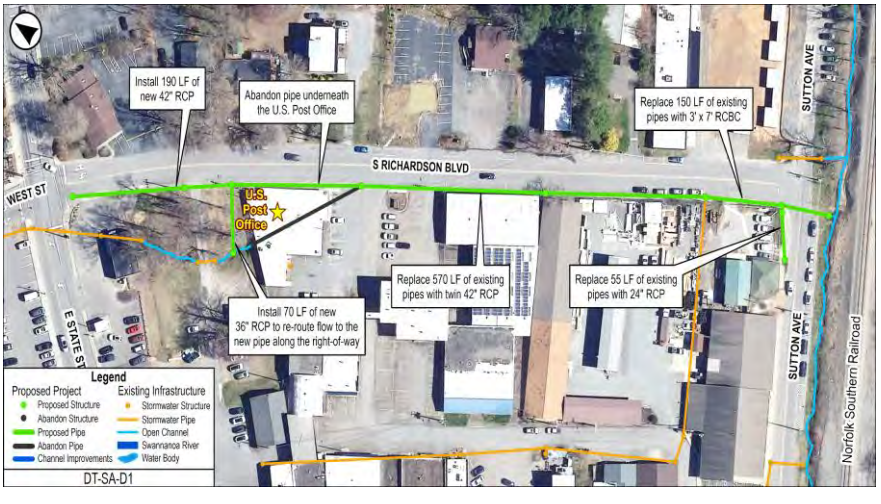
KEY CROSSING	LEVEL OF SERVICE EXISTING	LEVEL OF SERVICE PROPOSED	% REDUCTION 50 YR
Sutton Ave at Richardson	< 2-YR	50-YR	100
Post Office Infrastructure	2-YR	50-YR	100

PLANNING LEVEL OPINION OF COST

Construction estimate includes 30% contingency for planning. Design and permitting includes environmental permitting estimates. Proposed project footprints are based on GIS and modeling analyses. Detailed planning level costs are provided separately.

ITEM	COST OPINION
Construction	$ 2,913,000
Design and Permitting	$ 632,600
Other Project Costs	$ 757,400
Total Project	**$ 4,303,000**

PROJECT AREA MAP



PROJECT NAME **Police Station / Post Office Stormwater Improvements Phase I** PROJECT ID: **DT-SA-D1**

PROJECT TYPE: Stormwater Drainage WATERSHED: Downtown

PLANNING LEVEL COST ESTIMATE

Construction cost includes 30% contingency for planning. Improvements (LF): 1600
Proposed project footprints are based on GIS and modeling analyses.
Real estate, if privately-owned land, is estimated based on property value.

CONSTRUCTION COST:

ITEM DESCRIPTION	QUANTITY	UNIT	UNIT COST	AMOUNT
Mobilization	1	LS	$ 106,720.00	$ 106,700.00
Erosion Control	1	LS	$ 87,475.00	$ 87,500.00
Traffic Control	1	LS	$ 34,990.00	$ 35,000.00
Moderate Utility Conflict	1	LS	$ 262,425.00	$ 262,400.00
Unclassified Excavation/Hauling	2310	CY	$ 72.00	$ 166,300.00
Infrastructure Removal and Disposal	760	LF	$ 115.00	$ 87,400.00
Structure Removal and Disposal	6	EA	$ 6,800.00	$ 40,800.00
Standard Structure	3	EA	$ 8,600.00	$ 25,800.00
Large Structure or Headwall	8	EA	$ 12,000.00	$ 96,000.00
New Pipe: 18-inch to 24-inch	50	LF	$ 390.00	$ 19,500.00
New Pipe: 30-inch to 36-inch	70	LF	$ 535.00	$ 37,500.00
New Pipe: 42-inch to 54-inch	1330	LF	$ 670.00	$ 891,100.00
New Pipe: 60-inch	-	LF	$ 875.00	-
Arch Pipe (22.5" - 31.3")	-	LF	$ 500.00	-
Large RCBC	150	LF	$ 1,700.00	$ 255,000.00
Rip Rap	50	TN	$ 50.00	$ 2,500.00
Open Channel Improvements	-	LF	$ 350.00	-
Roadway/Sidewalk Replacement	610	SY	$ 110.00	$ 67,100.00
New Concrete Curb and Gutter	550	LF	$ 110.00	$ 60,500.00
Replace Driveway Culvert Pipe	-	LF	$ 300.00	-
Replace Existing Concrete Driveway	-	SY	$ 120.00	-
			Construction Contingency (30%):	$ 672,000.00
			PLANNING LEVEL OPINION OF CONSTRUCTION COST:	**$ 2,913,000.00**

PROJECT COST:

PROJECT BUDGET ITEM	% of CONSTRUCTION	AMOUNT
Survey	5%	$ 145,700.00
Design and Permitting	20%	$ 582,600.00
Environmental Permitting	-	$ 50,000.00
Railroad Permitting/Coordination	-	$ -
Geotechnical Investigation	1%	$ 29,100.00
Structural Evaluation	1%	$ 29,100.00
Real Estate	2%	$ 58,300.00
Utility Relocation	2%	$ 58,300.00
Project Maintenance (3yr)	5%	$ 145,700.00
Construction Inspections	10%	$ 291,300.00
Construction	100%	$ 2,913,000.00
PLANNING LEVEL OPINION OF TOTAL PROJECT COST:		$ 4,303,000.00

PROJECT NAME: **Police Station / Post Office Stormwater Improvements Phase II** PROJECT ID: **DT-SA-D2**

PROJECT INFORMATION

LOCATION: West St at E State St / Police Station
WATERSHED: Downtown
STORMWATER PROJECT TYPE: Stormwater Drainage
DRAINAGE IMPROVEMENTS (LF): 775

PROJECT DESCRIPTION

To improve level of service for surrounding roadways and reduce flood risk to nearby property owners:

- Install 170 LF of new 42-inch RCP from Honeycutt St crossing E State St to tie-into proposed project DT-SA-D1.
- Install 55 LF of new 24-inch RCP and 200 LF of new 36-inch RCP in a new alignment along West St.
- Install new connecting pipes north of the police station to re-route flow to the right-of-way.
- Remove/abandon in place stormwater system running underneath police station to south of E State St.
- Install 235 LF of 24-inch RCP at the West/Midland intersection.

PROJECT PRIORITIZATION and LEVEL OF SERVICE

CRITERIA	TOTAL SCORE
Utility Conflict	8
Street Flooding	32
Public or Privately-Owned Land	8
Effect of Improvements	20
Cost Effectiveness	15
Grant Bonus	2
Criticality Bonus	2
FINAL PROJECT SCORE:	**87**

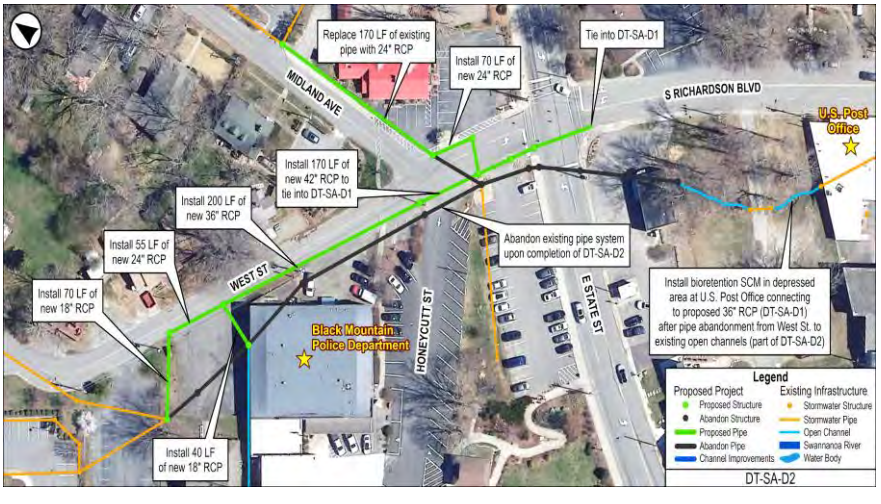
KEY CROSSING	LEVEL OF SERVICE EXISTING	LEVEL OF SERVICE PROPOSED	% REDUCTION 50 YR
E State St/Richardson INT	< 2-YR	50-YR	100
West/Midland INT	< 2-YR	50-YR	100
Police Station Infrastructure	< 2-YR	50-YR	100

PLANNING LEVEL OPINION OF COST

Construction estimate includes 30% contingency for planning. Design and permitting includes environmental permitting estimates. Proposed project footprints are based on GIS and modeling analyses. Detailed planning level costs are provided separately.

ITEM	COST OPINION
Construction	$ 1,323,000
Design and Permitting	$ 264,600
Other Project Costs	$ 344,400
Total Project	**$ 1,932,000**

PROJECT AREA MAP



PROJECT NAME **Police Station / Post Office Stormwater Improvements Phase II** PROJECT ID: **DT-SA-D2**

PROJECT TYPE: Stormwater Drainage WATERSHED: Downtown

PLANNING LEVEL COST ESTIMATE

Construction cost includes 30% contingency for planning. Improvements (LF): 775
Proposed project footprints are based on GIS and modeling analyses.
Real estate, if privately-owned land, is estimated based on property value.

CONSTRUCTION COST:

ITEM DESCRIPTION	QUANTITY	UNIT	UNIT COST	AMOUNT
Mobilization	1	LS	$ 48,475.00	$ 48,500.00
Erosion Control	1	LS	$ 39,735.00	$ 39,700.00
Traffic Control	1	LS	$ 15,894.00	$ 15,900.00
Moderate Utility Conflict	1	LS	$ 119,205.00	$ 119,200.00
Unclassified Excavation/Hauling	940	CY	$ 72.00	$ 67,700.00
Infrastructure Removal and Disposal	710	LF	$ 115.00	$ 81,700.00
Structure Removal and Disposal	10	EA	$ 6,800.00	$ 68,000.00
Standard Structure	7	EA	$ 8,600.00	$ 60,200.00
Large Structure or Headwall	4	EA	$ 12,000.00	$ 48,000.00
New Pipe: 18-inch to 24-inch	400	LF	$ 390.00	$ 156,000.00
New Pipe: 30-inch to 36-inch	200	LF	$ 535.00	$ 107,000.00
New Pipe: 42-inch to 54-inch	175	LF	$ 670.00	$ 117,300.00
New Pipe: 60-inch	-	LF	$ 875.00	-
Arch Pipe (22.5" - 31.3")	-	LF	$ 500.00	-
Large RCBC	-	LF	$ 1,700.00	-
Rip Rap	25	TN	$ 50.00	$ 1,300.00
Open Channel Improvements	-	LF	$ 350.00	-
Roadway/Sidewalk Replacement	370	SY	$ 110.00	$ 40,700.00
New Concrete Curb and Gutter	425	LF	$ 110.00	$ 46,800.00
Replace Driveway Culvert Pipe	-	LF	$ 300.00	-
Replace Existing Concrete Driveway	-	SY	$ 120.00	-
			Construction Contingency (30%):	$ 305,000.00
			PLANNING LEVEL OPINION OF CONSTRUCTION COST:	**$ 1,323,000.00**

PROJECT COST:

PROJECT BUDGET ITEM	% of CONSTRUCTION	AMOUNT
Survey	5%	$ 66,200.00
Design and Permitting	20%	$ 264,600.00
Environmental Permitting	-	$ -
Railroad Permitting/Coordination	-	$ -
Geotechnical Investigation	1%	$ 13,200.00
Structural Evaluation	1%	$ 13,200.00
Real Estate	2%	$ 26,500.00
Utility Relocation	2%	$ 26,500.00
Project Maintenance (3yr)	5%	$ 66,200.00
Construction Inspections	10%	$ 132,300.00
Construction	100%	$ 1,323,000.00
PLANNING LEVEL OPINION OF TOTAL PROJECT COST:		$ 1,932,000.00

PROJECT NAME: **Police Station / Post Office Stormwater Improvements Phase III** PROJECT ID: **DT-SA-D3**

PROJECT INFORMATION

LOCATION: Montreat Rd and Honeycutt St
WATERSHED: Downtown
STORMWATER PROJECT TYPE: Stormwater Drainage
DRAINAGE IMPROVEMENTS (LF): 575

PROJECT DESCRIPTION

To improve level of service for surrounding roadways and reduce flood risk to nearby property owners:

- Replace existing pipe with paved over inlet across Montreat Rd at Fire Station with 35 LF of 24-inch RCP.
- Install 540 LF of new 24-inch RCP along Montreat Rd to Honeycutt St connecting to 42-inch RCP at West St.
- Remove existing pipe directing public water onto private property just north of the Fire Station.

PROJECT PRIORITIZATION and LEVEL OF SERVICE

CRITERIA	TOTAL SCORE
Utility Conflict	8
Street Flooding	32
Public or Privately-Owned Land	4
Effect of Improvements	15
Cost Effectiveness	20
Grant Bonus	2
Criticality Bonus	0
FINAL PROJECT SCORE:	**81**

KEY CROSSING	LEVEL OF SERVICE EXISTING	LEVEL OF SERVICE PROPOSED	% REDUCTION 50 YR
Montreat Rd at Fire Station	< 2-YR	50-YR	100
Honeycutt St	NA	50-YR	New System

PLANNING LEVEL OPINION OF COST

Construction estimate includes 30% contingency for planning. Design and permitting includes environmental permitting estimates. Proposed project footprints are based on GIS and modeling analyses. Detailed planning level costs are provided separately.

ITEM	COST OPINION
Construction	$ 632,000
Design and Permitting	$ 126,400
Other Project Costs	$ 164,600
Total Project	**$ 923,000**

PROJECT AREA MAP



PROJECT NAME **Police Station / Post Office Stormwater Improvements Phase III** PROJECT ID: **DT-SA-D3**

PROJECT TYPE: Stormwater Drainage WATERSHED: Downtown

PLANNING LEVEL COST ESTIMATE

Construction cost includes 30% contingency for planning. Improvements (LF): 575
Proposed project footprints are based on GIS and modeling analyses.
Real estate, if privately-owned land, is estimated based on property value.

CONSTRUCTION COST:

ITEM DESCRIPTION	QUANTITY	UNIT	UNIT COST	AMOUNT
Mobilization	1	LS	$ 23,135.00	$ 23,100.00
Erosion Control	1	LS	$ 18,960.00	$ 19,000.00
Traffic Control	1	LS	$ 7,584.00	$ 7,600.00
Moderate Utility Conflict	1	LS	$ 56,880.00	$ 56,900.00
Unclassified Excavation/Hauling	510	CY	$ 72.00	$ 36,700.00
Infrastructure Removal and Disposal	100	LF	$ 115.00	$ 11,500.00
Structure Removal and Disposal	3	EA	$ 6,800.00	$ 20,400.00
Standard Structure	4	EA	$ 8,600.00	$ 34,400.00
Large Structure or Headwall	-	EA	$ 12,000.00	-
New Pipe: 18-inch to 24-inch	575	LF	$ 390.00	$ 224,300.00
New Pipe: 30-inch to 36-inch	-	LF	$ 535.00	-
New Pipe: 42-inch to 54-inch	-	LF	$ 670.00	-
New Pipe: 60-inch	-	LF	$ 875.00	-
Arch Pipe (22.5" - 31.3")	-	LF	$ 500.00	-
Large RCBC	-	LF	$ 1,700.00	-
Rip Rap	25	TN	$ 50.00	$ 1,300.00
Open Channel Improvements	-	LF	$ 350.00	-
Roadway/Sidewalk Replacement	310	SY	$ 110.00	$ 34,100.00
New Concrete Curb and Gutter	150	LF	$ 110.00	$ 16,500.00
Replace Driveway Culvert Pipe	-	LF	$ 300.00	-
Replace Existing Concrete Driveway	-	SY	$ 120.00	-
			Construction Contingency (30%):	$ 146,000.00
			PLANNING LEVEL OPINION OF CONSTRUCTION COST:	**$ 632,000.00**

PROJECT COST:

PROJECT BUDGET ITEM	% of CONSTRUCTION	AMOUNT
Survey	5%	$ 31,600.00
Design and Permitting	20%	$ 126,400.00
Environmental Permitting	-	$ -
Railroad Permitting/Coordination	-	$ -
Geotechnical Investigation	1%	$ 6,300.00
Structural Evaluation	1%	$ 6,300.00
Real Estate	2%	$ 12,600.00
Utility Relocation	2%	$ 12,600.00
Project Maintenance (3yr)	5%	$ 31,600.00
Construction Inspections	10%	$ 63,200.00
Construction	100%	$ 632,000.00
PLANNING LEVEL OPINION OF TOTAL PROJECT COST:		$ 923,000.00

PROJECT NAME: **West St to Montreat Rd Stormwater Improvements** PROJECT ID: **DT-SA-E1**

PROJECT INFORMATION

LOCATION: West St to Montreat Rd
WATERSHED: Downtown
STORMWATER PROJECT TYPE: Stormwater Drainage
DRAINAGE IMPROVEMENTS (LF): 760

PROJECT DESCRIPTION

To improve level of service for surrounding roadways and reduce flood risk to nearby property owners:

- Install 735 LF of new 24-inch system along Montreat Rd and West St to connect to Proposed Project DT-SA-D2.
- This requires a permanent easement along the property line with the bank and church.
- Install 575 LF of new 24-inch system along Montreat Rd at Fire Station and Honeycutt Rd.
- Proposed project re-routes flow away from private property into the right-of-way.

PROJECT PRIORITIZATION and LEVEL OF SERVICE

CRITERIA	TOTAL SCORE
Utility Conflict	8
Street Flooding	32
Public or Privately-Owned Land	8
Effect of Improvements	10
Cost Effectiveness	15
Grant Bonus	2
Criticality Bonus	1
FINAL PROJECT SCORE:	**76**

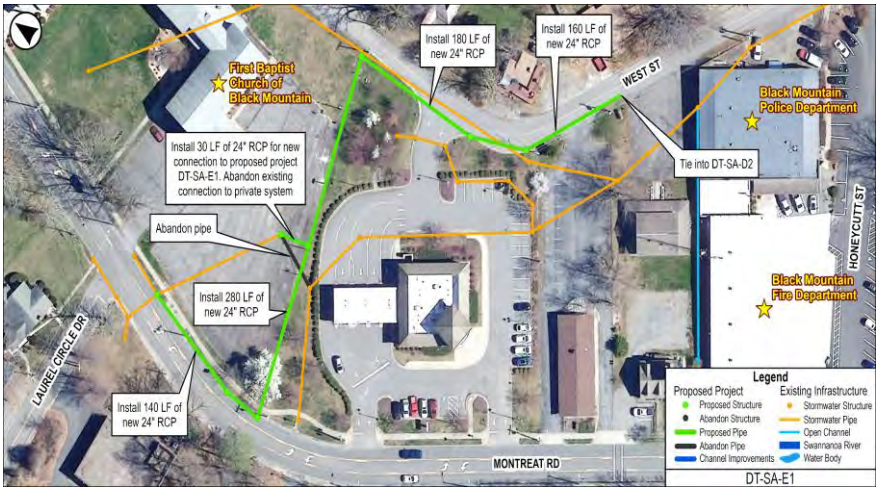
KEY CROSSING	LEVEL OF SERVICE EXISTING	LEVEL OF SERVICE PROPOSED	% REDUCTION 50 YR
Montreat Rd at the Church	NA	50-YR	New System
West St behind Bank	NA	50-YR	New System

PLANNING LEVEL OPINION OF COST

Construction estimate includes 30% contingency for planning. Design and permitting includes environmental permitting estimates. Proposed project footprints are based on GIS and modeling analyses. Detailed planning level costs are provided separately.

ITEM	COST OPINION
Construction	$ 841,000
Design and Permitting	$ 168,200
Other Project Costs	$ 218,800
Total Project	**$ 1,228,000**

PROJECT AREA MAP



PROJECT NAME **West St to Montreat Rd Stormwater Improvements** PROJECT ID: **DT-SA-E1**

PROJECT TYPE: Stormwater Drainage WATERSHED: Downtown

PLANNING LEVEL COST ESTIMATE

Construction cost includes 30% contingency for planning. Improvements (LF): 760
Proposed project footprints are based on GIS and modeling analyses.
Real estate, if privately-owned land, is estimated based on property value.

CONSTRUCTION COST:

ITEM DESCRIPTION	QUANTITY	UNIT	UNIT COST	AMOUNT
Mobilization	1	LS	$ 30,820.00	$ 30,800.00
Erosion Control	1	LS	$ 25,260.00	$ 25,300.00
Traffic Control	1	LS	$ 10,104.00	$ 10,100.00
Moderate Utility Conflict	1	LS	$ 75,780.00	$ 75,800.00
Unclassified Excavation/Hauling	910	CY	$ 72.00	$ 65,500.00
Infrastructure Removal and Disposal	30	LF	$ 115.00	$ 3,500.00
Structure Removal and Disposal	2	EA	$ 6,800.00	$ 13,600.00
Standard Structure	8	EA	$ 8,600.00	$ 68,800.00
Large Structure or Headwall	-	EA	$ 12,000.00	-
New Pipe: 18-inch to 24-inch	760	LF	$ 390.00	$ 296,400.00
New Pipe: 30-inch to 36-inch	-	LF	$ 535.00	-
New Pipe: 42-inch to 54-inch	-	LF	$ 670.00	-
New Pipe: 60-inch	-	LF	$ 875.00	-
Arch Pipe (22.5" - 31.3")	-	LF	$ 500.00	-
Large RCBC	-	LF	$ 1,700.00	-
Rip Rap	25	TN	$ 50.00	$ 1,300.00
Open Channel Improvements	-	LF	$ 350.00	-
Roadway/Sidewalk Replacement	210	SY	$ 110.00	$ 23,100.00
New Concrete Curb and Gutter	300	LF	$ 110.00	$ 33,000.00
Replace Driveway Culvert Pipe	-	LF	$ 300.00	-
Replace Existing Concrete Driveway	-	SY	$ 120.00	-
			Construction Contingency (30%):	$ 194,000.00
			PLANNING LEVEL OPINION OF CONSTRUCTION COST:	**$ 841,000.00**

PROJECT COST:

PROJECT BUDGET ITEM	% of CONSTRUCTION	AMOUNT
Survey	5%	$ 42,100.00
Design and Permitting	20%	$ 168,200.00
Environmental Permitting	-	$ -
Railroad Permitting/Coordination	-	$ -
Geotechnical Investigation	1%	$ 8,400.00
Structural Evaluation	1%	$ 8,400.00
Real Estate	2%	$ 16,800.00
Utility Relocation	2%	$ 16,800.00
Project Maintenance (3yr)	5%	$ 42,100.00
Construction Inspections	10%	$ 84,100.00
Construction	100%	$ 841,000.00
PLANNING LEVEL OPINION OF TOTAL PROJECT COST:		$ 1,228,000.00

PROJECT NAME: **Montreat Rd at Laurel Circle Dr Stormwater Improvements** PROJECT ID: **DT-SA-E2**

PROJECT INFORMATION

LOCATION:	Montreat Rd: E. Connally St to Laurel Circle Dr	STORMWATER PROJECT TYPE:	Stormwater Drainage
WATERSHED:	Downtown	DRAINAGE IMPROVEMENTS (LF):	350

PROJECT DESCRIPTION

To improve level of service for surrounding roadways and reduce flood risk to nearby property owners:

- Install 260 LF of new 24-inch RCP along Montreat Rd from E. Connally St to Laurel Circle Dr.
- Replace 90 LF of existing pipe with 24-inch RCP across Laurel Circle Dr to tie-into proposed project DT-SA-E1.

PROJECT PRIORITIZATION and LEVEL OF SERVICE

CRITERIA	TOTAL SCORE
Utility Conflict	4
Street Flooding	8
Public or Privately-Owned Land	4
Effect of Improvements	15
Cost Effectiveness	15
Grant Bonus	2
Criticality Bonus	1
FINAL PROJECT SCORE:	**49**

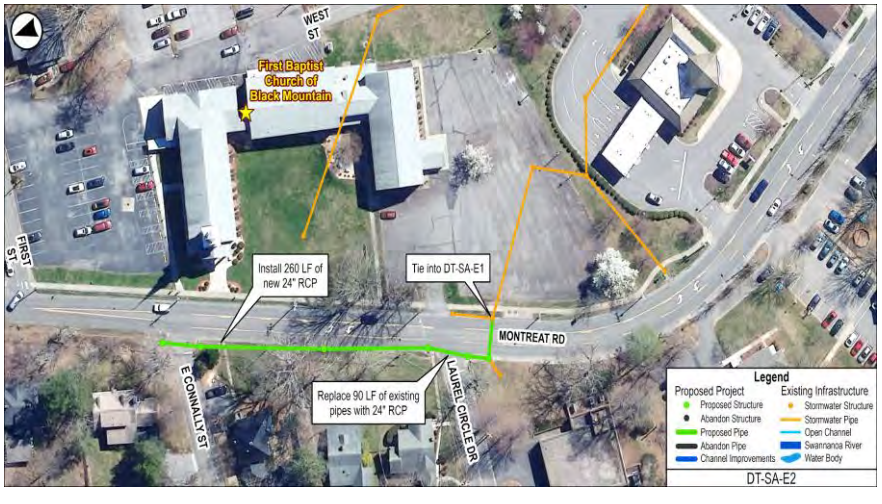
KEY CROSSING	LEVEL OF SERVICE EXISTING	LEVEL OF SERVICE PROPOSED	% REDUCTION 50 YR
Laurel Circle Dr	< 2-YR	25-YR	45
E Connally St at Montreat Rd	NA	25-YR	New Crossing

PLANNING LEVEL OPINION OF COST

Construction estimate includes 30% contingency for planning. Design and permitting includes environmental permitting estimates. Proposed project footprints are based on GIS and modeling analyses. Detailed planning level costs are provided separately.

ITEM	COST OPINION
Construction	$ 546,000
Design and Permitting	$ 109,200
Other Project Costs	$ 141,800
Total Project	**$ 797,000**

PROJECT AREA MAP



PROJECT NAME **Montreat Rd at Laurel Circle Dr Stormwater Improvements** PROJECT ID: **DT-SA-E2**

PROJECT TYPE: Stormwater Drainage WATERSHED: Downtown

PLANNING LEVEL COST ESTIMATE

Construction cost includes 30% contingency for planning.
Proposed project footprints are based on GIS and modeling analyses.
Real estate, if privately-owned land, is estimated based on property value.

Improvements (LF): 350

CONSTRUCTION COST:

ITEM DESCRIPTION	QUANTITY	UNIT	UNIT COST	AMOUNT
Mobilization	1	LS	$ 19,975.00	$ 20,000.00
Erosion Control	1	LS	$ 14,580.00	$ 14,600.00
Traffic Control	1	LS	$ 5,832.00	$ 5,800.00
Major Utility Conflict	1	LS	$ 87,480.00	$ 87,500.00
Unclassified Excavation/Hauling	300	CY	$ 72.00	$ 21,600.00
Infrastructure Removal and Disposal	95	LF	$ 115.00	$ 10,900.00
Structure Removal and Disposal	3	EA	$ 6,800.00	$ 20,400.00
Standard Structure	6	EA	$ 8,600.00	$ 51,600.00
Large Structure or Headwall	-	EA	$ 12,000.00	-
New Pipe: 18-inch to 24-inch	350	LF	$ 390.00	$ 136,500.00
New Pipe: 30-inch to 36-inch	-	LF	$ 535.00	-
New Pipe: 42-inch to 54-inch	-	LF	$ 670.00	-
New Pipe: 60-inch	-	LF	$ 875.00	-
Arch Pipe (22.5" - 31.3")	-	LF	$ 500.00	-
Large RCBC	-	LF	$ 1,700.00	-
Rip Rap	25	TN	$ 50.00	$ 1,300.00
Open Channel Improvements	-	LF	$ 350.00	-
Roadway/Sidewalk Replacement	110	SY	$ 110.00	$ 12,100.00
New Concrete Curb and Gutter	240	LF	$ 110.00	$ 26,400.00
Replace Driveway Culvert Pipe	30	LF	$ 300.00	$ 9,000.00
Replace Existing Concrete Driveway	15	SY	$ 120.00	$ 1,800.00
			Construction Contingency (30%):	$ 126,000.00
			PLANNING LEVEL OPINION OF CONSTRUCTION COST:	**$ 546,000.00**

PROJECT COST:

PROJECT BUDGET ITEM	% of CONSTRUCTION	AMOUNT
Survey	5%	$ 27,300.00
Design and Permitting	20%	$ 109,200.00
Environmental Permitting	-	$ -
Railroad Permitting/Coordination	-	$ -
Geotechnical Investigation	1%	$ 5,500.00
Structural Evaluation	1%	$ 5,500.00
Real Estate	2%	$ 10,900.00
Utility Relocation	2%	$ 10,900.00
Project Maintenance (3yr)	5%	$ 27,300.00
Construction Inspections	10%	$ 54,600.00
Construction	100%	$ 546,000.00
PLANNING LEVEL OPINION OF TOTAL PROJECT COST:		$ 797,000.00

PROJECT NAME: **Midland Ave Stormwater Improvements** PROJECT ID: **DT-SA-F**

PROJECT INFORMATION

LOCATION: Midland Ave
WATERSHED: Downtown
STORMWATER PROJECT TYPE: Stormwater Drainage
DRAINAGE IMPROVEMENTS (LF): 675

PROJECT DESCRIPTION

To improve level of service for surrounding roadways and reduce flood risk to nearby property owners:

- Replace existing culvert crossing at First St and Midland Ave with 30 LF of 24-inch RCP.
- Replace existing pipe and open channel system along Midland Ave with 24-inch RCP.
- Tie-into 24-inch RCP (part of proposed project DT-SA-D2) at Town Hall.

PROJECT PRIORITIZATION and LEVEL OF SERVICE

CRITERIA	TOTAL SCORE
Utility Conflict	12
Street Flooding	24
Public or Privately-Owned Land	8
Effect of Improvements	15
Cost Effectiveness	20
Grant Bonus	2
Criticality Bonus	1
FINAL PROJECT SCORE:	**82**

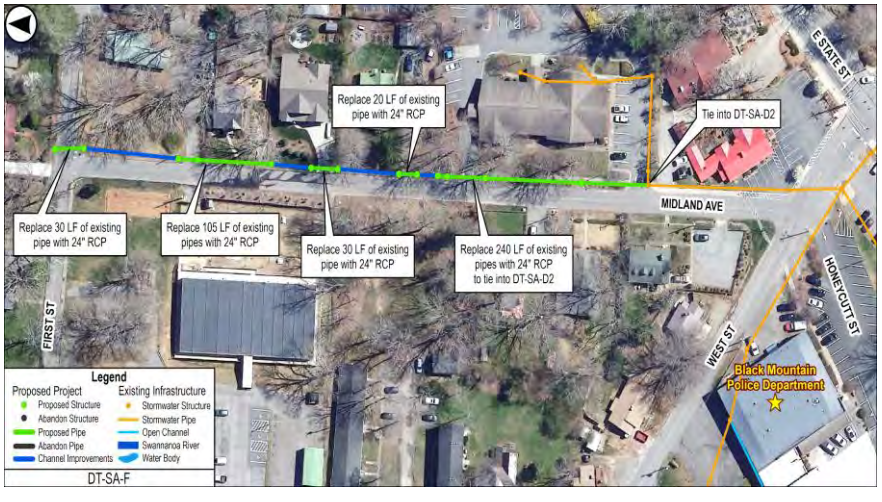
KEY CROSSING	LEVEL OF SERVICE EXISTING	LEVEL OF SERVICE PROPOSED	% REDUCTION 50 YR
First St at Midland Ave	2-YR	50-YR	100
System at Town Hall	2-YR	50-YR	100

PLANNING LEVEL OPINION OF COST

Construction estimate includes 30% contingency for planning. Design and permitting includes environmental permitting estimates. Proposed project footprints are based on GIS and modeling analyses. Detailed planning level costs are provided separately.

ITEM	COST OPINION
Construction	$ 768,000
Design and Permitting	$ 153,600
Other Project Costs	$ 199,400
Total Project	**$ 1,121,000**

PROJECT AREA MAP



PROJECT NAME **Midland Ave Stormwater Improvements** PROJECT ID: **DT-SA-F**

PROJECT TYPE: Stormwater Drainage WATERSHED: Downtown

PLANNING LEVEL COST ESTIMATE

Construction cost includes 30% contingency for planning.
Proposed project footprints are based on GIS and modeling analyses.
Real estate, if privately-owned land, is estimated based on property value.

Improvements (LF): 425

CONSTRUCTION COST:

ITEM DESCRIPTION	QUANTITY	UNIT	UNIT COST	AMOUNT
Mobilization	1	LS	$ 28,125.00	$ 28,100.00
Erosion Control	1	LS	$ 25,115.00	$ 25,100.00
Traffic Control	1	LS	$ 10,046.00	$ 10,000.00
Minor Utility Conflict	1	LS	$ 25,115.00	$ 25,100.00
Unclassified Excavation/Hauling	210	CY	$ 72.00	$ 15,100.00
Infrastructure Removal and Disposal	425	LF	$ 115.00	$ 48,900.00
Structure Removal and Disposal	5	EA	$ 6,800.00	$ 34,000.00
Standard Structure	13	EA	$ 8,600.00	$ 111,800.00
Large Structure or Headwall	-	EA	$ 12,000.00	-
New Pipe: 18-inch to 24-inch	425	LF	$ 390.00	$ 165,800.00
New Pipe: 30-inch to 36-inch	-	LF	$ 535.00	-
New Pipe: 42-inch to 54-inch	-	LF	$ 670.00	-
New Pipe: 60-inch	-	LF	$ 875.00	-
Arch Pipe (22.5" - 31.3")	-	LF	$ 500.00	-
Large RCBC	-	LF	$ 1,700.00	-
Rip Rap	25	TN	$ 50.00	$ 1,300.00
Open Channel Improvements	250	LF	$ 350.00	$ 87,500.00
Roadway/Sidewalk Replacement	110	SY	$ 110.00	$ 12,100.00
New Concrete Curb and Gutter	-	LF	$ 110.00	-
Replace Driveway Culvert Pipe	70	LF	$ 300.00	$ 21,000.00
Replace Existing Concrete Driveway	40	SY	$ 120.00	$ 4,800.00
			Construction Contingency (30%):	$ 177,000.00
			PLANNING LEVEL OPINION OF CONSTRUCTION COST:	**$ 768,000.00**

PROJECT COST:

PROJECT BUDGET ITEM	% of CONSTRUCTION	AMOUNT
Survey	5%	$ 38,400.00
Design and Permitting	20%	$ 153,600.00
Environmental Permitting	-	$ -
Railroad Permitting/Coordination	-	$ -
Geotechnical Investigation	1%	$ 7,700.00
Structural Evaluation	1%	$ 7,700.00
Real Estate	2%	$ 15,400.00
Utility Relocation	2%	$ 15,400.00
Project Maintenance (3yr)	5%	$ 38,400.00
Construction Inspections	10%	$ 76,800.00
Construction	100%	$ 768,000.00
PLANNING LEVEL OPINION OF TOTAL PROJECT COST:		$ 1,121,000.00

DRAFT for Review

PROJECT NAME: **S. Ridgeway Ave Stormwater Improvements** PROJECT ID: **DT-SA-G**

PROJECT INFORMATION

LOCATION: Sutton Ave at S. Ridgway Ave
WATERSHED: Downtown
STORMWATER PROJECT TYPE: Stormwater Drainage
DRAINAGE IMPROVEMENTS (LF): 310

PROJECT DESCRIPTION

To improve level of service for surrounding roadways and reduce flood risk to nearby property owners:

- Replace existing pipe with 50 LF of 30-inch RCP across Sutton Ave on east side of Richardson Blvd.
- Install 80 LF of new 18-inch RCP and 100 LF of new 24-inch RCP along S. Ridgeway Ave.
- Replace existing pipe with 85 LF of 36-inch RCP to outfall at the open channel along Sutton Ave.

PROJECT PRIORITIZATION and LEVEL OF SERVICE

CRITERIA	TOTAL SCORE
Utility Conflict	4
Street Flooding	32
Public or Privately-Owned Land	8
Effect of Improvements	10
Cost Effectiveness	20
Grant Bonus	2
Criticality Bonus	0
FINAL PROJECT SCORE:	**76**

KEY CROSSING	LEVEL OF SERVICE EXISTING	LEVEL OF SERVICE PROPOSED	% REDUCTION 50 YR
Sutton Ave at Richardson	< 2-YR	50-YR	100
Sutton Ave at Ridgeway Ave	< 2-YR	50-YR	100

PLANNING LEVEL OPINION OF COST

Construction estimate includes 30% contingency for planning. Design and permitting includes environmental permitting estimates. Proposed project footprints are based on GIS and modeling analyses. Detailed planning level costs are provided separately.

ITEM	COST OPINION
Construction	$ 532,000
Design and Permitting	$ 156,400
Other Project Costs	$ 138,600
Total Project	**$ 827,000**

PROJECT AREA MAP



PROJECT NAME **S. Ridgeway Ave Stormwater Improvements** PROJECT ID: **DT-SA-G**

PROJECT TYPE: Stormwater Drainage WATERSHED: Downtown

PLANNING LEVEL COST ESTIMATE

Construction cost includes 30% contingency for planning.
Proposed project footprints are based on GIS and modeling analyses.
Real estate, if privately-owned land, is estimated based on property value.

Improvements (LF): 310

CONSTRUCTION COST:

ITEM DESCRIPTION	QUANTITY	UNIT	UNIT COST	AMOUNT
Mobilization	1	LS	$ 19,475.00	$ 19,500.00
Erosion Control	1	LS	$ 14,215.00	$ 14,200.00
Traffic Control	1	LS	$ 5,686.00	$ 5,700.00
Major Utility Conflict	1	LS	$ 85,290.00	$ 85,300.00
Unclassified Excavation/Hauling	170	CY	$ 72.00	$ 12,200.00
Infrastructure Removal and Disposal	105	LF	$ 115.00	$ 12,100.00
Structure Removal and Disposal	3	EA	$ 6,800.00	$ 20,400.00
Standard Structure	9	EA	$ 8,600.00	$ 77,400.00
Large Structure or Headwall	-	EA	$ 12,000.00	-
New Pipe: 18-inch to 24-inch	175	LF	$ 390.00	$ 68,300.00
New Pipe: 30-inch to 36-inch	135	LF	$ 535.00	$ 72,200.00
New Pipe: 42-inch to 54-inch	-	LF	$ 670.00	-
New Pipe: 60-inch	-	LF	$ 875.00	-
Arch Pipe (22.5" - 31.3")	-	LF	$ 500.00	-
Large RCBC	-	LF	$ 1,700.00	-
Rip Rap	25	TN	$ 50.00	$ 1,300.00
Open Channel Improvements	-	LF	$ 350.00	-
Roadway/Sidewalk Replacement	110	SY	$ 110.00	$ 12,100.00
New Concrete Curb and Gutter	75	LF	$ 110.00	$ 8,300.00
Replace Driveway Culvert Pipe	-	LF	$ 300.00	-
Replace Existing Concrete Driveway	-	SY	$ 120.00	-
			Construction Contingency (30%):	$ 123,000.00
			PLANNING LEVEL OPINION OF CONSTRUCTION COST:	**$ 532,000.00**

PROJECT COST:

PROJECT BUDGET ITEM	% of CONSTRUCTION	AMOUNT
Survey	5%	$ 26,600.00
Design and Permitting	20%	$ 106,400.00
Environmental Permitting	-	$ 50,000.00
Railroad Permitting/Coordination	-	$ -
Geotechnical Investigation	1%	$ 5,300.00
Structural Evaluation	1%	$ 5,300.00
Real Estate	2%	$ 10,600.00
Utility Relocation	2%	$ 10,600.00
Project Maintenance (3yr)	5%	$ 26,600.00
Construction Inspections	10%	$ 53,200.00
Construction	100%	$ 532,000.00
PLANNING LEVEL OPINION OF TOTAL PROJECT COST:		$ 827,000.00

PROJECT NAME: **Black Mountain Ave Stormwater Improvements Phase I** PROJECT ID: **DT-BMA-A**

PROJECT INFORMATION

LOCATION: Vance Ave to the Swannanoa River
WATERSHED: Downtown
STORMWATER PROJECT TYPE: Stormwater Drainage
DRAINAGE IMPROVEMENTS (LF): 585

PROJECT DESCRIPTION

To improve level of service for surrounding roadways and reduce flood risk to nearby property owners:

- Install 85 LF of 30" RCP across Vance St at Black Mountain Ave.
- Replace 175 LF of existing pipe with 30" RCP and 36" RCP at Vance Ave intersection and moving south.
- Install 370 LF of new 36" RCP just north of the Terry Estate Dr intersection to the outfall.
- Install 40 LF of new 24" RCP across Black Mountain Ave at Terry Estate Dr.
- Remove 195 LF of existing pipe from service at Terry Estate Dr/Black Mountain Ave intersection.

PROJECT PRIORITIZATION and LEVEL OF SERVICE

CRITERIA	TOTAL SCORE
Utility Conflict	8
Street Flooding	32
Public or Privately-Owned Land	4
Effect of Improvements	20
Cost Effectiveness	15
Grant Bonus	2
Criticality Bonus	1
FINAL PROJECT SCORE:	**82**

KEY CROSSING	LEVEL OF SERVICE EXISTING	LEVEL OF SERVICE PROPOSED	% REDUCTION 50 YR
Terry Estate at Black Mtn Ave	< 2-YR	50-YR	100
Vance Ave at Black Mtn Ave	< 2-YR	25-YR	100

PLANNING LEVEL OPINION OF COST

Construction estimate includes 30% contingency for planning. Design and permitting includes environmental permitting estimates. Proposed project footprints are based on GIS and modeling analyses. Detailed planning level costs are provided separately.

ITEM	COST OPINION
Construction	$ 1,253,000
Design and Permitting	$ 300,600
Other Project Costs	$ 326,400
Total Project	**$ 1,880,000**

PROJECT AREA MAP



PROJECT NAME **Black Mountain Ave Stormwater Improvements Phase I** PROJECT ID: **DT-BMA-A**

PROJECT TYPE: Stormwater Drainage WATERSHED: Downtown

PLANNING LEVEL COST ESTIMATE

Construction cost includes 30% contingency for planning.
Proposed project footprints are based on GIS and modeling analyses.
Real estate, if privately-owned land, is estimated based on property value.

Improvements (LF): 585

CONSTRUCTION COST:

ITEM DESCRIPTION	QUANTITY	UNIT	UNIT COST	AMOUNT
Mobilization	1	LS	$ 45,910.00	$ 45,900.00
Erosion Control	1	LS	$ 37,630.00	$ 37,600.00
Traffic Control	1	LS	$ 15,052.00	$ 15,100.00
Moderate Utility Conflict	1	LS	$ 112,890.00	$ 112,900.00
Unclassified Excavation/Hauling	860	CY	$ 72.00	$ 61,900.00
Infrastructure Removal and Disposal	370	LF	$ 115.00	$ 42,600.00
Structure Removal and Disposal	4	EA	$ 6,800.00	$ 27,200.00
Standard Structure	3	EA	$ 8,600.00	$ 25,800.00
Large Structure or Headwall	8	EA	$ 12,000.00	$ 96,000.00
New Pipe: 18-inch to 24-inch	40	LF	$ 390.00	$ 15,600.00
New Pipe: 30-inch to 36-inch	25	LF	$ 535.00	$ 13,400.00
New Pipe: 42-inch to 54-inch	520	LF	$ 670.00	$ 348,400.00
New Pipe: 60-inch	-	LF	$ 875.00	-
Arch Pipe (22.5" - 31.3")	-	LF	$ 500.00	-
Large RCBC	-	LF	$ 1,700.00	-
Rip Rap	25	TN	$ 50.00	$ 1,300.00
Open Channel Improvements	-	LF	$ 350.00	-
Roadway/Sidewalk Replacement	560	SY	$ 110.00	$ 61,600.00
New Concrete Curb and Gutter	450	LF	$ 110.00	$ 49,500.00
Replace Driveway Culvert Pipe	25	LF	$ 300.00	$ 7,500.00
Replace Existing Concrete Driveway	15	SY	$ 120.00	$ 1,800.00
			Construction Contingency (30%):	$ 289,000.00
			PLANNING LEVEL OPINION OF CONSTRUCTION COST:	**$ 1,253,000.00**

PROJECT COST:

PROJECT BUDGET ITEM	% of CONSTRUCTION	AMOUNT
Survey	5%	$ 62,700.00
Design and Permitting	20%	$ 250,600.00
Environmental Permitting	-	$ 50,000.00
Railroad Permitting/Coordination	-	$ -
Geotechnical Investigation	1%	$ 12,500.00
Structural Evaluation	1%	$ 12,500.00
Real Estate	2%	$ 25,100.00
Utility Relocation	2%	$ 25,100.00
Project Maintenance (3yr)	5%	$ 62,700.00
Construction Inspections	10%	$ 125,300.00
Construction	100%	$ 1,253,000.00
PLANNING LEVEL OPINION OF TOTAL PROJECT COST:		$ 1,880,000.00

PROJECT NAME: **Black Mountain Ave Stormwater Improvements Phase II** PROJECT ID: **DT-BMA-B**

PROJECT INFORMATION

LOCATION: S. Doughtery St to Vance Ave
WATERSHED: Downtown
STORMWATER PROJECT TYPE: Stormwater Drainage
DRAINAGE IMPROVEMENTS (LF): 585

PROJECT DESCRIPTION

To improve level of service for surrounding roadways and reduce flood risk to nearby property owners:

- Replace nearly 400 LF of existing pipe along Black Mountain Ave from S. Doughtery St to Vance Ave.
- Install 160 LF of new 24" RCP at S. Doughtery St. to Black Mountain Ave.
- Replace existing culvert adjacent to the railroad tracks with 30 LF of 18" RCP.
- Install 50 LF of stormwater channel improvements as needed.

PROJECT PRIORITIZATION and LEVEL OF SERVICE

CRITERIA	TOTAL SCORE
Utility Conflict	12
Street Flooding	24
Public or Privately-Owned Land	8
Effect of Improvements	20
Cost Effectiveness	20
Grant Bonus	2
Criticality Bonus	2
FINAL PROJECT SCORE:	**88**

	LEVEL OF SERVICE		% REDUCTION
KEY CROSSING	EXISTING	PROPOSED	50 YR
Black Mountain Ave at RR	< 2-YR	50-YR	100
S. Dougherty St Bend	< 2-YR	50-YR	100

PLANNING LEVEL OPINION OF COST

Construction estimate includes 30% contingency for planning. Design and permitting includes environmental permitting estimates. Proposed project footprints are based on GIS and modeling analyses. Detailed planning level costs are provided separately.

ITEM	COST OPINION
Construction	$ 862,000
Design and Permitting	$ 222,400
Other Project Costs	$ 223,600
Total Project	**$ 1,308,000**

PROJECT AREA MAP



PROJECT NAME **Black Mountain Ave Stormwater Improvements Phase II** PROJECT ID: **DT-BMA-B**

PROJECT TYPE: Stormwater Drainage WATERSHED: Downtown

PLANNING LEVEL COST ESTIMATE

Construction cost includes 30% contingency for planning. Improvements (LF): 585
Proposed project footprints are based on GIS and modeling analyses.
Real estate, if privately-owned land, is estimated based on property value.

CONSTRUCTION COST:

ITEM DESCRIPTION	QUANTITY	UNIT	UNIT COST	AMOUNT
Mobilization	1	LS	$ 31,570.00	$ 31,600.00
Erosion Control	1	LS	$ 28,185.00	$ 28,200.00
Traffic Control	1	LS	$ 11,274.00	$ 11,300.00
Minor Utility Conflict	1	LS	$ 28,185.00	$ 28,200.00
Unclassified Excavation/Hauling	550	CY	$ 72.00	$ 39,600.00
Infrastructure Removal and Disposal	500	LF	$ 115.00	$ 57,500.00
Structure Removal and Disposal	4	EA	$ 6,800.00	$ 27,200.00
Standard Structure	6	EA	$ 8,600.00	$ 51,600.00
Large Structure or Headwall	-	EA	$ 12,000.00	-
New Pipe: 18-inch to 24-inch	190	LF	$ 390.00	$ 74,100.00
New Pipe: 30-inch to 36-inch	395	LF	$ 535.00	$ 211,300.00
New Pipe: 42-inch to 54-inch	-	LF	$ 670.00	-
New Pipe: 60-inch	-	LF	$ 875.00	-
Arch Pipe (22.5" - 31.3")	-	LF	$ 500.00	-
Large RCBC	-	LF	$ 1,700.00	-
Rip Rap	25	TN	$ 50.00	$ 1,300.00
Open Channel Improvements	-	LF	$ 350.00	-
Roadway/Sidewalk Replacement	350	SY	$ 110.00	$ 38,500.00
New Concrete Curb and Gutter	400	LF	$ 110.00	$ 44,000.00
Replace Driveway Culvert Pipe	50	LF	$ 300.00	$ 15,000.00
Replace Existing Concrete Driveway	30	SY	$ 120.00	$ 3,600.00
			Construction Contingency (30%):	$ 199,000.00
			PLANNING LEVEL OPINION OF CONSTRUCTION COST:	**$ 862,000.00**

PROJECT COST:

PROJECT BUDGET ITEM	% of CONSTRUCTION	AMOUNT
Survey	5%	$ 43,100.00
Design and Permitting	20%	$ 172,400.00
Environmental Permitting	-	$ -
Railroad Permitting/Coordination	-	$ 50,000.00
Geotechnical Investigation	1%	$ 8,600.00
Structural Evaluation	1%	$ 8,600.00
Real Estate	2%	$ 17,200.00
Utility Relocation	2%	$ 17,200.00
Project Maintenance (3yr)	5%	$ 43,100.00
Construction Inspections	10%	$ 86,200.00
Construction	100%	$ 862,000.00
PLANNING LEVEL OPINION OF TOTAL PROJECT COST:		$ 1,308,000.00

PROJECT NAME: **Terry Estate Dr Stormwater Improvements Phase I** PROJECT ID: **DT-TE-A**

PROJECT INFORMATION

LOCATION: Terry Estate Drive
WATERSHED: Downtown
STORMWATER PROJECT TYPE: Stormwater Drainage
DRAINAGE IMPROVEMENTS (LF): 745

PROJECT DESCRIPTION

To improve level of service for surrounding roadways and reduce flood risk to nearby property owners:

- Replace existing pipes across Terry Estate Dr in 5 locations with larger pipes.
- Replace the existing pipe on the south side of Terry Estate Dr with 55 LF of 30-inch and 400 LF of 36-inch RCP.
- Install a new 42-inch outfall pipe across the parking lot to the Swannanoa River.

PROJECT PRIORITIZATION and LEVEL OF SERVICE

CRITERIA	TOTAL SCORE
Utility Conflict	4
Street Flooding	24
Public or Privately-Owned Land	4
Effect of Improvements	15
Cost Effectiveness	10
Grant Bonus	2
Criticality Bonus	2
FINAL PROJECT SCORE:	**61**

KEY CROSSING	LEVEL OF SERVICE EXISTING	LEVEL OF SERVICE PROPOSED	% REDUCTION 50 YR
Terry Estate Dr at Bridge St	< 2-YR	50-YR	100
Terry Estate Dr	< 2-YR	25-YR	96

PLANNING LEVEL OPINION OF COST

Construction estimate includes 30% contingency for planning. Design and permitting includes environmental permitting estimates. Proposed project footprints are based on GIS and modeling analyses. Detailed planning level costs are provided separately.

ITEM	COST OPINION
Construction	$ 1,310,000
Design and Permitting	$ 312,000
Other Project Costs	$ 341,000
Total Project	**$ 1,963,000**

PROJECT AREA MAP



PROJECT NAME **Terry Estate Dr Stormwater Improvements Phase I** PROJECT ID: **DT-TE-A**

PROJECT TYPE: Stormwater Drainage WATERSHED: Downtown

PLANNING LEVEL COST ESTIMATE

Construction cost includes 30% contingency for planning. Improvements (LF): 745
Proposed project footprints are based on GIS and modeling analyses.
Real estate, if privately-owned land, is estimated based on property value.

CONSTRUCTION COST:

ITEM DESCRIPTION	QUANTITY	UNIT	UNIT COST	AMOUNT
Mobilization	1	LS	$ 48,010.00	$ 48,000.00
Erosion Control	1	LS	$ 35,045.00	$ 35,000.00
Traffic Control	1	LS	$ 14,018.00	$ 14,000.00
Major Utility Conflict	1	LS	$ 210,270.00	$ 210,300.00
Unclassified Excavation/Hauling	630	CY	$ 72.00	$ 45,400.00
Infrastructure Removal and Disposal	730	LF	$ 115.00	$ 84,000.00
Structure Removal and Disposal	7	EA	$ 6,800.00	$ 47,600.00
Standard Structure	9	EA	$ 8,600.00	$ 77,400.00
Large Structure or Headwall	-	EA	$ 12,000.00	-
New Pipe: 18-inch to 24-inch	120	LF	$ 390.00	$ 46,800.00
New Pipe: 30-inch to 36-inch	485	LF	$ 535.00	$ 259,500.00
New Pipe: 42-inch to 54-inch	140	LF	$ 670.00	$ 93,800.00
New Pipe: 60-inch	-	LF	$ 875.00	-
Arch Pipe (22.5" - 31.3")	-	LF	$ 500.00	-
Large RCBC	-	LF	$ 1,700.00	-
Rip Rap	25	TN	$ 50.00	$ 1,300.00
Open Channel Improvements	-	LF	$ 350.00	-
Roadway/Sidewalk Replacement	410	SY	$ 110.00	$ 45,100.00
New Concrete Curb and Gutter	-	LF	$ 110.00	-
Replace Driveway Culvert Pipe	-	LF	$ 300.00	-
Replace Existing Concrete Driveway	-	SY	$ 120.00	-
			Construction Contingency (30%):	$ 302,000.00
			PLANNING LEVEL OPINION OF CONSTRUCTION COST:	**$ 1,310,000.00**

PROJECT COST:

PROJECT BUDGET ITEM	% of CONSTRUCTION	AMOUNT
Survey	5%	$ 65,500.00
Design and Permitting	20%	$ 262,000.00
Environmental Permitting	-	$ 50,000.00
Railroad Permitting/Coordination	-	$ -
Geotechnical Investigation	1%	$ 13,100.00
Structural Evaluation	1%	$ 13,100.00
Real Estate	2%	$ 26,200.00
Utility Relocation	2%	$ 26,200.00
Project Maintenance (3yr)	5%	$ 65,500.00
Construction Inspections	10%	$ 131,000.00
Construction	100%	$ 1,310,000.00
PLANNING LEVEL OPINION OF TOTAL PROJECT COST:		$ 1,963,000.00

PROJECT NAME: **Terry Estate Dr Stormwater Improvements Phase II** PROJECT ID: **DT-TE-B**

PROJECT INFORMATION

LOCATION: Vance Ave at Bridge St and Spring St
WATERSHED: Downtown
STORMWATER PROJECT TYPE: Stormwater Drainage
DRAINAGE IMPROVEMENTS (LF): 715

PROJECT DESCRIPTION

To improve level of service for surrounding roadways and reduce flood risk to nearby property owners:

- Replace existing pipe and stormwater roadside ditches along Bridge St with 260 LF of 24-inch RCP.
- Replace existing pipe crossing Spring St and Vance St with 70 LF of 24-inch RCP.
- Install 375 LF of new 24-inch RCP to re-route flow to Vance Ave and Black Mountain Ave rights-of-way.
- Remove/abandon in place stormwater pipe running south to Terry Estate Dr through private property.

PROJECT PRIORITIZATION and LEVEL OF SERVICE

CRITERIA	TOTAL SCORE
Utility Conflict	8
Street Flooding	24
Public or Privately-Owned Land	8
Effect of Improvements	20
Cost Effectiveness	15
Grant Bonus	2
Criticality Bonus	1
FINAL PROJECT SCORE:	**78**

KEY CROSSING	LEVEL OF SERVICE EXISTING	LEVEL OF SERVICE PROPOSED	% REDUCTION 50 YR
Vance Ave at Bridge St	10-YR	50-YR	100
Vance Ave/Spring St INT	< 2-YR	50-YR	100

PLANNING LEVEL OPINION OF COST

Construction estimate includes 30% contingency for planning. Design and permitting includes environmental permitting estimates. Proposed project footprints are based on GIS and modeling analyses. Detailed planning level costs are provided separately.

ITEM	COST OPINION
Construction	$ 945,000
Design and Permitting	$ 189,000
Other Project Costs	$ 246,000
Total Project	**$ 1,380,000**

PROJECT AREA MAP



PROJECT NAME **Terry Estate Dr Stormwater Improvements Phase II** PROJECT ID: **DT-TE-B**

PROJECT TYPE: Stormwater Drainage WATERSHED: Downtown

PLANNING LEVEL COST ESTIMATE

Construction cost includes 30% contingency for planning. Improvements (LF): 715
Proposed project footprints are based on GIS and modeling analyses.
Real estate, if privately-owned land, is estimated based on property value.

CONSTRUCTION COST:

ITEM DESCRIPTION	QUANTITY	UNIT	UNIT COST	AMOUNT
Mobilization	1	LS	$ 34,625.00	$ 34,600.00
Erosion Control	1	LS	$ 28,380.00	$ 28,400.00
Traffic Control	1	LS	$ 11,352.00	$ 11,400.00
Moderate Utility Conflict	1	LS	$ 85,140.00	$ 85,100.00
Unclassified Excavation/Hauling	590	CY	$ 72.00	$ 42,500.00
Infrastructure Removal and Disposal	580	LF	$ 115.00	$ 66,700.00
Structure Removal and Disposal	4	EA	$ 6,800.00	$ 27,200.00
Standard Structure	7	EA	$ 8,600.00	$ 60,200.00
Large Structure or Headwall	-	EA	$ 12,000.00	-
New Pipe: 18-inch to 24-inch	265	LF	$ 390.00	$ 103,400.00
New Pipe: 30-inch to 36-inch	450	LF	$ 535.00	$ 240,800.00
New Pipe: 42-inch to 54-inch	-	LF	$ 670.00	-
New Pipe: 60-inch	-	LF	$ 875.00	-
Arch Pipe (22.5" - 31.3")	-	LF	$ 500.00	-
Large RCBC	-	LF	$ 1,700.00	-
Rip Rap	25	TN	$ 50.00	$ 1,300.00
Open Channel Improvements	-	LF	$ 350.00	-
Roadway/Sidewalk Replacement	180	SY	$ 110.00	$ 19,800.00
New Concrete Curb and Gutter	-	LF	$ 110.00	-
Replace Driveway Culvert Pipe	15	LF	$ 300.00	$ 4,500.00
Replace Existing Concrete Driveway	10	SY	$ 120.00	$ 1,200.00
			Construction Contingency (30%):	$ 218,000.00
			PLANNING LEVEL OPINION OF CONSTRUCTION COST:	**$ 945,000.00**

PROJECT COST:

PROJECT BUDGET ITEM	% of CONSTRUCTION	AMOUNT
Survey	5%	$ 47,300.00
Design and Permitting	20%	$ 189,000.00
Environmental Permitting	-	$ -
Railroad Permitting/Coordination	-	$ -
Geotechnical Investigation	1%	$ 9,500.00
Structural Evaluation	1%	$ 9,500.00
Real Estate	2%	$ 18,900.00
Utility Relocation	2%	$ 18,900.00
Project Maintenance (3yr)	5%	$ 47,300.00
Construction Inspections	10%	$ 94,500.00
Construction	100%	$ 945,000.00
PLANNING LEVEL OPINION OF TOTAL PROJECT COST:		$ 1,380,000.00

PROJECT NAME: **NC 9 Stormwater Improvements** PROJECT ID: **DT-NC9-A**

PROJECT INFORMATION

LOCATION: Vance Ave to outfall at Swannanoa River
WATERSHED: Downtown
STORMWATER PROJECT TYPE: Stormwater Drainage
DRAINAGE IMPROVEMENTS (LF): 595

PROJECT DESCRIPTION

To improve level of service for surrounding roadways and reduce flood risk to nearby property owners:

- Replace existing pipe along NC 9 with 280 LF of 36-inch RCP and tie-into culvert at Swannanaoa River.
- Replace existing pipe along Terry Estate Dr with 24-inch RCP and tie into proposed 36-inch pipe at NC 9.
- Install 130 LF of new 24-inch RCP to route flow along the Vance Ave right-of -way to tie into the NC 9 system.

PROJECT PRIORITIZATION and LEVEL OF SERVICE

CRITERIA	TOTAL SCORE
Utility Conflict	8
Street Flooding	24
Public or Privately-Owned Land	8
Effect of Improvements	10
Cost Effectiveness	15
Grant Bonus	2
Criticality Bonus	1
FINAL PROJECT SCORE:	**68**

KEY CROSSING	LEVEL OF SERVICE EXISTING	LEVEL OF SERVICE PROPOSED	% REDUCTION 50 YR
Terry Estate Dr west of NC9	< 2-YR	50-YR	100
Terry Estate Dr at NC9	25-YR	50-YR	100
Vance Ave at NC9	25-YR	50-YR	100
Vance Ave west of NC 9	2-YR	50-YR	100

PLANNING LEVEL OPINION OF COST

Construction estimate includes 30% contingency for planning. Design and permitting includes environmental permitting estimates. Proposed project footprints are based on GIS and modeling analyses. Detailed planning level costs are provided separately.

ITEM	COST OPINION
Construction	$ 880,000
Design and Permitting	$ 226,000
Other Project Costs	$ 229,000
Total Project	**$ 1,335,000**

PROJECT AREA MAP



PROJECT NAME **NC 9 Stormwater Improvements** PROJECT ID: **DT-NC9-A**

PROJECT TYPE: Stormwater Drainage WATERSHED: Downtown

PLANNING LEVEL COST ESTIMATE

Construction cost includes 30% contingency for planning. Improvements (LF): 595
Proposed project footprints are based on GIS and modeling analyses.
Real estate, if privately-owned land, is estimated based on property value.

CONSTRUCTION COST:

ITEM DESCRIPTION	QUANTITY	UNIT	UNIT COST	AMOUNT
Mobilization	1	LS	$ 32,250.00	$ 32,300.00
Erosion Control	1	LS	$ 26,435.00	$ 26,400.00
Traffic Control	1	LS	$ 10,574.00	$ 10,600.00
Moderate Utility Conflict	1	LS	$ 79,305.00	$ 79,300.00
Unclassified Excavation/Hauling	540	CY	$ 72.00	$ 38,900.00
Infrastructure Removal and Disposal	470	LF	$ 115.00	$ 54,100.00
Structure Removal and Disposal	7	EA	$ 6,800.00	$ 47,600.00
Standard Structure	7	EA	$ 8,600.00	$ 60,200.00
Large Structure or Headwall	-	EA	$ 12,000.00	-
New Pipe: 18-inch to 24-inch	315	LF	$ 390.00	$ 122,900.00
New Pipe: 30-inch to 36-inch	280	LF	$ 535.00	$ 149,800.00
New Pipe: 42-inch to 54-inch	-	LF	$ 670.00	-
New Pipe: 60-inch	-	LF	$ 875.00	-
Arch Pipe (22.5" - 31.3")	-	LF	$ 500.00	-
Large RCBC	-	LF	$ 1,700.00	-
Rip Rap	25	TN	$ 50.00	$ 1,300.00
Open Channel Improvements	-	LF	$ 350.00	-
Roadway/Sidewalk Replacement	270	SY	$ 110.00	$ 29,700.00
New Concrete Curb and Gutter	220	LF	$ 110.00	$ 24,200.00
Replace Driveway Culvert Pipe	-	LF	$ 300.00	-
Replace Existing Concrete Driveway	-	SY	$ 120.00	-
			Construction Contingency (30%):	$ 203,000.00
			PLANNING LEVEL OPINION OF CONSTRUCTION COST:	**$ 880,000.00**

PROJECT COST:

PROJECT BUDGET ITEM	% of CONSTRUCTION	AMOUNT
Survey	5%	$ 44,000.00
Design and Permitting	20%	$ 176,000.00
Environmental Permitting	-	$ 50,000.00
Railroad Permitting/Coordination	-	$ -
Geotechnical Investigation	1%	$ 8,800.00
Structural Evaluation	1%	$ 8,800.00
Real Estate	2%	$ 17,600.00
Utility Relocation	2%	$ 17,600.00
Project Maintenance (3yr)	5%	$ 44,000.00
Construction Inspections	10%	$ 88,000.00
Construction	100%	$ 880,000.00
PLANNING LEVEL OPINION OF TOTAL PROJECT COST:		$ 1,335,000.00



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AN ARDURRA COMPANY

Figure ES-6: Proposed Stormwater Improvement Projects
TOMAHAWK BRANCH PRIMARY SYSTEM
Town of Black Mountain Stormwater Master Plan

0 100 200 Feet
1 in = 200 ft

PROJECT NAME: **Laurel Circle Culvert Replacement (Tomahawk Branch)** PROJECT ID: **TB-A1**

PROJECT INFORMATION

LOCATION:	Laurel Circle Dr north of Lake Tomahawk	STORMWATER PROJECT TYPE:	Stormwater Drainage
WATERSHED:	Tomahawk Branch	DRAINAGE IMPROVEMENTS (LF):	220

PROJECT DESCRIPTION

To improve level of service for surrounding roadways and reduce flood risk to nearby property owners:

- Replace existing arch culverts with 40 LF of triple 5' x 9' RCBC.
- Install floodplain benching upstream/downstream of proposed culvert (documented separately).
- Tomahawk Lake analysis is required to determine any additional measures to improve the level of service.

PROJECT PRIORITIZATION and LEVEL OF SERVICE

CRITERIA	TOTAL SCORE
Utility Conflict	12
Street Flooding	8
Public or Privately-Owned Land	8
Effect of Improvements	10
Cost Effectiveness	15
Grant Bonus	3
Criticality Bonus	2
FINAL PROJECT SCORE:	**58**

KEY CROSSING	LEVEL OF SERVICE EXISTING	LEVEL OF SERVICE PROPOSED	% REDUCTION 50 YR
Laurel Circle Drive	< 2-YR	10-YR	0

PLANNING LEVEL OPINION OF COST

Construction estimate includes 30% contingency for planning. Design and permitting includes environmental permitting estimates. Proposed project footprints are based on GIS and modeling analyses. Detailed planning level costs are provided separately.

ITEM	COST OPINION
Construction	$ 455,000
Design and Permitting	$ 186,000
Other Project Costs	$ 119,000
Total Project	**$ 760,000**

PROJECT AREA MAP



PROJECT NAME **Laurel Circle Culvert Replacement (Tomahawk Branch)** PROJECT ID: **TB-A1**

PROJECT TYPE: Stormwater Drainage WATERSHED: Tomahawk B

PLANNING LEVEL COST ESTIMATE

Construction cost includes 30% contingency for planning.
Proposed project footprints are based on GIS and modeling analyses.
Real estate, if privately-owned land, is estimated based on property value.

Improvements (LF): 120

CONSTRUCTION COST:

ITEM DESCRIPTION	QUANTITY	UNIT	UNIT COST	AMOUNT
Mobilization	1	LS	$ 16,650.00	$ 16,700.00
Erosion Control	1	LS	$ 14,865.00	$ 14,900.00
Traffic Control	1	LS	$ 5,946.00	$ 5,900.00
Minor Utility Conflict	1	LS	$ 14,865.00	$ 14,900.00
Unclassified Excavation/Hauling	190	CY	$ 72.00	$ 13,700.00
Infrastructure Removal and Disposal	120	LF	$ 115.00	$ 13,800.00
Structure Removal and Disposal	-	EA	$ 6,800.00	-
Standard Structure	-	EA	$ 8,600.00	-
Large Structure or Headwall	2	EA	$ 12,000.00	$ 24,000.00
New Pipe: 18-inch to 24-inch	-	LF	$ 390.00	-
New Pipe: 30-inch to 36-inch	-	LF	$ 535.00	-
New Pipe: 42-inch to 54-inch	-	LF	$ 670.00	-
New Pipe: 60-inch	-	LF	$ 875.00	-
Arch Pipe (22.5" - 31.3")	-	LF	$ 500.00	-
Large RCBC	120	LF	$ 1,700.00	$ 204,000.00
Rip Rap	25	TN	$ 50.00	$ 1,300.00
Open Channel Improvements	100	LF	$ 350.00	$ 35,000.00
Roadway/Sidewalk Replacement	50	SY	$ 110.00	$ 5,500.00
New Concrete Curb and Gutter	-	LF	$ 110.00	-
Replace Driveway Culvert Pipe	-	LF	$ 300.00	-
Replace Existing Concrete Driveway	-	SY	$ 120.00	-
			Construction Contingency (30%):	$ 105,000.00
			PLANNING LEVEL OPINION OF CONSTRUCTION COST:	**$ 455,000.00**

PROJECT COST:

PROJECT BUDGET ITEM	% of CONSTRUCTION	AMOUNT
Survey	5%	$ 22,800.00
Design and Permitting	20%	$ 91,000.00
Environmental Permitting	-	$ 95,000.00
Railroad Permitting/Coordination	-	$ -
Geotechnical Investigation	1%	$ 4,600.00
Structural Evaluation	1%	$ 4,600.00
Real Estate	2%	$ 9,100.00
Utility Relocation	2%	$ 9,100.00
Project Maintenance (3yr)	5%	$ 22,800.00
Construction Inspections	10%	$ 45,500.00
Construction	100%	$ 455,000.00
PLANNING LEVEL OPINION OF TOTAL PROJECT COST:		$ 760,000.00

PROJECT NAME: **Tomahawk Branch Floodplain Benching at Golf Course** PROJECT ID: **TB-A2**

PROJECT INFORMATION

LOCATION:	Laurel Circle Dr north of Lake Tomahawk	STORMWATER PROJECT TYPE:	Floodplain Benching
WATERSHED:	Tomahawk Branch	DRAINAGE IMPROVEMENTS (LF):	500

PROJECT DESCRIPTION

To improve level of service for surrounding roadways and reduce flood risk to nearby property owners:

- Install approximately 500 LF of channel improvements with floodplain benching to lower WSELs.
- Floodplain benching improvements are located up and downstream of the proposed RCBC in project TB-A1.

PROJECT PRIORITIZATION AND PROPERTY REQUIREMENTS

CRITERIA	TOTAL SCORE
Utility Conflict	12
Street Flooding	8
Public or Privately-Owned Land	4
Effect of Improvements	10
Cost Effectiveness	15
Grant Bonus	3
Criticality Bonus	1
FINAL PROJECT SCORE:	**53**

KEY CROSSING	LEVEL OF SERVICE EXISTING	LEVEL OF SERVICE PROPOSED	% REDUCTION 50 YR
Laurel Circle Drive	< 2-YR	10-YR	0

PLANNING LEVEL OPINION OF COST

Construction estimate includes 30% contingency for planning. Design and permitting includes environmental permitting estimates. Proposed project footprints are based on GIS and modeling analyses. Detailed planning level costs are provided separately.

ITEM	COST OPINION
Construction	$ 406,000
Design and Permitting	$ 146,200
Other Project Costs	$ 137,800
Total Project	**$ 690,000**

PROJECT AREA MAP



PROJECT NAME: **Tomahawk Branch Floodplain Benching at Golf C** PROJECT ID: **TB-A2**

PROJECT TYPE: Floodplain Benching WATERSHED: Tomahawk Branch

PLANNING LEVEL COST ESTIMATE

- Construction estimate includes 30% contingency for planning.
- Proposed project footprints are based on GIS and modeling analyses.
- Real estate, if privately-owned land, is estimated based on property value.

CONSTRUCTION COST:

ITEM DESCRIPTION	QUANTITY	UNIT	UNIT COST	AMOUNT
Mobilization	1	LS	$ 15,660.00	$ 15,700.00
Erosion Control	1	LS	$ 13,980.00	$ 14,000.00
Traffic Control	1	LS	$ 5,592.00	$ 5,600.00
Minor Utility Conflict	1	LS	$ 13,980.00	$ 14,000.00
Clearing and Grubbing	1110	SY	$ 5.50	$ 6,100.00
Earthwork	370	CY	$ 90.00	$ 33,300.00
Fine Grading	1110	SY	$ 18.00	$ 20,000.00
Structure Removal and Disposal	-	EA	$ 6,800.00	-
Infrastructure Removal and Disposal	-	LF	$ 115.00	-
Stone, Class B	125	TN	$ 92.00	$ 11,500.00
Filter Fabric/Geotextiles	2780	SY	$ 35.00	$ 97,300.00
Plantings	1110	SY	$ 7.00	$ 7,800.00
3-gallon Container Plants	135	EA	$ 70.00	$ 9,500.00
Riffle Grade Control	2	EA	$ 4,025.00	$ 8,100.00
Floodplain Tree Removal	1	LS	$ 15,000.00	$ 15,000.00
Log Grade Control Structure	-	EA	$ 4,000.00	-
Pump Around Operation	1	LS	$ 46,000.00	$ 46,000.00
Golf Course Bridge	1	LS	$ 25,000.00	$ 25,000.00
			Construction Contingency (30%):	$ 77,000.00
			PLANNING LEVEL OPINION OF CONSTRUCTION COST:	**$ 406,000.00**

PROJECT COST:

PROJECT BUDGET ITEM	% of CONSTRUCTION	AMOUNT
Survey	5%	$ 20,300.00
Design and Permitting	20%	$ 81,200.00
Environmental Permitting	-	$ 65,000.00
Railroad Permitting/Coordination	-	$ -
Geotechnical Investigation	1%	$ 4,100.00
Structural Evaluation	1%	$ 4,100.00
Real Estate	10%	$ 40,600.00
Utility Relocation	2%	$ 8,100.00
Project Maintenance (3yr)	5%	$ 20,300.00
Construction Inspections	10%	$ 40,600.00
Construction	100%	$ 406,000.00
PLANNING LEVEL OPINION OF TOTAL PROJECT COST:		$ 690,000.00

PROJECT NAME: **Swannanoa Ave Culvert Replacement and Stream Stabilization** PROJECT ID: **TB-B**

PROJECT INFORMATION

LOCATION:	Swannanoa Ave near Cragmont Rd	STORMWATER PROJECT TYPE:	Stormwater Drainage
WATERSHED:	Tomahawk Branch	DRAINAGE IMPROVEMENTS (LF):	355

PROJECT DESCRIPTION

To improve level of service for surrounding roadways and reduce flood risk to nearby property owners:

- Replace existing culvert with 30 LF of 48-inch RCP.
- Install approximately 200 LF of stream stabilization measures.

PROJECT PRIORITIZATION and LEVEL OF SERVICE

CRITERIA	TOTAL SCORE
Utility Conflict	12
Street Flooding	24
Public or Privately-Owned Land	8
Effect of Improvements	10
Cost Effectiveness	20
Grant Bonus	2
Criticality Bonus	1
FINAL PROJECT SCORE:	**77**

KEY CROSSING	LEVEL OF SERVICE EXISTING	LEVEL OF SERVICE PROPOSED	% REDUCTION 50 YR
Swannanoa Ave	2-YR	25-YR	50

PLANNING LEVEL OPINION OF COST

Construction estimate includes 30% contingency for planning. Design and permitting includes environmental permitting estimates. Proposed project footprints are based on GIS and modeling analyses. Detailed planning level costs are provided separately.

ITEM	COST OPINION
Construction	$ 250,000
Design and Permitting	$ 115,000
Other Project Costs	$ 65,000
Total Project	**$ 430,000**

PROJECT AREA MAP



PROJECT NAME **Swannanoa Ave Culvert Replacement and Stream Stabilization** PROJECT ID: **TB-B**

PROJECT TYPE: Stormwater Drainage WATERSHED: Tomahawk B

PLANNING LEVEL COST ESTIMATE

Construction cost includes 30% contingency for planning. Improvements (LF): 35
Proposed project footprints are based on GIS and modeling analyses.
Real estate, if privately-owned land, is estimated based on property value.

CONSTRUCTION COST:

ITEM DESCRIPTION	QUANTITY	UNIT	UNIT COST	AMOUNT
Mobilization	1	LS	$ 9,140.00	$ 9,100.00
Erosion Control	1	LS	$ 8,155.00	$ 8,200.00
Traffic Control	1	LS	$ 3,262.00	$ 3,300.00
Minor Utility Conflict	1	LS	$ 8,155.00	$ 8,200.00
Unclassified Excavation/Hauling	40	CY	$ 72.00	$ 2,900.00
Infrastructure Removal and Disposal	35	LF	$ 115.00	$ 4,000.00
Structure Removal and Disposal	-	EA	$ 6,800.00	-
Standard Structure	2	EA	$ 8,600.00	$ 17,200.00
Large Structure or Headwall	-	EA	$ 12,000.00	-
New Pipe: 18-inch to 24-inch	-	LF	$ 390.00	-
New Pipe: 30-inch to 36-inch	-	LF	$ 535.00	-
New Pipe: 42-inch to 54-inch	35	LF	$ 670.00	$ 23,500.00
New Pipe: 60-inch	-	LF	$ 875.00	-
Arch Pipe (22.5" - 31.3")	-	LF	$ 500.00	-
Large RCBC	-	LF	$ 1,700.00	-
Rip Rap	25	TN	$ 50.00	$ 1,300.00
Open Channel Improvements	320	LF	$ 350.00	$ 112,000.00
Roadway/Sidewalk Replacement	20	SY	$ 110.00	$ 2,200.00
New Concrete Curb and Gutter	-	LF	$ 110.00	-
Replace Driveway Culvert Pipe	-	LF	$ 300.00	-
Replace Existing Concrete Driveway	-	SY	$ 120.00	-
			Construction Contingency (30%):	$ 58,000.00
			PLANNING LEVEL OPINION OF CONSTRUCTION COST:	**$ 250,000.00**

PROJECT COST:

PROJECT BUDGET ITEM	% of CONSTRUCTION	AMOUNT
Survey	5%	$ 12,500.00
Design and Permitting	20%	$ 50,000.00
Environmental Permitting	-	$ 65,000.00
Railroad Permitting/Coordination	-	$ -
Geotechnical Investigation	1%	$ 2,500.00
Structural Evaluation	1%	$ 2,500.00
Real Estate	2%	$ 5,000.00
Utility Relocation	2%	$ 5,000.00
Project Maintenance (3yr)	5%	$ 12,500.00
Construction Inspections	10%	$ 25,000.00
Construction	100%	$ 250,000.00
PLANNING LEVEL OPINION OF TOTAL PROJECT COST:		$ 430,000.00

PROJECT NAME: **Padgettown Rd Stormwater Improvements** PROJECT ID: **TR35-A**

PROJECT INFORMATION

LOCATION: Padgettown Rd/US Hwy 70E Intersection
WATERSHED: Tributary 35
STORMWATER PROJECT TYPE: Stormwater Drainage
DRAINAGE IMPROVEMENTS (LF): 460

PROJECT DESCRIPTION

To improve level of service for surrounding roadways and reduce flood risk to nearby property owners:

- Install 145 LF of twin 60-inch RCP by-pass system to depression area south of the gas station.
- Replace existing pipe across Padgettown Road at Old US 70E with twin 48" RCP.
- Excavate and enlarge existing open channel and outfall area downstream of gas station.
- Existing conditions severly limit options to provide desired LOS. An option is presented herein.
- Additional survey and engineering investigation required to determine constructability and achievable LOS.

PROJECT PRIORITIZATION and LEVEL OF SERVICE

CRITERIA	TOTAL SCORE
Utility Conflict	4
Street Flooding	16
Public or Privately-Owned Land	8
Effect of Improvements	15
Cost Effectiveness	15
Grant Bonus	3
Criticality Bonus	1
FINAL PROJECT SCORE:	**62**

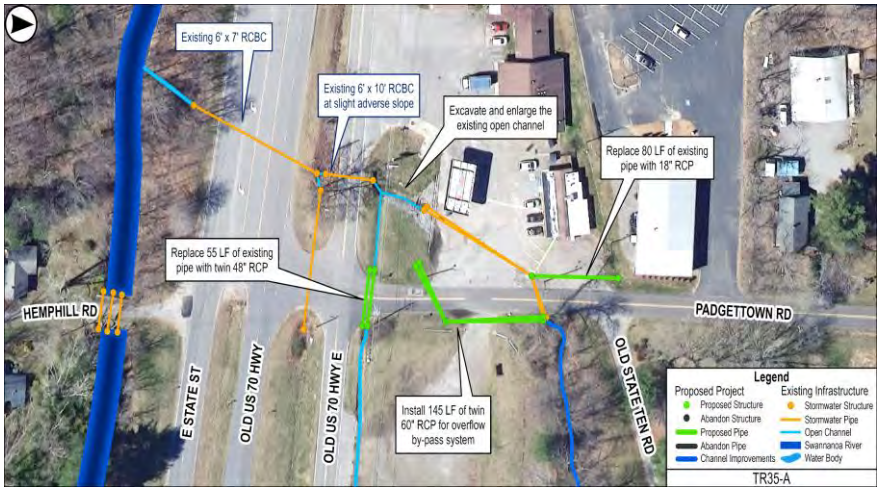
KEY CROSSING	LEVEL OF SERVICE EXISTING	LEVEL OF SERVICE PROPOSED	% REDUCTION 50 YR
Padgettown at Old US70E	2-YR	25-YR	80
Gas Station (Twin 36")	2-YR	10-YR	76
Padgettown Rd (Twin 36")	< 2-YR	10-YR	68
Padgettown Rd (Twin 60")	NA	25-YR	New Crossing

PLANNING LEVEL OPINION OF COST

Construction estimate includes 30% contingency for planning. Design and permitting includes environmental permitting estimates. Proposed project footprints are based on GIS and modeling analyses. Detailed planning level costs are provided separately.

ITEM	COST OPINION
Construction	$ 909,000
Design and Permitting	$ 276,800
Other Project Costs	$ 236,200
Total Project	**$ 1,422,000**

PROJECT AREA MAP



PROJECT NAME **Padgettown Rd Stormwater Improvements** PROJECT ID: **TR35-A**

PROJECT TYPE: Stormwater Drainage WATERSHED: Tributary 35

PLANNING LEVEL COST ESTIMATE

Construction cost includes 30% contingency for planning. Improvements (LF): 460
Proposed project footprints are based on GIS and modeling analyses.
Real estate, if privately-owned land, is estimated based on property value.

CONSTRUCTION COST:

ITEM DESCRIPTION	QUANTITY	UNIT	UNIT COST	AMOUNT
Mobilization	1	LS	$ 33,290.00	$ 33,300.00
Erosion Control	1	LS	$ 24,300.00	$ 24,300.00
Traffic Control	1	LS	$ 9,720.00	$ 9,700.00
Major Utility Conflict	1	LS	$ 145,800.00	$ 145,800.00
Unclassified Excavation/Hauling	770	CY	$ 72.00	$ 55,400.00
Infrastructure Removal and Disposal	125	LF	$ 115.00	$ 14,400.00
Structure Removal and Disposal	-	EA	$ 6,800.00	-
Standard Structure	1	EA	$ 8,600.00	$ 8,600.00
Large Structure or Headwall	5	EA	$ 12,000.00	$ 60,000.00
New Pipe: 18-inch to 24-inch	-	LF	$ 390.00	-
New Pipe: 30-inch to 36-inch	-	LF	$ 535.00	-
New Pipe: 42-inch to 54-inch	90	LF	$ 670.00	$ 60,300.00
New Pipe: 60-inch	290	LF	$ 875.00	$ 253,800.00
Arch Pipe (22.5" - 31.3")	-	LF	$ 500.00	-
Large RCBC	-	LF	$ 1,700.00	-
Rip Rap	25	TN	$ 50.00	$ 1,300.00
Open Channel Improvements	-	LF	$ 350.00	-
Roadway/Sidewalk Replacement	100	SY	$ 110.00	$ 11,000.00
Earthwork	105	CY	$ 90.00	$ 9,500.00
Fine Grading	550	SY	$ 18.00	$ 9,900.00
Plantings	250	SY	$ 7.00	$ 1,800.00
			Construction Contingency (30%):	$ 210,000.00
			PLANNING LEVEL OPINION OF CONSTRUCTION COST:	**$ 909,000.00**

PROJECT COST:

PROJECT BUDGET ITEM	% of CONSTRUCTION	AMOUNT
Survey	5%	$ 45,500.00
Design and Permitting	20%	$ 181,800.00
Environmental Permitting	-	$ 95,000.00
Railroad Permitting/Coordination	-	$ -
Geotechnical Investigation	1%	$ 9,100.00
Structural Evaluation	1%	$ 9,100.00
Real Estate	2%	$ 18,200.00
Utility Relocation	2%	$ 18,200.00
Project Maintenance (3yr)	5%	$ 45,500.00
Construction Inspections	10%	$ 90,900.00
Construction	100%	$ 909,000.00
PLANNING LEVEL OPINION OF TOTAL PROJECT COST:		$ 1,422,000.00

PROJECT NAME: **Old State 10 Rd Culvert Replacement and Stream Stabilization** PROJECT ID: **TR35-B1**

PROJECT INFORMATION

LOCATION:	Old State 10 Rd Culvert Crossing	STORMWATER PROJECT TYPE:	Stormwater Drainage
WATERSHED:	Tributary 35	DRAINAGE IMPROVEMENTS (LF):	160

PROJECT DESCRIPTION

To improve level of service for surrounding roadways and reduce flood risk to nearby property owners:

- Replace existing pipe with 30 LF of twin 4'x6' RCBC under Old State 10 Rd.
- Install 100 LF of upstream channel improvements to accommodate flow into new RCBC.

PROJECT PRIORITIZATION and LEVEL OF SERVICE

CRITERIA	TOTAL SCORE
Utility Conflict	4
Street Flooding	32
Public or Privately-Owned Land	8
Effect of Improvements	10
Cost Effectiveness	20
Grant Bonus	2
Criticality Bonus	1
FINAL PROJECT SCORE:	**77**

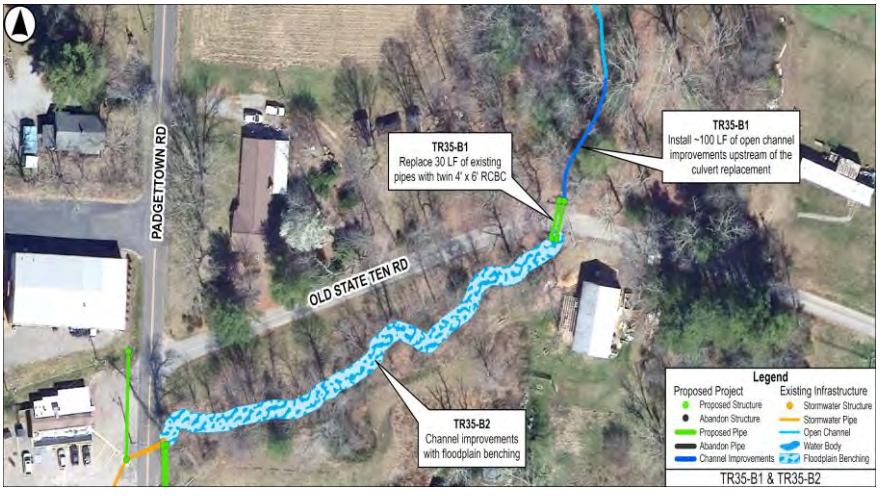
	LEVEL OF SERVICE		% REDUCTION
KEY CROSSING	EXISTING	PROPOSED	50 YR
Old State 10 Road (Twin 36")	2-YR	25-YR	91

PLANNING LEVEL OPINION OF COST

Construction estimate includes 30% contingency for planning. Design and permitting includes environmental permitting estimates. Proposed project footprints are based on GIS and modeling analyses. Detailed planning level costs are provided separately.

ITEM	COST OPINION
Construction	$ 351,000
Design and Permitting	$ 165,200
Other Project Costs	$ 91,800
Total Project	**$ 608,000**

PROJECT AREA MAP



PROJECT NAME **Old State 10 Rd Culvert Replacement and Stream Stabilization** PROJECT ID: **TR35-B1**

PROJECT TYPE: Stormwater Drainage WATERSHED: Tributary 35

PLANNING LEVEL COST ESTIMATE

Construction cost includes 30% contingency for planning. Improvements (LF): 60
Proposed project footprints are based on GIS and modeling analyses.
Real estate, if privately-owned land, is estimated based on property value.

CONSTRUCTION COST:

ITEM DESCRIPTION	QUANTITY	UNIT	UNIT COST	AMOUNT
Mobilization	1	LS	$ 12,860.00	$ 12,900.00
Erosion Control	1	LS	$ 9,385.00	$ 9,400.00
Traffic Control	1	LS	$ 3,754.00	$ 3,800.00
Major Utility Conflict	1	LS	$ 56,310.00	$ 56,300.00
Unclassified Excavation/Hauling	70	CY	$ 72.00	$ 5,000.00
Infrastructure Removal and Disposal	30	LF	$ 115.00	$ 3,500.00
Structure Removal and Disposal	2	EA	$ 6,800.00	$ 13,600.00
Standard Structure	-	EA	$ 8,600.00	-
Large Structure or Headwall	2	EA	$ 12,000.00	$ 24,000.00
New Pipe: 18-inch to 24-inch	-	LF	$ 390.00	-
New Pipe: 30-inch to 36-inch	-	LF	$ 535.00	-
New Pipe: 42-inch to 54-inch	-	LF	$ 670.00	-
New Pipe: 60-inch	-	LF	$ 875.00	-
Arch Pipe (22.5" - 31.3")	-	LF	$ 500.00	-
Large RCBC	60	LF	$ 1,700.00	$ 102,000.00
Rip Rap	25	TN	$ 50.00	$ 1,300.00
Open Channel Improvements	100	LF	$ 350.00	$ 35,000.00
Roadway/Sidewalk Replacement	30	SY	$ 110.00	$ 3,300.00
New Concrete Curb and Gutter	-	LF	$ 110.00	-
Replace Driveway Culvert Pipe	-	LF	$ 300.00	-
Replace Existing Concrete Driveway	-	SY	$ 120.00	-
			Construction Contingency (30%):	$ 81,000.00
			PLANNING LEVEL OPINION OF CONSTRUCTION COST:	**$ 351,000.00**

PROJECT COST:

PROJECT BUDGET ITEM	% of CONSTRUCTION	AMOUNT
Survey	5%	$ 17,600.00
Design and Permitting	20%	$ 70,200.00
Environmental Permitting	-	$ 95,000.00
Railroad Permitting/Coordination	-	$ -
Geotechnical Investigation	1%	$ 3,500.00
Structural Evaluation	1%	$ 3,500.00
Real Estate	2%	$ 7,000.00
Utility Relocation	2%	$ 7,000.00
Project Maintenance (3yr)	5%	$ 17,600.00
Construction Inspections	10%	$ 35,100.00
Construction	100%	$ 351,000.00
PLANNING LEVEL OPINION OF TOTAL PROJECT COST:		$ 608,000.00

PROJECT NAME: **Tributary 35 Floodplain Benching at Old State 10 Rd** PROJECT ID: **TR35-B2**

PROJECT INFORMATION

LOCATION: Old State 10 Road near Padgettown Rd
WATERSHED: Tributary 35
STORMWATER PROJECT TYPE: Floodplain Benching
DRAINAGE IMPROVEMENTS (LF): 350

PROJECT DESCRIPTION

To improve level of service for surrounding roadways and reduce flood risk to nearby property owners:

- Install approximately 350 LF of channel improvements with floodplain benching to lower WSELs.
- Floodplain benching improvements are located downstream of the proposed RCBC in project TR35-B1.

PROJECT PRIORITIZATION AND PROPERTY REQUIREMENTS

CRITERIA	TOTAL SCORE
Utility Conflict	12
Street Flooding	16
Public or Privately-Owned Land	4
Effect of Improvements	10
Cost Effectiveness	20
Grant Bonus	3
Criticality Bonus	1
FINAL PROJECT SCORE:	**66**

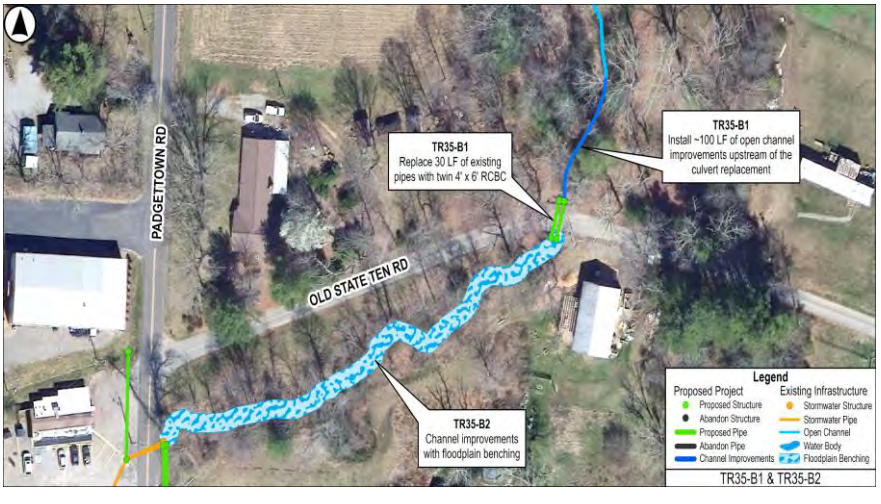
KEY CROSSING	LEVEL OF SERVICE EXISTING	LEVEL OF SERVICE PROPOSED	% REDUCTION 50 YR
Padgettown Rd (Twin 36")	< 2-YR	10-YR	68
Old State 10 Road (Twin 36")	2-YR	25-YR	91

PLANNING LEVEL OPINION OF COST

Construction estimate includes 30% contingency for planning. Design and permitting includes environmental permitting estimates. Proposed project footprints are based on GIS and modeling analyses. Detailed planning level costs are provided separately.

ITEM	COST OPINION
Construction	$ 234,000
Design and Permitting	$ 111,800
Other Project Costs	$ 79,200
Total Project	**$ 425,000**

PROJECT AREA MAP



PROJECT NAME: **Tributary 35 Floodplain Benching at Old State 10** PROJECT ID: **TR35-B2**

PROJECT TYPE: Floodplain Benching WATERSHED: Tributary 35

PLANNING LEVEL COST ESTIMATE

- Construction estimate includes 30% contingency for planning.
- Proposed project footprints are based on GIS and modeling analyses.
- Real estate, if privately-owned land, is estimated based on property value.

CONSTRUCTION COST:

ITEM DESCRIPTION	QUANTITY	UNIT	UNIT COST	AMOUNT
Mobilization	1	LS	$ 9,090.00	$ 9,100.00
Erosion Control	1	LS	$ 8,120.00	$ 8,100.00
Traffic Control	1	LS	$ 3,248.00	$ 3,200.00
Minor Utility Conflict	1	LS	$ 8,120.00	$ 8,100.00
Clearing and Grubbing	390	SY	$ 5.50	$ 2,100.00
Earthwork	0	CY	$ 90.00	$ -
Fine Grading	390	SY	$ 18.00	$ 7,000.00
Structure Removal and Disposal	-	EA	$ 6,800.00	-
Infrastructure Removal and Disposal	-	LF	$ 115.00	-
Stone, Class B	75	TN	$ 92.00	$ 6,900.00
Filter Fabric/Geotextiles	1940	SY	$ 35.00	$ 67,900.00
Plantings	390	SY	$ 7.00	$ 2,700.00
3-gallon Container Plants	95	EA	$ 70.00	$ 6,700.00
Riffle Grade Control	2	EA	$ 4,025.00	$ 8,100.00
Floodplain Tree Removal	1	LS	$ 15,000.00	$ 15,000.00
Log Grade Control Structure	-	EA	$ 4,000.00	-
Pump Around Operation	1	LS	$ 46,000.00	$ 46,000.00

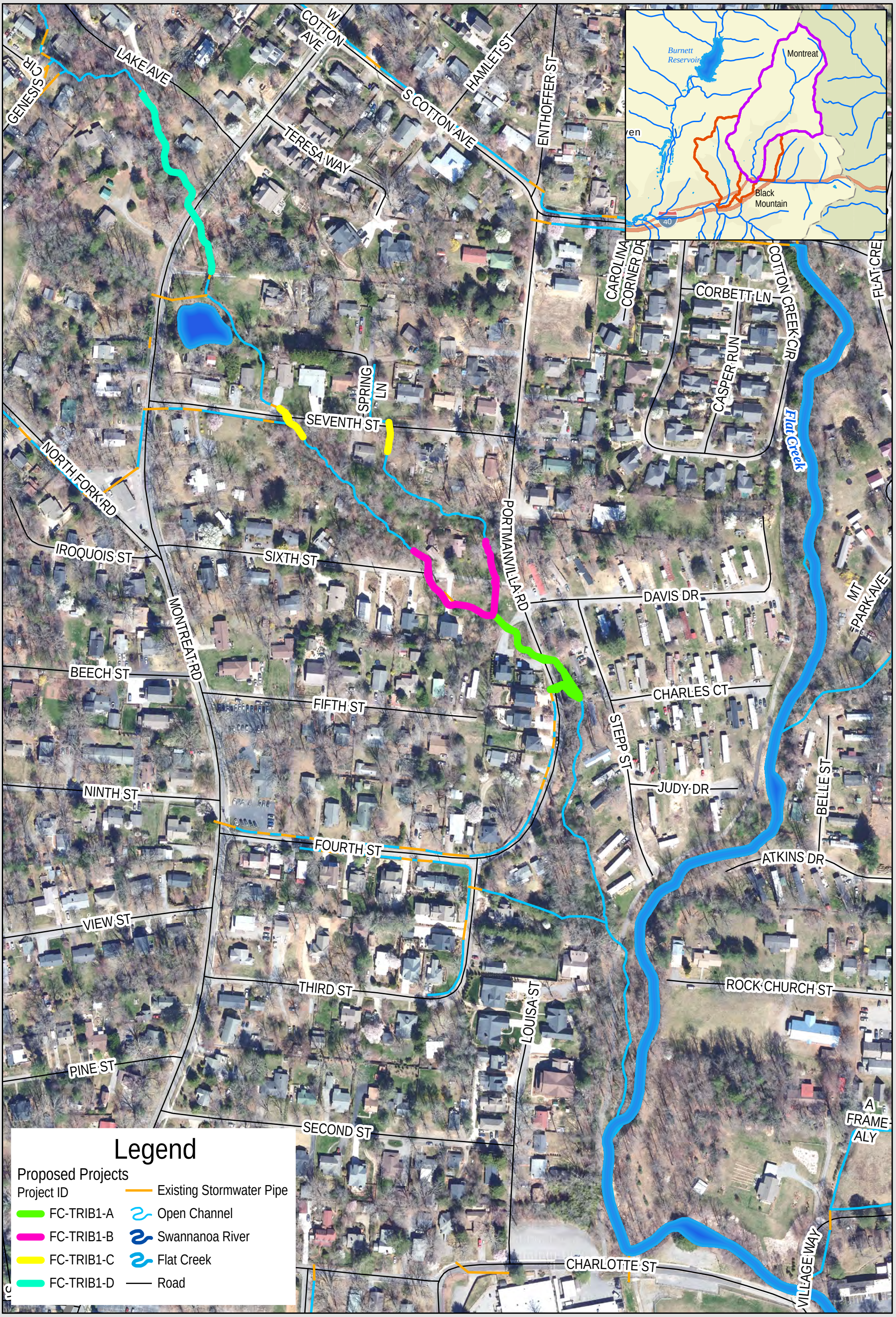
Construction Contingency (30%): $ 43,000.00

PLANNING LEVEL OPINION OF CONSTRUCTION COST: **$ 234,000.00**

PROJECT COST:

PROJECT BUDGET ITEM	% of CONSTRUCTION	AMOUNT
Survey	5%	$ 11,700.00
Design and Permitting	20%	$ 46,800.00
Environmental Permitting	-	$ 65,000.00
Railroad Permitting/Coordination	-	$ -
Geotechnical Investigation	1%	$ 2,300.00
Structural Evaluation	1%	$ 2,300.00
Real Estate	10%	$ 23,400.00
Utility Relocation	2%	$ 4,700.00
Project Maintenance (3yr)	5%	$ 11,700.00
Construction Inspections	10%	$ 23,400.00
Construction	100%	$ 234,000.00

PLANNING LEVEL OPINION OF TOTAL PROJECT COST: $ 425,000.00



WK DICKSON
AN ARDURRA COMPANY

Figure ES-7: Proposed Stormwater Improvement Projects
FLAT CREEK TRIBUTARY 1 PRIMARY SYSTEM
Town of Black Mountain Stormwater Master Plan

0 100 200 Feet
1 in = 200 ft

PROJECT NAME: **Portmanvilla Rd Stormwater Improvements** PROJECT ID: **FC-TRIB1-A**

PROJECT INFORMATION

LOCATION: Portmanvilla Rd near Davis Dr
WATERSHED: Flat Creek
STORMWATER PROJECT TYPE: Stormwater Drainage
DRAINAGE IMPROVEMENTS (LF): 540

PROJECT DESCRIPTION

To improve level of service for surrounding roadways and reduce flood risk to nearby property owners:

- Replace existing 15-inch CMP with 35 LF of twin 22.5" x 36.25" (30" Eq) Concrete Arch Pipe.
- Replace existing 30-inch CMP with 45 LF of twin 31.31" x 51.13" (42" Eq) Concrete Arch Pipe.
- Replace existing upstream private pipe with 25 LF of twin 31.31" x 51.13" (42" Eq) Concrete Arch Pipe.
- Replace existing downstream private pipe with 40 LF of twin 31.31" x 51.13" (42" Eq) Concrete Arch Pipe.
- Install approximately 250 LF of stream stabilization measures.

PROJECT PRIORITIZATION and LEVEL OF SERVICE

CRITERIA	TOTAL SCORE
Utility Conflict	8
Street Flooding	32
Public or Privately-Owned Land	8
Effect of Improvements	15
Cost Effectiveness	20
Grant Bonus	2
Criticality Bonus	2
FINAL PROJECT SCORE:	**87**

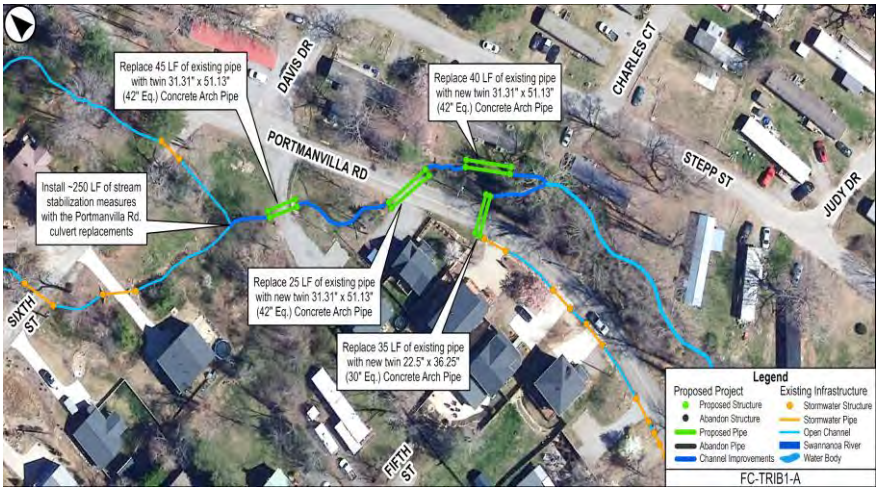
KEY CROSSING	LEVEL OF SERVICE EXISTING	LEVEL OF SERVICE PROPOSED	% REDUCTION 50 YR
Portmanvilla Rd (15" CMP)	< 2-YR	50-YR	100
Portmanvilla Rd (30" RCP)	2-YR	50-YR	100

PLANNING LEVEL OPINION OF COST

Construction estimate includes 30% contingency for planning. Design and permitting includes environmental permitting estimates. Proposed project footprints are based on GIS and modeling analyses. Detailed planning level costs are provided separately.

ITEM	COST OPINION
Construction	$ 572,000
Design and Permitting	$ 179,400
Other Project Costs	$ 148,600
Total Project	**$ 900,000**

PROJECT AREA MAP



PROJECT NAME **Portmanvilla Rd Stormwater Improvements** PROJECT ID: **FC-TRIB1-A**

PROJECT TYPE: Stormwater Drainage WATERSHED: Flat Creek

PLANNING LEVEL COST ESTIMATE

Construction cost includes 30% contingency for planning. Improvements (LF): 290
Proposed project footprints are based on GIS and modeling analyses.
Real estate, if privately-owned land, is estimated based on property value.

CONSTRUCTION COST:

ITEM DESCRIPTION	QUANTITY	UNIT	UNIT COST	AMOUNT
Mobilization	1	LS	$ 20,940.00	$ 20,900.00
Erosion Control	1	LS	$ 17,160.00	$ 17,200.00
Traffic Control	1	LS	$ 6,864.00	$ 6,900.00
Moderate Utility Conflict	1	LS	$ 51,480.00	$ 51,500.00
Unclassified Excavation/Hauling	270	CY	$ 72.00	$ 19,400.00
Infrastructure Removal and Disposal	140	LF	$ 115.00	$ 16,100.00
Structure Removal and Disposal	2	EA	$ 6,800.00	$ 13,600.00
Standard Structure	-	EA	$ 8,600.00	-
Large Structure or Headwall	4	EA	$ 12,000.00	$ 48,000.00
New Pipe: 18-inch to 24-inch	-	LF	$ 390.00	-
New Pipe: 30-inch to 36-inch	-	LF	$ 535.00	-
New Pipe: 42-inch to 54-inch	-	LF	$ 670.00	-
New Pipe: 60-inch	-	LF	$ 875.00	-
Arch Pipe (22.5" - 31.3")	290	LF	$ 500.00	$ 145,000.00
Large RCBC	-	LF	$ 1,700.00	-
Rip Rap	25	TN	$ 50.00	$ 1,300.00
Open Channel Improvements	250	LF	$ 350.00	$ 87,500.00
Roadway/Sidewalk Replacement	60	SY	$ 110.00	$ 6,600.00
New Concrete Curb and Gutter	-	LF	$ 110.00	-
Replace Driveway Culvert Pipe	15	LF	$ 300.00	$ 4,500.00
Replace Existing Concrete Driveway	10	SY	$ 120.00	$ 1,200.00
			Construction Contingency (30%):	$ 132,000.00
			PLANNING LEVEL OPINION OF CONSTRUCTION COST:	**$ 572,000.00**

PROJECT COST:

PROJECT BUDGET ITEM	% of CONSTRUCTION	AMOUNT
Survey	5%	$ 28,600.00
Design and Permitting	20%	$ 114,400.00
Environmental Permitting	-	$ 65,000.00
Railroad Permitting/Coordination	-	$ -
Geotechnical Investigation	1%	$ 5,700.00
Structural Evaluation	1%	$ 5,700.00
Real Estate	2%	$ 11,400.00
Utility Relocation	2%	$ 11,400.00
Project Maintenance (3yr)	5%	$ 28,600.00
Construction Inspections	10%	$ 57,200.00
Construction	100%	$ 572,000.00
PLANNING LEVEL OPINION OF TOTAL PROJECT COST:		$ 900,000.00

PROJECT NAME: **6th Street Culvert Replacements and Stream Stabilization** PROJECT ID: **FC-TRIB1-B**

PROJECT INFORMATION

LOCATION: 6th St near Portmanvilla Rd
WATERSHED: Flat Creek
STORMWATER PROJECT TYPE: Stormwater Drainage
DRAINAGE IMPROVEMENTS (LF): 500

PROJECT DESCRIPTION

To improve level of service for surrounding roadways and reduce flood risk to nearby property owners:

- Replace existing 15-inch CMP with 20 LF of twin 22.5" x 36.25" (30" Eq) Concrete Arch Pipe.
- Replace existing 42-inch CMP with 30 LF of twin 26.625" x 43.75" (36" Eq) Concrete Arch Pipe.
- Install approximately 150 LF of stream stabilization measures upstream of the proposed culverts.
- Install approximately 250 LF of stream stabilization measures downstream of the proposed culverts.

PROJECT PRIORITIZATION and LEVEL OF SERVICE

CRITERIA	TOTAL SCORE
Utility Conflict	12
Street Flooding	24
Public or Privately-Owned Land	8
Effect of Improvements	10
Cost Effectiveness	20
Grant Bonus	2
Criticality Bonus	2
FINAL PROJECT SCORE:	**78**

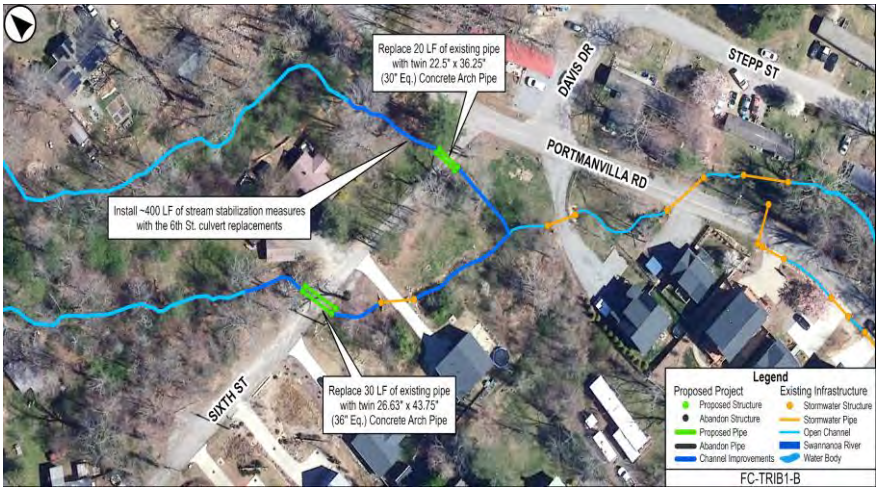
KEY CROSSING	LEVEL OF SERVICE EXISTING	LEVEL OF SERVICE PROPOSED	% REDUCTION 50 YR
6th St at Portmanvilla Rd	< 2-YR	50-YR	100
6th Street	10-YR	50-YR	100

PLANNING LEVEL OPINION OF COST

Construction estimate includes 30% contingency for planning. Design and permitting includes environmental permitting estimates. Proposed project footprints are based on GIS and modeling analyses. Detailed planning level costs are provided separately.

ITEM	COST OPINION
Construction	$ 389,000
Design and Permitting	$ 142,800
Other Project Costs	$ 101,200
Total Project	**$ 633,000**

PROJECT AREA MAP



PROJECT NAME **6th Street Culvert Replacements and Stream Stabilization** PROJECT ID: **FC-TRIB1-B**

PROJECT TYPE: Stormwater Drainage WATERSHED: Flat Creek

PLANNING LEVEL COST ESTIMATE

Construction cost includes 30% contingency for planning. Improvements (LF): 100
Proposed project footprints are based on GIS and modeling analyses.
Real estate, if privately-owned land, is estimated based on property value.

CONSTRUCTION COST:

ITEM DESCRIPTION	QUANTITY	UNIT	UNIT COST	AMOUNT
Mobilization	1	LS	$ 14,250.00	$ 14,300.00
Erosion Control	1	LS	$ 12,725.00	$ 12,700.00
Traffic Control	1	LS	$ 5,090.00	$ 5,100.00
Minor Utility Conflict	1	LS	$ 12,725.00	$ 12,700.00
Unclassified Excavation/Hauling	70	CY	$ 72.00	$ 5,000.00
Infrastructure Removal and Disposal	50	LF	$ 115.00	$ 5,800.00
Structure Removal and Disposal	-	EA	$ 6,800.00	-
Standard Structure	2	EA	$ 8,600.00	$ 17,200.00
Large Structure or Headwall	2	EA	$ 12,000.00	$ 24,000.00
New Pipe: 18-inch to 24-inch	-	LF	$ 390.00	-
New Pipe: 30-inch to 36-inch	-	LF	$ 535.00	-
New Pipe: 42-inch to 54-inch	-	LF	$ 670.00	-
New Pipe: 60-inch	-	LF	$ 875.00	-
Arch Pipe (22.5" - 31.3")	100	LF	$ 500.00	$ 50,000.00
Large RCBC	-	LF	$ 1,700.00	-
Rip Rap	25	TN	$ 50.00	$ 1,300.00
Open Channel Improvements	400	LF	$ 350.00	$ 140,000.00
Roadway/Sidewalk Replacement	50	SY	$ 110.00	$ 5,500.00
New Concrete Curb and Gutter	-	LF	$ 110.00	-
Replace Driveway Culvert Pipe	15	LF	$ 300.00	$ 4,500.00
Replace Existing Concrete Driveway	10	SY	$ 120.00	$ 1,200.00
			Construction Contingency (30%):	$ 90,000.00
			PLANNING LEVEL OPINION OF CONSTRUCTION COST:	**$ 389,000.00**

PROJECT COST:

PROJECT BUDGET ITEM	% of CONSTRUCTION	AMOUNT
Survey	5%	$ 19,500.00
Design and Permitting	20%	$ 77,800.00
Environmental Permitting	-	$ 65,000.00
Railroad Permitting/Coordination	-	$ -
Geotechnical Investigation	1%	$ 3,900.00
Structural Evaluation	1%	$ 3,900.00
Real Estate	2%	$ 7,800.00
Utility Relocation	2%	$ 7,800.00
Project Maintenance (3yr)	5%	$ 19,500.00
Construction Inspections	10%	$ 38,900.00
Construction	100%	$ 389,000.00
PLANNING LEVEL OPINION OF TOTAL PROJECT COST:		$ 633,000.00

PROJECT NAME: **7th Street Culvert Replacements and Stream Stabilization** PROJECT ID: **FC-TRIB1-C**

PROJECT INFORMATION

LOCATION: 7th St near Portmanvilla Rd
WATERSHED: Flat Creek
STORMWATER PROJECT TYPE: Stormwater Drainage
DRAINAGE IMPROVEMENTS (LF): 210

PROJECT DESCRIPTION

To improve level of service for surrounding roadways and reduce flood risk to nearby property owners:

- Replace existing 15-inch CPP with 25 LF of 22.5" x 36.25" (30" Eq) Concrete Arch Pipe.
- Replace existing triple 24-inch CMP with 25 LF of twin 22.5" x 36.25" (30" Eq) Concrete Arch Pipe.
- Install approximately 110 LF of stream stabilization measures.

PROJECT PRIORITIZATION and LEVEL OF SERVICE

CRITERIA	TOTAL SCORE
Utility Conflict	12
Street Flooding	24
Public or Privately-Owned Land	8
Effect of Improvements	20
Cost Effectiveness	20
Grant Bonus	2
Criticality Bonus	1
FINAL PROJECT SCORE:	**87**

KEY CROSSING	LEVEL OF SERVICE EXISTING	LEVEL OF SERVICE PROPOSED	% REDUCTION 50 YR
7th St at Portmanvilla Rd	< 2-YR	50-YR	100
7th Street	2-YR	25-YR	78

PLANNING LEVEL OPINION OF COST

Construction estimate includes 30% contingency for planning. Design and permitting includes environmental permitting estimates. Proposed project footprints are based on GIS and modeling analyses. Detailed planning level costs are provided separately.

ITEM	COST OPINION
Construction	$ 233,000
Design and Permitting	$ 111,600
Other Project Costs	$ 60,400
Total Project	**$ 405,000**

PROJECT AREA MAP



PROJECT NAME **7th Street Culvert Replacements and Stream Stabilization** PROJECT ID: **FC-TRIB1-C**

PROJECT TYPE: Stormwater Drainage WATERSHED: Flat Creek

PLANNING LEVEL COST ESTIMATE

Construction cost includes 30% contingency for planning. Improvements (LF): 100
Proposed project footprints are based on GIS and modeling analyses.
Real estate, if privately-owned land, is estimated based on property value.

CONSTRUCTION COST:

ITEM DESCRIPTION	QUANTITY	UNIT	UNIT COST	AMOUNT
Mobilization	1	LS	$ 8,525.00	$ 8,500.00
Erosion Control	1	LS	$ 7,615.00	$ 7,600.00
Traffic Control	1	LS	$ 3,046.00	$ 3,000.00
Minor Utility Conflict	1	LS	$ 7,615.00	$ 7,600.00
Unclassified Excavation/Hauling	60	CY	$ 72.00	$ 4,300.00
Infrastructure Removal and Disposal	100	LF	$ 115.00	$ 11,500.00
Structure Removal and Disposal	-	EA	$ 6,800.00	-
Standard Structure	2	EA	$ 8,600.00	$ 17,200.00
Large Structure or Headwall	2	EA	$ 12,000.00	$ 24,000.00
New Pipe: 18-inch to 24-inch	-	LF	$ 390.00	-
New Pipe: 30-inch to 36-inch	-	LF	$ 535.00	-
New Pipe: 42-inch to 54-inch	-	LF	$ 670.00	-
New Pipe: 60-inch	-	LF	$ 875.00	-
Arch Pipe (22.5" - 31.3")	100	LF	$ 500.00	$ 50,000.00
Large RCBC	-	LF	$ 1,700.00	-
Rip Rap	25	TN	$ 50.00	$ 1,300.00
Open Channel Improvements	110	LF	$ 350.00	$ 38,500.00
Roadway/Sidewalk Replacement	50	SY	$ 110.00	$ 5,500.00
New Concrete Curb and Gutter	-	LF	$ 110.00	-
Replace Driveway Culvert Pipe	-	LF	$ 300.00	-
Replace Existing Concrete Driveway	-	SY	$ 120.00	-
			Construction Contingency (30%):	$ 54,000.00
			PLANNING LEVEL OPINION OF CONSTRUCTION COST:	**$ 233,000.00**

PROJECT COST:

PROJECT BUDGET ITEM	% of CONSTRUCTION	AMOUNT
Survey	5%	$ 11,700.00
Design and Permitting	20%	$ 46,600.00
Environmental Permitting	-	$ 65,000.00
Railroad Permitting/Coordination	-	$ -
Geotechnical Investigation	1%	$ 2,300.00
Structural Evaluation	1%	$ 2,300.00
Real Estate	2%	$ 4,700.00
Utility Relocation	2%	$ 4,700.00
Project Maintenance (3yr)	5%	$ 11,700.00
Construction Inspections	10%	$ 23,300.00
Construction	100%	$ 233,000.00
PLANNING LEVEL OPINION OF TOTAL PROJECT COST:		$ 405,000.00

PROJECT NAME: **Montreat Road Culvert Replacement (Flat Creek)** PROJECT ID: **FC-TRIB1-D**

PROJECT INFORMATION

LOCATION: Montreat Rd near Lake Ave
WATERSHED: Tomahawk Branch
STORMWATER PROJECT TYPE: Stormwater Drainage
DRAINAGE IMPROVEMENTS (LF): 350

PROJECT DESCRIPTION

To improve level of service for surrounding roadways and reduce flood risk to nearby property owners:

- Replace existing 24-inch CMP with 50 LF of 42-inch RCP.
- Install approximately 200 LF of stream stabilization measures upstream.
- Install approximately 100 LF of stream stabilization measures downstream of the proposed culvert.

PROJECT PRIORITIZATION and LEVEL OF SERVICE

CRITERIA	TOTAL SCORE
Utility Conflict	4
Street Flooding	32
Public or Privately-Owned Land	8
Effect of Improvements	20
Cost Effectiveness	20
Grant Bonus	3
Criticality Bonus	1
FINAL PROJECT SCORE:	**88**

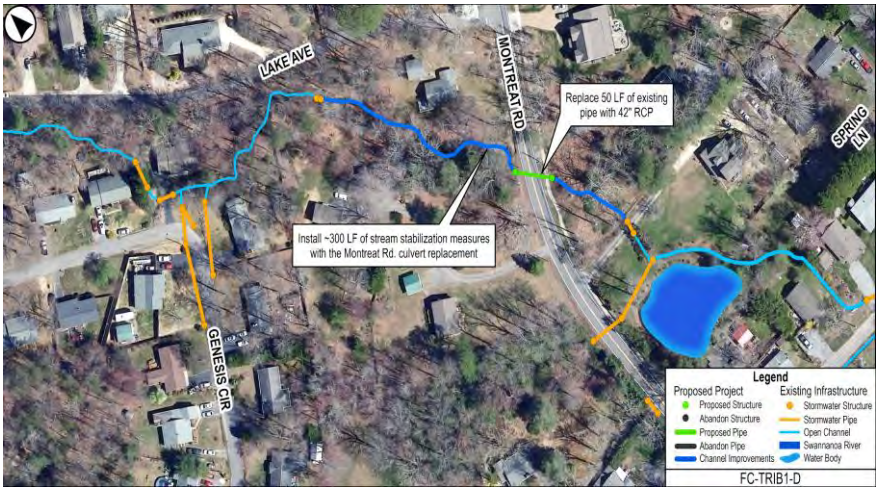
KEY CROSSING	LEVEL OF SERVICE EXISTING	LEVEL OF SERVICE PROPOSED	% REDUCTION 50 YR
Montreat Rd near Lake Ave	2-YR	50-YR	100

PLANNING LEVEL OPINION OF COST

Construction estimate includes 30% contingency for planning. Design and permitting includes environmental permitting estimates. Proposed project footprints are based on GIS and modeling analyses. Detailed planning level costs are provided separately.

ITEM	COST OPINION
Construction	$ 329,000
Design and Permitting	$ 130,800
Other Project Costs	$ 86,200
Total Project	**$ 546,000**

PROJECT AREA MAP



PROJECT NAME **Montreat Road Culvert Replacement (Flat Creek)** PROJECT ID: **FC-TRIB1-D**

PROJECT TYPE: Stormwater Drainage WATERSHED: Tomahawk B

PLANNING LEVEL COST ESTIMATE

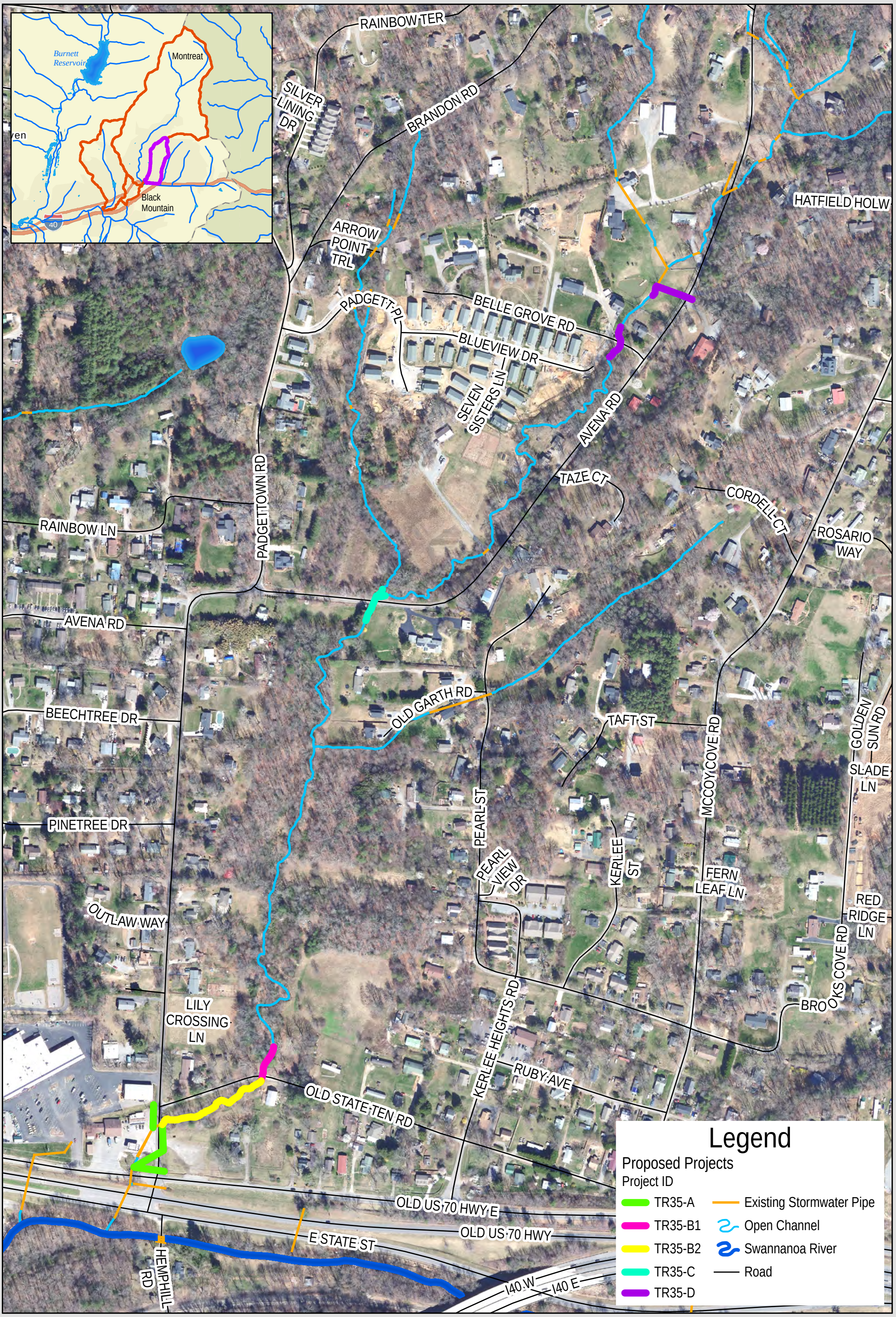
Construction cost includes 30% contingency for planning. Improvements (LF): 50
Proposed project footprints are based on GIS and modeling analyses.
Real estate, if privately-owned land, is estimated based on property value.

CONSTRUCTION COST:

ITEM DESCRIPTION	QUANTITY	UNIT	UNIT COST	AMOUNT
Mobilization	1	LS	$ 12,060.00	$ 12,100.00
Erosion Control	1	LS	$ 8,805.00	$ 8,800.00
Traffic Control	1	LS	$ 3,522.00	$ 3,500.00
Major Utility Conflict	1	LS	$ 52,830.00	$ 52,800.00
Unclassified Excavation/Hauling	60	CY	$ 72.00	$ 4,300.00
Infrastructure Removal and Disposal	50	LF	$ 115.00	$ 5,800.00
Structure Removal and Disposal	-	EA	$ 6,800.00	-
Standard Structure	-	EA	$ 8,600.00	-
Large Structure or Headwall	2	EA	$ 12,000.00	$ 24,000.00
New Pipe: 18-inch to 24-inch	-	LF	$ 390.00	-
New Pipe: 30-inch to 36-inch	-	LF	$ 535.00	-
New Pipe: 42-inch to 54-inch	50	LF	$ 670.00	$ 33,500.00
New Pipe: 60-inch	-	LF	$ 875.00	-
Arch Pipe (22.5" - 31.3")	-	LF	$ 500.00	-
Large RCBC	-	LF	$ 1,700.00	-
Rip Rap	25	TN	$ 50.00	$ 1,300.00
Open Channel Improvements	300	LF	$ 350.00	$ 105,000.00
Roadway/Sidewalk Replacement	20	SY	$ 110.00	$ 2,200.00
New Concrete Curb and Gutter	-	LF	$ 110.00	-
Replace Driveway Culvert Pipe	-	LF	$ 300.00	-
Replace Existing Concrete Driveway	-	SY	$ 120.00	-
			Construction Contingency (30%):	$ 76,000.00
			PLANNING LEVEL OPINION OF CONSTRUCTION COST:	**$ 329,000.00**

PROJECT COST:

PROJECT BUDGET ITEM	% of CONSTRUCTION	AMOUNT
Survey	5%	$ 16,500.00
Design and Permitting	20%	$ 65,800.00
Environmental Permitting	-	$ 65,000.00
Railroad Permitting/Coordination	-	$ -
Geotechnical Investigation	1%	$ 3,300.00
Structural Evaluation	1%	$ 3,300.00
Real Estate	2%	$ 6,600.00
Utility Relocation	2%	$ 6,600.00
Project Maintenance (3yr)	5%	$ 16,500.00
Construction Inspections	10%	$ 32,900.00
Construction	100%	$ 329,000.00
PLANNING LEVEL OPINION OF TOTAL PROJECT COST:		$ 546,000.00



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AN ARDURRA COMPANY

Figure ES-8: Proposed Stormwater Improvement Projects
AVENA ROAD/TRIBUTARY 35 PRIMARY SYSTEM
Town of Black Mountain Stormwater Master Plan

0 150 300
Feet
1 in = 300 ft

PROJECT NAME: **Padgettown Rd Stormwater Improvements** PROJECT ID: **TR35-A**

PROJECT INFORMATION

LOCATION: Padgettown Rd/US Hwy 70E Intersection
WATERSHED: Tributary 35
STORMWATER PROJECT TYPE: Stormwater Drainage
DRAINAGE IMPROVEMENTS (LF): 460

PROJECT DESCRIPTION

To improve level of service for surrounding roadways and reduce flood risk to nearby property owners:

- Install 145 LF of twin 60-inch RCP by-pass system to depression area south of the gas station.
- Replace existing pipe across Padgettown Road at Old US 70E with twin 48" RCP.
- Excavate and enlarge existing open channel and outfall area downstream of gas station.
- Existing conditions severly limit options to provide desired LOS. An option is presented herein.
- Additional survey and engineering investigation required to determine constructability and achievable LOS.

PROJECT PRIORITIZATION and LEVEL OF SERVICE

CRITERIA	TOTAL SCORE
Utility Conflict	4
Street Flooding	16
Public or Privately-Owned Land	8
Effect of Improvements	15
Cost Effectiveness	15
Grant Bonus	3
Criticality Bonus	1
FINAL PROJECT SCORE:	**62**

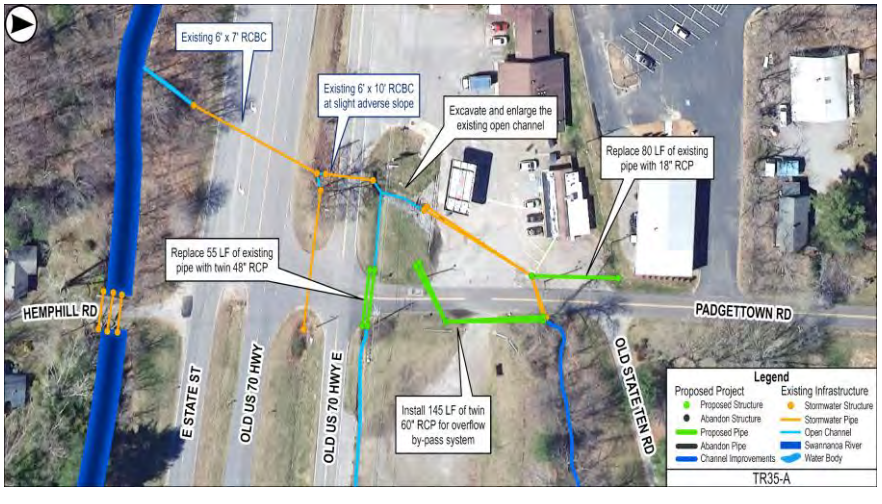
KEY CROSSING	LEVEL OF SERVICE EXISTING	LEVEL OF SERVICE PROPOSED	% REDUCTION 50 YR
Padgettown at Old US70E	2-YR	25-YR	80
Gas Station (Twin 36")	2-YR	10-YR	76
Padgettown Rd (Twin 36")	< 2-YR	10-YR	68
Padgettown Rd (Twin 60")	NA	25-YR	New Crossing

PLANNING LEVEL OPINION OF COST

Construction estimate includes 30% contingency for planning. Design and permitting includes environmental permitting estimates. Proposed project footprints are based on GIS and modeling analyses. Detailed planning level costs are provided separately.

ITEM	COST OPINION
Construction	$ 909,000
Design and Permitting	$ 276,800
Other Project Costs	$ 236,200
Total Project	**$ 1,422,000**

PROJECT AREA MAP



PROJECT NAME **Padgettown Rd Stormwater Improvements** PROJECT ID: **TR35-A**

PROJECT TYPE: Stormwater Drainage WATERSHED: Tributary 35

PLANNING LEVEL COST ESTIMATE

Construction cost includes 30% contingency for planning. Improvements (LF): 460
Proposed project footprints are based on GIS and modeling analyses.
Real estate, if privately-owned land, is estimated based on property value.

CONSTRUCTION COST:

ITEM DESCRIPTION	QUANTITY	UNIT	UNIT COST	AMOUNT
Mobilization	1	LS	$ 33,290.00	$ 33,300.00
Erosion Control	1	LS	$ 24,300.00	$ 24,300.00
Traffic Control	1	LS	$ 9,720.00	$ 9,700.00
Major Utility Conflict	1	LS	$ 145,800.00	$ 145,800.00
Unclassified Excavation/Hauling	770	CY	$ 72.00	$ 55,400.00
Infrastructure Removal and Disposal	125	LF	$ 115.00	$ 14,400.00
Structure Removal and Disposal	-	EA	$ 6,800.00	-
Standard Structure	1	EA	$ 8,600.00	$ 8,600.00
Large Structure or Headwall	5	EA	$ 12,000.00	$ 60,000.00
New Pipe: 18-inch to 24-inch	-	LF	$ 390.00	-
New Pipe: 30-inch to 36-inch	-	LF	$ 535.00	-
New Pipe: 42-inch to 54-inch	90	LF	$ 670.00	$ 60,300.00
New Pipe: 60-inch	290	LF	$ 875.00	$ 253,800.00
Arch Pipe (22.5" - 31.3")	-	LF	$ 500.00	-
Large RCBC	-	LF	$ 1,700.00	-
Rip Rap	25	TN	$ 50.00	$ 1,300.00
Open Channel Improvements	-	LF	$ 350.00	-
Roadway/Sidewalk Replacement	100	SY	$ 110.00	$ 11,000.00
Earthwork	105	CY	$ 90.00	$ 9,500.00
Fine Grading	550	SY	$ 18.00	$ 9,900.00
Plantings	250	SY	$ 7.00	$ 1,800.00
			Construction Contingency (30%):	$ 210,000.00
			PLANNING LEVEL OPINION OF CONSTRUCTION COST:	**$ 909,000.00**

PROJECT COST:

PROJECT BUDGET ITEM	% of CONSTRUCTION	AMOUNT
Survey	5%	$ 45,500.00
Design and Permitting	20%	$ 181,800.00
Environmental Permitting	-	$ 95,000.00
Railroad Permitting/Coordination	-	$ -
Geotechnical Investigation	1%	$ 9,100.00
Structural Evaluation	1%	$ 9,100.00
Real Estate	2%	$ 18,200.00
Utility Relocation	2%	$ 18,200.00
Project Maintenance (3yr)	5%	$ 45,500.00
Construction Inspections	10%	$ 90,900.00
Construction	100%	$ 909,000.00
PLANNING LEVEL OPINION OF TOTAL PROJECT COST:		$ 1,422,000.00

PROJECT NAME: **Old State 10 Rd Culvert Replacement and Stream Stabilization** PROJECT ID: **TR35-B1**

PROJECT INFORMATION

LOCATION:	Old State 10 Rd Culvert Crossing	STORMWATER PROJECT TYPE:	Stormwater Drainage
WATERSHED:	Tributary 35	DRAINAGE IMPROVEMENTS (LF):	160

PROJECT DESCRIPTION

To improve level of service for surrounding roadways and reduce flood risk to nearby property owners:

- Replace existing pipe with 30 LF of twin 4'x6' RCBC under Old State 10 Rd.
- Install 100 LF of upstream channel improvements to accommodate flow into new RCBC.

PROJECT PRIORITIZATION and LEVEL OF SERVICE

CRITERIA	TOTAL SCORE
Utility Conflict	4
Street Flooding	32
Public or Privately-Owned Land	8
Effect of Improvements	10
Cost Effectiveness	20
Grant Bonus	2
Criticality Bonus	1
FINAL PROJECT SCORE:	**77**

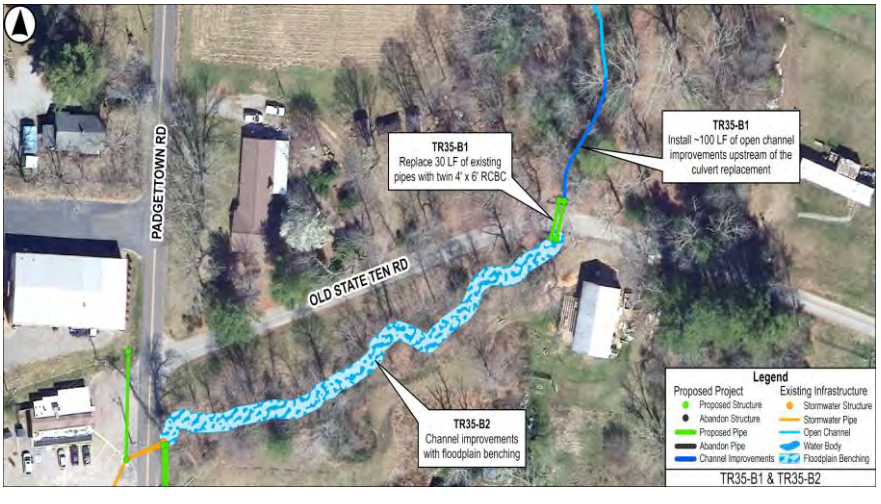
	LEVEL OF SERVICE		% REDUCTION
KEY CROSSING	EXISTING	PROPOSED	50 YR
Old State 10 Road (Twin 36")	2-YR	25-YR	91

PLANNING LEVEL OPINION OF COST

Construction estimate includes 30% contingency for planning. Design and permitting includes environmental permitting estimates. Proposed project footprints are based on GIS and modeling analyses. Detailed planning level costs are provided separately.

ITEM	COST OPINION
Construction	$ 351,000
Design and Permitting	$ 165,200
Other Project Costs	$ 91,800
Total Project	**$ 608,000**

PROJECT AREA MAP



PROJECT NAME **Old State 10 Rd Culvert Replacement and Stream Stabilization** PROJECT ID: **TR35-B1**

PROJECT TYPE: Stormwater Drainage WATERSHED: Tributary 35

PLANNING LEVEL COST ESTIMATE

Construction cost includes 30% contingency for planning. Improvements (LF): 60
Proposed project footprints are based on GIS and modeling analyses.
Real estate, if privately-owned land, is estimated based on property value.

CONSTRUCTION COST:

ITEM DESCRIPTION	QUANTITY	UNIT	UNIT COST	AMOUNT
Mobilization	1	LS	$ 12,860.00	$ 12,900.00
Erosion Control	1	LS	$ 9,385.00	$ 9,400.00
Traffic Control	1	LS	$ 3,754.00	$ 3,800.00
Major Utility Conflict	1	LS	$ 56,310.00	$ 56,300.00
Unclassified Excavation/Hauling	70	CY	$ 72.00	$ 5,000.00
Infrastructure Removal and Disposal	30	LF	$ 115.00	$ 3,500.00
Structure Removal and Disposal	2	EA	$ 6,800.00	$ 13,600.00
Standard Structure	-	EA	$ 8,600.00	-
Large Structure or Headwall	2	EA	$ 12,000.00	$ 24,000.00
New Pipe: 18-inch to 24-inch	-	LF	$ 390.00	-
New Pipe: 30-inch to 36-inch	-	LF	$ 535.00	-
New Pipe: 42-inch to 54-inch	-	LF	$ 670.00	-
New Pipe: 60-inch	-	LF	$ 875.00	-
Arch Pipe (22.5" - 31.3")	-	LF	$ 500.00	-
Large RCBC	60	LF	$ 1,700.00	$ 102,000.00
Rip Rap	25	TN	$ 50.00	$ 1,300.00
Open Channel Improvements	100	LF	$ 350.00	$ 35,000.00
Roadway/Sidewalk Replacement	30	SY	$ 110.00	$ 3,300.00
New Concrete Curb and Gutter	-	LF	$ 110.00	-
Replace Driveway Culvert Pipe	-	LF	$ 300.00	-
Replace Existing Concrete Driveway	-	SY	$ 120.00	-
			Construction Contingency (30%):	$ 81,000.00
			PLANNING LEVEL OPINION OF CONSTRUCTION COST:	**$ 351,000.00**

PROJECT COST:

PROJECT BUDGET ITEM	% of CONSTRUCTION	AMOUNT
Survey	5%	$ 17,600.00
Design and Permitting	20%	$ 70,200.00
Environmental Permitting	-	$ 95,000.00
Railroad Permitting/Coordination	-	$ -
Geotechnical Investigation	1%	$ 3,500.00
Structural Evaluation	1%	$ 3,500.00
Real Estate	2%	$ 7,000.00
Utility Relocation	2%	$ 7,000.00
Project Maintenance (3yr)	5%	$ 17,600.00
Construction Inspections	10%	$ 35,100.00
Construction	100%	$ 351,000.00
PLANNING LEVEL OPINION OF TOTAL PROJECT COST:		$ 608,000.00

PROJECT NAME: **Tributary 35 Floodplain Benching at Old State 10 Rd** PROJECT ID: **TR35-B2**

PROJECT INFORMATION

LOCATION: Old State 10 Road near Padgettown Rd
WATERSHED: Tributary 35
STORMWATER PROJECT TYPE: Floodplain Benching
DRAINAGE IMPROVEMENTS (LF): 350

PROJECT DESCRIPTION

To improve level of service for surrounding roadways and reduce flood risk to nearby property owners:

- Install approximately 350 LF of channel improvements with floodplain benching to lower WSELs.
- Floodplain benching improvements are located downstream of the proposed RCBC in project TR35-B1.

PROJECT PRIORITIZATION AND PROPERTY REQUIREMENTS

CRITERIA	TOTAL SCORE
Utility Conflict	12
Street Flooding	16
Public or Privately-Owned Land	4
Effect of Improvements	10
Cost Effectiveness	20
Grant Bonus	3
Criticality Bonus	1
FINAL PROJECT SCORE:	**66**

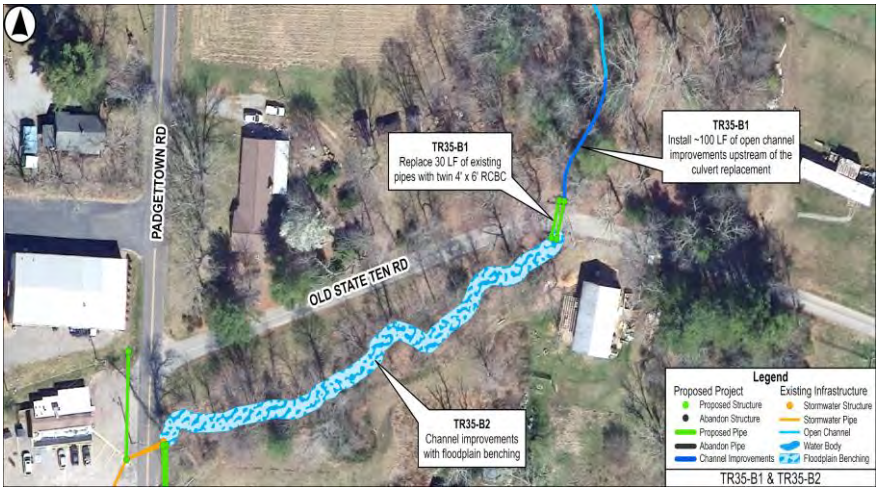
KEY CROSSING	LEVEL OF SERVICE EXISTING	LEVEL OF SERVICE PROPOSED	% REDUCTION 50 YR
Padgettown Rd (Twin 36")	< 2-YR	10-YR	68
Old State 10 Road (Twin 36")	2-YR	25-YR	91

PLANNING LEVEL OPINION OF COST

Construction estimate includes 30% contingency for planning. Design and permitting includes environmental permitting estimates. Proposed project footprints are based on GIS and modeling analyses. Detailed planning level costs are provided separately.

ITEM	COST OPINION
Construction	$ 234,000
Design and Permitting	$ 111,800
Other Project Costs	$ 79,200
Total Project	**$ 425,000**

PROJECT AREA MAP



PROJECT NAME: **Tributary 35 Floodplain Benching at Old State 10** PROJECT ID: **TR35-B2**

PROJECT TYPE: Floodplain Benching WATERSHED: Tributary 35

PLANNING LEVEL COST ESTIMATE

- Construction estimate includes 30% contingency for planning.
- Proposed project footprints are based on GIS and modeling analyses.
- Real estate, if privately-owned land, is estimated based on property value.

CONSTRUCTION COST:

ITEM DESCRIPTION	QUANTITY	UNIT	UNIT COST	AMOUNT
Mobilization	1	LS	$ 9,090.00	$ 9,100.00
Erosion Control	1	LS	$ 8,120.00	$ 8,100.00
Traffic Control	1	LS	$ 3,248.00	$ 3,200.00
Minor Utility Conflict	1	LS	$ 8,120.00	$ 8,100.00
Clearing and Grubbing	390	SY	$ 5.50	$ 2,100.00
Earthwork	0	CY	$ 90.00	$ -
Fine Grading	390	SY	$ 18.00	$ 7,000.00
Structure Removal and Disposal	-	EA	$ 6,800.00	-
Infrastructure Removal and Disposal	-	LF	$ 115.00	-
Stone, Class B	75	TN	$ 92.00	$ 6,900.00
Filter Fabric/Geotextiles	1940	SY	$ 35.00	$ 67,900.00
Plantings	390	SY	$ 7.00	$ 2,700.00
3-gallon Container Plants	95	EA	$ 70.00	$ 6,700.00
Riffle Grade Control	2	EA	$ 4,025.00	$ 8,100.00
Floodplain Tree Removal	1	LS	$ 15,000.00	$ 15,000.00
Log Grade Control Structure	-	EA	$ 4,000.00	-
Pump Around Operation	1	LS	$ 46,000.00	$ 46,000.00

Construction Contingency (30%): $ 43,000.00

PLANNING LEVEL OPINION OF CONSTRUCTION COST: **$ 234,000.00**

PROJECT COST:

PROJECT BUDGET ITEM	% of CONSTRUCTION	AMOUNT
Survey	5%	$ 11,700.00
Design and Permitting	20%	$ 46,800.00
Environmental Permitting	-	$ 65,000.00
Railroad Permitting/Coordination	-	$ -
Geotechnical Investigation	1%	$ 2,300.00
Structural Evaluation	1%	$ 2,300.00
Real Estate	10%	$ 23,400.00
Utility Relocation	2%	$ 4,700.00
Project Maintenance (3yr)	5%	$ 11,700.00
Construction Inspections	10%	$ 23,400.00
Construction	100%	$ 234,000.00

PLANNING LEVEL OPINION OF TOTAL PROJECT COST: $ 425,000.00

PROJECT NAME: **Avena Road Culvert Replacement and Stream Stabilizaton** PROJECT ID: **TR35-C**

PROJECT INFORMATION

LOCATION: Avena Road near Padgettown Rd
WATERSHED: Tributary 35
STORMWATER PROJECT TYPE: Stormwater Drainage
DRAINAGE IMPROVEMENTS (LF): 230

PROJECT DESCRIPTION

To improve level of service for surrounding roadways and reduce flood risk to nearby property owners:

- Replace existing pipe with 40 LF of twin 48" RCP across Avena Rd.
- Install approximately 120 LF of stream stabilization measures.

PROJECT PRIORITIZATION and LEVEL OF SERVICE

CRITERIA	TOTAL SCORE
Utility Conflict	12
Street Flooding	32
Public or Privately-Owned Land	8
Effect of Improvements	10
Cost Effectiveness	20
Grant Bonus	2
Criticality Bonus	1
FINAL PROJECT SCORE:	**85**

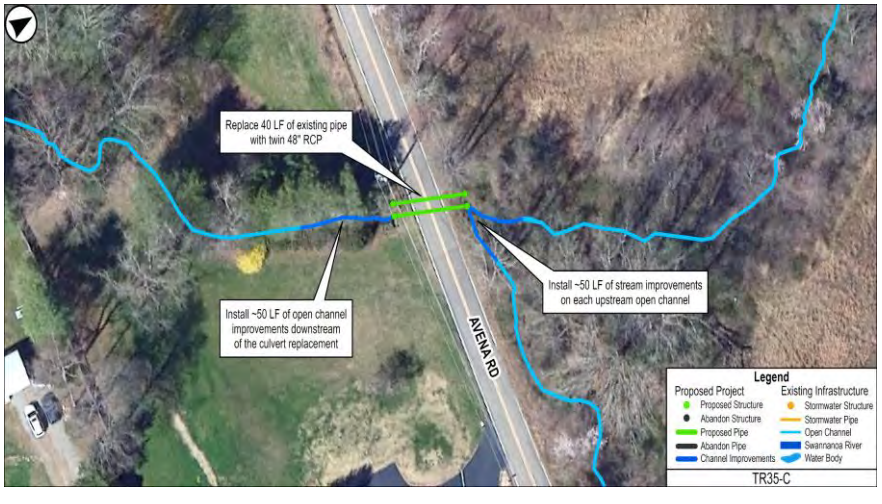
KEY CROSSING	LEVEL OF SERVICE EXISTING	LEVEL OF SERVICE PROPOSED	% REDUCTION 50 YR
Avena Road	2-YR	25-YR	97

PLANNING LEVEL OPINION OF COST

Construction estimate includes 30% contingency for planning. Design and permitting includes environmental permitting estimates. Proposed project footprints are based on GIS and modeling analyses. Detailed planning level costs are provided separately.

ITEM	COST OPINION
Construction	$ 235,000
Design and Permitting	$ 142,000
Other Project Costs	$ 61,000
Total Project	**$ 438,000**

PROJECT AREA MAP



PROJECT NAME **Avena Road Culvert Replacement and Stream Stabilizaton** PROJECT ID: **TR35-C**

PROJECT TYPE: Stormwater Drainage WATERSHED: Tributary 35

PLANNING LEVEL COST ESTIMATE

Construction cost includes 30% contingency for planning. Improvements (LF): 80
Proposed project footprints are based on GIS and modeling analyses.
Real estate, if privately-owned land, is estimated based on property value.

CONSTRUCTION COST:

ITEM DESCRIPTION	QUANTITY	UNIT	UNIT COST	AMOUNT
Mobilization	1	LS	$ 8,605.00	$ 8,600.00
Erosion Control	1	LS	$ 7,680.00	$ 7,700.00
Traffic Control	1	LS	$ 3,072.00	$ 3,100.00
Minor Utility Conflict	1	LS	$ 7,680.00	$ 7,700.00
Unclassified Excavation/Hauling	120	CY	$ 72.00	$ 8,600.00
Infrastructure Removal and Disposal	40	LF	$ 115.00	$ 4,600.00
Structure Removal and Disposal	1	EA	$ 6,800.00	$ 6,800.00
Standard Structure	-	EA	$ 8,600.00	-
Large Structure or Headwall	2	EA	$ 12,000.00	$ 24,000.00
New Pipe: 18-inch to 24-inch	-	LF	$ 390.00	-
New Pipe: 30-inch to 36-inch	-	LF	$ 535.00	-
New Pipe: 42-inch to 54-inch	80	LF	$ 670.00	$ 53,600.00
New Pipe: 60-inch	-	LF	$ 875.00	-
Arch Pipe (22.5" - 31.3")	-	LF	$ 500.00	-
Large RCBC	-	LF	$ 1,700.00	-
Rip Rap	25	TN	$ 50.00	$ 1,300.00
Open Channel Improvements	150	LF	$ 350.00	$ 52,500.00
Roadway/Sidewalk Replacement	20	SY	$ 110.00	$ 2,200.00
New Concrete Curb and Gutter	-	LF	$ 110.00	-
Replace Driveway Culvert Pipe	-	LF	$ 300.00	-
Replace Existing Concrete Driveway	-	SY	$ 120.00	-
			Construction Contingency (30%):	$ 54,000.00
			PLANNING LEVEL OPINION OF CONSTRUCTION COST:	**$ 235,000.00**

PROJECT COST:

PROJECT BUDGET ITEM	% of CONSTRUCTION	AMOUNT
Survey	5%	$ 11,800.00
Design and Permitting	20%	$ 47,000.00
Environmental Permitting	-	$ 95,000.00
Railroad Permitting/Coordination	-	$ -
Geotechnical Investigation	1%	$ 2,400.00
Structural Evaluation	1%	$ 2,400.00
Real Estate	2%	$ 4,700.00
Utility Relocation	2%	$ 4,700.00
Project Maintenance (3yr)	5%	$ 11,800.00
Construction Inspections	10%	$ 23,500.00
Construction	100%	$ 235,000.00
PLANNING LEVEL OPINION OF TOTAL PROJECT COST:		$ 438,000.00

PROJECT NAME: **Bellgrove Road/Avena Road Stormwater Improvements** PROJECT ID: **TR35-D**

PROJECT INFORMATION

LOCATION: Bellegrove Rd and Avena Rd Culvert Crossings
WATERSHED: Tributary 35
STORMWATER PROJECT TYPE: Stormwater Drainage
DRAINAGE IMPROVEMENTS (LF): 475

PROJECT DESCRIPTION

To improve level of service for surrounding roadways and reduce flood risk to nearby property owners:

- Replace existing pipe with 20 LF of twin 48" RCP under Bellegrove Rd.
- Install approximately 140 LF of stream stabilization measures with the Bellgrove culvert.
- Replace existing pipe with 135 LF of 30" RCP under Avena Rd.
- Install 35 LF of channel improvements downstream of 30" RCP.

PROJECT PRIORITIZATION and LEVEL OF SERVICE

CRITERIA	TOTAL SCORE
Utility Conflict	8
Street Flooding	24
Public or Privately-Owned Land	8
Effect of Improvements	20
Cost Effectiveness	20
Grant Bonus	2
Criticality Bonus	1
FINAL PROJECT SCORE:	**83**

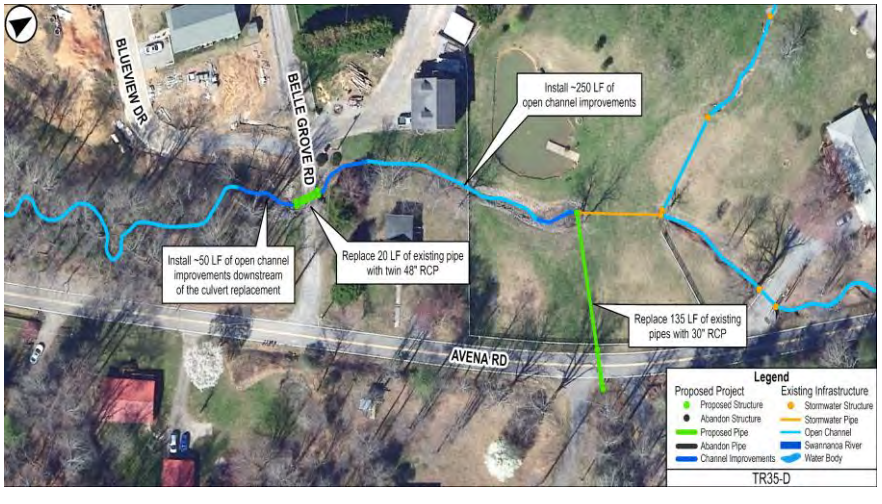
KEY CROSSING	LEVEL OF SERVICE EXISTING	LEVEL OF SERVICE PROPOSED	% REDUCTION 50 YR
Bellegrove Road	2-YR	50-YR	100
Avena Road	2-YR	50-YR	100

PLANNING LEVEL OPINION OF COST

Construction estimate includes 30% contingency for planning. Design and permitting includes environmental permitting estimates. Proposed project footprints are based on GIS and modeling analyses. Detailed planning level costs are provided separately.

ITEM	COST OPINION
Construction	$ 499,000
Design and Permitting	$ 194,800
Other Project Costs	$ 130,200
Total Project	**$ 824,000**

PROJECT AREA MAP



PROJECT NAME **Bellgrove Road/Avena Road Stormwater Improvements** PROJECT ID: **TR35-D**

PROJECT TYPE: Stormwater Drainage WATERSHED: Tributary 35

PLANNING LEVEL COST ESTIMATE

Construction cost includes 30% contingency for planning.
Proposed project footprints are based on GIS and modeling analyses.
Real estate, if privately-owned land, is estimated based on property value.

Improvements (LF): 175

CONSTRUCTION COST:

ITEM DESCRIPTION	QUANTITY	UNIT	UNIT COST	AMOUNT
Mobilization	1	LS	$ 18,295.00	$ 18,300.00
Erosion Control	1	LS	$ 14,995.00	$ 15,000.00
Traffic Control	1	LS	$ 5,998.00	$ 6,000.00
Moderate Utility Conflict	1	LS	$ 44,985.00	$ 45,000.00
Unclassified Excavation/Hauling	180	CY	$ 72.00	$ 13,000.00
Infrastructure Removal and Disposal	155	LF	$ 115.00	$ 17,800.00
Structure Removal and Disposal	3	EA	$ 6,800.00	$ 20,400.00
Standard Structure	2	EA	$ 8,600.00	$ 17,200.00
Large Structure or Headwall	2	EA	$ 12,000.00	$ 24,000.00
New Pipe: 18-inch to 24-inch	-	LF	$ 390.00	-
New Pipe: 30-inch to 36-inch	135	LF	$ 535.00	$ 72,200.00
New Pipe: 42-inch to 54-inch	40	LF	$ 670.00	$ 26,800.00
New Pipe: 60-inch	-	LF	$ 875.00	-
Arch Pipe (22.5" - 31.3")	-	LF	$ 500.00	-
Large RCBC	-	LF	$ 1,700.00	-
Rip Rap	25	TN	$ 50.00	$ 1,300.00
Open Channel Improvements	300	LF	$ 350.00	$ 105,000.00
Roadway/Sidewalk Replacement	20	SY	$ 110.00	$ 2,200.00
New Concrete Curb and Gutter	-	LF	$ 110.00	-
Replace Driveway Culvert Pipe	-	LF	$ 300.00	-
Replace Existing Concrete Driveway	-	SY	$ 120.00	-
			Construction Contingency (30%):	$ 115,000.00
			PLANNING LEVEL OPINION OF CONSTRUCTION COST:	**$ 499,000.00**

PROJECT COST:

PROJECT BUDGET ITEM	% of CONSTRUCTION	AMOUNT
Survey	5%	$ 25,000.00
Design and Permitting	20%	$ 99,800.00
Environmental Permitting	-	$ 95,000.00
Railroad Permitting/Coordination	-	$ -
Geotechnical Investigation	1%	$ 5,000.00
Structural Evaluation	1%	$ 5,000.00
Real Estate	2%	$ 10,000.00
Utility Relocation	2%	$ 10,000.00
Project Maintenance (3yr)	5%	$ 25,000.00
Construction Inspections	10%	$ 49,900.00
Construction	100%	$ 499,000.00
PLANNING LEVEL OPINION OF TOTAL PROJECT COST:		$ 824,000.00