Amended

TOWN OF BLACK MOUNTAIN

Town Hall, 160 Midland Avenue, Black Mountain, NC 28711

Date: September 12, 2022 Time: 6:00 p.m. Regular Session Agenda

*The agenda and all related documentation may be accessed electronically via Wi-Fi in Town Hall. From your laptop or smartphone, access the Town's website at **www.townofblackmountain.org**. **Click** on **Town Government** and select **Mayor and Council** to download materials for all Town Council meetings.*

Conserve resources; print only when necessary.

The Town of Black Mountain is committed to providing accessible facilities, programs, and services for all people in compliance with the American with Disabilities Act (ADA). Hearing assistive devices are available at the door. Should you need other assistance or accommodation for this meeting, please contact Town Clerk at 419-9310, or by email at townclerk@townofblackmountain.org
(828) 419-9300 / TDD (800) 735-2962

1. CALL TO ORDER

- Welcome
- Prayer – Chaplain Jack Taylor
- Pledge of Allegiance
- Announcements
- Ethics Statement*: In accordance with the Code of Ethics adopted by the Council, all council members have a duty to conduct the affairs of the governing board in an open and public manner free of conflicts of interest. Is there any item on the agenda the outcome of which will have a direct, substantial, and readily identifiable financial impact for any Council member, his or her family or close business associates? Does any council member have a financial interest in any public contract coming before this Council today?*
  There being none all Board members have a duty and obligation to vote.

2. PROCLAMATIONS, AWARDS & RECOGNITION

A. International Day of Peace Proclamation

3. CITIZEN COMMENTS

*Individuals wishing to address the Council are asked to sign in at the entrance to the Council room, indicating the topic(s) or agenda item(s) you wish to discuss, so that the chair may group speakers according to topic. The chair will recognize individuals requesting to address the Council. **Comments by any one speaker shall be limited to three (3) minutes**.*

To send comments prior to the meeting, please call Town Hall at 828-419-9310 or email comments to Comments@townofblackmountain.org. The Clerk will compile them and present them to the Mayor for consideration.

4. COMMUNICATIONS FROM STAFF, COUNCILS, COMMISSIONS & AGENCIES

A. Annual Streets and Parks Report

5. CONSENT AGENDA

All items on the consent agenda are considered routine, to be enacted by one motion without discussion. If a member of the governing body requests discussion of an item, the item will be removed from the consent agenda and considered separately.

A. Adoption of Minutes

Motion: *To approve the minutes of the August 8, 2022 Regular Session Meeting, the August 4, 2022 Agenda Meeting, the August 4,2022 Special Meeting the August 4,2022 Closed Meeting.*

B. Resolution to Apply for Grant Funding for Fall 2022 Stormwater and Water Infrastructure Funding ***#R-22-20***

C. Resolution of Support for MPO Application for Safe Streets for All Action Plan Funding from USDOT ***#R-22-21***

Consent Motion: To approve consent item A-C as presented.

6. CITIZEN COMMENTS

The chair will recognize individuals requesting to address the Council regarding the specific ***New Business or Unfinished Business items below****. Comments by any one* ***speaker shall be limited to three (3) minutes.***
If the topic you wish to discuss pertains to a ***public hearing*** *scheduled for this meeting, please reserve your comment for the applicable public hearing.*

To send comments prior to the meeting, please call Town Hall at 828-419-9310 or email comments to Comments@townofblackmountain.org. The Clerk will compile and present written comments to the Mayor for consideration.

7. UNFINISHED BUSINESS - NONE

8. NEW BUSINESS

A. Approval of the Stormwater Master Plan

Motion*: To adopt the Stormwater Master Plan as presented.*

B. Public Parking Space Closure Policy

Motion: *To approve the policy as presented.*

C. Selection of Parks and Recreation Master Plan Consultant

Motion*: Approve the acceptance of the recommended firm to complete the comprehensive recreation master plan.*

D. Water Policy Updates

E. Discussion of Future Date to Determine Allocation of American Rescue Plan Act Funds

F. Discussion of forming Town Council Subcommittees

9. PUBLIC HEARING

The chair will recognize individuals requesting to address the Council regarding the specific topic of the public hearing. ***Public hearing comments by any on speaker shall be limited to ten (10) minutes****. The Mayor reserves the right to alter time limits and other rules of procedure at the beginning of each Public Hearing.*

A. Public Hearing to Amend Text for Residential Uses in the Central Business District
#O-22-07

Motions for consideration:

1. *To open the public hearing for* ***Ordinance #O-22-07*** *for amendments to the Central Business District for residential uses.*
2. *To close the public hearing.*
3. *To adopt* ***Ordinance #O-22-07*** *as presented [or as amended].*

10. COMMUNICATION FROM STAFF

A. Town Attorney – Ron Sneed

B. Town Manager – Josh Harrold

11. COMMUNICATION FROM MAYOR AND TOWN COUNCIL

12. CLOSED SESSION

A. Closed Session to Discuss the Acquisition of Property as Permitted by North Carolina General Statue 143-318.11(5)

Motion: *To enter into Closed Session as permitted by NC General Statues.*

13. ADJOURNMENT

Josh Harrold
Town Manager

PUBLIC NOTICE

BLACK MOUNTAIN TOWN COUNCIL

JUNTA DEL AYUNTAMIENTO

Thursday, September 8, 2022 at 5:00 p.m.
Jueves 8 de Septiembre 2022 a las 5:00 p.m.

The Black Mountain Town Council will meet for their monthly Agenda Workshop Meeting on **Thursday, September 8, 2022 at 5:00 p.m.** in the Board Room in the Town Hall Building, 160 Midland Avenue, Black Mountain, NC.

The meeting is open to the public.
Está abierta al público.

Savannah Parrish
Savannah Parrish
Town Clerk

The Town of Black Mountain is committed to providing accessible facilities, programs and services for all people in compliance with the Americans with Disabilities Act (ADA). Should you need assistance or a particular accommodation for this meeting please contact, Savannah Parrish, Town Clerk at 419-9310 or by email at townclerk@townofblackmountain.org

Estamos comprometidos a proporcionar instalaciones, programas y servicios accesibles para todas las personas de conformidad con la Ley de Estadounidenses con Discapacidades (ADA). Si necesita ayuda o una adaptación en particular para esta reunión, comuníquese con Savannah Parrish, secretaria municipal al 419-9300 o por correo electrónico a townclerk@townofblackmountain.org

Please visit www.townofblackmountain.org to obtain agenda packets and other meeting information.
Visite www.townofblackmountain.org para obtener paquetes de la agenda y otra información.

Posted to the Town Bulletin Board 08/19/2022

PUBLIC NOTICE
NOTICIA PÚBLICA

BLACK MOUNTAIN TOWN COUNCIL

REGULAR SESSION MEETING
JUNTA DEL AYUNTAMIENTO

Monday, September 12 at 6:00 p.m.
Lunes 12 de Septiembre 2022 a las 6:00 p.m.

The Black Mountain Town Council will meet for their monthly Regular Session Meeting on **Monday, September 12 at 6:00 p.m.** in the Board Room in the Town Hall Building, 160 Midland Avenue, Black Mountain, NC.

The meeting is open to the public. Abierta al público.

Savannah Parrish
Savannah Parrish
Town Clerk

The Town of Black Mountain is committed to providing accessible facilities, programs and services for all people in compliance with the Americans with Disabilities Act (ADA). Should you need assistance or a particular accommodation for this meeting please contact, Savannah Parrish, Town Clerk at 419-9310 or by email at townclerk@townofblackmountain.org

Estamos comprometidos a proporcionar instalaciones, programas y servicios accesibles para todas las personas de conformidad con la Ley de Estadounidenses con Discapacidades (ADA). Si necesita ayuda o una adaptación en particular para esta reunión, comuníquese con Savannah Parrish, secretaria municipal al 419-9300 o por correo electrónico a townclerk@townofblackmountain.org

Please visit www.townofblackmountain.org to obtain agenda packets and other meeting information.
Visite www.townofblackmountain.org para obtener paquetes de la agenda y otra información.

Posted to the Town Bulletin Board 08/19/22

Proclamation
International Day of Peace in Black Mountain

WHEREAS, the ideal of peace embraces the deepest hopes of all people, and remains humanity's guiding inspiration; and

WHEREAS, beginning in 2002, the United Nations has designated September 21st of each year as the International Day of Peace with one complete day of ceasefire around the globe; and

WHEREAS, the United Nations dedicates the International Day of Peace to nonviolence and the cessation of hostilities, and calls upon all nations and people to commemorate the day through educational efforts, public awareness, and adherence to the global ceasefire; and

WHEREAS, Peace Day activities around the world include peace marches, concerts, events, poetry readings, prayer ceremonies, art exhibits, vaccination campaigns, memorial services, school assemblies, family reunions and sporting events - all made possible by the laying down of arms; and

WHEREAS, the Town of Black Mountain, North Carolina, has asserted itself by declaring itself as an International Peace Zone; and

WHEREAS, Black Mountain Town Leaders call upon the people of Black Mountain to observe this day in our community as we step out to imagine, build, cultivate, expect and celebrate Peace on Earth.

NOW, THEREFORE, I, Larry B. Harris, Mayor of Black Mountain, NC do hereby proclaim September 21, 2022 as:

"INTERNATIONAL DAY OF PEACE"

Proclaimed this, the 12th day of September 2022.

_____
Larry B. Harris, Mayor

Attest:

_____
Savannah Parrish, Town Clerk

TOWN OF BLACK MOUNTAIN TOWN COUNCIL
AGENDA WORKSHOP MEETING MINUTES
July 7, 2022

THE BLACK MOUNTAIN TOWN COUNCIL held an agenda workshop Thursday, August 4, 2022 at 5:00 p.m. in the board room of Town Hall, 160 Midland Avenue, Black Mountain, NC. The purpose of the meeting was to review the agenda for the regular monthly meeting scheduled for Monday, August 8, 2022 at 6:00 p.m.

1. CALL TO ORDER

Mayor Larry B. Harris called the meeting to order at 5:00 p.m. *with the following members present*:

Mayor Larry B. Harris
Vice Mayor Ryan Stone
Council Member Archie Pertiller
Council Member Pam King
Council Member Doug Hay - absent
Council Member Bill Christy

The following staff members were present:

Josh Harrold, Town Manager
Savannah Parrish, Town Clerk
Ron Sneed, Town Attorney

Mayor Larry Harris opened the meeting. Town Manager, Josh Harrold, presented the proposed agenda to the Town Council.

Mayor Harris announced that Black Mountain Stingrays swim team will be present at the meeting to be congratulated for their first conference title at the Tarheel Swim League Championship.

Attorney Sneed requested that Item **7A – The Buncombe County Library Lease** be removed from the agenda as there is no new information at this time.

Manager Harrold requested that **Item 8D – Bike Boulevard** be added to the agenda. The public voted on potential names for the new bike boulevard, and the Manager would like the Council to vote on a final selection.

Council Member Archie Pertiller moved to approve the agenda as amended. The motion was approved by a vote of 4-0.

2. ADJOURNMENT

There being no further discussion Mayor Larry B. Harris adjourned the meeting at 5:08 p.m.

ATTEST:

_____	_____
Savannah Parrish, Assistant to Manger/Town Clerk	Larry B. Harris, Mayor

TOWN OF BLACK MOUNTAIN TOWN COUNCIL
SPECIAL CALL MEETING MINUTES
August 4, 2022

THE BLACK MOUNTAIN TOWN COUNCIL held a special called meeting on Thursday, August 4, 2022 at 5:15 p.m. in the board room of Town Hall, 160 Midland Avenue, Black Mountain NC. The purpose of this meeting is for the Town Council is to discuss the Greenways Project.

CALL TO ORDER

Mayor Larry Harris called the meeting to order at 5:15 p.m. with the following members present:

Mayor Larry B. Harris
Vice Mayor Ryan Stone
Council Member Archie Pertiller
Council Member Bill Christy
Council Member Doug Hay – absent
Council Member Pam King

The following staff members were present:
Josh Harrold, Town Manager
Savannah Parrish, Town Clerk
Ron Sneed, Town Attorney

Mayor Harris called the meeting to order at 5:15 p.m and informed the public in attendance that the primary purpose of the meeting was for the Town Council to discuss matters in a Closed Session. Manager Harrold then presented a timeline of events to the Council and public.

Riverwalk Decision Dates

- 10/29/2020 – In a special called meeting, the Town Council learned from Michael Baker International (MBI) that a no-rise would not be possible on the bridge crossing.
- 2/18/2021 – The Town Council heard a presentation on alternate routes from MBI.
- 4/12/2021 – The Town Council voted to split the project into two segments.
- 7/12/2021 - The Town Council voted to approve the alternate alignment using existing infrastructure.
- 10/11/2021 - The Town Council voted to approve an amended contract with MBI for Section B of the project.
- 12/13/2021 - The Town Council voted to approve the contract with MBI for Section A.
- 4/11/2022 - The Town Council held a closed session to discuss the project.
- 5/9/2022 - The Town Council held a closed session to discuss the project.

- 6/13/2022 - The Town Council held a closed session to discuss the project.
- 7/11/2022 - The Town Council held a closed session to discuss the project. The Town Attorney spoke with MBI on July 20, 2022.

Vice Ryan Ryan Stone moved to enter into closed session. The motion was approved by a vote of 4-0.

Vice Mayor Ryan Stone moved to return to open session. The motion was approved by a vote of 4-0.

The Town Council returned to open session.

Council Member Pam King moved to adjourn the meeting. The motion was approved by a vote of 4-0.

ADJOURNMENT

There being no further business, Mayor Harris adjourned the meeting at 5:38 p.m.

ATTEST:

_____ _____

Savannah M. Parrish Town Clerk Larry B. Harris, Mayor

_____

Josh Harrold, Town Manager

TOWN OF BLACK MOUNTAIN

Town Hall, 160 Midland Avenue, Black Mountain, NC 28711

Date: **August 8, 2022** Time: **6:00 p.m.** **Regular Session Minutes**

*The agenda and all related documentation may be accessed electronically via Wi-Fi in Town Hall. From your laptop or smartphone, access the Town's website at www.townofblackmountain.org. **Click** on **Town Government** and select **Mayor and Town Council** to download materials for all Town board meetings.*

Conserve resources; print only when necessary.

The Town of Black Mountain is committed to providing accessible facilities, programs and services for all people in compliance with the American with Disabilities Act (ADA). Hearing assistive devices are available at the door. Should you need other assistance or accommodation for this meeting, please contact Town Clerk Savannah Parrish at 419-9310, or by email at townclerk@tobm.org
(828) 419-9300 / TDD (800) 735-2962

1. CALL TO ORDER

Mayor Larry Harris called the meeting to order at 6:00 p.m. with the following members present:

Mayor Larry B. Harris
Vice Mayor Ryan Stone
Council Member Archie Pertiller
Council Member Bill Christy
Council Member Doug Hay
Council Member Pam King

The following staff members were present:
Josh Harrold, Town Manager
Savannah Parrish, Town Clerk
Ron Sneed, Town Attorney

Mayor Harris welcomed the public and led the room in a moment of silence. Mayor Harris then read the ethics statement and reminded the public of the Council's duty to vote, save a conflict of interest.

2. PROCLAMATIONS, AWARDS & RECOGNITION

Mayor Harris and the Town Council honored the Black Mountain Stingrays swim team for their first ever Tarheel Swim League Championship win. The swim team is led by Black Mountain Pool manager, Beth Rathbone.

Local elementary school student, Ella Millwood was honored for "Ella's Clean Air Project". Ella won a statewide art contest that raises awareness about air pollution, she then sold yard signs with her artwork to raise money to plant trees locally. Six trees were planted in Black Mountain as a result of Ella's project.

Police Chief Steve Parker recognized Police Cadet Daniel Averette who received a scholarship through the Criminal Justice Fellowship Program.

3. CITIZEN COMMENTS

Marian Kaminitz of 360 Genesis Circle spoke in support of the Black Mountain Community Garden and advocated for the Garden Manager's position to be made full-time.

Shawn Slome of 115 3rd Street requested the Town Council consider making Garden Manager's position to be made full-time.

Phil Bisesi of 15 Highview Drive requested that the Town Council recognize International Day of Peace with a proclamation. He also requested that a crosswalk be added on Broadway Ave.

4. COMMUNICATIONS FROM STAFF, COUNCILS, COMMISSIONS & AGENCIES

Jennifer Billstrom made a presentation as a representative of Better with Bonds: Buncombe Says Yes. This is a campaign that supports passage of two bonds on the ballot this November in Buncombe County - a $30 million bond for land protection and greenways/trails, and a $40 million bond for workforce and affordable housing. These are general obligation, twenty-year bonds. Ms. Billstrom's presentation will be included as an addendum to these minutes.

Planning Director Jessica Trotman presented the Development Services Annual Report. Director Trotman noted several projects which contribute to downtown redevelopment. Director Trotman observed a significant uptick in residential remodel, addition, and trade permits in FY20-21. 100 residential units were permitted in this last fiscal year. Building inspections and permit fees have also been rising.

There are 24 permitted accessory dwelling units in town (total). Of those 87.5% are on the same property as the owner. 4.1% are owned by people who do not live in North Carolina. There have been a few condo projects and one triplex project over the last 20 years. There have been no apartments since 1986.

Director Trotman also noted that all rezoning applications made since 2017 have been made to increase the allowable residential density for a project. No rezonings have been pursued in effort to utilize a different use. Conditional zoning adopted in 2021 but has not been utilized to date. The Unified Development Ordinance will explore opportunities for lot size flexibility and other development regulations to achieve/incentivize desirable types of development without needing to seek a rezoning.

5. CONSENT AGENDA

Manager Harrold presented the consent agenda to the Town Council. There was no discussion of the items.

A. Adoption of Minutes

Motion: *To approve the minutes of the July 11, 2022 Regular Session Meeting, the July 11, 2022 Closed Session Meeting, the July 7, 2022 Agenda Meeting, the June 28, 2022 Public Hearing.*

B. Call for Public Hearing to Amend Text for Residential Uses in the Central Business District ***#O-22-07***

Council Member Archie Pertiller moved to approve the consent agenda. The motion was approved by a vote of 5-0.

6. CITIZEN COMMENTS – None

7. UNFINISHED BUSINESS – None

8. NEW BUSINESS

A. Art in the Afternoon Lease

There was discussion of the Art in the Afternoon Lease. Attorney Sneed presented a proposed lease for an additional year at the same terms.

Vice Mayor Ryan Stone moved to approve the Art in the Afternoon Lease as presented. The motion was approved by a vote of 5-0.

B. Public Parking Space Discussion

The Town Manager received a request to close a parking space in a Town owned parking lot located off of Broadway Street. The parking space affronts a business owned by John Richardson, who is making the request to make access to the business easier. Manager Harrold presented a list of suggestions which he proposed bringing back to the Town Council in a policy format at the next regular meeting.

C. Revised Charles D. Owen Babe Ruth Memorandum of Understanding

Charles D Owen Babe Ruth uses fields at Veteran's Park for their spring and fall youth baseball/softball leagues. This MOU is a revision of the approved version from 2021. Mayor Harris suggested two changes. The first being that background checks must be preformed by a town

approved vendor. The other change suggested was that the amount of liability insurance required be added to the memorandum.

Council Member Archie Pertiller moved to approve the memorandum of understanding as amended. The motion was approved by a vote of 5-0.

D. Bike Boulevard

Council Member Pam King moved to approve the name of Grey Eagle Bike Boulevard. The motion was approved by a vote of 5-0.

E. Board Appointments

Active Mobility Commission – (2) 3-year terms ending June 30, 2025

The Active Mobility Commission reviewed three applications for two vacant seats – Michelle Knight, Kyle Cole, and Kevin Bates. The Active Mobility Commission voted 4-0 to recommend Michelle Knight and Kyle Cole for appointment to the vacant seats.

The Town Council appointed Michelle Knight and Kyle Cole to fil two 3-year terms ending June 30, 2025 by a vote of 5 for and 0 against.

ABC Board – Appointment of Alcoholic Beverage Commission Board Chair

The Town Council is responsible for appointing a Chair for the ABC Board. Current members, in order of time of service, are Sam Hobson, Sharon Tabor and Amanda Nichols

Council Member Bill Christy moved to appoint Sam Hobson as Chair of the ABC Board. The motion was approved by a vote of 5-0.

9. PUBLIC HEARING

*The chair will recognize individuals requesting to address the Council regarding the specific topic of the public hearing. **Public hearing comments by any on speaker shall be limited to ten (10) minutes**. The Mayor reserves the right to alter time limits and other rules of procedure at the beginning of each Public Hearing.*

10. COMMUNICATION FROM STAFF

Town Manager Josh Harrold updated the Town Council on several ongoing projects. Town Clerk Savannah Parrish encouraged the public to apply for Citizen Academy.

11. COMMUNICATION FROM MAYOR AND TOWN COUNCIL

Council Member King reminded the public that the Sourwood Festival takes place on August 13th and 14th.

Council Member Hay thank Chief Parker for the National Night Out event.

12. CLOSED SESSION - None

13. ADJOURNMENT

There being no further business, Mayor Harris adjourned the meeting at 7:25 p.m.

ATTEST:

_____ _____

Savannah M. Parrish Town Clerk Larry B. Harris, Mayor

_____

Josh Harrold, Town Manager

TOWN OF BLACK MOUNTAIN TOWN COUNCIL
SPECIAL CALL MEETING MINUTES
August 23, 2022

THE BLACK MOUNTAIN TOWN COUNCIL held a special called meeting on Tuesday August 23, 2022 at 4:00 p.m. in the board room of Town Hall, 160 Midland Avenue, Black Mountain NC. The purpose of this meeting is for the Town Council is to discuss the Greenways Project.

CALL TO ORDER

Mayor Larry Harris called the meeting to order at 4:04 p.m. with the following members present:

Mayor Larry B. Harris
Vice Mayor Ryan Stone
Council Member Archie Pertiller – absent
Council Member Bill Christy
Council Member Doug Hay
Council Member Pam King – absent

The following staff members were present:
Josh Harrold, Town Manager
Savannah Parrish, Town Clerk
Ron Sneed, Town Attorney

Mayor Harris called the meeting to order at 4:04 p.m. Council Member Bill Christy moved to enter into Closed Session.

The Council returned to open session at 4:12 p.m. The Town Manager presented a timeline of major events in EB5547A and EB5547B history.

2002
- ID'd in Greenway Master Plan

2013-2014
- Hydro study for NCDOT culverts denied by NCDOT for use

2015
- MPO funds prelim design for alignment feasibility
- Town creates capital project fund

2016-2017
- Prelim design occurs for 18 months
- Town requests MPO funding for project funding
- 12 months are devoted to the rail crossing study
- Project is paused for six months between planning directors

2018

- Project end points extend to include Hampton Inn and, In The Oaks, to go along river.
- Metropolitan Planning Organization (MPO) awards additional funding
- Town signs contract with Michael Baker International.
- North Carolina Department of Transportation review takes 6 months.
- Property owners reject river alignment. New alignment developed.

2019

- Preliminary *engineering* begins
- Town accepts financial support from Buncombe County
- Town applies for additional funding from MPO

2020

- Preliminary engineering continues
- 30% plan submitted to NDOT
- Project fails NCDOT Hydro requirements in August

2021

- Alignment considerations continue through July.
- Town Council votes to split the project. The STIP is amended to create EB5547A and EB5547B
- Contract with MBI amended becomes section B
- End points for section A determined (Sutton/NC9 to Black Mountain Ave)
- Town approves new contract with MBI for A and B

2022

- Updating PE/ROW/Construction budget for STIP amendment begins in January

Council Member Bill Christy moved to continue the contractual relationship with MBI regarding engineering for work required for completion of Riverwalk Greenway Parts A and B or EB-5547A and EB-5547B per the 2020-2029 STIP. The motion was approved by a vote of 3-0.

ADJOURNMENT

There being no further business, Mayor Harris adjourned the meeting at 4:20 p.m.

ATTEST:

_____ _____

Savannah Parrish Town Clerk Larry B. Harris, Mayor

_____

Josh Harrold, Town Manager

RESOLUTION BY THE TOWN OF BLACK MOUNTAIN

R-22-20

WHEREAS, The Town of Black Mountain has need for and intends to construct a stormwater project for North Bank Swannanoa River Floodbench Project, and

WHEREAS, The Town of Black Mountain has a need for and plans to conduct a study in a project described as the Stormwater LASII Planning Asset Inventory and Assessment Project, and

WHEREAS, The Town of Black Mountain has a need for and plans to construct a water construction project for waterline rehabilitation/replacement, and

WHEREAS, The Town of Black Mountain intends to request State loan and/or grant assistance for these projects,

NOW THEREFORE BE IT RESOLVED, BY THE TOWN COUNCIL OF THE TOWN OF BLACK MOUNTAIN:

That the Town of Black Mountain, the **Applicant**, will arrange financing for all remaining costs of the project, if approved for a State loan and/or grant award.

That the **Applicant** will provide for efficient operation and maintenance of the project on completion of construction thereof.

That the **Applicant** will adopt and place into effect on or before completion of the project a schedule of fees and charges and other available funds which will provide adequate funds for proper operation, maintenance, and administration of the system and the repayment of all principal and interest on the debt.

That the governing body of the **Applicant** agrees to include in the loan agreement a provision authorizing the State Treasurer, upon failure of the Town of Black Mountain to make a scheduled repayment of the loan, to withhold from the Town of Black Mountain any State funds that would otherwise be distributed to the local government unit in an amount sufficient to pay all sums then due and payable to the State as a repayment of the loan.

That Larry B. Harris, Mayor and Josh Harrold, Town Manager, the **Authorized Officials**, and successors so titled, is hereby authorized to execute and file an application on behalf of the **Applicant** with the State of North Carolina for loans and/or grants to aid in the study of or construction of the projects described above.

That the **Authorized Officials**, and successors so titled, are hereby authorized and directed to furnish such information as the appropriate State agency may request in connection with such application or the project:

to make the assurances as contained above; and to execute such other documents as may be required in connection with the application.

That the **Applicant** has substantially complied or will substantially comply with all Federal, State, and local laws, rules, regulations, and ordinances applicable to the projects and to Federal and State grants and loans pertaining thereto.

Adopted this the 12th day of September 2022 at Black Mountain, North Carolina.

_____

Josh M. Harrold, Town Manager

_____

Larry B. Harris, Mayor

CERTIFICATION BY RECORDING OFFICER

The undersigned duly qualified and acting Town Clerk of the Town of Black Mountain does hereby certify: That the above/attached resolution is a true and correct copy of the resolution authorizing the filing of an application with the State of North Carolina, as regularly adopted at a legally convened meeting of the Town Council duly held on the 12th day of September, 2022; and, further, that such resolution has been fully recorded in the journal of proceedings and records in my office. IN WITNESS WHEREOF, I have hereunto set my hand this _____ day of _____, 20____.

_____
Savannah Parrish, Town Clerk

WithersRavenel
Our People. Your Success.

August 29, 2022

Josh Harrold, Town Manager
Town of Black Mountain
160 Midland Avenue
Black Mountain, NC 28711

RE: Proposal for Professional Services
LASII Stormwater Construction Application Assistance
Black Mountain, North Carolina
WR Project No. 08220882.00

Dear Mr. Harrold,

WithersRavenel is pleased to provide this Proposal for Professional Services. We look forward to working with you on this project. If you have any questions or concerns about this proposal, please do not hesitate to call me at the number listed below.

Sincerely,
WithersRavenel

Amanda Whitaker
Director, Funding Services, Funding and Asset Management

awhitaker@withersravenel.com
Ph. 336.605.3009 | Mobile. 336.250.7778

Attachment:

Proposal for Professional Services

WithersRavenel
Our People. Your Success.

Town of Black Mountain
Black Mountain, North Carolina
Proposal for Professional Services

A. Project Description

This fee proposal is intended to provide the scope of services and associated fees to provide consulting services per request of Town of Black Mountain and formalize an agreement for the implementation and logistics for these services.

This proposal is based on the project located in Buncombe County, Black Mountain, North Carolina.

Listed below is a summary of the key aspects of the project based on discussions and preliminary research. Refer to the Scope of Services and Additional Services/Exclusions for further detailed information.

For the purposes of this proposal and any subsequent agreements the following references shall apply:

1. Town of Black Mountain shall be known as the “Client” or "Town";
2. WithersRavenel shall be known as the “Consultant”;
3. The property and overall project shall be known as the “Project”;
4. Buncombe County shall be known as “County”;
5. North Carolina Department of Environmental Quality shall be known as “NCDEQ”;
6. Division of Water Infrastructure shall be known as “DWI”;
7. Local Assistance for Stormwater Infrastructure Investments shall be known as “LASII”;
8. The executed proposal shall be known as the “Agreement”.

The Client wishes to pursue funding assistance from NCDEQ’s DWI through the Local Assistance for Stormwater Infrastructure Investments (LASII) Construction Grant Program and would like assistance with completing the application for the Fall 2022 funding cycle (Project). The primary objective of this Project is to obtain infrastructure funding for the Black Mountain North Bank Swannanoa River Floodbench Project.

B. Timeline for Services

Consultant will begin work upon receipt of executed Agreement and written notice to proceed from the Client. Services will complete upon Consultant’s submission of the proposed application to the North Carolina Division of Water Infrastructure by the Fall 2022 application deadline, which is 09/30/2022, and delivery of a copy of the application to the Client.

C. Scope of Services

Consultant shall provide the services identified under each task below as its “Basic Services” under the Agreement.

Task 1 - Application Preparation, Submittal, and Support

A. Assemble all materials necessary for the applications as outlined in DWI’s LASII 2022 Construction Funding Program guidance.

B. Prepare all forms, narratives, and all required documents to support the application process.

C. Coordinate collection of any supporting information required for the application.

D. Draft required application resolutions for Client to present to Council for adoption to support the application process.

E. Meet with Client representatives to discuss the scope of the projects which may be via web-based conferencing.

F. Thoroughly understand project scope and prepare a technical project description. The description of the project will be described in enough detail that it will include the project purpose, what the project entails, as well as technical information such as estimates of size/length and materials.

G. Develop project cost estimates based off a technical project description. Budgets will be in the format stipulated by the DWI and will also be signed and sealed by Consultant's licensed professional engineer.

H. Circulate application information to the Client for review and approval.

I. Participate in any teleconferences with DWI and Client as needed.

J. Provide other assistance, as required, to facilitate the complete application process.

K. Work with Client to support obtaining needed signatures of the application materials from the Client representative;

L. Submit application to DWI via their approved method and by their submittal deadline.

M. Provide a PDF copy of the submitted application to Client. Hardcopy to be provided upon request.

D. Exclusions/Additional Services

Services that are not included in the Scope of Services or are specifically excluded from this Proposal (see below) shall be considered Additional Services if those services can be performed by Consultant and its agents if requested in writing by the Client and accepted by Consultant. Additional services shall be paid by the Client in accordance with the Fee & Expense Schedule outlined in Exhibit II. The exclusions are described below but are not limited to the following:

General

- All plan submittal, review, or permitting fees;
- Any work previously provided in other proposals;
- Any other services not specifically listed within the Scope of Services.

The above list is not all inclusive, and the Scope of Services defines the services to be provided by Consultant for this project.

E. Client Responsibilities

The following are responsibilities of the Client and Consultant will rely upon the accuracy and completeness of this information:

1. General:

   a. Provide representative for communications and decisions;
   b. Preferred media platforms for communications with the Client;
   c. Provide any information needed to complete the Project not specifically addressed in the Scope of Services;
   d. Provide all available information pertinent to the Project, including any GIS information, reports, maps, drawings, and any other data relative to the Project;

e. Examine all proposals, reports, sketches, estimates and other documents presented by the Consultant and render in writing decisions pertaining thereto within a reasonable period so as not to delay the services of the Consultant;
f. Give prompt written notice to Consultant whenever Client observes or otherwise becomes aware of any defect in the Project or the services of Consultant;
g. Attend one (1) virtual Town meeting as required/needed;
h. Coordinate adoption of the required DWI resolution ahead of the application deadline;
i. Review and execution of application materials by authorized official ahead of the application deadline.

F. Compensation for Services

Consultant proposes to provide the Basic Services outlined in the Scope of Services on a lump sum basis with budgets as shown below plus reimbursable expenses in accordance with Exhibit II. The amounts set forth below have been determined based on the nature, scope and complexity of the Project as represented in the information provided to Consultant by Client prior to submittal of this proposal; subsequent changes thereto may result in additional fees. Budgeted amount reflects a discounted fee due to Client contracting for multiple application projects.

Task No.	Task Name	Fee
1	Application Preparation, Submittal, and Support	$3,500
	TOTAL	**$3,500**

(Hourly) Denotes hourly tasks. The fee budgets represented with hourly tasks are good faith estimates of what can be expected during the performance of this contract.

1. Invoices will be issued monthly, based on the percentage of completion for each lump sum task and the hourly rate for Consultant personnel in accordance with Exhibit II for hourly tasks, as accomplished during the billing period. Payment is due upon receipt of invoice.
2. The above fees are based on the estimated timelines noted in the Timeline for Services. Any adjustments to those timelines may result in additional fees.
3. The attached Exhibit II, Fee & Expense Schedule, is based on Consultant's rates as of the date of this proposal and may be subject to change for hourly tasks and any Additional Services that occur after any adjustments to such rates go into effect.

G. Acceptance

This proposal is valid 15 days from the date it is transmitted to Client. Receipt of an executed copy of this proposal will serve as the written Agreement between WithersRavenel and Town of Black Mountain. All Exhibits identified after the signature blocks below, including the Standard Terms and Conditions (Exhibit I) and the Fee & Expense Schedule (Exhibit II), are incorporated herein and are integral parts of the Agreement.

OFFERED BY:	ACCEPTED BY:
WITHERSRAVENEL	TOWN OF BLACK MOUNTAIN
_____	_____
Signature	Signature
Amanda Whitaker	_____
Name	Name
Director, Funding Services Funding and Asset Management	_____
Title	Title

PREAUDIT STATEMENT: *This instrument has been preaudited in the manner required by the Local Government Budget and Fiscal Control Act (NC G.S. 159-28(a)).*

Signature of Finance Officer: _____

Printed Name: _____

Date: _____

Attachments:

Exhibit I- Standard Terms and Conditions

Exhibit II- Fee & Expense Schedule

WithersRavenel
Our People. Your Success.

EXHIBIT I

Standard Terms and Conditions

WithersRavenel, Inc.

The proposal submitted by WithersRavenel, INC. ("CONSULTANT") is subject to the following terms and conditions, which form an integral part of the Agreement. By accepting the proposal, the services, or any part thereof, the CLIENT agrees and accepts the terms and conditions outlined below:

1. **Payment:**

   a) The CLIENT will pay CONSULTANT for services and expenses in accordance with periodic invoices to CLIENT and a final invoice upon completion of the services. Each invoice is due and payable in full upon presentation to CLIENT. Invoices are past due after 30 days. Past due amounts are subject to interest at a rate of one and one-half percent per month (18% per annum) on the outstanding balance from the date of the invoice.

   b) If the CLIENT fails to make payment to the CONSULTANT within 45 days after the transmittal of an invoice, the CONSULTANT may, after giving 7 days written notice to the CLIENT, suspend services under this Agreement until all amounts due hereunder are paid in full. If an invoice remains unpaid after 90 days from invoice date, the CONSULTANT may terminate the Agreement. If Consultant initiates legal proceedings to collect the fees owed, Consultant shall also be entitled to recover the reasonable expenses of collection including attorney's fees.

2. **Notification of Breach or Default:** The CLIENT shall provide prompt written notice to the CONSULTANT if CLIENT becomes aware of any breach, error, omission, or inconsistency arising out of CONSULTANT's services or any other alleged breach of contract or negligence by the CONSULTANT. The failure of CLIENT to provide such written notice within ten (10) days from the time CLIENT became aware of the fault, defect, error, omission, inconsistency or breach, shall constitute a waiver by CLIENT of any and all claims against the CONSULTANT arising out of such fault, defect, error, omission, inconsistency or breach. Emails shall be considered adequate written notice for purposes of this Agreement.

3. **Standard of Care:** CONSULTANT shall perform its services in a professional manner, using that degree of care and skill ordinarily exercised by and consistent with the standards of professionals providing the same services in the same or a similar locality as the Project. THERE ARE NO OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE THAT WILL OR CAN ARISE OUT OF THE SERVICES PROVIDED BY CONSULTANT OR THIS AGREEMENT.

4. **Waiver of Consequential Damages/Limitation of Liability:** CLIENT agrees that CONSULTANT's aggregate liability for any and all claims that may be asserted by CLIENT is limited to $50,000 or to the fee paid to CONSULTANT under this Agreement, whichever is greater. Both CLIENT and CONSULTANT hereby waive any right to pursue claims for consequential damages against one another, including any claims for lost profits.

5. **Representations of CLIENT:** CLIENT warrants and covenants that sufficient funds are available or will be available upon receipt of CONSULTANT's invoice to make payment in full for the services rendered by CONSULTANT.

6. **Ownership of Instruments of Service:** All reports, plans, specifications, field data and notes and other documents, including all documents on electronic media, prepared by the CONSULTANT as instrument of service, shall remain the property of the CONSULTANT. The CONSULTANT shall retain all common law, statutory and other rights, including the copyright thereto. In the event of termination of this Agreement and upon full payment of fees owed to CONSULTANT, CONSULTANT shall make available to CLIENT copies of all plans and specifications.

7. **Change Orders:** CONSULTANT will treat as a proposed change order any written or oral order (including directions, instructions, interpretations, or determinations) from CLIENT which requests changes in the Agreement or CONSULTANT's Scope of Services. If CONSULTANT accepts the proposed change order, CONSULTANT will give CLIENT written notice within ten (10) days of acceptance of any resulting increase in CONSULTANT's fees.

8. **Opinion of Cost/Cost Estimates:** Since the CONSULTANT has no control over the cost of labor, materials, equipment or services furnished by others, or over methods of determining prices, or over competitive bidding or market conditions, any and all opinions as to costs rendered hereunder, including but not limited to opinions as to the costs of construction and materials, shall be made on the basis of CONSULTANT'S experience and qualifications and represent its reasonable judgment as an experienced and qualified professional familiar with the construction industry; but the CONSULTANT cannot and does not guarantee the proposals, bids or actual costs will not vary significantly from opinions of probable costs prepared by it. If at any time the CLIENT wishes assurances as to the amount of any costs, CLIENT shall employ an independent cost estimator to make such determination.

9. **Assignment and Third Parties:** Nothing under this Agreement shall be construed to give any rights or benefits in this Agreement to anyone other than the CLIENT and CONSULTANT, and all duties and responsibilities undertaken pursuant to this Agreement will be for the sole and exclusive benefit of the CLIENT and the CONSULTANT and not for the benefit of any other party. Neither the CLIENT nor the CONSULTANT shall assign, sublet, or transfer any rights under or interests in this Agreement without the written consent of the other, which shall not be unreasonably withheld. However, nothing contained herein shall prevent or restrict the CONSULTANT from employing independent subconsultants as the CONSULTANT may deem appropriate to assist in the performance of services hereunder.

10. **Project Site:** Should CLIENT not be owner of the Project site, then CLIENT agrees to notify the site owner of the possibility of unavoidable alteration and damage to the site. CLIENT further agrees to indemnify, defend, and hold harmless CONSULTANT against any claims by the CLIENT, the owner of the site, or persons having possession of the site which are related to such alteration or damage.

11. **Access to Site:** CLIENT is responsible for providing legal and unencumbered access to site, including securing all necessary site access agreements or easements, to the extent necessary for the CONSULTANT to carry out its services.

12. **Survival:** All of CLIENT's obligations and liabilities, including but not limited to, its indemnification obligations and limitations of liability, and CONSULTANT's rights and remedies with respect thereto, shall survive completion, expiration or termination of this Agreement.

13. **Termination:** Either party may terminate the Agreement with or without cause upon ten (10) days advance written notice, if the other party has not cured or taken reasonable steps to cure the breach giving rise to termination within the ten (10) day notice period. If CLIENT terminates without cause or if CONSULTANT terminates for cause, CLIENT will pay CONSULTANT for all costs incurred, non-cancelable commitments, and fees earned to the date of termination and through demobilization, including any cancellation charges of vendors and subcontractors, as well as demobilization costs.

14. **Severability:** If any provision of this Agreement, or application thereof to any person or circumstance, is found to be invalid then such provision shall be modified if possible, to fulfill the intent of the parties as reflected in the original provision. The remainder of this Agreement, or the application of such provision to persons or circumstances other than those as to which it is held invalid, shall not be affected thereby, and each provision of this Agreement shall be valid and enforced to the fullest extent permitted by applicable law.

15. **No Waiver:** No waiver by either party of any default by the other party in the performance of any provision of this Agreement shall operate as or be construed as a waiver of any future default, whether like or different in character.

16. **Merger, Amendment:** This Agreement constitutes the entire Agreement between the CONSULTANT and the CLIENT and all negotiations, written and oral understandings between the parties are integrated and merged herein. This Agreement can be supplemented and/or amended only by a written document executed by both the CONSULTANT and the CLIENT.

17. **Unforeseen Occurrences:** If, during the performance of services hereunder, any unforeseen hazardous substance, material, element of constituent or other unforeseen conditions or occurrences are encountered which affects or may affect the services, the risk involved in providing the service, or the recommended scope of services, CONSULTANT will promptly notify CLIENT thereof. Subsequent to that notification, CONSULTANT may: (a) if practicable, in CONSULTANT's sole judgment and with approval of CLIENT, complete the original Scope of Services in accordance with the procedures originally intended in the Proposal; (b) Agree with CLIENT to modify the Scope of Services and the estimate of charges to include study of the previously unforeseen conditions or occurrences, such revision to be in writing and signed by the parties and incorporated herein; or (c) Terminate the services effective on the date of notification pursuant to the terms of the Agreement.

18. **Force Majeure:** Should completion of any portion of the Agreement be delayed for causes beyond the control of or without the fault or negligence of CONSULTANT, including force majeure, the reasonable time for performance shall be extended for a period at least equal to the delay and the parties shall mutually agree on the terms and conditions upon which Agreement may be continued. Force majeure includes but is not restricted to acts of God, acts or failures of governmental authorities, acts of CLIENT's contractors or agents, fire, floods, epidemics, pandemics, riots, quarantine restrictions, strikes, civil insurrections, freight embargoes, and unusually severe weather.

19. **Safety:** CONSULTANT is not responsible for site safety or compliance with the Occupational Safety and Health Act of 1970 ("OSHA"). Job site safety remains the sole exclusive responsibility of CLIENT or CLIENT's contractors, except with respect to CONSULTANT'S own employees. Likewise, CONSULTANT shall have no right to direct or stop the work of CLIENT's contractors, agents, or employees.

20. **Dispute Resolution/Arbitration:** Any claim or other dispute arising out of or related to this Agreement shall first be subject to non-binding mediation in accordance with the then-current Construction Industry Mediation Procedures of the American Arbitration Association ("AAA"). If mediation is unsuccessful, such claim or other dispute shall be subject to arbitration in accordance with the AAA's then-current Construction Industry Arbitration Rules. Any demand for arbitration shall be filed in writing with the other party and with the American Arbitration Association. CLIENT agrees to the inclusion in such arbitration (whether by initial filing, by joinder or by consolidation) of any other parties and of any other claims arising out of or relating to the Project or to the transaction or occurrence giving rise to the claim or other dispute between CLIENT and CONSULTANT.

21. **Independent Contractor:** In carrying out its obligations, CONSULTANT shall always be acting as an independent contractor and not an employee, agent, partner or joint venturer of CLIENT. CONSULTANT's work does not include any supervision or direction of the work of other contractors, their employees or agents, and CONSULTANT's presence shall in no way create any liability on behalf of CONSULTANT for failure of other contractors, their employees or agents to properly or correctly perform their work

22. **Hazardous Substances:** CLIENT agrees to advise CONSULTANT upon execution of this Agreement of any hazardous substances or any condition existing in, on or near the Project Site presenting a potential danger to human health, the environment or equipment. By virtue of entering into the Agreement or of providing services, CONSULTANT does not assume control of, or responsibility for, the Project site or the person in charge of the Project site or undertake responsibility for reporting to any federal, state or local public agencies, any conditions at the Project site that may present a potential danger to the public, health, safety or environment except where required of CONSULTANT by applicable law. In the event CONSULTANT encounters hazardous or toxic substances or contamination significantly beyond that originally represented by CLIENT, CONSULTANT may suspend or terminate the Agreement. CLIENT acknowledges that CONSULTANT has no responsibility as a generator, treater, storer, or disposer of hazardous or toxic substances found or identified at a site. Except to the extent that CONSULTANT has negligently caused such pollution or contamination, CLIENT agrees to defend, indemnify, and hold harmless CONSULTANT, from any claim or liability, arising out of CONSULTANT's performance of services under the Agreement and made or brought against CONSULTANT for any actual or threatened environmental pollution or contamination if the fault (as defined in N.C.G.S. 22B-1(f)(7)) of CLIENT or its derivative parties (as defined in N.C.G.S. 22B-1(f)(3)) is a proximate cause of such claim or liability.

23. **Choice of Law:** The validity, interpretation, and performance of this Agreement shall be governed by and construed in accordance with the law of the State of North Carolina, excluding only its conflicts of laws principles.

24. **Construction Services:** If construction administration and review services are requested by the CLIENT, CLIENT agrees that such administration, review, or interpretation of construction work or documents by CONSULTANT shall not relieve any contractor from liability in regard to its duty to comply with the applicable plans, specifications, and standards for the Project, and shall not give rise to a claim against CONSULTANT for contractor's failure to perform in accordance with the applicable plans, specifications or standards.

25. **Field Representative:** If CONSULTANT provides field services or construction observation services, the presence of the CONSULTANT's field personnel will only be for the purpose of providing observation and field testing of specific aspects of the Project. Should a contractor be involved in the Project, the CONSULTANT's responsibility does not include the supervision or direction of the actual work of any contractor, its employees, or agents. All contractors should be so advised. Contractors should also be informed that neither the presence of the CONSULTANT's field representative nor the observation and testing by the CONSULTANT shall excuse contractor in any way for defects in contractor's work. It is agreed that the CONSULTANT will not be responsible for job or site safety on the Project and that the CONSULTANT does not have the right to stop the work of any contractor.

26. **Submittals:** CONSULTANT's review of shop drawings and other submittals is to determine conformity with the design concept only. Review of shop drawings and submittals does not include means, methods, techniques, or procedures of construction, including but not limited to, safety requirements.

WithersRavenel
Our People. Your Success.

EXHIBIT II

Fee & Expense Schedule

Description	Rate
Project Management	
Director	$ 215
Client Experience Manager	$ 209
Assistant Project Manager	$ 161
Project Manager	$ 177
Senior Project Manager	$ 193
Principal	$ 225
Engineering	
Intern I	$ 60
Intern II	$ 80
CAD Technician I	$ 96
CAD Technician II	$ 107
Senior CAD Technician	$ 128
Designer I	$ 123
Designer II	$ 134
Senior Designer	$ 155
Project Coordinator I	$ 91
Project Coordinator II	$ 102
Project Coordinator III	$ 112
Senior Project Coordinator	$ 118
Project Coordinator Team Leader	$ 134
Project Engineer I	$ 150
Project Engineer II	$ 161
Project Engineer III	$ 177
Staff Professional I	$ 86
Staff Professional II	$ 128
Staff Professional III	$ 139
Staff Professional IV	$ 171
Senior Staff Professional	$ 166
Senior Project Engineer	$ 193
Senior Technical Consultant	$ 209
Zoning Specialist	$ 246
Construction Administration	
Construction Manager I	$ 139
Construction Manager II	$ 150
Senior Construction Manager	$ 171
Resident Project Representative I	$ 86
Resident Project Representative II	$ 102
Resident Project Representative III	$ 118
Senior Resident Project Representative	$ 128
Administration	
Administrative Assistant	$ 54
Office Administration	$ 59
Administrative Assistant I	$ 70
Administrative Assistant II	$ 80
Administrative Assistant III	$ 91
Director of Marketing	$ 91
Marketing Administration II	$ 102
Marketing Administration I	$ 80
Office Administrator I	$ 102
Office Administrator II	$ 107
Office Administrator III	$ 112

Description	Rate
Geomatics	
Geomatics CAD I	$ 85
Geomatics CAD II	$ 105
Geomatics CAD III	$ 120
Geomatics Project Manager I	$ 150
Geomatics Project Manager II	$ 160
Geomatics Project Professional I	$ 135
Geomatics Project Professional II	$ 155
Geomatics Principal	$ 220
Geomatics Remote Sensing Crew I	$ 195
Geomatics Remote Sensing Crew II	$ 275
Geomatics Survey Crew I	$ 140
Geomatics Survey Crew II (2 Man)	$ 170
Geomatics Survey Crew III (3 Man)	$ 210
Geomatics Senior Manager	$ 190
Geomatics Survey Tech I	$ 50
Geomatics Survey Tech II	$ 80
Geomatics Survey Tech III	$ 105
Geomatics Survey Tech IV	$ 115
Geomatics Sr. Technical Consultant	$ 200
Geomatics SUE Crew 1	$ 175
Geomatics SUE Crew 2	$ 245
Geographic Information Systems	
GIS Survey Technician I	$ 65
GIS Survey Technician II	$ 86
GIS Survey Technician III	$ 102
GIS Survey Lead	$ 118
GIS Technician	$ 86
GIS Analyst I	$ 102
GIS Analyst II	$ 118
GIS Specialist	$ 134
GIS Senior Specialist	$ 150
GIS Project Manager	$ 150
Funding & Asset Management	
F&AM Project Consultant I	$ 102
F&AM Project Consultant II	$ 112
F&AM Project Consultant III	$ 118
F&AM Senior Project Consultant I	$ 134
F&AM Senior Project Consultant II	$ 139
F&AM Implementation Specialist	$ 134
F&AM Staff Professional III	$ 139
F&AM Assistant Project Manager	$ 145
F&AM Project Manager	$ 150
F&AM Senior Project Manager	$ 187
F&AM Principal	$ 203
F&AM Senior Technical Consultant	$ 225

Description	Rate
Environmental	
Environmental Tech I	$ 90
Environmental Tech II	$ 100
Senior Environmental Tech	$ 120
Environmental Geologist I	$ 110
Environmental Geologist II	$ 125
Environmental Geologist III	$ 135
Project Geologist I	$ 145
Project Geologist II	$ 155
Project Geologist III	$ 165
Sr. Environmental Project Geologist	$ 180
Environmental Scientist I	$ 110
Environmental Scientist II	$ 125
Environmental Scientist III	$ 135
Environmental Project Scientist I	$ 145
Environmental Project Scientist II	$ 155
Environmental Project Scientist III	$ 165
Sr. Environmental Project Scientist	$ 180
Environmental Professional I	$ 110
Environmental Professional II	$ 125
Environmental Professional III	$ 135
Environmental Project Engineer I	$ 145
Environmental Project Engineer II	$ 155
Environmental Project Engineer III	$ 165
Sr. Environmental Project Engineer	$ 180
Environmental Assistant PM	$ 155
Environmental Project Manager	$ 165
Environmental Sr. Project Manager	$ 175
Environmental Sr. Technical Consultant	$ 205
Environmental Principal	$ 225
Landscape Architecture/Planning	
Landscape Architect I	$ 139
Landscape Architect II	$ 150
Landscape Architect III	$ 166
Landscape Designer I	$ 118
Landscape Designer II	$ 128
Planner I	$ 112
Planner II	$ 128
Planner III	$ 150
Planning Technician	$ 102
Senior Landscape Architect	$ 182
Senior Planner	$ 171
Expenses	
Bond Prints (Per Sheet)	$ 1.75
Mylar Prints (Per Sheet)	$ 11.00
Mileage	Per IRS
Delivery – Project Specific (Distance & Priority)	
Subcontractor Fees (Markup)	1.15
Expenses / Reprod. / Permits (Markup)	1.15

Effective January 1, 2022 – Schedule is subject to change

WithersRavenel
Our People. Your Success.

August 29, 2022

Josh Harrold, Town Manager
Town of Black Mountain
160 Midland Avenue
Black Mountain, NC 28711

RE: Proposal for Professional Services
Stormwater LASII Planning Application Assistance
Black Mountain, North Carolina
WR Project No. 08221134.00

Dear Mr. Harrold,

WithersRavenel is pleased to provide this Proposal for Professional Services. We look forward to working with you on this project. If you have any questions or concerns about this proposal, please do not hesitate to call me at the number listed below.

Sincerely,
WithersRavenel

Amanda Whitaker
Director, Funding Services, Funding and Asset Management

awhitaker@withersravenel.com
Ph. 336.605.3009 | Mobile. 336.250.7778

Attachment:

Proposal for Professional Services

WithersRavenel
Our People. Your Success.

Town of Black Mountain
Black Mountain, North Carolina
Proposal for Professional Services

A. Project Description

This fee proposal is intended to provide the scope of services and associated fees to provide consulting services per request of Town of Black Mountain and formalize an agreement for the implementation and logistics for these services.

This proposal is based on the project located in Black Mountain, North Carolina.

Listed below is a summary of the key aspects of the project based on discussions and preliminary research. Refer to the Scope of Services and Additional Services/Exclusions for further detailed information.

For the purposes of this proposal and any subsequent agreements the following references shall apply:

1. Town of Black Mountain shall be known as the “Client” or "Town";
2. WithersRavenel shall be known as the “Consultant”;
3. The property and overall project shall be known as the “Project”;
4. North Carolina Department of Environmental Quality shall be known as “NCDEQ”;
5. Division of Water Infrastructure shall be known as “DWI”;
6. Local Assistance for Stormwater Infrastructure Investments Program shall be known as “LASII”;
7. The executed proposal shall be known as the “Agreement”.

The Client wishes to pursue funding assistance from the NCDEQ DWI’s Local Assistance for Stormwater Infrastructure Investments Program (LASII) and would like assistance with completing the application for the Fall 2022 funding cycle (Project). The Project provides funding to complete an inventory of existing stormwater infrastructure, to document the condition of the inventoried infrastructure, and to prepare tools to help manage the system, such as an Asset Management Plan.

B. Timeline for Services

Consultant will begin work upon receipt of executed Agreement and written notice to proceed from the Client. Services will complete upon Consultant’s submission of the proposed application to the North Carolina Division of Water Infrastructure by the Fall 2022 application deadline, which is 09/30/2022, and delivery of an application copy to the Client.

C. Scope of Services

Consultant shall provide the services identified under each task below as its “Basic Services” under the Agreement.

Task 1 - LASII Planning Application Preparation, Submittal, and Support

A. Assemble all materials necessary for the applications as outlined in DWI’s LASII 2022 program guidance.

B. Prepare all forms, narratives, and all required documents to support the application process.

C. Coordinate collection of any supporting information required for the applications.

D. Draft required application resolutions for Client to present to Board for adoption to support

the application process.

E. Meet with Client representatives to discuss the scope of the projects which may be via web-based conferencing.

F. Thoroughly understand project scope and prepare a technical project description. The description of the project will be described in enough detail that it will include the project purpose, what the project entails, as well as technical information such as estimates of size/length and materials.

G. Develop project cost estimates based off a technical project description. Budgets will be in the format stipulated by the DWI and will also be signed and sealed by Consultant's licensed professional engineer.

H. Circulate application information to the Client for review and approval.

I. Participate in any teleconferences with DWI and Client as needed.

J. Provide other assistance, as required, to facilitate the complete application process.

K. Work with Client to support obtaining needed signatures of the application materials from the Client representative.

L. Submit application to DWI, using the prescribed method, by their submittal deadline.

M. Provide a PDF copy of the submitted application to Client. Hardcopy to be provided upon request.

D. Exclusions/Additional Services

Services that are not included in the Scope of Services or are specifically excluded from this Proposal (see below) shall be considered Additional Services if those services can be performed by Consultant and its agents if requested in writing by the Client and accepted by Consultant. Additional services shall be paid by the Client in accordance with the Fee & Expense Schedule outlined in Exhibit II. The exclusions are described below but are not limited to the following:

General

- All plan submittal, review, or permitting fees;
- Any work previously provided in other proposals;
- Any other services not specifically listed within the Scope of Services.

The above list is not all inclusive, and the Scope of Services defines the services to be provided by Consultant for this project.

E. Client Responsibilities

The following are responsibilities of the Client and Consultant will rely upon the accuracy and completeness of this information:

1. General:
    a. Provide representative for communications and decisions;
    b. Preferred media platforms for communications with the Client;
    c. Provide any information needed to complete the Project not specifically addressed in the Scope of Services;
    d. Provide all available information pertinent to the Project, including any GIS information, reports, maps, drawings, and any other data relative to the Project;
    e. Examine all proposals, reports, sketches, estimates and other documents presented by the Consultant and render in writing decisions pertaining thereto within a reasonable period so as not to delay the services of the Consultant;

f. Give prompt written notice to Consultant whenever Client observes or otherwise becomes aware of any defect in the Project or the services of Consultant;
g. Attend one (1) virtual Town meeting as required/needed;
h. Coordinate adoption of the required DWI resolution ahead of the application deadline;
i. Review and execution of application materials by authorized official ahead of the application deadline.

F. Compensation for Services

Consultant proposes to provide the Basic Services outlined in the Scope of Services on a lump sum basis with budgets as shown below plus reimbursable expenses in accordance with Exhibit II. The amounts set forth below have been determined based on the nature, scope and complexity of the Project as represented in the information provided to Consultant by Client prior to submittal of this proposal; subsequent changes thereto may result in additional fees.

Task No.	Task Name	Fee
1	LASII Planning Application Preparation, Submittal, and Support	$3,000
	TOTAL	**$3,000**

(Hourly) Denotes hourly tasks. The fee budgets represented with hourly tasks are good faith estimates of what can be expected during the performance of this contract.

1. Invoices will be issued monthly, based on the percentage of completion for each lump sum task and the hourly rate for Consultant personnel in accordance with Exhibit II for hourly tasks, as accomplished during the billing period. Payment is due upon receipt of invoice.
2. The above fees are based on the estimated timelines noted in the Timeline for Services. Any adjustments to those timelines may result in additional fees.
3. The attached Exhibit II, Fee & Expense Schedule, is based on Consultant's rates as of the date of this proposal and may be subject to change for hourly tasks and any Additional Services that occur after any adjustments to such rates go into effect.

G. Acceptance

This proposal is valid 15 days from the date it is transmitted to Client. Receipt of an executed copy of this proposal will serve as the written Agreement between WithersRavenel and Town of Black Mountain. All Exhibits identified after the signature blocks below, including the Standard Terms and Conditions (Exhibit I) and the Fee & Expense Schedule (Exhibit II), are incorporated herein and are integral parts of the Agreement.

OFFERED BY:	ACCEPTED BY:
WITHERSRAVENEL	TOWN OF BLACK MOUNTAIN
_____	_____
Signature	Signature
Amanda Whitaker	_____
Name	Name
Director, Funding Services Funding and Asset Management	_____
Title	Title

PREAUDIT STATEMENT: *This instrument has been preaudited in the manner required by the Local Government Budget and Fiscal Control Act (NC G.S. 159-28(a)).*

Signature of Finance Officer: _____

Printed Name: _____

Date: _____

Attachments:

Exhibit I- Standard Terms and Conditions

Exhibit II- Fee & Expense Schedule

WithersRavenel
Our People. Your Success.

EXHIBIT I

Standard Terms and Conditions

WithersRavenel, Inc.

The proposal submitted by WithersRavenel, INC. ("CONSULTANT") is subject to the following terms and conditions, which form an integral part of the Agreement. By accepting the proposal, the services, or any part thereof, the CLIENT agrees and accepts the terms and conditions outlined below:

1. **Payment:**

   a) The CLIENT will pay CONSULTANT for services and expenses in accordance with periodic invoices to CLIENT and a final invoice upon completion of the services. Each invoice is due and payable in full upon presentation to CLIENT. Invoices are past due after 30 days. Past due amounts are subject to interest at a rate of one and one-half percent per month (18% per annum) on the outstanding balance from the date of the invoice.

   b) If the CLIENT fails to make payment to the CONSULTANT within 45 days after the transmittal of an invoice, the CONSULTANT may, after giving 7 days written notice to the CLIENT, suspend services under this Agreement until all amounts due hereunder are paid in full. If an invoice remains unpaid after 90 days from invoice date, the CONSULTANT may terminate the Agreement. If Consultant initiates legal proceedings to collect the fees owed, Consultant shall also be entitled to recover the reasonable expenses of collection including attorney's fees.

2. **Notification of Breach or Default:** The CLIENT shall provide prompt written notice to the CONSULTANT if CLIENT becomes aware of any breach, error, omission, or inconsistency arising out of CONSULTANT's services or any other alleged breach of contract or negligence by the CONSULTANT. The failure of CLIENT to provide such written notice within ten (10) days from the time CLIENT became aware of the fault, defect, error, omission, inconsistency or breach, shall constitute a waiver by CLIENT of any and all claims against the CONSULTANT arising out of such fault, defect, error, omission, inconsistency or breach. Emails shall be considered adequate written notice for purposes of this Agreement.

3. **Standard of Care:** CONSULTANT shall perform its services in a professional manner, using that degree of care and skill ordinarily exercised by and consistent with the standards of professionals providing the same services in the same or a similar locality as the Project. THERE ARE NO OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE THAT WILL OR CAN ARISE OUT OF THE SERVICES PROVIDED BY CONSULTANT OR THIS AGREEMENT.

4. **Waiver of Consequential Damages/Limitation of Liability:** CLIENT agrees that CONSULTANT's aggregate liability for any and all claims that may be asserted by CLIENT is limited to $50,000 or to the fee paid to CONSULTANT under this Agreement, whichever is greater. Both CLIENT and CONSULTANT hereby waive any right to pursue claims for consequential damages against one another, including any claims for lost profits.

5. **Representations of CLIENT:** CLIENT warrants and covenants that sufficient funds are available or will be available upon receipt of CONSULTANT's invoice to make payment in full for the services rendered by CONSULTANT.

6. **Ownership of Instruments of Service:** All reports, plans, specifications, field data and notes and other documents, including all documents on electronic media, prepared by the CONSULTANT as instrument of service, shall remain the property of the CONSULTANT. The CONSULTANT shall retain all common law, statutory and other rights, including the copyright thereto. In the event of termination of this Agreement and upon full payment of fees owed to CONSULTANT, CONSULTANT shall make available to CLIENT copies of all plans and specifications.

7. **Change Orders:** CONSULTANT will treat as a proposed change order any written or oral order (including directions, instructions, interpretations, or determinations) from CLIENT which requests changes in the Agreement or CONSULTANT's Scope of Services. If CONSULTANT accepts the proposed change order, CONSULTANT will give CLIENT written notice within ten (10) days of acceptance of any resulting increase in CONSULTANT's fees.

8. **Opinion of Cost/Cost Estimates:** Since the CONSULTANT has no control over the cost of labor, materials, equipment or services furnished by others, or over methods of determining prices, or over competitive bidding or market conditions, any and all opinions as to costs rendered hereunder, including but not limited to opinions as to the costs of construction and materials, shall be made on the basis of CONSULTANT'S experience and qualifications and represent its reasonable judgment as an experienced and qualified professional familiar with the construction industry; but the CONSULTANT cannot and does not guarantee the proposals, bids or actual costs will not vary significantly from opinions of probable costs prepared by it. If at any time the CLIENT wishes assurances as to the amount of any costs, CLIENT shall employ an independent cost estimator to make such determination.

9. **Assignment and Third Parties:** Nothing under this Agreement shall be construed to give any rights or benefits in this Agreement to anyone other than the CLIENT and CONSULTANT, and all duties and responsibilities undertaken pursuant to this Agreement will be for the sole and exclusive benefit of the CLIENT and the CONSULTANT and not for the benefit of any other party. Neither the CLIENT nor the CONSULTANT shall assign, sublet, or transfer any rights under or interests in this Agreement without the written consent of the other, which shall not be unreasonably withheld. However, nothing contained herein shall prevent or restrict the CONSULTANT from employing independent subconsultants as the CONSULTANT may deem appropriate to assist in the performance of services hereunder.

10. **Project Site:** Should CLIENT not be owner of the Project site, then CLIENT agrees to notify the site owner of the possibility of unavoidable alteration and damage to the site. CLIENT further agrees to indemnify, defend, and hold harmless CONSULTANT against any claims by the CLIENT, the owner of the site, or persons having possession of the site which are related to such alteration or damage.

11. **Access to Site:** CLIENT is responsible for providing legal and unencumbered access to site, including securing all necessary site access agreements or easements, to the extent necessary for the CONSULTANT to carry out its services.

12. **Survival:** All of CLIENT's obligations and liabilities, including but not limited to, its indemnification obligations and limitations of liability, and CONSULTANT's rights and remedies with respect thereto, shall survive completion, expiration or termination of this Agreement.

13. **Termination:** Either party may terminate the Agreement with or without cause upon ten (10) days advance written notice, if the other party has not cured or taken reasonable steps to cure the breach giving rise to termination within the ten (10) day notice period. If CLIENT terminates without cause or if CONSULTANT terminates for cause, CLIENT will pay CONSULTANT for all costs incurred, non-cancelable commitments, and fees earned to the date of termination and through demobilization, including any cancellation charges of vendors and subcontractors, as well as demobilization costs.

14. **Severability:** If any provision of this Agreement, or application thereof to any person or circumstance, is found to be invalid then such provision shall be modified if possible, to fulfill the intent of the parties as reflected in the original provision. The remainder of this Agreement, or the application of such provision to persons or circumstances other than those as to which it is held invalid, shall not be affected thereby, and each provision of this Agreement shall be valid and enforced to the fullest extent permitted by applicable law.

15. **No Waiver:** No waiver by either party of any default by the other party in the performance of any provision of this Agreement shall operate as or be construed as a waiver of any future default, whether like or different in character.

16. **Merger, Amendment:** This Agreement constitutes the entire Agreement between the CONSULTANT and the CLIENT and all negotiations, written and oral understandings between the parties are integrated and merged herein. This Agreement can be supplemented and/or amended only by a written document executed by both the CONSULTANT and the CLIENT.

17. **Unforeseen Occurrences:** If, during the performance of services hereunder, any unforeseen hazardous substance, material, element of constituent or other unforeseen conditions or occurrences are encountered which affects or may affect the services, the risk involved in providing the service, or the recommended scope of services, CONSULTANT will promptly notify CLIENT thereof. Subsequent to that notification, CONSULTANT may: (a) if practicable, in CONSULTANT's sole judgment and with approval of CLIENT, complete the original Scope of Services in accordance with the procedures originally intended in the Proposal; (b) Agree with CLIENT to modify the Scope of Services and the estimate of charges to include study of the previously unforeseen conditions or occurrences, such revision to be in writing and signed by the parties and incorporated herein; or (c) Terminate the services effective on the date of notification pursuant to the terms of the Agreement.

18. **Force Majeure:** Should completion of any portion of the Agreement be delayed for causes beyond the control of or without the fault or negligence of CONSULTANT, including force majeure, the reasonable time for performance shall be extended for a period at least equal to the delay and the parties shall mutually agree on the terms and conditions upon which Agreement may be continued. Force majeure includes but is not restricted to acts of God, acts or failures of governmental authorities, acts of CLIENT's contractors or agents, fire, floods, epidemics, pandemics, riots, quarantine restrictions, strikes, civil insurrections, freight embargoes, and unusually severe weather.

19. **Safety:** CONSULTANT is not responsible for site safety or compliance with the Occupational Safety and Health Act of 1970 ("OSHA"). Job site safety remains the sole exclusive responsibility of CLIENT or CLIENT's contractors, except with respect to CONSULTANT'S own employees. Likewise, CONSULTANT shall have no right to direct or stop the work of CLIENT's contractors, agents, or employees.

20. **Dispute Resolution/Arbitration:** Any claim or other dispute arising out of or related to this Agreement shall first be subject to non-binding mediation in accordance with the then-current Construction Industry Mediation Procedures of the American Arbitration Association ("AAA"). If mediation is unsuccessful, such claim or other dispute shall be subject to arbitration in accordance with the AAA's then-current Construction Industry Arbitration Rules. Any demand for arbitration shall be filed in writing with the other party and with the American Arbitration Association. CLIENT agrees to the inclusion in such arbitration (whether by initial filing, by joinder or by consolidation) of any other parties and of any other claims arising out of or relating to the Project or to the transaction or occurrence giving rise to the claim or other dispute between CLIENT and CONSULTANT.

21. **Independent Contractor:** In carrying out its obligations, CONSULTANT shall always be acting as an independent contractor and not an employee, agent, partner or joint venturer of CLIENT. CONSULTANT's work does not include any supervision or direction of the work of other contractors, their employees or agents, and CONSULTANT's presence shall in no way create any liability on behalf of CONSULTANT for failure of other contractors, their employees or agents to properly or correctly perform their work

22. **Hazardous Substances:** CLIENT agrees to advise CONSULTANT upon execution of this Agreement of any hazardous substances or any condition existing in, on or near the Project Site presenting a potential danger to human health, the environment or equipment. By virtue of entering into the Agreement or of providing services, CONSULTANT does not assume control of, or responsibility for, the Project site or the person in charge of the Project site or undertake responsibility for reporting to any federal, state or local public agencies, any conditions at the Project site that may present a potential danger to the public, health, safety or environment except where required of CONSULTANT by applicable law. In the event CONSULTANT encounters hazardous or toxic substances or contamination significantly beyond that originally represented by CLIENT, CONSULTANT may suspend or terminate the Agreement. CLIENT acknowledges that CONSULTANT has no responsibility as a generator, treater, storer, or disposer of hazardous or toxic substances found or identified at a site. Except to the extent that CONSULTANT has negligently caused such pollution or contamination, CLIENT agrees to defend, indemnify, and hold harmless CONSULTANT, from any claim or liability, arising out of CONSULTANT's performance of services under the Agreement and made or brought against CONSULTANT for any actual or threatened environmental pollution or contamination if the fault (as defined in N.C.G.S. 22B-1(f)(7)) of CLIENT or its derivative parties (as defined in N.C.G.S. 22B-1(f)(3)) is a proximate cause of such claim or liability.

23. **Choice of Law:** The validity, interpretation, and performance of this Agreement shall be governed by and construed in accordance with the law of the State of North Carolina, excluding only its conflicts of laws principles.

24. **Construction Services:** If construction administration and review services are requested by the CLIENT, CLIENT agrees that such administration, review, or interpretation of construction work or documents by CONSULTANT shall not relieve any contractor from liability in regard to its duty to comply with the applicable plans, specifications, and standards for the Project, and shall not give rise to a claim against CONSULTANT for contractor's failure to perform in accordance with the applicable plans, specifications or standards.

25. **Field Representative:** If CONSULTANT provides field services or construction observation services, the presence of the CONSULTANT's field personnel will only be for the purpose of providing observation and field testing of specific aspects of the Project. Should a contractor be involved in the Project, the CONSULTANT's responsibility does not include the supervision or direction of the actual work of any contractor, its employees, or agents. All contractors should be so advised. Contractors should also be informed that neither the presence of the CONSULTANT's field representative nor the observation and testing by the CONSULTANT shall excuse contractor in any way for defects in contractor's work. It is agreed that the CONSULTANT will not be responsible for job or site safety on the Project and that the CONSULTANT does not have the right to stop the work of any contractor.

26. **Submittals:** CONSULTANT's review of shop drawings and other submittals is to determine conformity with the design concept only. Review of shop drawings and submittals does not include means, methods, techniques, or procedures of construction, including but not limited to, safety requirements.

WithersRavenel
Our People. Your Success.

EXHIBIT II

Fee & Expense Schedule

Description	Rate
Project Management	
Director	$ 215
Client Experience Manager	$ 209
Assistant Project Manager	$ 161
Project Manager	$ 177
Senior Project Manager	$ 193
Principal	$ 225
Engineering	
Intern I	$ 60
Intern II	$ 80
CAD Technician I	$ 96
CAD Technician II	$ 107
Senior CAD Technician	$ 128
Designer I	$ 123
Designer II	$ 134
Senior Designer	$ 155
Project Coordinator I	$ 91
Project Coordinator II	$ 102
Project Coordinator III	$ 112
Senior Project Coordinator	$ 118
Project Coordinator Team Leader	$ 134
Project Engineer I	$ 150
Project Engineer II	$ 161
Project Engineer III	$ 177
Staff Professional I	$ 86
Staff Professional II	$ 128
Staff Professional III	$ 139
Staff Professional IV	$ 171
Senior Staff Professional	$ 166
Senior Project Engineer	$ 193
Senior Technical Consultant	$ 209
Zoning Specialist	$ 246
Construction Administration	
Construction Manager I	$ 139
Construction Manager II	$ 150
Senior Construction Manager	$ 171
Resident Project Representative I	$ 86
Resident Project Representative II	$ 102
Resident Project Representative III	$ 118
Senior Resident Project Representative	$ 128
Administration	
Administrative Assistant	$ 54
Office Administration	$ 59
Administrative Assistant I	$ 70
Administrative Assistant II	$ 80
Administrative Assistant III	$ 91
Director of Marketing	$ 91
Marketing Administration II	$ 102
Marketing Administration I	$ 80
Office Administrator I	$ 102
Office Administrator II	$ 107
Office Administrator III	$ 112

Description	Rate
Geomatics	
Geomatics CAD I	$ 85
Geomatics CAD II	$ 105
Geomatics CAD III	$ 120
Geomatics Project Manager I	$ 150
Geomatics Project Manager II	$ 160
Geomatics Project Professional I	$ 135
Geomatics Project Professional II	$ 155
Geomatics Principal	$ 220
Geomatics Remote Sensing Crew I	$ 195
Geomatics Remote Sensing Crew II	$ 275
Geomatics Survey Crew I	$ 140
Geomatics Survey Crew II (2 Man)	$ 170
Geomatics Survey Crew III (3 Man)	$ 210
Geomatics Senior Manager	$ 190
Geomatics Survey Tech I	$ 50
Geomatics Survey Tech II	$ 80
Geomatics Survey Tech III	$ 105
Geomatics Survey Tech IV	$ 115
Geomatics Sr. Technical Consultant	$ 200
Geomatics SUE Crew 1	$ 175
Geomatics SUE Crew 2	$ 245
Geographic Information Systems	
GIS Survey Technician I	$ 65
GIS Survey Technician II	$ 86
GIS Survey Technician III	$ 102
GIS Survey Lead	$ 118
GIS Technician	$ 86
GIS Analyst I	$ 102
GIS Analyst II	$ 118
GIS Specialist	$ 134
GIS Senior Specialist	$ 150
GIS Project Manager	$ 150
Funding & Asset Management	
F&AM Project Consultant I	$ 102
F&AM Project Consultant II	$ 112
F&AM Project Consultant III	$ 118
F&AM Senior Project Consultant I	$ 134
F&AM Senior Project Consultant II	$ 139
F&AM Implementation Specialist	$ 134
F&AM Staff Professional III	$ 139
F&AM Assistant Project Manager	$ 145
F&AM Project Manager	$ 150
F&AM Senior Project Manager	$ 187
F&AM Principal	$ 203
F&AM Senior Technical Consultant	$ 225

Description	Rate
Environmental	
Environmental Tech I	$ 90
Environmental Tech II	$ 100
Senior Environmental Tech	$ 120
Environmental Geologist I	$ 110
Environmental Geologist II	$ 125
Environmental Geologist III	$ 135
Project Geologist I	$ 145
Project Geologist II	$ 155
Project Geologist III	$ 165
Sr. Environmental Project Geologist	$ 180
Environmental Scientist I	$ 110
Environmental Scientist II	$ 125
Environmental Scientist III	$ 135
Environmental Project Scientist I	$ 145
Environmental Project Scientist II	$ 155
Environmental Project Scientist III	$ 165
Sr. Environmental Project Scientist	$ 180
Environmental Professional I	$ 110
Environmental Professional II	$ 125
Environmental Professional III	$ 135
Environmental Project Engineer I	$ 145
Environmental Project Engineer II	$ 155
Environmental Project Engineer III	$ 165
Sr. Environmental Project Engineer	$ 180
Environmental Assistant PM	$ 155
Environmental Project Manager	$ 165
Environmental Sr. Project Manager	$ 175
Environmental Sr. Technical Consultant	$ 205
Environmental Principal	$ 225
Landscape Architecture/Planning	
Landscape Architect I	$ 139
Landscape Architect II	$ 150
Landscape Architect III	$ 166
Landscape Designer I	$ 118
Landscape Designer II	$ 128
Planner I	$ 112
Planner II	$ 128
Planner III	$ 150
Planning Technician	$ 102
Senior Landscape Architect	$ 182
Senior Planner	$ 171
Expenses	
Bond Prints (Per Sheet)	$ 1.75
Mylar Prints (Per Sheet)	$ 11.00
Mileage	Per IRS
Delivery – Project Specific (Distance & Priority)	
Subcontractor Fees (Markup)	1.15
Expenses / Reprod. / Permits (Markup)	1.15

Effective January 1, 2022 – Schedule is subject to change

WithersRavenel
Our People. Your Success.

August 30, 2022

Josh Harrold, Town Manager
Town of Black Mountain
160 Midland Avenue
Black Mountain, NC 28711

RE: Proposal for Professional Services
Water SRF Application Assistance
Black Mountain, North Carolina
WR Project No. 08221135.00

Dear Mr. Harrold,

WithersRavenel is pleased to provide this Proposal for Professional Services. We look forward to working with you on this project. If you have any questions or concerns about this proposal, please do not hesitate to call me at the number listed below.

Sincerely,
WithersRavenel

Amanda Whitaker
Director, Funding Services, Funding and Asset Management

awhitaker@withersravenel.com
Ph. 336.605.3009 | Mobile. 336.250.7778

Attachment:

Proposal for Professional Services

WithersRavenel
Our People. Your Success.

Town of Black Mountain
Black Mountain, North Carolina
Proposal for Professional Services

A. Project Description

This fee proposal is intended to provide the scope of services and associated fees to provide consulting services per request of Town of Black Mountain and formalize an agreement for the implementation and logistics for these services.

This proposal is based on the project located in Buncombe County, Black Mountain, North Carolina.

Listed below is a summary of the key aspects of the project based on discussions and preliminary research. Refer to the Scope of Services and Additional Services/Exclusions for further detailed information.

For the purposes of this proposal and any subsequent agreements the following references shall apply:

1. Town of Black Mountain shall be known as the “Client” or "Town";
2. WithersRavenel shall be known as the “Consultant”;
3. The property and overall project shall be known as the “Project”;
4. Buncombe County shall be known as “County”;
5. North Carolina Department of Environmental Quality shall be known as “NCDEQ”;
6. Division of Water Infrastructure shall be known as “DWI”;
7. State Revolving Fund shall be known as “SRF”;
8. The executed proposal shall be known as the “Agreement”.

The Client wishes to pursue funding assistance from NCDEQ’s DWI through the construction State Revolving Fund (SRF) and would like assistance with completing the application for the Fall 2022 funding cycle (Project). The primary objective of the Project is to obtain infrastructure funding for the Black Mountain Water Rehab / Replacement Project.

B. Timeline for Services

Consultant will begin work upon receipt of executed Agreement and written notice to proceed from the Client. Services will complete upon Consultant’s submission of the proposed application to the North Carolina Division of Water Infrastructure by the Fall 2022 application deadline, which is 09/30/2022, and delivery of a copy of the application to the Client.

C. Scope of Services

Consultant shall provide the services identified under each task below as its “Basic Services” under the Agreement.

Task 1 - Application Preparation, Submittal, and Support

A. Assemble all materials necessary for the applications as outlined in DWI’s 2022 Construction Funding Program guidance.

B. Prepare all forms, narratives, and all required documents to support the application process.

C. Coordinate collection of any supporting information required for the application.

D. Draft required application resolutions for Client to present to Council for adoption to support

the application process.

E. Meet with Client representatives to discuss the scope of the projects which may be via web-based conferencing.

F. Thoroughly understand project scope and prepare a technical project description. The description of the project will be described in enough detail that it will include the project purpose, what the project entails, as well as technical information such as estimates of size/length and materials.

G. Develop project cost estimates based off a technical project description. Budgets will be in the format stipulated by the DWI and will also be signed and sealed by Consultant's licensed professional engineer.

H. Circulate application information to the Client for review and approval.

I. Participate in any teleconferences with DWI and Client as needed.

J. Provide other assistance, as required, to facilitate the complete application process.

K. Work with Client to support obtaining needed signatures of the application materials from the Client representative;

L. Submit application to DWI via their approved method and by their submittal deadline.

M. Provide a PDF copy of the submitted application to Client. Hardcopy to be provided upon request.

D. Exclusions/Additional Services

Services that are not included in the Scope of Services or are specifically excluded from this Proposal (see below) shall be considered Additional Services if those services can be performed by Consultant and its agents if requested in writing by the Client and accepted by Consultant. Additional services shall be paid by the Client in accordance with the Fee & Expense Schedule outlined in Exhibit II. The exclusions are described below but are not limited to the following:

General

- All plan submittal, review, or permitting fees;
- Any work previously provided in other proposals;
- Any other services not specifically listed within the Scope of Services.

The above list is not all inclusive, and the Scope of Services defines the services to be provided by Consultant for this project.

E. Client Responsibilities

The following are responsibilities of the Client and Consultant will rely upon the accuracy and completeness of this information:

1. General:
    a. Provide representative for communications and decisions;
    b. Preferred media platforms for communications with the Client;
    c. Provide any information needed to complete the Project not specifically addressed in the Scope of Services;
    d. Provide all available information pertinent to the Project, including any GIS information, reports, maps, drawings, and any other data relative to the Project;
    e. Examine all proposals, reports, sketches, estimates and other documents presented by the Consultant and render in writing decisions pertaining thereto within a reasonable period so as not to delay the services of the Consultant;

f. Give prompt written notice to Consultant whenever Client observes or otherwise becomes aware of any defect in the Project or the services of Consultant;
g. Attend one (1) virtual Town meeting as required/needed;
h. Coordinate adoption of the required DWI resolution ahead of the application deadline;
i. Review and execution of application materials by authorized official ahead of the application deadline.

F. Compensation for Services

Consultant proposes to provide the Basic Services outlined in the Scope of Services on a lump sum basis with budgets as shown below plus reimbursable expenses in accordance with Exhibit II. The amounts set forth below have been determined based on the nature, scope and complexity of the Project as represented in the information provided to Consultant by Client prior to submittal of this proposal; subsequent changes thereto may result in additional fees. Budgeted amount reflects a discounted fee due to Client contracting for multiple application projects.

Task No.	Task Name	Fee
1	Application Preparation, Submittal, and Support	$3,500
	TOTAL	**$3,500**

(Hourly) Denotes hourly tasks. The fee budgets represented with hourly tasks are good faith estimates of what can be expected during the performance of this contract.

1. Invoices will be issued monthly, based on the percentage of completion for each lump sum task and the hourly rate for Consultant personnel in accordance with Exhibit II for hourly tasks, as accomplished during the billing period. Payment is due upon receipt of invoice.
2. The above fees are based on the estimated timelines noted in the Timeline for Services. Any adjustments to those timelines may result in additional fees.
3. The attached Exhibit II, Fee & Expense Schedule, is based on Consultant's rates as of the date of this proposal and may be subject to change for hourly tasks and any Additional Services that occur after any adjustments to such rates go into effect.

G. Acceptance

This proposal is valid 15 days from the date it is transmitted to Client. Receipt of an executed copy of this proposal will serve as the written Agreement between WithersRavenel and Town of Black Mountain. All Exhibits identified after the signature blocks below, including the Standard Terms and Conditions (Exhibit I) and the Fee & Expense Schedule (Exhibit II), are incorporated herein and are integral parts of the Agreement.

OFFERED BY:	ACCEPTED BY:
WITHERSRAVENEL	TOWN OF BLACK MOUNTAIN
_____	_____
Signature	Signature
Amanda Whitaker	_____
Name	Name
Director, Funding Services Funding and Asset Management	_____
Title	Title

PREAUDIT STATEMENT: *This instrument has been preaudited in the manner required by the Local Government Budget and Fiscal Control Act (NC G.S. 159-28(a)).*

Signature of Finance Officer: _____

Printed Name: _____

Date: _____

Attachments:

Exhibit I- Standard Terms and Conditions

Exhibit II- Fee & Expense Schedule

TOWN OF BLACK MOUNTAIN TOWN COUNCIL
REQUEST FOR COUNCIL ACTION
Meeting Date: September 12, 2022

SUBJECT: Resolution of Support for MPO Application for Safe Streets for All Action Plan Funding from USDOT

AGENDA INFORMATION

Agenda Location:	**CONSENT**
Item Number:	5C
Department:	Planning and Development
Contact:	Department Jessica Trotman, Planning
Presenter:	Director Jessica Trotman, Planning Director

BRIEF SUMMARY: At the August MPO meeting, the French Broad River MPO Board authorized MPO and RPO staff to submit a grant application to USDOT for a regional Safe Streets for All Action Plan that would create a plan to improve roadway safety in Buncombe, Haywood, Henderson, Madison, and Transylvania counties and enable all of our local jurisdictions to pursue implementation funds through the Safe Streets for All program as needed.

The data made available to us shows roadway safety trends in our region moving in unfavorable directions- something we would like to help change and something that's going to require a lot of work from a lot of partners.

The MPO has requested a resolution of support for the application.

MOTION FOR CONSIDERATION: To approve the resolution as presented.

FUNDING SOURCE: N/A

ATTACHMENTS: Draft resolution

MANAGER'S COMMENTS AND RECOMMENDATIONS: To approve the resolution as presented.

RESOLUTION #R-22-21

RESOLUTION OF SUPPORT FOR A REGIONAL ACTION PLANNING GRANT APPLICATION THROUGH THE SAFE STREETS FOR ALL PROGRAM

WHEREAS, the USDOT has developed a new discretionary grant program to address roadway safety through the new Safe Streets for All Program; and

WHEREAS, the Bipartisan Infrastructure Bill has appropriated $5 billion for the Safe Streets for All Program through FY 2026; and

WHEREAS, the Safe Streets for All Program requires that entities, including local governments, that are interested in utilizing implementation funds through the Safe Streets for All Program have an adopted Action Plan; and

WHEREAS, an Action Plan that covers the French Broad River MPO and Land of Sky RPO region would include the Town of Black Mountain, and

WHEREAS, the French Broad River MPO and Land of Sky RPO planning areas have observed an increase in roadway crashes and fatalities;

NOW THEREFORE, BE IT RESOLVED, BY THE TOWN COUNCIL OF THE TOWN OF BLACK MOUNTAIN, NORTH CAROLINA THAT the Town Council support the joint application from French Broad River MPO and the Land of Sky RPO to develop an Action Plan for the region through the Safe Streets for All Program.

I move and adopt the foregoing resolution:

_____
Council Member

READ, APPROVED AND ADOPTED, by a vote of _____ to _____ on this 12th day of September 2022.

_____
Larry B. Harris, Mayor

ATTEST:

_____
Savannah Parrish, Town Clerk

_____
Josh Harrold, Town Manager

September 12, 2022

Office of the Secretary of Transportation
1200 New Jersey Ave, SE
Washington, DC, 20590

To Whom it May Concern:

The Town of Black Mountain offers support for the French Broad River Metropolitan Planning Organization (FBRMPO) and Land of Sky Rural Planning Organization (LOSRPO) application for an Action Plan Grant being submitted to the Safe Streets for All Program. We support this grant application and the focus on creating a plan that helps eliminate all traffic related deaths and severe injuries in our growing region of Western North Carolina.

The Town of Black Mountain understands the need for strategic planning for the future transportation landscape of the five-county region that includes Buncombe, Haywood, Henderson, Madison, and Transylvania counties. With this, safety of drivers as well as the pedestrians and cyclists that share these roads are of the upmost importance. With the creation of a Safety Action Plan, the FBRMPO and LOSRPO can help insure that as infrastructure is improved upon and constructed, safety of the citizens is at the forefront.

With the creation of a Safety Action Plan for the FBRMPO and LOSRPO, it will be the first plan of its kind in Western North Carolina. Our region has the opportunity to be a blueprint for other mountainous communities that are typically challenged by its geography. This plan will also allow many communities in the region to apply for implementation funds in future funding rounds to help create safe and robust roadways and pathways for all modes of transportation.

The Town of Black Mountain supports the FBRMPO and LOSRPO's request for federal funding for an Action Plan Grant through the Safe Streets for All Program. This plan will have significant benefits for the region's transportation network and the health of our community.

Sincerely,

_____

Larry Harris, Mayor

TOWN OF BLACK MOUNTAIN TOWN COUNCIL
REQUEST FOR COUNCIL ACTION
Meeting Date: September 12, 2022

SUBJECT: Stormwater Master Plan Update

AGENDA INFORMATION

Agenda Location:	**NEW BUSINESS**
Item Number:	8A
Department:	Planning and Development Department
Contact:	Jessica Trotman, Planning Director
Presenter:	Jessica Trotman, Planning Director Staff from Wildlands Engineering

BRIEF SUMMARY: Wildland Engineering and staff have been working to update the stormwater master plan for several months. This update is a significant, taking a holistic view of the stormwater system and program in consideration of both the communities concerns and the regulatory environment from the NPDES permit and the associated stormwater management plan. This document considers and defines level of service, maintenance improvements, traditional stormwater pipe system, flood mitigation and environmental planning and engineering efforts that also improve water quality. We aim to protect the health and welfare of the people of Black Mountain, adhere to the federal compliance, and improve the health of the Swannanoa River, which is has been identified for many years as an impair surface water.

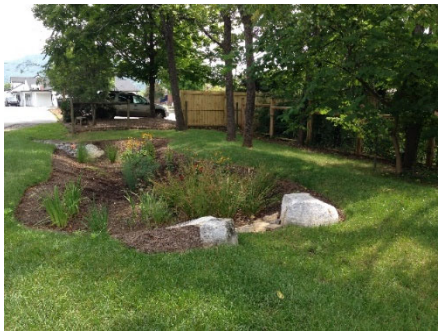
The plan was created using existing data, extensive data collection efforts with the community to identify areas of concern, a working group, collaboration with Public Works and a public survey as well. This plan provides staff the information to apply for grants, engage in capital planning, budgeting, and advance the identify and function of the Town's stormwater infrastructure.

MOTION FOR CONSIDERATION: To adopt the Stormwater Master Plan as presented.

FUNDING SOURCE: N/A

ATTACHMENTS: Draft Stormwater Master Plan

MANAGER'S COMMENTS AND RECOMMENDATIONS: To approve the Stormwater Master Plan as presented.






FINAL REPORT

Submitted to:
Town of Black Mountain

September 2, 2022

TOWN OF BLACK MOUNTAIN STORMWATER MASTER PLAN UPDATE

Wildlands Project No.: W20259

PREPARED FOR:

Jessica Trotman – Planning Director, Town of Black Mountain
Anne Phillip – Stormwater Technician, Town of Black Mountain
Jamey Matthews – Public Works Director, Town of Black Mountain
Chris Sloan – Public Works Operations Manager, Town of Black Mountain

PREPARED BY:

WILDLANDS ENGINEERING

Project Staff:
Jacob McLean, PE, CFM, *Project Manager*
Marshall Taylor, PE, *Planning, Engineering and Advisory* (Blue Earth Planning and Design)
Jane Margaret Bell, *Planning & GIS*
Scott Gregory, PLS, GISP, *GIS Support*

Contents

Appendices

Digital Deliverables

Internal TOBM SWMP Support App (Map Application) – *password protected*

Public Hydrology and Updated Stormwater Asset and Project Layers posted on Existing Town Map Educational Storymap Application

Executive Summary

The Town of Black Mountain (Town) engaged Wildlands Engineering (Wildlands) with assistance from Blue Earth Planning, Engineering and Design (Blue Earth) to update its Stormwater Master Plan (SWMP), originally developed in 2009. Overall, the SWMP is a roadmap to help support the Town's stormwater program refine on-going stormwater management efforts and guide future investment. This update included review and evaluation of gaps in service and expectations, and how to close these gaps. Stormwater issues raised through public surveys, as well as those identified by staff and the consulting team, have been evaluated to identify root causes and opportunities for addressing persistent issues through planning, investment, implementation, and education.

The Town recently established a Stormwater Utility (Utility), and while on-going operations and maintenance discussed in this SWMP are a significant expenditure of the Utility, one primary focus of this SWMP update was to guide the planning and implementation of larger capital projects made possible by the Utility.

The goals of the stormwater program are to maintain compliance with the Town's National Pollutant Discharge Elimination System (NPDES) Municipal Separate Storm Sewer System (MS4) Permit and to increase the level of service to its customers, the residents and business owners of Black Mountain. Adequate service must include managing many universal challenges, including finite infrastructure life cycles, regulatory requirements, population growth, climate change, jurisdiction, and inflation, but also some more nuanced challenges. The location of Black Mountain on the Blue Ridge escarpment means that rainfall intensity and total rainfall exceed other nearby areas. The Town has steep topography with a dense network of natural streams and wetland areas, and historic and recent development alike have rerouted or built upon these natural networks. Historic development in the Town has piped natural springs and drainages, and private owners have extended Town stormwater systems through and under private property and businesses. These areas, as well as NCDOT-maintained roads and the railroad right-of-way, lie outside of the Town's jurisdiction posing challenges with regards to the policies and partnership agreements necessary to address engineering challenges. Customer service includes managing these challenges but also managing the gap between expectations and service through education and support of private efforts to improve stormwater management on private property.

The recent development of the Utility, hiring of a dedicated stormwater technician, and this plan update are all part of Town efforts to improve stormwater management and service to its customers. The SWMP will assist the Town to continue to pursue improvements in stormwater management through planning, capacity building at the organizational level, refinement of operation and maintenance activities where opportunity for improvement is identified, continuation of a long-standing commitment to protect the natural environment through green infrastructure (GI) investment, and implementation of larger-scale infrastructure projects whose prioritization, logistical, and financial challenges were a primary focus of this update. This update also renews the Town's commitment and expands the capability of the Town to track, evaluate, and manage persistent stormwater issues in the Town. As part of this, primary objectives included:

- Define and recommend level of service metrics to prioritize expenditures and efforts of the Utility;
- Document and evaluate root causes of stormwater issues that include flooding, erosion, poor condition, and blockage concerns;
- Develop system-wide and site-specific recommendations for improving evaluation and response of stormwater issues;
- Evaluate challenges from future development and opportunities to address these challenges;

- Document and evaluate conveyance system expansion, replacement, and rehabilitation opportunities;
- Document and evaluate GI opportunities which serve to both enhance and complement other stormwater system management efforts;
- Support continued compliance with regulatory requirements by providing recommendations for data management, educational information, and other capacity-building;
- Develop a short- and long-term Capital Improvement Plan (CIP) including cost estimates and funding and implementation strategy; and
- Provide maps, data layers, and other supporting information to document and manage completed efforts.

To support meeting these objectives, primary activities conducted under the SWMP update included:

- Stakeholder outreach -
    - A Stakeholder Advisory Board representing the public, businesses, and town leadership was established for the project and contributed perspective and first-hand knowledge during two planning sessions conducted during the update effort, and
    - The Town conducted outreach efforts to the public through surveys and a public meeting to gather information on issues including flooding, erosion, condition, and blockage concerns.
- Existing asset data and issue and stormwater system evaluation -
    - Digital and other available data was collected, reviewed, and used to prepare base mapping, along with issue data. Additionally, data gaps were identified,
    - New data sets were developed pertaining to runoff patterns and topography,
    - The data structure and fields contained within the existing pipe and collection system database used by the Town for asset management and issue evaluation were reviewed for their utility. Recommendations have been made for future mapping and assessment, as well as for expanding database information to support additional uses of data, and
    - Extensive desktop and field review of resident and staff concerns by consulting team led to recommendations and projects identified in the report.
- Development of recommendations for stormwater issues and programmatic needs -
    - Asset and data management,
    - Level of service recommendations to support permit compliance, citizen response and stormwater system performance targets,
    - Screening and prioritization recommendations and metrics for project evaluation, and
    - Addressing typical and prominent engineering and stormwater management challenges facing the Town including undersized or lack of infrastructure, jurisdiction and other challenges.
- Project identification and evaluation -
    - A projects database was developed to track projects and their various stages of development, including documenting completed projects,
    - Planning and engineering evaluation of projects was used to develop project information based on their screening and prioritization evaluations,
    - Tested screening and prioritization metrics to evaluate projects and preliminary and final development stages of SWMP update efforts,
    - More than thirty CIP projects have been developed with concept designs or better and some level of cost estimate. All preliminary engineering designs, and many of the

concept designs have been developed with more detailed planning or engineering planning level cost estimates,

- Provide Town with short and medium-to-long range CIP planning targets and cost tool in excel to evaluate annualized costs and funding options, and
- Develop recommendations for broad project type categories, particularly for open channel networks.

Initiatives, projects, and other priorities identified under this effort are subject to change and revisiting these along with other planning priorities related to stormwater management on a more routine basis will help guide the program through challenges posed by a rapid pace of land development, increasing frequency and intensity of storms, inflation, and other social and environmental factors.

1.0 Overview

1.1 Study Area Context

The Town of Black Mountain is located in the eastern portion of Buncombe County within the Swannanoa River Valley at an approximate elevation of 2,400 feet. The Town was incorporated in 1893. The current population is approximately 8,471. Black Mountain was originally known as Grey Eagle and later named for the range of mountains that border the town to the north. At the time of incorporation, the Town of Black Mountain had become a major pathway for westbound immigrants, commercial trade, and the mountain railroad. This strategic location helped establish Black Mountain as one of the most prosperous and picturesque communities in the state.

Black Mountain continues to value a strong sense of place in the face of significant residential development. The community enjoys the small-town character and heritage of the rural, natural beauty of the Blue Ridge Mountains, flavored by the independent spirits and outdoor enthusiasts who have been drawn to western North Carolina.

The central business district is designated as a Historic District, filled with locally owned restaurants, boutiques, and office space. Surrounding the Historic District is a well-maintained ring of newer development, which has made an effort to fit into the physical characteristics of the town. The downtown area as a whole enjoys a well-connected pedestrian network, Town Square Park, Black Mountain Library, and seasonal plantings and displays. It is a short walk to Lake Tomahawk, featuring a walking trail around the lake, playground, tennis courts, and swimming pool.

The downtown area is surrounded largely by residential areas. The greatest density is currently eight single family homes per acre. These residential districts are dotted with minimum permitted non-residential uses such as bed and breakfasts and summer camps. There are also a number of legally non-conforming uses which pre-date the 2010 changes to the zoning map. The town is experiencing a significant period of residential development. The town and the surrounding area, including Montreat and Ridgecrest are home to many religiously affiliated conference centers and summer camps, which influence seasonal tourism. Other area festivals also bring surges of guests, including the Swannanoa Gathering at Warren Wilson College and the LEAF festival at Lake Eden.

The Town's commercial industry includes many stakeholders, notably, the Ingles distribution center. The Black Mountain Commerce Park is developing adjacent to the town limits, bringing nearly sixty acres of commercial and residential development to the area, which is already influencing the demand for housing and water system infrastructure in the town.

1.2 Applicable Planning Documents

The following planning documents contain background information about the Town and its stormwater and watershed planning challenges, opportunities, and history, organized by date completed:

1.2.1 2020 - Elevate Black Mountain

Elevate Black Mountain is the Town's updated comprehensive plan. It was adopted in 2021. It identifies stormwater implementation as one of four key needs and proposes stormwater retrofit and new development targets by land use type. Emphasizes low impact and green infrastructure (GI) stormwater management as high priority to meet overarching watershed stewardship goals and natural and built environmental resiliency. Identifies water quality protection, expansion of GI throughout the built environment (e.g., street trees), vegetation management to promote native species, and long-term capital investments in stormwater management as policy goals.

Completed action items from this plan include:

- Incentivize low impact development;
- Create stormwater utility; and
- Maintain compliance with the NPDES Phase II Regulations.

Action items from this plan forwarded by this SWMP update, include:

- Evaluate current practices to ensure they result in intended stormwater management;
- Construct downtown stormwater control measures (SCMs) with grant support from DWQ; and
- Implement the Stormwater Management Plan.

Outstanding activities include:

- Coordinate with Buncombe County, NCDOT, and other partners to ensure best practices for stormwater are carried out and incorporated into engineering handbooks;
- Update the LUC to incorporate directly or by reference best practices for stormwater management; and
- Identify stormwater SCMs that could be incorporated into downtown streetscapes.

This graphic from the Elevate Black Mountain Plan is an example of stormwater incorporation into transportation elements and is analogous to parking lot retrofit concepts proposed in the SWMP Update

1.2.2 2017 - Upper Swannanoa River Watershed Management Plan (USRWMP)

The USRWMP defined water quality projects to address urban runoff and biological impairments in the Swannanoa River. Stream and riparian and stormwater management projects were the primary types of efforts identified, along with education and organizational efforts to support addressing stressors in the watershed. While some of the projects are entirely on Town-owned property, many involve private property owner coordination. To date, multiple projects have been implemented.

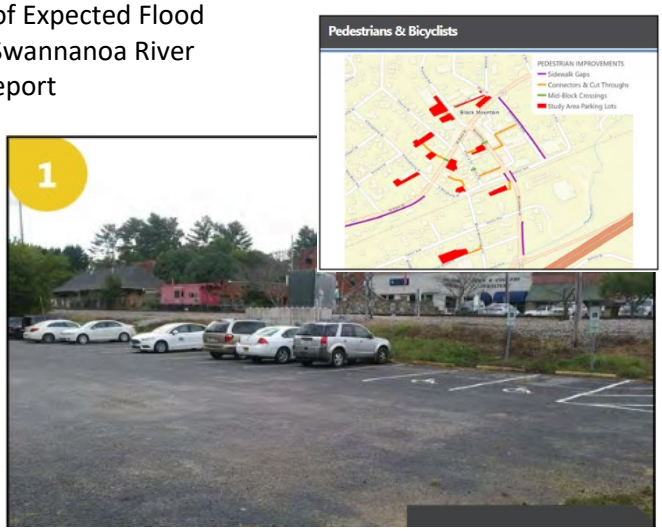
Under the SWMP update, all the projects were reviewed and added to the projects database. It was noted that many of the stream restoration projects could use verification and development and that SCM's on Town property have largely been, or are in the processing of being, implemented and that additional SCM implementation will likely require more private landowner outreach efforts as an important first step.

1.2.3 Swannanoa Flood Risk Mitigation Planning

At least three relevant flood reports were prepared following the 2004 hurricanes (Francis and Ivan). These include:

- US Army Corps of Engineers. August, 2017. Swannanoa River Watershed Section 205, Flood Risk Management Detailed Project Report and Environmental Assessment
- Brown and Caldwell. 2010a. Swannanoa River Watershed-Wide Assessment – Task 5.1. Technical Memorandum prepared for the City of Asheville as part of the Swannanoa Flood Risk Management Project. Charlotte, North Carolina.
- Brown and Caldwell. 2010b. A Summary of Expected Flood Damages in the Swannanoa River Basin. Swannanoa River Watershed-Wide Assessment – Task 4. Report prepared for the City of Asheville as part of the Swannanoa Flood Risk Management Project. Charlotte, North Carolina.

Copies of the Brown and Caldwell reports may be available through the City of Asheville but were not reviewed under the scope of the SWMP update.



This recommendation from the Parking Study is compatible with proposed GI parking lot retrofit recommendations proposed by the SWMP update

1.2.4 Other Plans

Other plans, such as the US 70 Corridor Study, Parking and Circulation Study and Blue Ridge Small Area Plan, may have relevance to specific stormwater projects; the Town maintains copies of adopted plans on its website at https://www.townofblackmountain.org/234/Adopted-Plans.

1.3 Terms & Definitions

Stormwater Assets – Infrastructures, both traditional and green, associated with stormwater management, operations and/or maintenance. Types used in the SWMP include open system, closed system, SCM, outfalls, stream restoration, land or easements, and other GI.

Open System – channels, both natural and man-made that convey, and in some cases treat, stormwater. Common open system features in Black Mountain include roadway ditch networks, natural conveyances in valley low points that may be dry or wet, and streams and rivers further downstream in these systems.

Closed System – pipe networks and small pipes (<4' diameter), culverts and bridges associated with road-stream crossings that convey stormwater flow, and in some cases piped springs and streams.

Collection System – where stormwater is collected off the landscape and enters into open or closed systems including various types of inlets on streets or in open areas (features include curb inlets, curb and grate inlets, grate inlets, yard inlets and pipe headwalls).

Outfalls – where closed systems end and terminate into an open system.

Stormwater Control Measures (SCMs) – typically refers to manmade land-based (depressions, ponds, filter strips) that involve the collection, storage and treatment of stormwater which may also include underground practices (e.g., storage vaults). SCMs can be for the purpose of managing stormwater from new construction (as in the case of post-construction stormwater management requirements) or from existing developed or intensively used land uses, often referred to as retrofits. Retrofitting may also

include rehabilitation, conversion (of type), or expansion of older era SCMs or SCMs whose function can be improved or expanded.

Green Infrastructure (GI) – can be broadly defined as open spaces, vegetation, wetlands, wooded corridors, land-based SCMs, floodplains and other improved or unimproved natural areas that provide one or more functions, potentially including stormwater treatment, floodwater storage, habitat enhancement.

Disconnected Impervious Surfaces – this is a type of SCM where rooftops, driveways, parking lots and other impervious surfaces that are originally piped or otherwise direct connected into stormwater systems are disconnected and redirected into passive or managed areas (open spaces, other SCMs such as rain gardens or infiltration trenches) often with a vegetative component.

1.4 Stormwater Management Overview

1.4.1 Operations & Functions

The Town's Stormwater Management program is implemented by the Planning and Public Works departments, and serves the following primary functions:

- Operate MS4 - the Town operates a Phase II Municipal Separate Storm Sewer System (MS4) and has an approved MS4 Stormwater Management Plan that defines annual management and reporting requirements for compliance with the National Pollutant Discharge Elimination System (NPDES) Municipal Separate Storm Sewer System (MS4) permit, further discussed in Section 1.5.2;
- Conduct routine and non-routine management of assets. Management of these assets requires routine and non-routine efforts by Town staff, including:
    - Response to complaints and concerns regarding stormwater or flooding,
    - Education and outreach,
    - Inspection of private SCMs and Town assets, including collection of data on the location and condition of system assets,
    - Storm preparations in anticipation of large storm events,
    - Maintenance and replacement of stormwater assets to improve and maintain stormwater system performance,
- Plan for and prioritize long-term replacement and augmentation of stormwater assets based on various economic, social, and environmental factors to improve and maintain stormwater system performance

In 2021, the Town implemented a Stormwater Utility to dedicate funding to support these primary functions. The Town recently hired a stormwater coordinator to assist with these and other MS4 and non-MS4-required stormwater program management activities. The Stormwater Utility funds this position and activities required to maintain permit compliance, as well as the primary programmatic functions discussed above. The Town is undertaking the Stormwater Master Plan (SWMP) Update to revisit their management of stormwater assets by addressing specific challenges and conduct capital improvement planning for system repair, replacement, and expansion.

1.4.2 Assets

Within the SWMP Update, assets have been defined in the projects database within the following categories:

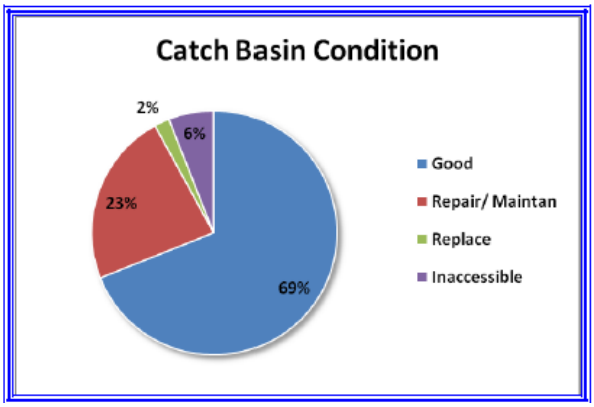
- Closed System
- Open System (Ditches)
- Outfalls

- SCMs
- Stream Restoration
- Other GI
- Easements and Land

Traditional assets within the Town were mapped as part of the 2009 SWMP. In review of mapping data, the assets appear to include both Town, NCDOT and private assets. One of the recommendations to the Town is to add an ownership field to stormwater asset mapping to be able to filter and isolate Town-owned and maintained assets. Unfortunately, none of the data collected in 2009 is still available in digital format and the only source of data still available is report maps and text in pdf format.

As part of the 2009 SWMP mapping, the following asset summaries were provided:

- Closed system
    - Inlets – 98 catch basins with 68% of inlets being stand-alone drop inlet style. 69% of inlets were found to be in good condition with 23% of the remaining structures being flagged for obstruction issues (often trash, sediment or yard waste);



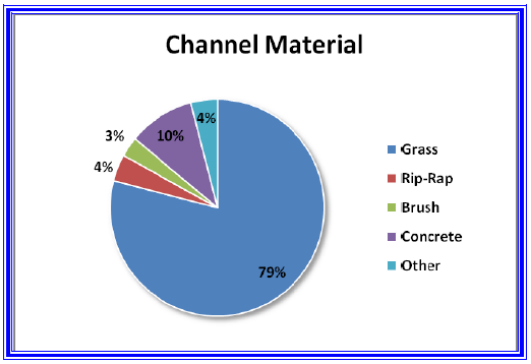
Summary of Mapped Catch Basins (2009 SWMP)

    - Junction Boxes – 19 boxes were identified in downtown with 12 of them classified as “blind” (typically inaccessible with exact location unknown, having been previously buried or paved over);
    - Pipe by Class – a total of 142 pipe segments were collected in Black Mountain’s center with a length of approximately 10,000 feet. The 2009 report indicated that 6% of pipes needed replacement, citing 9 corroded CMP, or failing RCP (Reinforced Concrete Pipe) pipes as the primary replacement needs. Another 8% of the pipe system was stated to need some type of maintenance or repair, citing obstruction as the most common issue; and

Pipe Material	Pipe Size in Inches								
	10	12	15	18	21	24	30	36	48
Reinforced Concrete (RCP)	0	641	789	612	0	415	513	0	0
Corrugated Metal (CMP)	0	65	1112	771	0	247	56	19	0
Ductile Iron (DIP)	0	34	0	88	0	192	0	0	0
Polyvinyl Chloride (PVC)	77	35	110	22	0	0	0	0	0
Vitrified Clay (VCP)	0	1493	690	635	0	51	0	0	0
High Density Polyethylene (HDPE)	0	111	350	474	0	637	0	0	0

Summary of Mapped Pipe Assets (2009 SWMP)

- Open system – 26 engineered channels were collected with 81% identified as in good condition.



Summary of Channels (2009 SWMP)

NCDOT and private landowners also manage stormwater assets in the Town. Often the performance of stormwater systems relies on the combined function of facilities operated by the Town and other entities.

Land of Sky has conducted follow-up mapping of infrastructure in 2015, with incremental addition of information since that time, and current mapping indicates that 537 inlets and 138 outfalls have been mapped within Town limits.

One asset that has been lumped in with Closed Systems for the purposes of the SWMP Update but which should be tracked separate from other closed systems are road-stream crossings consisting of culverts and bridges, particularly those under Town ownership and maintenance. These assets represent significant liabilities with high replacement costs. No digital or paper copy mapping was furnished for these assets, however, the Town has many of these inspected by NCDOT's structural consultants on a periodic basis to evaluate condition and deficiencies. It is recommended that the Town develop improved mapping of these structures and tracks relevant maintenance activities to address structural deficiencies, routine maintenance, or flood maintenance such as debris removal. The Town should also consider aquatic passage, flooding and level of service and future bicycle and pedestrian corridors among other things when evaluating upgrade and replacement needs of culverts and bridges.

1.5 Programmatic Details

1.5.1 Stormwater Utility

The creation of a Stormwater Utility in 2021 was in growing recognition that stormwater management in Black Mountain is a community wide challenge and the pre-existing stormwater program and level of funding did not adequately support or address the challenge. The utility is funded by property owner fees based on tiered rates correlated to the stormwater impacts.

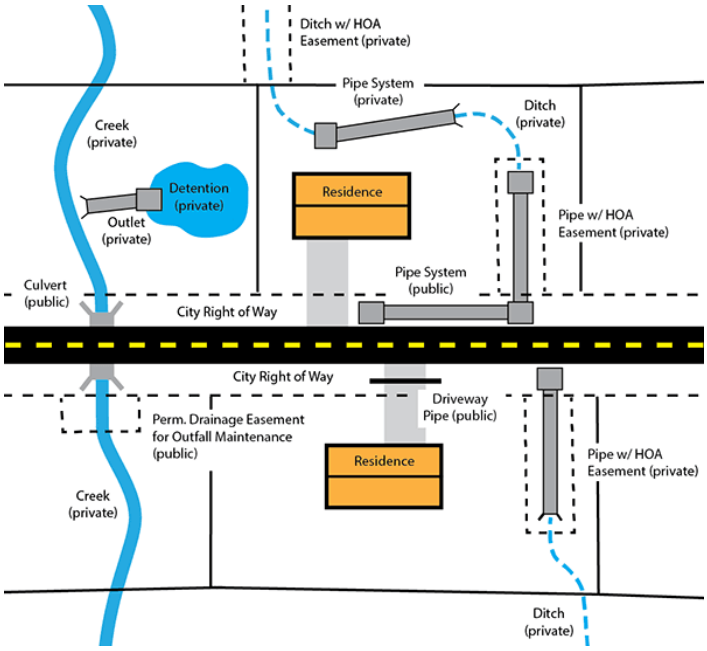
The Utility is necessary to support the Town's activities discussed within this section, notably compliance with its National Pollutant Discharge Elimination System (NPDES) permit, the Town's requirements under the Municipal Separate Storm Sewer System (MS4) program and to improve infrastructure and programmatic capacity.

1.5.2 NPDES MS4 Phase II Program

The Town is regulated by the State of North Carolina Department of Environmental Quality (DEQ) as a MS4 Phase II community and has an approved Stormwater Management Plan (SMP) describing MS4 permit requirements and compliance. As part of the Town's stormwater management program, the Town is legally required to perform the activities described in the SMP and provide annual updates. Included under the MS4 program, educational, outfall and illicit discharge detection activities are required, among other things.

1.5.2.1 Town Jurisdiction – Extent of Service

The Town is legally limited in its ability to maintain stormwater assets on private property or in NCDOT or railroad right-of-way. The sections below explain the range of management areas present within the Town and the nuance of jurisdiction within those areas.



The City of Greenville, SC has developed this figure and formal policy to help define their extent of service to the community

1.5.2.2 Roadways

Town, NCDOT, and private roads exist within the Town limits. The stormwater infrastructure that exists along roadways includes various types of inlets, pipe systems, and ditch networks.

Stormwater infrastructure does not always follow roadways and where infrastructure diverges from the road right-of-way, this infrastructure is considered private and, in most cases, has been installed by private property owners for the purpose of developing the adjacent land.

1.5.2.3 Private Property

The Town does not maintain stormwater infrastructure on private property. An example of this type of infrastructure is the number of historic piped streams in Black Mountain that connect private properties, which the Town does not maintain.

The Town does enter into public/ private partnerships with property owners to replace failed culverts in the right-of-way under driveways. The agreement is such that the property owner pays for the cost of the culvert pipe, and the Town's Public Works department will install the culvert, covering the labor and equipment cost to install the pipe.

1.5.2.4 Drainage Easements

Drainage easements are used to establish long-term access to stormwater facilities owned and maintained by the Town. Currently, few or no drainage easements exist. In the future, for various types

of potential public-private partnerships, drainage easements may be used to guarantee long-term protection of infrastructure and maintenance access. Section 2.2.3.1 expands upon this topic.

1.5.2.5 Inspection, Maintenance, Rehabilitation and Replacement

Public Works has traditionally focused on maintenance activities to react to pressing issues rather than proactive improvement projects.

Maintenance activities typically conducted include:

- Debris and leaf clearing from ditches and culverts
- Addressing non-functioning open and closed stormwater system assets
- Emergency ditch and lake management for storm preparation
- Repairing storm damage and removing debris from culvert and bridge structures

In addition, other activities that have been implemented by Public Works in the past include:

- Minor replacement projects as part of addressing non-functioning assets
- Driveway culverts have been installed for new development projects

Inspection activities conducted by the Town's Stormwater Technician include:

- Town-owned SCMs for functionality, recommending maintenance activities to Public Works.
- Site visits at the request of residents to assess whether their stormwater issues can be addressed by Public Works or if they are the responsibility of the private property owner or the Department of Transportation (DOT).

1.5.3 Capital Improvement Projects (CIP) - Planning and Implementation

Town Planning and Public Works staff are tasked with planning, overseeing, and implementing capital improvement projects (CIP). This presents a major challenge to staff who are occupied with on-going routine needs. The size and effort involved in development and implementation of capital projects can be significant. This has lent itself to a preference for smaller and simpler projects and a lack of resources, financial and staff, to take on larger CIP. This issue will continue to exist into the future. Efforts to break down CIP projects into next steps and phases may provide a better roadmap for larger endeavors, but implementation of stormwater CIP may also need to come at the expense of other project development given limited staff capacity.

1.6 Stormwater Regulations in Black Mountain

The Town also regulates development based on its development ordinances. The Town is currently drafting a Unified Development Ordinance (UDO) to create an updated and consistent treatment of various Land Use Development requirements.

Development requirements with direct relevance to stormwater management include:

- Zoning
- Stream Buffers
- FEMA Floodplain Regulations
- Post- Construction Stormwater Management

<u>Post-Construction Stormwater Management</u>

As a Phase II community, Black Mountain must require Post-Construction Stormwater Control (of stormwater quantity and quality) through the implementation of SCMs, often referred to as Best

Management Practices (BMPs). SCMs must be designed to meet state requirements in the NC Stormwater Design Manual (updated 2020).

The Town regulates new development and redevelopment and has thresholds that trigger post-construction stormwater requirements which are more stringent than state minimum requirements and provide an additional level of protection to residents, businesses, infrastructure, and the natural environment.

Under the stormwater ordinance, private SCMs are established to address post-construction volume and water quality control requirements and include annual inspection, maintenance, and reporting requirements. According to Town documents, in 2021 there are more than 60 private SCMs that have been constructed under Phase II post-construction stormwater ordinance requirements whose management and maintenance must be overseen by the Town.

Stormwater Design Standards

The Town has not previously adopted standards for pipe and ditch sizing, instead relying on design professionals to properly design and size stormwater conveyance infrastructure. Municipalities often adopt minimum design standards to establish a benchmark for design of private and public facilities. Benefits of adopting minimum design standards are to ensure minimum performance and consistency in the design of infrastructure. The LOS recommendations in Appendix C address proposed stormwater design standards and recommend adoption of standards to improve the resiliency of new and redevelopment.

The Town should conduct more strict enforcement of stormwater as-built documentation. As-builts should document elevation information, construction phase modifications, and be part of a sealed document provided by an engineer or surveyor.

1.7 Stormwater Challenges

1.7.1 Addressing Citizen Concerns

Citizen complaints and concerns are an important aspect of identifying and resolving stormwater issues in Black Mountain. Citizen surveys have been conducted annually in recent years to gather information about on-going stormwater management concerns, as well as perceptions. These surveys have helped the Town identify specific and general stormwater concerns as well as programmatic concerns and where actions or educational efforts may help close the gap of expectations and service.

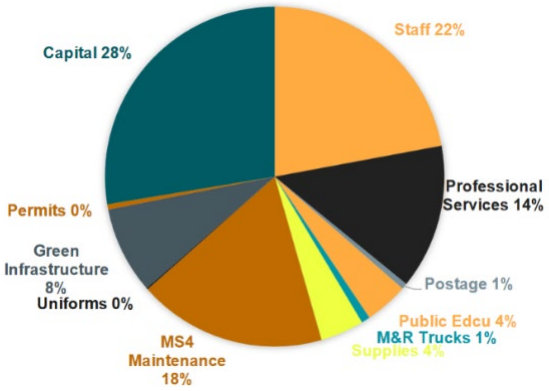
The major areas of concern expressed by citizens participating in the survey include:

- New development – concerns focus on the sentiment that better enforcement and higher standards are needed;
- Lack of or insufficient infrastructure – there are calls for more (or larger) pipe systems as well as curb & gutter, and to enlarge ditches;
- Flooding – heavy rains and drainage for flood prone areas as well as activities to prevent damage to infrastructure and flooding;
- Planning and design – comments suggest the need for detailed infrastructure improvement planning and preventative action versus reactive, as well as more analysis and prioritization of efforts;
- Roadway runoff – prevent runoff from roadways onto private property particularly where it is a threat to homes and infrastructure;
- Storm drain condition / maintenance – vegetation, debris and sediment clogging concerns are common with concern as to the regularity of ditch and drain cleaning activities;

- Ditch condition / maintenance – concerns that ditches do not drain properly or are not maintained;
- Education/assistance – provide resources to residents; and
- Other concerns – cost of extensive underground pipe systems, safety, and washout of edge of roads.

Staff have also indicated that Citizens want to know what the utility fee is being used for and that it is being used wisely. In this document, the Town has worked towards developing a level of service policy that can be implemented to set and measure expectations of the Town's stormwater program efforts – see Section 4 and Appendix C for more information about these efforts.

The Utility Fee generates $360,000 per year, with $84,000 going to meet operational needs of the stormwater program. The adjacent pie chart is an example of how funding may be allocated on a yearly basis.



Extreme rainfall events have become more frequent and result in stormwater flow episodes that are unlikely to be preventable by upgrades to infrastructure. It is recommended that the Town track stormwater complaints based on the date and rainfall event information based on best available gage data.

The Town is unable to complete work on private property except within Town right-of-way for the purpose of maintenance of Town facilities. Likewise, the Town is typically unable to complete work within NCDOT maintained right-of-way and complaints associated with NCDOT facilities are shared with NCDOT.

Historically, runoff from public roads has been outlet to natural drainage pathways on private property. Henderson County has a web page with resources on North Carolina water law as well as other resources. When receiving parcels were developed, these natural drainage courses were piped to create additional space for development. These choices, in some cases, have led to pipe systems under buildings and in other settings where their condition or size can result in problems for private property owners. The Town recognizes the value of exploring options to reroute certain major storm systems that affect many private owners and adversely impact downstream Town infrastructure or natural resources, but in general the Town does not have resource or the mandate to resolve issues present on private property.

New development is sometimes conducted by those unfamiliar with the hydrologic conditions of Black Mountain including the density of natural wet and dry weather springs and drainage features. Development in drainageways is unadvisable as these areas can have high groundwater and stormwater flows may impact developed areas and cause considerable damage during extreme events. It must be understood that there is an implied level of risk associated with building in drainage paths.

Citizens would like to see a focus on conveyance projects. The Town recognizes the need for conveyance upgrades but is equally committed to implementing environmentally sensitive stormwater measures to reduce current and historic development impacts. This balanced approach also considers that conveyance is also an approach that moves the problem downstream and does not resolve all issues.

1.7.2 System Design Standards

The Town has not historically had design standards for stormwater system design. Other municipalities, such as the City of Asheville, dictate the sizing and performance of new private and public collection and

conveyance systems. The Level of Service Recommendations in Appendix C provide an example of typical stormwater design standards.

It should be noted that typical design standards are based on the 2-, 10- and 25-year design storms.

The Town's current stormwater system has not been modeled to evaluate its current hydraulic performance and associated level of service in terms of design storm events. This type of modeling is a complex effort and requires detailed hydrologic modeling as well as high quality mapping data indicating the size, material and elevation of stormwater collection and conveyance features. Mapping and data collection recommendations include the development of this type of data which would be helpful for project development planning by helping with system sizing as well as with the locating of new infrastructure where it will result in minimal impacts to existing utilities and infrastructure.

1.7.3 Challenges from Landscape, Urbanization, Climate Change and Extreme Precipitation

Part of the Town's rugged beauty is the mountain landscape with its dense drainage network of natural conveyances, streams, springs, and wetlands. In addition, larger creeks running through Town are steep and erosive and floodplains have been historically built upon or put into agriculture resulting in a loss of natural flood storage on river floodplains, particularly the Swannanoa River.

Both urban and suburban development significantly alter landscape hydrology by increasing impervious surfaces, piping, or building upon drainage ways, and increasing the connectivity of stormwater runoff to conveyances to rapidly move water off the landscape and carrying pollutants and causing thermal impacts to waterways. In natural landscapes, vegetated areas, ephemeral (dry) conveyance channels, streams, and wetlands serve essential functions in reducing downstream flows. This "green infrastructure" serves natural functions for water quality management, runoff reduction and flood control, as well as providing habitat for terrestrial and aquatic lift.

Climate change, long-term shifts in temperature and weather patterns, will have differing impacts around the planet. In Black Mountain, climate change models predict that we will receive more intense and more frequent precipitation events. An increase in the volume of rain and frequency of rain events will exacerbate any existing issues created by topography. This will increase the demand by residents to have a more robust stormwater system to be able to manage more of the regular rain events.

While the Town has one of the most stringent Post-Construction Stormwater Ordinances in the state of North Carolina, requiring installation of an SCM when adding 5,000 sq ft (about the area of a basketball court) or more of impervious surface, development will continue to result in additional impervious surface replacing previously pervious land covered with either trees, grass, or other plants.

1.7.4 Funding

The priority for the stormwater utility revenue is compliance with the NPDES permit. The establishment of a Stormwater Utility was a key step in maintaining the integrity of the Stormwater Management program in Black Mountain and starting to be able to address unmet needs. The current level of funding is, however, inadequate to address current and future stormwater asset management, replacement and augmentation needs. The Town must evaluate the level of service it hopes to provide its residents and realistically evaluate the cost of deferred pipe replacements and other important projects that have been considered in the past and again by this project, as well as new potential projects. Thirty-five (35) CIP projects have been developed with concept designs or better; in order to implement these projects, the total cost of these projects to the Utility is estimated to be on the order of $15,000,000, approximately evenly split in thirds between hard infrastructure, GI and flood mitigation needs. 115

additional projects have been identified and documented in the projects database, many of them with substantial merit.

1.8 Stormwater Opportunities and Keys to Future Success

The Town has stormwater success stories to point to as waypoints along their ongoing stormwater journey, including early adoption of GI, implementation of strict land development ordinance thresholds, and recent Stormwater Utility establishment to support ongoing operations and CIP development and implementation. In addition, the Town has had interest from many in the community during the stormwater master planning process and support and interest from the community can be one of the greatest assets in Stormwater Management.

Starting in the early 2000's, the Town was an early adopter of water quality practices and GI as a sustainable way to enhance public spaces and add social and environmental value to Town stormwater infrastructure assets.

The Town has implemented a strict development and redevelopment policy to reduce runoff volumes and treat water quality at a low threshold for new impervious surface development to help protect stormwater systems, neighbors, and the natural environment. This does not mean that development has not affected the Town, but its effects have been buffered by this foresight and commitment. Over time, the Town has increased its capacity for good enforcement, and the increasing adoption and understanding of low impact development practices over time has resulted in increasingly effective stormwater management being put into place for new and redevelopment. At least 60 private stormwater practices have been permitted associated with 78 building permits since 2010.

The Town established a dedicated Stormwater Utility in 2021 to comply with the requirements of its NPDES MS4 Permit. The Town has an MS4 Stormwater Management Plan and maintains compliance with all MS4 regulatory requirements. Most recently, the Town established a permanent staff Stormwater Technician position and had their Public Works department recognized for its excellence in receipt of the NC Source Water Protection Award for 2022.

This update to the SWMP has identified, with Town staff input, key areas of continued or new focus that will support the ongoing evolution of the Town's stormwater program, summarized in the sections below. They include continued and enhanced public outreach, laying groundwork for public-private and public-public partnerships to help implement important projects as cost-effectively and holistically as possible, improving programmatic efforts in the areas of data and asset management, root cause evaluation and complaint and problem area tracking, developing policy for LOS and design standards for stormwater system implementation in new development and future Town projects, and creating project evaluation and development tools to help the Town implement larger and more complex projects.

1.8.1 Public Education

The Town recently hired a Stormwater Technician who has a significant role interfacing with the public, increasing service to the public, and providing education about stormwater management in Town.

One program the Town has offered in the past and again this fall is the Citizen Academy. This and other outreach and education help citizens understand the functions of the Town's departments involved in stormwater management as well as what individual landowners can do to contribute to the challenges of stormwater management. RiverLink assists with workshops and has also developed the WaterRICH Guide for homeowner scale stormwater management and rainwater harvesting. In stormwater surveys, about 1/3 of participants expressed an interest and willingness to donate stormwater easements to the Town for installing rain gardens or similar practices which may be eligible for water quality funding to implement.

The Town uses Rain Garden Workshops and other educational outreach to encourage homeowner-scale stormwater practice adoption

1.8.2 Partnerships

As discussed, Town jurisdiction is limited to Town-maintained roads and Town-owned property, as well as the potential for the use of drainage easements in the future. Many existing pipe systems leave Town jurisdiction and will require partnerships with NCDOT, Norfolk Southern, or private property owners to cost-effectively address deficiencies.

Project partnering needs should be explored and vetted early in the project development process and it is likely that a project-by-project approach must dictate specifics on outreach activities. Often, specifics of interest to landowners are lacking at preliminary stages in the process. However, an emphasis can be placed on what is known, on requested coordination such as access for survey and assessment activities, on anticipated project timelines and other factors, including unknowns or discussion of change and change management that will help with development of trust and understanding in the process.

It is critical to schedule check-ins with landowners and partners during periods of prolonged inactivity. This helps both parties share evolving information and will help the Town maintain good rapport.

Tools that should be evaluated for applicability with regards to partnerships and working with other public partners, or private entities include permanent drainage easements as discussed in Section 1.5.3.3, temporary construction easements which consist of recorded maps and language to document the terms of temporary access to complete projects, and conservation easement which are voluntary easements that restrict development rights with the opportunity for reserved future rights to be maintained. Conservation easements must be upheld by a long-term steward and are most typically required for NC Land and Water Fund (LWF) projects as a stipulation for funding ecological restoration projects. On public land, deed restrictions are an alternative to conservation easements for NCLWF projects.

Where applicable, the anticipated cost of easement or land acquisition should be developed when comparing viable project alternatives and the life-cycle cost to the Utility and other public benefit should guide decision making, when clear.

1.8.3 Programmatic Initiatives

This update has identified key challenges and opportunities associated with programmatic development, routine maintenance and small project implementation, and CIP projects implementation that will help

the stormwater program further develop and refine its routine management & operations, as well as provide a road map and critical information for stepwise development of complex CIP projects.

Primary programmatic needs identified, and discussed in more detail in subsequent sections, include:

- Improve asset inventory mapping;
- Conduct conditions assessment of existing assets;
- Use new tools to tie concerns and complaints to storm frequency and root cause evaluation;
- Implement new guidance to enhance open channel (ditch) management;
- Evaluate LOS recommendations and adopt LOS policy including stormwater design standards; and
- Use CIP planning and development conducted under this SWMP Update to take next steps in implementing project.

1.8.4 Investment Strategy

The Town will need to develop a more comprehensive investment strategy to generate adequate funding for necessary stormwater investments. The Stormwater Utility is the primary revenue stream to funding on-going programmatic needs and requirements as well as future investment in repair, replacement, and new infrastructure. Given the anticipated costs, the Town is encouraged to continue to use grants and explore no-interest loans through DWI, but also to explore debt service and potential Stormwater Utility increases to funding CIP projects. Additional discussion of funding is discussion in Section 6.0.

1.9 Stakeholders

As part of completing the SWMP Update, a project stakeholder group consisting of representatives of Town Council, local businesses, homeowners, Public Works, Planning and Emergency Management staff was established. The group met twice during the project to review target planning, project development efforts, and provide input on resident and business concerns.

The Town also requested public input as part of the SWMP Update. Public surveys, outreach and public meetings were held to share the purpose of the plan with citizens and solicit feedback and input on general and specific stormwater management concerns. Town staff also did outreach to nearly 100 downtown businesses, discussing concerns, requesting survey participation, and sharing Town stormwater management information.

The last two years, the Town has conducted citizen stormwater surveys in order to gather information about stormwater concerns and perceptions. Frequent concerns have been documented and organized in Appendix B.

Several datasets developed by the SWMP Update are being made available to the public on the Town's GIS map.

1.10 Prior Implementation Efforts

The Town has completed many of the efforts identified in the original SWMP (McGill, 2009). Notable among these efforts is the completion of multiple phases of the Tomahawk Branch restoration concepts proposed to reduce sediment flowing into Lake Tomahawk. The projects have received significant funding contributions from state grant sources. The Town continues to use the USRWMP to obtain EPA (Environmental Protection Agency) 319 grant funding to implement water quality treatment practices in and around Town that are intended to address the impairment status of the Swannanoa River as well as improve the quality of life in Black Mountain.

The Town is doing consistent routine system operatons and management that often goes unnoticed, as described in Sections 1.4.1. and 1.5.3.4. In addition to conducting routine inspection and maintenance, the Town Public Works department has completed the following replacement and repair projects within the last 12 months:

- New inlet box and stormwater pipe behind the Primary School along Charlotte Street;
- Headwall and culvert entrance repair at the intersection of N. Park and S. Park Lane;
- French drain installation to address seepage on S. Park Lane;
- Storm drain repairs at S. Cherokee & Tomahawk Ave;
- Storm inlet and culvert installation at Sutton & S. Ridgeway;
- Culvert installation at the lower end of Hiawassee Ave; and
- Culvert and catch basin installation near 300 block of East State St.

This update has prepared a database for completed projects as well as for those under development. This database will serve as a valuable resource to support project development and long term project management. The database can also be used in the future to highlight accomplishments.

2.0 Review of Available Data and Recommendations for Data Management

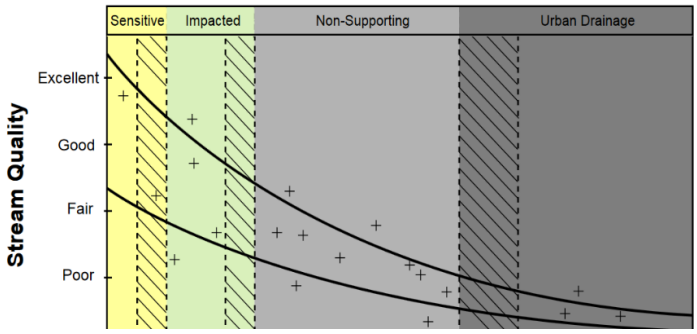
Accurate, comprehensive data and efficient data management are critical to proactive stormwater management. Having complete and accurate environmental and asset inventory data can help predict and address current and future stormwater management issues. Several useful data sets are discussed in this section with reference to their role in stormwater management. Discussion of the currently available data and recommended data development initiatives to support future program development is also provided. Additional information (metadata) on data collected or developed under the SWMP Update is provided in Appendix A.

2.1 Watershed Data

2.1.1 Land Use

Rainfall carries stormwater runoff through natural and manmade features on the landscape into streams and rivers, and eventually to the ocean. Urban development on the landscape can significantly change the hydrologic cycle to the detriment of stream quality. Increased impervious cover (roads, parking lots, roofs, etc.) has been correlated to reductions in stream quality. This is the result of increased runoff and pollutant delivery from impervious surfaces. Hydrologic impacts from increased impervious surfaces include decreased infiltration and removal of natural storage, the distributed capture of rainwater in upper portions of watershed, by vegetation and depressional areas on the landscape.

Increased water quantity in streams and rivers from stormwater runoff causes banks to erode and fail, can undermine infrastructure, like bridges and culverts, and can lead to more frequent flooding. Runoff from impervious surfaces can carry harmful chemicals, *E. coli*, sediment, trash, and even thermal pollution, thereby threatening aquatic life and other target human and environmental uses of water.



Source:

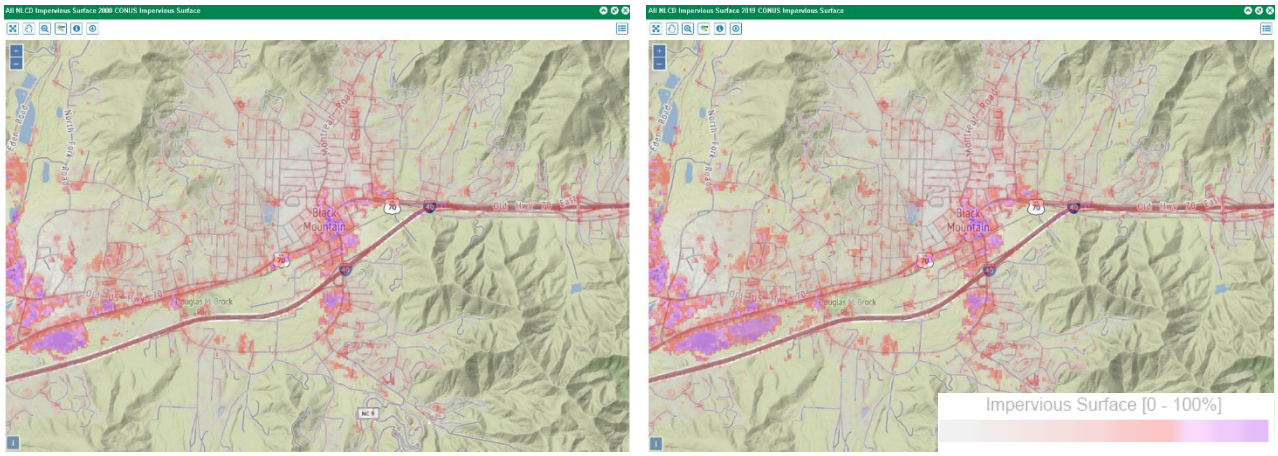
https://chesapeakestormwater.net/wp-content/uploads/2022/07/3310-3.pdf

Black Mountain is home to sensitive and rare ecosystems, thus impacts from stormwater pollutants are a concern for biodiversity as well as use of streams for fishing and recreation including bodily contact (e.g., swimming). The Swannanoa River has been documented as impaired below Town through biological sampling results. It is important that the Town continue its efforts to offset land use change with post-construction stormwater management and to invest in GI and water quality improving measures (SCMs and stream restorations). For properties developed before post-construction stormwater regulations were in place, voluntary stormwater retrofits are critical to addressing impervious surfaces and other land uses that threaten water body integrity for human and biological use. Intact stream buffers have also been shown to mitigate the impacts of impervious cover on stream health when cover is less than 10%. The impervious cover model is a simple model that can prioritize subwatersheds for projects, or develop realistic goals on a subwatershed-by-subwatershed basis based on existing percent impervious. Currently, the Town does not have detailed subwatershed mapping to compare relative characteristics and risk of subwatersheds and specific stream reaches. In North Carolina, all waters must meet minimum use classification of Class C, defined as "Waters protected for uses such as aquatic life propagation, survival and maintenance of biological integrity (including fishing and fish), wildlife, secondary contact recreation, and agriculture. Secondary contact recreation means wading, boating, other uses not involving human body contact with water, and activities involving human body contact with water where such activities take place on an infrequent, unorganized, or incidental basis."

The USGS Streamstats web application was used to evaluate Tomahawk Branch at Black Mountain Rec Park where it confluences with the Swanannoa River. Tomahawk Branch was 5-6% impervious based on 2001 and 2011 land use data. Swannanoa River above the confluence with Tomahawk Branch was just over 3% impervious based on 2001 and 2011 land use data. Flat Creek above the confluence with Swannanoa River was just over 2%. At the downstream Town limits, the Swannanoa River was 4-4.5% impervious between 2001-2011. Streamstats has not been updated with the 2019 land use data set but undoubtedly these percentages has increased some during that period.

2.1.1.1 Zoning & Land Use Trends

Existing zoning data and the future land-use datasets were reviewed during this project, but it was beyond the scope of this project to model future demands on the stormwater system based on targeted



Percent Impervious Change between 2008 (left) and 2019 (right) (Source: https://www.mrlc.gov/viewer/)

development patterns. One activity recommended by this study is to consider evaluating system-wide capacity with modeling. As part of such an evaluation, it may be prudent to consider both existing and future flows within systems that serve areas proposed for additional or re-development.

2.1.2 Watershed Hydrology

Development on the landscape can significantly change the hydrologic cycle by removing or reducing capture and storage of rainfall and stormwater runoff that occurs on unaltered landscapes through interception by vegetation, in shallow ponding areas, and via the soil's absorption capacity. Water that is no longer stored on the landscape, or infiltrated, runs off and contributes to flow in natural and manmade conveyances, including ditches, streams and rivers. Treating impervious areas near their source is a key strategy in effective stormwater management, and restoration of streams and floodplains can provide downstream mitigation of urbanization. Flood storage on floodplains can also be altered by prior encroachment, fill or by streambed downcutting through erosive processes that often result from historic and ongoing land use change. Increased runoff in streams perpetuates a cycle of geomorphic change whereby streams become disconnected from their floodplains and no longer access them at the same frequency. This results in loss of floodplain storage and increases in downstream flow.

2.1.2.1 Drainage Basin Delineation

Black Mountain's watershed comprises all the land that drains to the furthest point along the Swannanoa River within Town limits, which is immediately above its confluence with the North Fork River. The watershed is approximately 22 square miles, however the Town occupies only approximately 6 square miles of that area. Buncombe County and Montreat share in the challenge to address impairments within this area, which is the subject of the recent *Upper Swannanoa River Watershed Management Plan*. A watershed-wide approach to solving water quantity and quality requires working collaborative efforts amongst stakeholders.

The Black Mountain Watershed was broken in subwatersheds (or "subcatchments" or "subbasins") of an average size of 20-acres using QL1 LiDAR topography and modeling routines in PCSWMM to guide development of proposed projects and studies under the SWMP Update. Delineation at a large scale is useful to see the watershed broken out into regions that can be used in the future to identify subwatershed characteristics and to plan management activities. Subcatchment delineation was completed using elevation data derived from QL1 LiDAR in the application PCSWMM. The output dataset called "TOBM_Subcatchments" is listed in Appendix A and is being provided digitally to the Town.

2.1.2.2 Headwater Streams and Ephemeral (Wet-weather) Conveyances

The Black Mountain Watershed is made up of approximately 83 miles of streams and conveyances. Streams are categorized and regulated based on whether they have perennial (year-round), intermittent (seasonal), or ephemeral (wet-weather only) flow. Perennial and intermittent streams fall under the Clean Water Act regulations and are therefore jurisdictional waters under the regulatory authority of the Army Corps of Engineers and North Carolina's Department of Environmental Quality (NCDEQ). Wetlands are also protected in this way. Wetland delineation and stream determination are typically completed by environmental professionals familiar with the federal and state regulations and methods required to document and map these features. Work, such as bank grading or channel realignment, in jurisdictional waters requires coverage through state and federal permits.

Prior to the Clean Water Act, streams and wetland seeps in Black Mountain may have been piped, channelized, or otherwise altered, changing the natural hydrology of the landscape, and resulting in streams routed into the Town's closed and open conveyance system.

Ephemeral channels only have flow during and immediately after rainfall events. The mountainous topography and temperate climate of Black Mountain result in a high-density drainage network with many ephemeral drainages and channels that convey stormwater. As development pressure increases,

remaining parcels are more likely to be in natural drainageways and other areas that are more challenging to develop and which also play a key role in the overall watershed hydrology of the watershed.

Flow pathways have been mapped based on QL1 LiDAR topography and modeling routines in PCSWMM and are being furnished to the Town in a dataset called “WDT_Channels” (see Appendix A). The modeling is typically more accurate in natural areas and can be less accurate where drainage manipulation and microtopography (e.g., curbs, ditches) are present. Never-the-less, these flow pathways are a useful cue in evaluating whether an area lies within a natural or manmade drainage corridor. Predicted flow paths should be field verified.

The SWMP Update also makes use of a hydrographic (flow pathway) mapping dataset that combines the USGS NHDPlus High Resolution for NC (Dec 2018) and the CGIA NC Stream Mapping Program data (2005) which includes high density stream network delineation for WNC (NHD-WNC).

These two datasets include even ephemeral (wet weather) drainages and should not be confused with jurisdictional streams, or ‘blue-lined' stream approximations which are shown on 1:24000 and other USGS topo quadrangles. The datasets also overlap considerably, and the WDT_Channels data may be most useful as an alternate prediction of flow pathways in complicated areas, or high on slopes above the limits of the NHD-WNC mapping.

2.1.2.3 Regulated Floodplains and FEMA Data

Larger streams and rivers are also regulated under FEMA given their potential for causing flood damage. Land within the FEMA regulated floodplain is subject to restrictions that minimize or prevent disturbance that could adversely affect flooding in adjacent areas. A local floodplain development permit is required to conduct grading, building, and other activities within regulated floodplains.

In unaltered streams and rivers, high-flow events that occur every 1-2 years on average, access their adjacent floodplain and spread out into low lying areas. This process stores water, reduces downstream flooding, and dissipates the energy of the flow, thus helping protect the integrity of the stream channel. Building or other activities within natural river floodplains are subjected to this regular flood inundation to the detriment of the user and to the natural processes of the river.

During riverine flooding, water in adjoining tributary streams, and in natural and manmade conveyances (including pipe systems), can back up from the high water. This backwater reduces the flow capacity of the system and can result in flooding impacts. Understanding the impacts of backwater on system performance and flooding is an important aspect of stormwater management design and communication of risk to the public.

The Town maintains culverts and bridges that span FEMA-regulated streams. Modeling data is typically available for these streams and can be used to evaluate the hydraulic capacity and

FRIS Mapping of FEMA Floodplain, Floodway and Buildings with Flood Risk

frequency of road flooding. To date, available data has not been used to conduct this type of assessment. Other crossings maintained by NCDOT may also be analyzed using FEMA models. FEMA produces maps for studied streams that are used to regulate development and understand the risk to existing structures that lie within floodprone areas. Building footprints and elevation data have been developed by the North Carolina Floodplain Mapping Program (NCFMP, North Carolina's delegated FEMA program). This data, along with building risk data developed through GIS modeling of inundation frequency, depth and building data, was requested from NCFMP and has been provided to the Town for future use. Useful online tools pertaining to floodplain management and data include:

- Flood Inundation Mapping and Alert Network (FIMAN) https://fiman.nc.gov/#
- Flood Risk Information System (FRIS) https://fris.nc.gov/fris/Home.aspx?ST=NC

These sites have data that is both useful for the Town, emergency management personnel, and homeowners. FIMAN predicts flooding levels and the timing of flood peaks. FRIS has modeling and mapping data as well as information about building flood risk.

2.1.2.4 Rainfall Data

The national Weather Service (NWS) operates a weather station with daily rain gauge at North Fork Reservoir (identified as 316236 (Coop), USC00316236 (GHCN), BMTN7 (NWS LI)) that has been in operation since 1942. Another gage near Black Mountain was discontinued in 2020.

Both of these stations have precipitation data and normals that can be graphed and downloaded at https://xmacis.rcc-acis.org/.

To use the site, the precipitation accumulation graphs can be plotted as follows:
1) Choose Single Station -> Graphs -> Accumulation Graph
2) Under Options Selection -> Variable:, select Precipitation.
3) Under Additional lines:, you can plot whatever you would like. Option to plot Normal, Highest year, and Lowest year, but Other years gives you the flexibility to choose whichever years you would like.
*4) Under Station Selection -> Change CWA select "**GSP - Greer/Greenville, SC**".*
*5) Under Station Selection -> Station select "**NORTH FORK 2**" or "**BLACK MOUNTAIN 2 W**".*
6) Click Go.

In addition, Citizen rainfall data is available through the Community Collaborative Rain, Hail & Snow Network (CoCoRaHS). The primary active station with data is Station NC-BC-105: Black Mountain 1.3 NNE (35.6319, -82.3221) which has been in operation since April 2015 and collects daily rainfall totals. Summaries of precipitation by date can be obtained by entering station ID information and time period of interest into the summary query table on this website:
https://www.cocorahs.org/ViewData/StationPrecipSummary.aspx

2.1.2.5 Hydrology Data Recommendations

A coarse hydrology dataset was developed during this project using QL1 LiDAR. Flow paths were generated, and a threshold analysis determined which flow paths are likely streams based on size of contributing area. This dataset needs further refinements to fix errors in the stream line generation and needs to be field verified. Using LiDAR to create flow path data is less accurate in developed areas due to drainage alterations from roads, bridges, and culverts. Once the dataset is more robust, perennial vs. intermittent vs. ephemeral streams can be broken out into separate datasets. The ephemeral channel data could be helpful in educating the public on backyard stormwater management and help property owners understand what to expect if an ephemeral channel runs through their property. The flow path layer is also provided and can be helpful during development of stormwater projects.

It is recommended that the Town improve stream and wetland mapping across the watershed. Mapping of known water quality impairments related to streambank erosion or other stressors, as well as aquatic connectivity issues related to road and utility crossings of streams are important aspects of enhancing and restoring biological integrity to impaired and unimpaired streams alike.

2.2 Stormwater System Asset Data

2.2.1 Open System Asset Mapping

2.2.1.1 Open System Ditch Network

Black Mountain's stormwater network contains a substantial number of open channel conveyances, mostly in the form of roadside ditches under Town or NCDOT maintenance. Challenges exist with these open channel networks, however vegetated channels can also provide greater capacity and more water quality benefit than piped systems. Currently, the Town does not have mapping for open channel networks. Citizen concerns that center around the management of Town ditches include:

- Lack of maintenance
- Ditch network connectivity
- Excessive use of ditch digging to solve issues

Town staff concerns related to ditch management include:

- How to increase residence acceptance and understanding of ditch maintenance best practices and their role in helping maintain ditches free of leaves and debris,
- How to maintain ditches such that they are not excessively deep or erosional, which can result in safety or water quality concerns,
- How to identify and prepare high priority ditches ahead of extreme weather events.

It is recommended that ditch networks be mapped to understand this prominent aspect of the Town's conveyance system. Mapping will help the Town understand its maintenance and rehabilitation burden, track networks with repetitive problems, and identify pinch points, discontinuities, erosion, and other issues. Manual remote sensing and field reconnaissance will be necessary to map existing ditches through the Town and identify ditch network issues and opportunities. Desktop analysis should include right-of-way width research, ownership (maintenance jurisdiction) categorization of roads and ditches, and the use of LiDAR elevation and slope analysis data to perform preliminary mapping. Field activities should include verification of desktop mapping and assessment of condition and performance factors (size/shape, roadway build-up, driveway culvert density and condition, etc.).

This topic has been given a more thorough review and discussion in Appendix F. The Town also needs cooperation from residents to maintain this network for both environmental, safety and flood benefits. Clogging from leaf and yard debris is a frequent challenge that affects system performance and landowners should continue to be educated on how to play their part in system maintenance, or at least in avoiding counterproductive behaviors.

2.2.1.2 Open System Ditch Network Data Recommendations

Important data related to management of stormwater ditch networks include:

- Continuity/connectivity of networks;
- Functional issues such as inadequate size or slope;
- Repetitive maintenance issues; and
- Safety or water quality concerns.

Improved mapping and tracking of frequent maintenance and functional issues will help target management activities which may include but are not limited to education, cleanout, rehabilitation, replacement, and new open system conveyance projects. GI opportunities may also be present along ditch networks and could be mapped where identified. A prime example is improving ditch infiltration and subsurface storage of runoff through addition of sand-based media; this may be particularly effective high in ditch networks where runoff volume is manageable. Challenges for this type of management include utilities, potential clogging of media with fine sediment, and private property owner coordination.

2.2.2 Closed System and Outfall Asset Mapping

All existing data described below has been compiled and described in Appendix A. In this Section, a summary of these data sets is provided with discussion of the potential uses and shortcomings, as well as recommendations on their use and potential enhancement, where applicable.

2.2.2.1 Prior Mapping Efforts and Existing Data

Land of Sky

In 2015, Land of Sky conducted field and GIS mapping of stormwater structures in Black Mountain, including:

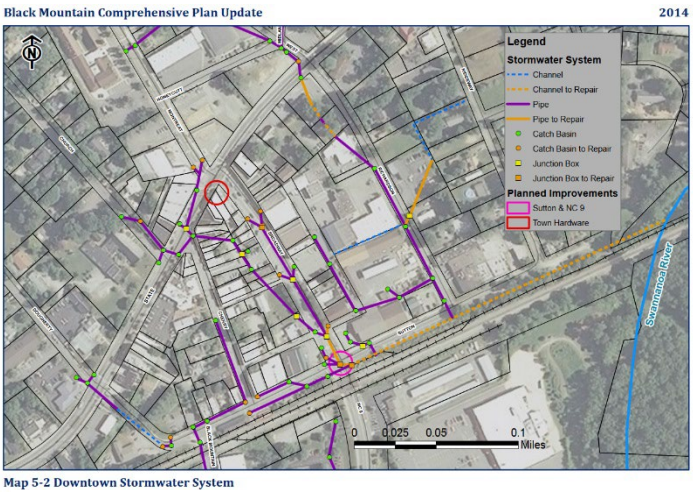
- Structures: inlets, junction boxes, and outfalls; and
- Pipes.

The focus is understood to have been inventory of Town-owned infrastructure, which is a good starting point but leaves an incomplete picture of areas of the conveyance network where many private systems are interconnected with public systems. This data continues to be maintained by Land of Sky and is housed on the Town's ArcGIS Online server using a Town log-in to do so. The Town may request updates to the data based on observations, and Land of Sky will execute those updates within the data set. The data set contains size, material, and measurements from the top of structures down to the invert of the outlet pipe ("drop down measurements") in most cases. This data is not in a format that directly translates to absolute elevations and is therefore of more limited use for system modeling or design tasks in its current format. Furthermore, inlet pipe elevations are not provided. The data does not have supporting metadata to describe the methods and shorthand used in the data development.

The Town should develop information to supplement the dataset and explicitly define fields, collection methods, and other relevant quality control practices.

McGill

During the 2009 SWMP, McGill provided a submeter survey of structures and described the typical types of inlet configurations within the Town's system. Due to its continued relevance, this information, found in Section 3 of the McGill report, has been revisited in Section 1.4.2 of this report. This mapping appears to have been used in the 2014 Comprehensive Plan Update, which may



Stormwater Asset Map from 2014 Comprehensive Plan Update

be a relevant source of digitized data – the original McGill data could not be located in digital (shape file or geodatabase) format.

NCDOT

NCDOT maintains mapping on structures within their jurisdiction. NCDOT datasets were obtained from publicly available GIS servers. The data is limited and contains some, or many, of the structures present, but in many cases not the connecting pipe systems.

2.2.2.2 Closed System and Outfall Asset Mapping Data Recommendations

Recommendations are being made for closed system and outfall asset mapping data. The primary recommendations are as follows:

- Attempt again to locate 2009 McGill data in digital format;
- Update Land of Sky data for accuracy through Town staff or volunteer efforts
    - Prioritize systems based on priority projects or other rationale;
- Couple mapping and verification efforts with new data collection based on the database field recommendations provided in Appendix A; and
- Utilize the highest level of accuracy the Town can efficiently provide but prioritize accurate mapping of system connections and components over accuracy of location and elevation data. Elevation data to within 3-6" (except where slopes are exceptionally low) and location data to within 3-5' will provide comparable function of more accurate data for modeling and preliminary design analysis.

2.2.3 Other Data

2.2.3.1 Jurisdiction Data

Parcels

Statewide parcel data has been provided in the AGOL application provided to the Town. Data information is provided in Appendix A.

Drainage Easements

As presently understood, very few or no drainage easements exist for which the Town has reserved access rights to maintain drainage features. The Town may wish to conduct further research on whether any recorded drainage/maintenance easements exist to better understand the Town's maintenance burden on private property within such easements.

The Town may wish to establish a policy for when and how drainage easements should be established. One example may be where the Town is given permission to route components of a Town-maintained drainage network through private property and requires some level of long-term access to maintain and replace the system.

NCDOT and Town Maintained Roads

NCDOT maintained roads have been identified using an NCDOT-published map layer. Other roads are maintained by the Town of Black Mountain unless they are private. The Town does not have a map of private roads published to ArcGIS online.

The Town has a streets dedication policy that describes the requirements for streets to be adopted by the Town. The dedication policy requires a minimum of 30 feet when previously platted, or 40 feet where no plat exists.

The Town operates an extensive, but unmapped, network of open channel ditch conveyances along Town maintained streets. It would be useful for the Town to conduct the following mapping and data collection or policy development:

- Map Town maintained streets and private streets;
- Map right-of-way widths, where platted;
- Establish a policy that where no right-of-way exists, a street width policy of 40 feet shall apply for purpose of stormwater ditch maintenance; and
- Map open channel ditch network along Town, NCDOT, and privately maintained streets, in that order of priority (see 2.2.1.2).

Inspection and Maintenance Mapping

- There is a list of maintained inlets that are cleaned out before and after all storm events; and
- There are work orders for all Public Works activities – an example of work order format and activities in provided in Appendix B.

2.2.4 Green Infrastructure (GI) Asset Mapping

GI refers to nature-based or naturally occurring features that provide ecological, hydrologic, water quality, or other environmental services and/or functions. Many GI assets in the Town are captured by the Projects Database that was developed under the SWMP Update to document completed projects of all types. Other GI assets may be existing assets that perform functions which benefit the Town and its residents directly and indirectly. They may include things like wooded or vegetated parcels, to parcels that function for water or flood storage, to reaches of streams that provide habitat, water conveyance and other benefits. For example, in Greenville, SC, stream reaches within City limits have been divided into 500-foot reaches and each reach is categorized by its probability and consequence of failure. In this way, degraded reaches can be prioritized for restoration to reduce risk to infrastructure and improve water quality. In Durham, NC, high quality private or public parcels that play a role in providing environmental services are denoted during watershed evaluations as “Urban Gems” as a way of identifying them for their future preservation potential. In this way, often-times difficult to develop parcels are recognized for their existing value of providing environmental services.

Inspection and maintenance of GI, including and especially completed SCMs and stream restorations, can be tracked using a related database for this type of activity. Related tables can tie assets to management events and show the management history of a given asset. The Town utilizes a system called iWorQ, as described in the next section, to oversee the management of private assets and, if they are not presently, could utilize this system to inspect and prescribe necessary maintenance of Town-owned GI assets. The Town should seek assistance for the development of inspection protocols and management of stream restoration projects and identify appropriate frequency and type of maintenance of these investments. One of the most critical aspects of stream restoration success is vegetative success and the long-term establishment of deep-rooted woody vegetation and canopy. If nothing else, efforts to further this end should be a focus of future planning and resource allocation in this area. Local groups and volunteers may be willing to assist with maintenance projects.

2.2.5 Condition Assessment

Condition assessment has not been conducted on a systematic basis except as part of the 2009 SWMP. Data from that effort is no longer digitally available and pdf maps have only limited information and value. The Town conducts some condition assessment as part of work orders and expansion of this practice could help the Town develop a more robust set of condition assessment data. This data is critical in prioritizing preventative maintenance and replacement.

2.2.6 Data Management Platforms

iWorQ System (iWorkQs)

Since 2021, the Town has started to integrate iWorQs as a stormwater work order management software, SCM inspection management, illicit discharge investigation, and permits/plan review, among other things. The Town can pull maintenance summaries which are supported by a database of relevant information. Notably missing from this information is latitude/longitude information, although site location information is available based on address or street data. Data that is currently collected includes: work order request type, maintenance type, quantity of sediment/debris removed, and general comments. Town staff have indicated that the system has an internal mapping feature, but which is not geared for more outward (public) facing uses. The database is easily editable and can be used to track information over time.

The Town prefers to use this platform as the primary internal tool to avoid redundancy and associated duplication of efforts. The Town indicated that in the future they would like to further evaluate how data can be shared to/from iWorkQs for public information sharing and updates.

ArcGIS Online (AGOL)

AGOL is a cloud-based mapping interface where organizations can publish, share, and utilize other shared data for mapping, data collection, and other more sophisticated operations and applications. The SWMP utilized a map application viewer in AGOL to support the SWMP Update. The application was used to compile and borrow from existing cloud-based mapping data relevant to stormwater planning and published by reliable sources, to, map and store citizen complaint and areas of concern identified by staff, and to develop new datasets, notably including topographic data, CIP project development data, and subwatershed mapping.

The map application will continue to be used as an internal tool by the Town. Data is currently housed by Wildlands Engineering's organizational account and the Town has a login for specific internal data sets and applications; other data is publicly available on AGOL. Relocating this data to the Town's AGOL organization account should be a future priority. Specifics datasets have been made publicly available due to their potential utility to private landowners as well as for educational purposes. It is anticipated that these datasets will be made available via the Town's public AGOL map:

https://bmt.maps.arcgis.com/apps/webappviewer/index.html?id=b71b29247aa14a47a8a8a64c49de0dc0

The town has redundant stormwater data on AGOL which should be removed and archived or disposed of in favor of quality-controlled asset data that is currently published by Land of Sky via their AGOL organizational account on behalf of the Town.

2.2.7 Drivers for Asset Data Management

The rationale for further investment in data management is for the Town to enhance its capabilities to proactively manage its system and respond to complaints within the Town with efficiency. Understanding the extent, connectivity, ownership, and other information (materials, age, size,

condition, elevation, etc.) about assets is key to effective and efficient management of the system, interfacing with the public, and informed decision making. Asset management begins with accurate mapping but extends next into condition assessment and lifecycle planning. Assessment of asset vulnerability relies on a suite of data, most of which the Town does not currently collect or maintain. This same data would be valuable for more comprehensive hydraulic performance modeling and/or planning and preliminary design of CIP projects.

There are data gaps and conflicting mapping information within the Town's current stormwater data sources. Additionally, examples of incorrect mapping data were found in both the 2009 data and more recent data leading to the conclusion that part of mapping efforts should include the verification of existing data and the establishment of methods to document where verification has been performed. Collection of supplemental information including elevation and other data would be a logical activity to pair with verification efforts to enhance the utility of stormwater asset data.

The Town may wish to consider how to establish an asset data management system that more seamlessly integrates between Public Works staff and the Town Planning Department. One option is to work with iWorQs customer support to evaluate typical workflows and integrate a mapping component that would allow the Town to visualize, track, filter and otherwise analyze the location and distribution of Public Works efforts. Furthermore, as assets are maintained, repaired, or replaced asset data could be updated to reflect these changes.

The Town may also wish to track complaints spatially. Other sections of this report discuss the use of spatial tracking and tying complaints to storm events, where relevant, to improving system management and identification of CIP and other operational needs.

This type of tracking and analysis is difficult and inefficient to do manually across an entire stormwater network. Putting effective asset management systems in place would support multiple objectives of the stormwater department and be a power tool for rapid and ongoing prioritization and decision-making for projects and O&M priorities. Additionally, the system could be set up to support management of MS4 permit requirements and in the future could be adapted to have a public facing component to communicate both what the Town is doing for stormwater and the proposed CIP projects.

3.0 Stormwater Management Level of Service

3.1 Developing Level of Service (LOS) Goals

The Town of Black Mountain created its Stormwater Utility in 2021 as an enterprise fund to comply with regulatory requirements, address infrastructure challenges, and better meet the needs of current customers and proactively manage growth. LOS goals are often established with respect to stormwater utility planning to create targets for defining priority program elements and targets. A memo was prepared in Appendix C that describes recommended goals and metrics for LOS, developed with feedback from Town staff and consideration of stakeholder input. These metrics include permit compliance and natural resource protection, community/customer service, and system performance. If adopted, the LOS metrics recommend tracking and reporting activities, complaint management and tracking, flood hazard mitigation efforts preliminarily focused on education and awareness, system performance criteria with mapping, assessment and improvement targets, and new stormwater design standards to be required for new public and private facilities.

3.2 Permit Compliance and Natural Resource Protection

An important LOS component of the Town's stormwater program is to maintain permit compliance. The Town also recognizes the importance of going beyond the minimum control measures specified by the permit in order to more fully embody the community's expectations with respect to its waterways and environment. The Town has collaborated with the consultant on developing metrics that could be used to track efforts to maintain clean water and healthy aquatic environments and which may be used to demonstrate providing the expected level of natural resource protection.

3.3 Factors in System Performance

The implementation of design standards would help the Town to establish a baseline for performance of new and replacement infrastructure. There are multiple factors that affect the performance of infrastructure under different scenarios. Existing infrastructure is Black Mountain is not currently mapped with adequate detail to evaluate hydraulic performance. Only limited condition assessment has been performed on the system over the last 10-15 years and even this is not well documented such as to be of use. Mapping and assessment have been identified as priorities to better understand the condition and be able to evaluate performance of small or large parts of the system. Further complicating these efforts is that systems are tied into private systems which may affect overall performance in some cases.

3.3.1 Age, Size, Condition and Connectivity

Improving system mapping will allow for more detailed evaluation of the age (commonly estimated by the material type utilized), size and connectivity of public and private systems. Where private systems are directly connected and potentially affect the performance of upstream or downstream public infrastructure, mapping and assessing the condition of private lines is justified and recommended to help better understand factors affecting system performance, deficiencies, and potential solutions.

Understanding the condition of existing systems is a crucial factor in prioritizing work. For the management of stormwater assets, high prioritization is often given to replacement or new infrastructure needs where the combined likelihood and consequence of failure are highest. Evaluation of mapping data and condition assessment data are often the basis for the likelihood of failure and are also the basis for system modeling which is another common dataset developed to supplement evaluation.

3.3.2 Extreme Weather and Flooding

The increased frequency of extreme weather as part of climate change is an evolving challenge. Stormwater systems have not traditionally been designed to convey infrequent large events. Due to climate change, these large events triggered by more intense rainfall or larger rainfall volume totals, are becoming more frequent. There are often practical geometric and economic limitations on sizing stormwater systems to handle the resulting flows from larger events. These are compounded in highly developed areas by the cost of removing and replacing existing infrastructure in order to accommodate larger systems. For events that exceed system design capacity, the system will be overwhelmed.

The Town would like to build replacement and new infrastructure to meet future needs, but climate change is raising the bar with the new normal being a moving target. The best short-term activity to meet new challenges posed by evolving climatic norms is establishing a better understanding of the most vulnerable components of the system and evaluating failures that are more likely to result in threats to safety and critical infrastructure. This will also help with emergency planning, which is and will continue to be a necessary part of stormwater considerations.

Without increased funding, the Town cannot do important planning, design, and replacement activities to address problems of increased frequency and complexity, nor other emergency planning that could improve preparation for inevitable events that exceed system capacity.

One tool being provided to the Town under the SWMP Update is a storm frequency calculator that will allow staff to enter the rainfall depth and duration to evaluate storm-related complaints and observations against storm frequency. Understanding the impacts of storms of differing magnitude and frequency will help the Town with future prioritization and decision making and with being able to categorize concerns as extreme weather related versus repetitive and routine issues.

The LOS memo in Appendix C has floodplain management-related metrics that would help the Town establish a greater priority on these topics and put in motion the development of various tools that would help the Town and private landowners be in a position to be more flood resilient. It is recommended that the Town have their stormwater technician cross-trained in at least basic floodplain management considerations due to the significant practical overlap.

3.3.3 Inspection, Maintenance & Minor Replacement

Based on assessment of work order reports for approximately 9 months between July 2021 – March 2022 (see Appendix B), storm drain inspections occur on average on a biweekly basis to review storm drain clearing needs around Town. During this period, 88 work order activities were completed – an average of approximately 1 activity per 2 days. The following activities/issues were performed/addressed and documented in the iWorQs work order system during this period:

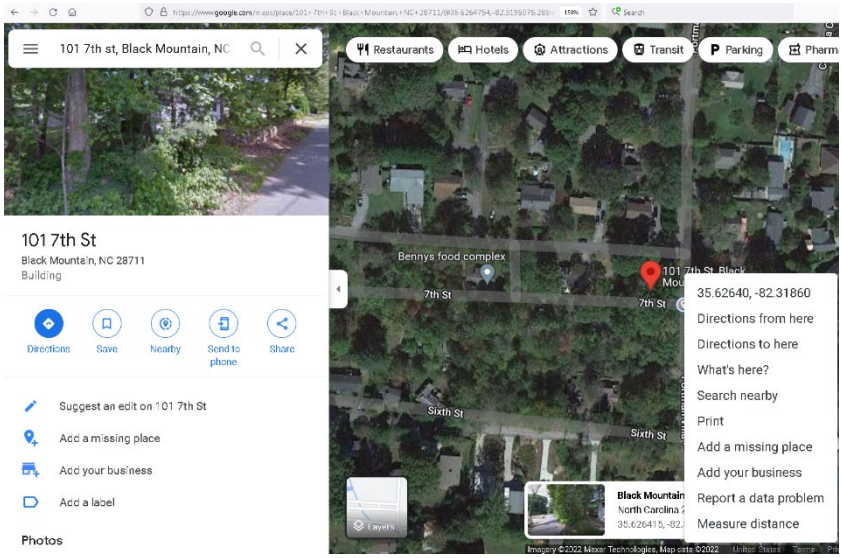
Work Orders July 2021 – March 2022

Activity	Frequency
Storm Drain - Clear Tree limbs and Debris	16
Install French Drain	1
Sediment Removal	4
Accumulation of Litter	3
Blocked Culvert	28
Vegetation	2
Install Culvert	3
Storm Drainage Walkthrough	11
Cleaned out ditch	11
Other	9

It is recommended that mapping and condition assessment activities be added as a "type" to work order reports since Public Works has been involved in helping the Planning Department with mapping-related efforts and should be involved in condition assessment moving forward. The work order reports already include some level of condition evaluation as it pertains to inlet grate condition. Expanding the ability of field staff to identify other types of condition deficiencies may help increase the rate at which the Town is able to document condition deficiencies. It is also recommended that work order reports collect latitude/longitude to allow for maintenance and replacement work to be more readily mapped.

3.3.4 Recommendations

The Town should utilize the AGOL layers, in particular flow path layers, subwatershed drainage delineation and LiDAR to understand issues in greater detail. Street view within Google Maps and Google Earth can help understand existing or prior issues. Maintenance efforts should be mapped spatially for greater understanding of the distribution of work throughout Town.



Latitude/Longitude can be extracted from google maps by right clicking on the pin. The pin is located by using the address search

When sediment is an issue implicated in ditch or culvert clogging, the source of the sediment should be investigated and addressed when possible.

Private landowners should be notified when the management of their property is contributing to sediment, leaves, or debris. The Town may consider a general fact sheet that explains how these negatively impact the stormwater system with solutions to typical issues (e.g., revegetation).

Maintenance should be tracked by location and repeat maintenance requests or needs should be evaluated by staff to assess root cause and whether other activities are necessary to resolve issues and reduce or prevent repetitive maintenance.

The Town should associate maintenance events with storm events, and storm event frequency where applicable.

Public and private partnerships may be beneficial where issues on private property are the result of multiple compounding factors, and these can be resolved on private property with minor public investment. Policy would likely be necessary around such activities. One good example is driveway culverts – driveway culverts have a significant bearing on the performance of ditch networks but are the property of the owner. Furthermore, the Town should tightly regulate the installation of new driveway culverts through permitting or other means if it does not do so currently.

In the Town's transition to a more holistic program, the following phases and focus activities are proposed to allow the Town to focus on more immediate needs which will support longer-term goals:

Phase 1:

- Enhanced Education & Awareness Tools
- Complaint Response and Documentation
- GIS Database Refinement for Assets
- System Mapping Verification, Gaps and Augmentation of Asset Data Collection
- Funding Issues for CIP
- Project Planning

Phase 2:

- Condition Assessment
- Reevaluation of Project Prioritization based on Condition Assessment
- Project Implementation
- Project Inspection & Maintenance Funding Issues for CIP
- Ability to take on bigger Project implementation

3.4 Community / Customer Service

3.4.1 Stormwater Concern and Complaints

The Town provides phone and website options for citizen concerns and complaints. It is typical for the Stormwater Technician to investigate these and provide feedback to the source. The Town is being encouraged to track complaints by storm magnitude and frequency and also by mapping and documenting notes and complaint resolution data for future reference.

3.4.2 Education and Outreach

The Town provides a host of education and outreach services to residents including those described in Section 1.8.1. The Town conducts routine upkeep and updates to website, newsletter, and social media and conducts an Annual Stormwater Survey.

3.4.3 SWMP Update Outreach

The Town conducted specific efforts to expand outreach around the SWMP update process. Public input was digitized into mapping information used by the Town and Consultant Team to identify issues and potential projects. The Annual Stormwater Survey was conducted extended for an additional month and various supplemental outreach efforts were conducted in an effort to expand input into the update process. The following specific activities were conducted as part of the update:

- Stormwater Survey was initially posted online and on the Town's website in November 2021 and advertised on the Town's Facebook page at the end of December 2021,
- Increased outreach was conducted to solicit more community input:
  - Emailed and sent letters to churches in the Black Mountain area,
  - Created Spanish language versions of the survey, made printed versions available,
  - Black Mountain News published an announcement on 12/30/21,
  - Emailed Black Mountain Chamber of Commerce, Kiwanis, Lions Club, and Rotary, and
  - Created flyer for Stormwater Survey (English and Spanish), posted in town; and
- Extended deadline for Stormwater Survey from January 31, 2022 to February 28, 2022 and continued outreach to receive more community input:
  - Posted flyers with extended deadline in town,
  - Visited downtown businesses to discuss stormwater program and survey,

        - Visited 93 downtown businesses total and spoke with owners, employees,
        - Handed out 112 printed surveys, 3 stormwater brochures, 4 thumb drives with resources,
        - Posted 47 flyers, and
        - Distributed announcement about stormwater survey with water bill insert for Feb. 1 distribution, and reminder of extended survey deadline.
- Public Meetings
    - The Town held two Stormwater Planning Charrettes with a small working group to provide comments on data gathered during the stormwater survey and provide feedback about what information would be most useful to include in the public meeting
    - A Public Meeting was held April 12th 5-7pm. The Town advertised for the meeting on the Town's Facebook page, with flyers, and a bulletin on the main page of Town website. At the meeting, information was presented about stormwater in Black Mountain and input requested from participants regarding Level of Service, preference for types of stormwater projects, and reporting of areas with stormwater issues.

3.4.4 Data for the Public

As part of the update, data has been developed that provides private citizens an overview of stormwater and related considerations in Black Mountain, available in this online Educational Storymap Application. Data is described in Section 2.0.

- Added all stormwater issue data reported on Stormwater Survey by public to AGOL map for visualization,
- Added records of work orders from Public Works regarding blockages and ditch maintenance they performed to improve stormwater conveyance, and
- Generated data sets to help the public visualize natural flow pathways, drainage areas and topography.

3.4.5 Community/Customer Service Recommendations

The Town does a lot of extra outreach to the public above the requirements of their MS4 permit and has gathered a wealth of information about public perceptions, interests, and concerns around stormwater management. Public survey forms and results are provided in Appendix B. The Town should continue outreach around the following areas of importance:

- Services the Town provides and how to access those services, as well as accomplishments of the Stormwater Program;
- The limitations of the Town's program as it relates to jurisdiction, extreme flooding, and financial limitations based on the cost of new and replacement infrastructure; and
- The public's role in stormwater management on private property and in their support of public investment.

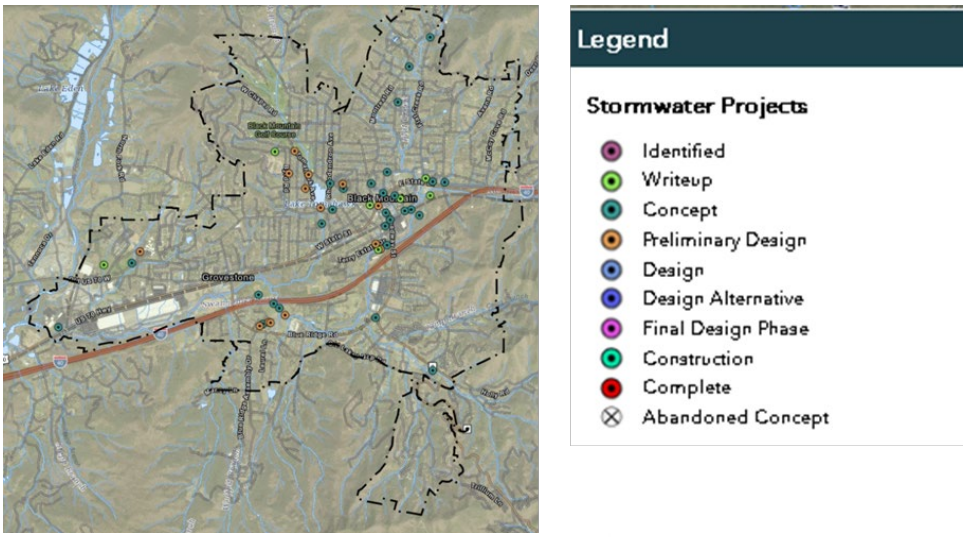
4.0 Capital Improvement Project (CIP) Development and Implementation

4.1 Overview

The Town's major technical needs to support CIP development and implementation are:

- Selection rationale and prioritization metrics (see Appendix D, Screening and Ranking Memo),
- Project information and cost estimates, and
- Execution strategy, scheduling, and budgeting.

Under the current scope of work, more than thirty (30) CIP have been described, screened, and ranked. Screening and ranking followed the procedures outlined in Appendix D. Project information and cost estimates have been prepared for CIP with three levels of accuracy: (1) *planning level* – order of magnitude cost, (2) *conceptual design level* – order of magnitude cost supported by project details, and (3) *preliminary engineering design level* with cost consistent with a 10-15% level of engineering design based on preliminary quantities and unit pricing. In most cases project cost estimates have been assigned a contingency of 30% to account for the preliminary level of design as well as rapid cost inflation affecting the accuracy of current unit pricing. Future cost escalation should be handled with separate calculations for inflation based on the anticipated construction date.



A projects database was developed for tracking and step-wise development of projects

Project descriptions have been developed for all CIP and descriptions include background, design, land ownership and next step information.

To help the Town track project development, compare projects, and document information about projects over time, a database of projects was developed as part of the SWMP Update and is being provided in digital format with project data. Various project types may be defined within the project database, as described in the table below.

Project Types and Descriptions

Project Type	Asset Classes Applicable to Type	Description
Stormwater Pipes and Collection	Closed System	Pipe systems, including inlets, pipes and outfalls when connected to system
Collection system only	Closed System	Ditches, natural channels
Outfall Stabilization or repair	Closed System	Outfalls
Single pipe or cross drain	Closed System	Road crossing pipes <4’ in diameter
Culvert or bridge road crossing	Closed System	Road crossing culverts (>=4’ in diameter) and bridges
Closed System O&M	Closed System	Routine stormwater pipe, collection and outfall maintenance activities or minor improvement that warrant documentation as project including larger mapping and assessment projects
Open System O&M	Open System	Projects involving ditch extension, modifications, routine ditch maintenance or other minor improvement activities that warrant documentation as project
Stream Stabilization	Stream Restoration	Stream repairs, harder solutions
Stream Restoration	Stream Restoration	Stream repairs, natural bank solutions
New SCM	SCM	New SCM, may be retrofit to existing development
SCM Retrofit or Rehabilitation	SCM	Retrofit (modification or upgrade) or rehabilitation of an existing SCM
Acquisition	Other	Land acquisition
Flood Mitigation	Other	Activities that have been identified to reduce flooding
Wetland Restoration	Other	Restoring, enhancing, or creating wetlands
Riparian Management	Other	Invasive species management, buffer planting, implementing guidance for management (e.g., not now)
Other	Other	
N/A	N/A	

The project status is documented in the attribute data. Potential project status options include those described in the table below.

Project Status and Status Descriptions

Project Status	Description
Identified	Newly identified projects
Writeup	Identified projects with writeup related to intent and ideas
Concept	Identified projects that have a writeup, sketch of proposed activities and for which a site visit has been conducted and constraints and opportunities identified
Preliminary Design	More developed concept with cost estimate
Design Alternate	Only used for sites that have multiple design options, alternates may be identified at the concept or preliminary design stage and designated
Design	Design underway including any of the following four steps: (1) Basis of Design Report (formalized preliminary design), (2) 30% Design, (3) 60% Design, (4) Final Design.
Final Design Complete	Design complete, with engineer's estimate
in Construction	Construction underway
Complete	Construction complete
Abandoned Concept	Project has been abandoned due to feasibility or other reasons

The additional database fields are documented in Appendix A.

4.2 Project Types

The Town has a wide range of stormwater CIP infrastructure needs, including replacement of aging or substandard infrastructure, addressing system capacity or blockage issues that result in flooding concerns, providing new conveyance where the lack of conveyance results in nuisance flooding or safety issues, addressing water quality and biological integrity concerns in the Swannanoa River watershed, and targeting flood reduction opportunities, where present. Citizen concerns, town staff knowledge, prior studies and drainage system information and assessment were used to target projects.

While some projects may meet multiple needs, often different projects are required to address various needs. The Town desired to use the SWMP Update to focus on collection and conveyance CIP for which stormwater service fees are the primary funding mechanism:

- Stormwater Pipes and Collection
- Road Crossings: single pipe, culvert, and bridge structures
- O&M: Closed and Open Systems

Other projects, including several types of GI were also identified or organized from prior planning efforts. GI and conveyance project types may often be unsuitable for direct side-by-side comparison, as they are often used to target kinds of issues. The Town has traditionally pursued grant funding to implement GI. Integrating GI components into collection and conveyance projects may increase funding opportunities. GI approaches are typically more holistic and encouraged where they can be cost-effectively applied. Examples of GI projects include:

- Stream and Riparian Corridor Restoration
- New SCMs and SCM Retrofits (Expansion, Conversion) & Rehabilitation
- Distributed (Neighborhood scale) SCMs

4.3 Project Planning & Development

4.3.1 Project Scale

Projects can vary in scale based on their size and/or complexity. It is helpful to characterize project types by scale to contextualize different project types and scales with reference to current or future funding sources available to complete projects. Large projects may require consideration of new funding sources such as bonds and/or phasing.

Comparison of Project Types and Scales Defined for Town of Black Mountain

	Project Types					
Project Scale	Closed System	Open Channel	Green Infrastruc-ture	Closed System Rehab/Minor Replacement	Open System Rehab/Minor Replacement	Inspection & Mapping
Large (>$750k)						
Large ($400-750k)						
Medium ($100-400k)						
Medium ($50-100k)						
Small ($10-50k)						
Small ($<10k)						

Typical	Occasion-ally	O&M Scale

4.3.2 Project Screening and Prioritization

The project screening tool developed for the town targets projects based on various selection factors used to evaluate projects and identify opportunities and challenges. Selection factors are, in most cases, qualitative and somewhat subjective. When projects are developed to a lesser degree (at initial identification or concept stages), many of these factors can be challenging to accurately evaluate. However, using this framework aids project development and selection of high-quality projects with consideration of their potential challenges. Project selection factors discussed in detail in Appendix D include:

- Project Effectiveness
- Direct Community Impacts
- Water Quality Benefit
- Infrastructure Upgrade
- Utilities
- Land Ownership
- Other Constraints
- Other Benefits

Some, often larger, municipalities develop prioritization scoring and ranking systems that help identify the highest scoring projects. Ranking systems can be challenging to use with consistency, and often rely on a level of data and analysis that is not currently available to the Town. A qualitative system was developed and described in Appendix D.

The Town is committed to developing a well-founded prioritization for projects and under this effort to update the SWMP, the Town and Consultant Team has revisited and developed projects as follows:

- Projects identified under prior plans were revisited for applicability, effectiveness and based on how accessible they were for the Town to implement as framed
- Town Staff identified known issues and potential projects for investigation
- The Town solicited citizen input as to the location and types of known issues
- Consultants evaluated prior plans and system maps including issues mapping from staff and citizen sources and identified new potential projects
- Town Staff and Consultants investigated areas of concentrated issues to evaluate potential solutions
- Projects and their potential to be effective with respect to selection factors were qualitatively evaluated using a green-yellow-orange-red scoring system as described in Appendix D.

4.4 Projects Development

4.4.1 Preliminary Proposed 2- and 10-Year CIP Plans

Preliminary CIP Planning based on the priorities and projects identified under the SWMP update have been incorporated into 2- and 10-Year CIP Plans along with associated cost estimates. Town staff will work to refine CIP plans which are tied to financial planning implications which must be simultaneously addressed.

Preliminary Proposed 2-Year CIP Activities and Costs (2022 – 2025)

Activity	Estimated Cost to Town	Total Cost
[1]Further develop planning and design information for system and project needs through mapping and assessment: • Improve accuracy of pipe collection and conveyance network • Map ditch network, evaluate deficiencies • Begin issue tracking/mapping • Conduct camera work to inspect existing aging lines with priority on systems with proposed projects	$20,000[1] + Staff time	$20,000
Finalize prioritization of high-ranking projects screened and develop financial planning to implement on or more projects.	Staff time	
Implement 1 GI project (Public Works parking retrofit)	$51,000	$100,000
Implement repairs to projects damaged by Hurricane Fred	$88,000	$340,000
Complete outreach for Distributed (Neighborhood scale) SCMs and prepare information for future funding requests	Staff time	
Implement 3-6 small to medium scale projects per year (Public Works)	$20,000 – 60,000 + Staff time	$20,000 – 60,000
Total (Years 1-2)	219,000	520,000

[1] Based on camera survey of approximately 5,000 LF of line (half of existing mapped system) at $4/LF. Thereafter, survey 10% (1,000 LF per year). Town should evaluate potential long-term cost savings from purchase of camera equipment. Pole cameras can give good representative information about straight pipe systems and cost ~$15,000 for initial purchase.

Preliminary Proposed 10-Year CIP Activities and Costs (2025 – 2033)

Activity	Estimated Cost to Town[1]	Sub-Total Cost
Further evaluate project needs and update project ranking based on new mapping and assessment data: • Use issue tracking/mapping to enhance project targeting • Identify primary ditch network deficiencies • Develop preliminary design engineering plans / basis of design report for highest ranking project(s)	$20,000 + Staff time	$40,000
Implement 1-2 larger scale conveyance projects	$800,000 – 1,500,000	$800,000 – 1,500,000
Revisit and update planning for watershed-based GI projects	$20,000	$40,000
Pursue grant funding for 3 additional GI projects including Distributed (Neighborhood scale) SCMs pilot	Staff time, seek assistance from Land of Sky and/or RiverLink	
Implement 3 additional GI projects	$150,000	$300,000
Implement 3-6 small to medium scale projects per year (Public Works) including focus on identified ditch projects	$80,000 – 240,000 + Staff time	$80,000 – 240,000 + Staff Time
Total (Years 3 – 10)	$1,930,000	$2,100,000
Total (Years 1 – 10)[2]	$2,149,000	$2,620,000

[1] Staff time has only been listed when it is a dominant method by which work is being performed. While not explicitly indicated in each case, all projects involve investment of staff time and larger projects require larger investment of staff time.

[2] See table for 2-Year CIP.

4.5 CIP Funding and Implementation Planning

4.5.1 Funding Options

Funding CIP projects is anticipated to take one or multiple of the following three forms:

- Stormwater Utility save and spend approach;
- Stormwater Utility debt service approach where utility funds pay off debt to implement larger scale projects on a shorter period; and
- Pursuit of grants and/or low interest loans.

In addition, rising inflation means that financial planning done to establish the Stormwater Utility should be revisited with consideration of rising prices, and with the completion of more robust planning and design cost information under the SWMP Update. Funding levels are discussed in Section 5.

4.5.2 Implementation Planning

4.5.2.1 Project Development Process

It is recommended that the Town of Black Mountain adopt a stepwise approach to developing projects. For this purpose, typical project phases are defined in the table below. At each phase, project details and information are further developed and used to update next steps, project budgetary information, and project priorities. During this update process, several projects were developed to the Concept and Preliminary Design stage.

Typical Project Development Phases and Associated Information and Activities

Phase	Description of typical level of detail	Cost Estimate Status	Constraints Assessment	Key Activities (may vary by project type)
Identification	Identify project type and rationale	N/A	Identify where known	Identify
Writeup	Detailed preliminary description of rationale and project	N/A or Concept	Identify where known	Describe
Concept	Writeup and spatial information along with preliminary evaluation of major components	Concept or Planning Level Cost Estimate	Identify through cursory evaluation	Develop
Preliminary Design	Preliminary sizing, layout, grading if possible	Engineering Planning Level Cost Estimate	Identify through more detailed evaluation	Preliminary design and sizing of components,
Basis of Design Report (BODR)	Similar to preliminary design, BODR provides enhanced existing conditions and alternatives analysis	Preliminary Engineering Estimate	Identify, evaluate solutions/alter -natives	Alternative analysis, detailed assessment, rule out fatal flaws, improve cost estimates and keys to implementation/schedule
30% Design	Detailed design phases, level of detail and 30/60/90% or Final Engineering Estimate and constraints assessment refined during each stage			Stakeholder coordination and easements
60% Design				Finalize design approach and easement needs, detailed cost estimate
Final Design				Construction document development

4.5.2.2 Cost Estimating Definitions

While the exact activities going into cost estimating may vary, the following definitions below are provided within the context of the SWMP update, and should provide guidance on the level of detail involved in estimating projects costs within this document:

Concept Level Cost Estimate – Based on comparable projects and/or preliminary GIS measurements and judgment or preliminary design-based estimates of lengths, areas, or other factors.

Planning Level Cost Estimate – Based on quantity and unit cost estimates with measurements in GIS or CAD based on a cursory preliminary design to size or draw infrastructure roughly to scale and identify significant costs and evaluate the likelihood of conflicts and include allowances for such considerations. Depending on the project type, contingency and design costs have typically been set between 10-30% of construction costs.

Engineering Planning Level Cost Estimate – Derived in a manner similar to Planning Level but with additional data development and design to evaluate quantities and potential conflicts in more detail. It is suggested that for grant submittals, this level of detail be the minimum level of detail provided

Preliminary Engineering Estimate – Based on unit quantities and unit costs supported by more detailed assessment and design providing a higher degree of certainty and targeting design solutions to address significant conflicts or cost factors.

Engineering Estimate (30/60/90% or Final) – based on unit quantities and unit costs supported by increasingly complete project design information at various stages.

5.0 Financial Planning

The Town's established Stormwater Utility generates approximately $360,000 under the 2022 fee structure. The operation of the stormwater program requires an allocation of approximately $84,000, leaving a remainder of approximately $275,000/yr. for CIP and other in-house rehabilitation and replacement costs. This may allow the Town to prioritize and implement small and medium scale needs using in-house or other external crews, however, investments in larger scale capital project expenses are generally beyond the reach of the current Utility funding. The following schedule of proposed costs has been prepared to exemplify the existing funding capacity as compared to identified CIP needs.

Total Cost of Selected CIP (e.g., 10-year CIP)	Estimate number of medium-large to large scale projects	Estimated Total Annual Cost of bond at 6% interest	Note
$1,500,000	0-1	$250,000	Existing Utility funding available, maintain status quo and implement minor improvements
$2,620,000	1-2	$580,000	Funding level consistent with example 2- and 10-Year CIP layouts in Section 3.4.1 to make programmatic improvements and implement 1 or more CIP projects
$5,000,000	6-10	$830,000	Implement greater number of projects - approximately 14 traditional conveyance projects and more than 35 total projects have been developed for CIP planning purposes, dozens of other potential projects have been identified
$9,000,000	15-20	$1,500,000	

The development of this SWMP update provides the Town with cost estimates and the framework for developing short and longer-term CIP expenditure outlay. The default save-and-spend approach should be compared against a debt service approach to spending for CIP investments.

6.0 Plan Participants

The Town thanks Stakeholders, the Public, Staff and Consulting Team who participated in this project:

- Pam King – Council Member, Town of Black Mountain
- Chas Fitzgerald – Planning Board, Town of Black Mountain
- Charlie Russell – Fire Inspector, Black Mountain Fire & Rescue
- Ruth Pittard – Citizen, Retired educator, stormwater pond owner
- Casey McKissick – Owner, Foothills Meats
- David Ross – Owner, Falcon Construction, Bush Restaurant in Black Mountain
- Anne Phillip – Stormwater Technician, Town of Black Mountain
- Jessica Trotman – Planning Director, Town of Black Mountain
- Chris Sloan – Public Works Operations Manager, Town of Black Mountain
- Jamey Matthews – Public Works Director, Town of Black Mountain
- Jake McLean – Senior Water Resources Engineer, Wildlands Engineering
- Marshall Taylor – Senior Water Resources Engineer, Blue Earth Planning & Design
- Jane Margaret Bell – Environmental Designer / Planner, Wildlands Engineering

Appendix A – Existing and Proposed Spatial Data

1. **Metadata for Data Sources**

2. **Existing Data Structure for:**

Pipes
Structures (SW Features)
Issues
SWAP
Projects
Project Drawing Objects
New ID Pipes
New ID Structures (SW Features)

3. **Proposed Draft Data Structure for:**

Pipes
Structures (SW Features)
Ditches

Appendix A - Part 1 - Metadata for Spatial Data Sources Referenced and Created under SWMP Update			
Layer Name in AGOL Map	**Data Description**	**Data Format**	**Source**
Infrastructure			
TOBM - SWPipes	Existing stormwater pipe dataset	Stream from TOBM Server	Located by LOS staff and updated by TOBM staff
TOBM - SWFeatures	Existing stormwater inlet and outfall (structures) dataset	Stream from TOBM Server	Located by LOS staff and updated by TOBM staff
TOBM - SWPipes BY DIAMETER	Exitsing stormwater pipe dataset symbolized by pipe diameter	Stream from TOBM Server	Located by LOS staff and updated by TOBM staff
Permitted SCMs	SCMs permitted under MS4 permit	Feature layer from TOBM server	Streamed from TOBM server
HydrantValvesTrans	Public water hydrant valves	Feature layer from TOBM server	Streamed from TOBM server
HydrantTrans	Public water hydrants	Feature layer from TOBM server	Streamed from TOBM server
WaterLinesTrans	Public water lines	Feature layer from TOBM server	Streamed from TOBM server
Stormwater Projects	Existing, Completed, Proposed Stormwater Projects	Geodatabase	WEI Staff, Town Staff, past master plans
PrjDrawPnts	Point drawing layer associated with a record from 'Stormwater Projects'	Geodatabase	WEI Staff
PrjDrawLines	Lines drawing layer associated with a record from 'Stormwater Projects'	Geodatabase	WEI Staff
PrjDrawPoly	Polygon layer associated with a record from 'Stormwater Projects'	Geodatabase	WEI Staff
SWAP	Stormwater Area Plan polygon	Geodatabase	WEI Staff
ADD SWFeatures (Points)	Point drawing layer to add missing stormwater structures (low res)	Geodatabase	WEI Staff
ADD SWPipes (Lines)	Line drawing layer to add missing stormwater pipes (low res)	Geodatabase	WEI Staff
NCDOT - Inlets	NCDOT stormwater inlets	Feature Service	Streamed from NCDOT server
NCDOT - Maintenance Pipes	NCDOT maintenance pipes	Feature Service	Streamed from NCDOT server
NCDOT - Non NBIS Pipes	NCDOT non NBIS pipes	Feature Service	Streamed from NCDOT server
NCDOT - Storm Drainage Pipes	NCDOT storm drainage pipes	Feature Service	Streamed from NCDOT server
NCDOT - Structures	NCDOT structures	Feature Service	Streamed from NCDOT server
NCDOT_StateMaintainedRoadsQtr	NC State maintained roads	Map Service	Streamed from NCDOT server
MSD Services	Buncombe county MSD sewer pipe network	Map Image Layer	Streamed from MSD of Buncombe County server
Stormwater Issues			
Issues - Flooding	Reported stormwater frequent flooding locations	Feature Service	2022 Stormwater Survey, WEI Staff, Town Staff, Public Complaints, 2009 McGill SWMP
Issues - Blockage	Reported stormwater system blockage locations	Feature Service	2022 Stormwater Survey, WEI Staff, Town Staff, Public Complaints, 2009 McGill SWMP
Issues - Erosion	Reported stormwater related erosion	Feature Service	2022 Stormwater Survey, WEI Staff, Town Staff, Public Complaints, 2009 McGill SWMP
Issues - Pollution	Reported pollutant source to stormwater system	Feature Service	2022 Stormwater Survey, WEI Staff, Town Staff, Public Complaints, 2009 McGill SWMP
Issues - Substandard Condition SW Infra	Reported insufficient/substandard stormwater infrastructure	Feature Service	2022 Stormwater Survey, WEI Staff, Town Staff, Public Complaints, 2009 McGill SWMP
Hydrology			
TOBM Watershed	Watershed Boundary / Contributing Drainage Area to Town Limits	Shapefile	WEI Staff, developed from QL1 3ft lidar
TOBM Subcatchments	Subwatersheds to larger watershed boundary	Shapefile	WEI Staff, developed from QL1 3ft lidar
WDT Channels	Runoff flow paths generated from QL1 LiDAR	Shapefile	WEI Staff, developed from QL1 3ft lidar
NHD_WNC	National Hydrography Dataset for Western North Carolina	Feature Service	USGS and CGIA
USGSHydroCached	USA National Hydrography Dataset	Tile layer	USGS
USA Wetlands	Wetlands of the US from National Wetland Inventory	Map Image Layer	USFWS NWI
Soils and Topography			
NC Statewide Hydric Soils (WEI)	NC Statewide hydric soils layer developed by Wildlands	Feature Service	WEI staff, developed from SSURGO and NRCS datasets
QL1 3ft Lidar*	3 ft resolution LiDAR elevation data (LAS format)	LAS	NC Spatial Data Download
QL1 3ft Lidar DEM*	3 ft resolution LiDAR elevation data (DEM format)	DEM	NC Spatial Data Download
Contours_1ft (from QL1 LiDAR)	Town Limits 1ft contours from QL1 DEM03 (elevations)	shapefile	WEI Staff, developed from Q1 3ft lidar
Contours_1ft	Town Limits 1ft contours from QL1 DEM03 (lines)		WEI Staff, developed from Q1 3ft lidar
Slope Surface (QL1 LiDAR)	Topographic slope raster rendered with hillshade effect	Raster	WEI Staff, developed from Q1 3ft lidar
Planning and Regulatory			
NC1Map_Parcels (Map Service)	NC Statewide parcel boundary dataset	Map Image Layer	NC One Map
County	NC statewide county boundary layer	Feature Service	Streamed from NCDEQ DMS server
Black Mountain Town Boundary	Buncombe county incorporated areas dataset	Feature Service	Streamed from Buncombe county server
TOBM_Parcels_withLU	TOBM Parcels symbolized by LU	Feature Service	Streamed from WEI server
Black Mountain Zoning Dec 2020	TOBM current zoning boundaries (updated Dec 2020)	Feature Service	Streamed from TOBM server
Black Mountain Comp Plan FLUM	TOBM Future Landuse Map developed for 2021 Comp Plan	Feature Service	TOBM staff, 2021 Comp Plan, streamed from WEI server
Black Mountain Public Properties	Town-owned parcels within Town limits	Feature Service	Streamed from TOBM server
BM_CommunityFacilities	TOBM critical communities facilities	Feature Service	Developed during Comp Plan, Streamed from WEI server

Appendix A - Part 1 - Metadata for Spatial Data Sources Referenced and Created under SWMP Update			
Layer Name in AGOL Map	**Data Description**	**Data Format**	**Source**
USA Flood Hazard Areas	FEMA Flood Hazard Zones	Feature Service	FEMA
Imagery			
TOBM Aerial Imagery	Town-wide 2019 aerial imagery, moderate resolution	jpg	2019 NC One Map
Elementary School Aerial	2019 aerial imagery zoomed to elementary school, high res	jpg	2020 NC One Map
Downtown Aerial	2019 aerial imagery zoomed to downtown, high resolution	jpg	2021 NC One Map
Datasets developed during 2022 SWMP Update			
*data available in digital deliverable but not included in AGOL map			

Appendix A - Part 2 - Existing database structure for: stormwater pipes

TOBM - SW Pipes				
Existing database houses pipe data				
Fields	**Diameter**	**Material**	**Condition**	**GlobalID**
Description	Diamater of pipe	Pipe	Pipe condition description	ESRI unique ID system field
Example Entry	18	Plastic		9259e613-a937-4ffa-a16e-ff41e0ce3489
Data Units/Type	inches	type	text	system field
Data Collection Method	Measure down from invert	ID in field	Assess in field	
Domain Picklist Options		*Galvanized*		
		Plastic		
		PVC		
		Concrete		
		Terracotta		
		Steel		

Appendix A - Part 2 - Existing database structure for: stormwater features

TOBM - SW Features														
Existing database houses structures (inlet, outfall, junction) data														
Field Name	**OBJECTID**	**Inv_Depth**	**Inl_Mat**	**Outlet_To**	**Photo**	**Diameter**	**Material**	**Condition**	**Watershed**	**InletNum**	**Type**	**HUC**	**OutfallNum**	**Out_Diamet**
Description		Inlet depth to bottom of box	Inlet material	Pipe out cardinal direction, size, material	link to photo hosted on Land of Sky's website	Outfall pipe diamter	Outfall Pipe material	Outfall condition	Watershed that inlet or outlet drains to	Inlet ID	Type of structure	Watershed HUC code	Outfall ID	Outlet diameter
Example Entry		60.00	Concrete	s 36 p	http://www.landofs				Camp Branch	19	Inlet		0	
Example Entry		0			http://www.landofs	18	Galvanized	Needs Improvement	Swannanoa River	0	Outfall		40	18
Data Units/Type		inches	domain text	cardinal direction, inches, type	Text link	inches	domain text	domain text	domain text	numeric	domain text	HUC code	numeric	inches
Data Collection Method		Measure up from inlet invert	ID in field	Determine direction w/ compass, measure up from pipe invert, ID material in field		Measure up from pipe invert	ID in field	Assess in field	Desktop analysis	Assign	ID in field	Desktop analysis	Assign	Measure up from outfall invert
Domain Picklist Options			*Concrete*				*Galvanized*	*Needs Improvement*	*Camp Branch*		*Inlet*			
			Brick				*Plastic*	*Good*	*Swannanoa River*		*Outfall*			
			Block				*PVC*	*Fair*	*Tomahawk Branch*		*Junction Box*			
			Concrete Block				*Concrete*		*Flat Creek*					
			Rock				*Terracotta*							
			Other				*Steel*							

Appendix A - Part 2 - Existing database structure for: issues

Issues - Flooding, Issues - Erosion, Issues - Blockage, Issues - Pollution, Issues - Substandard Condition

Existing database houses structures (inlet and outfalls) data

Fields	OBJECTID	ID	Location_Feature	Cause	DateIdentified	Origin	Source	Ownership	SafetyIssue	Severity	RequestStatus	Access Issues	Issue Frequency	Issue Occurrence Timeframe	Note1	ContactName	DataEntryBy	Contact Followup Note	Note2	GlobalID	CreationDate	Creator	EditDate	Editor
Description	ESRI system field for unique ID	Assigned ID	General location of flooding	Flooding cause, if known	Date reported or identified	Origin of data	Communication method	Property or asset ownership	Describe if flooding is causing a serious safety issue	Severity of issue							Initials of who entered the data			ESRI Unique ID system field	Date of record creation	Creator of record	Last edit data	Last edit by
Example Entry:	27		House/Structure			Town Staff	Other	Private Property			Unassigned				Part of the asphalt parking lot was carried away in 2018 flooding from tropical event They sandbag the building to keep water out.		AP			{00000000-0000-0000-0000-000000000000}	2/8/2022 14:29	wlasheville	4/20/2022 12:40	wlpublic
Data Units	system field		Domain text	Text	Date	Domain text	Domain text	Domain text	Text	Domain text	Domain text	Text	Text	Text	Text	Text	Text	Text	Text	System field	System field	System field	System field	System field
Data Collection Method																								
Domain Picklist Options			*House/Structure*			*Town Staff*	*Website*	*Private Property*		*Minor*	*Unassigned*													
			Street			*Citizen*	*Other*	*Public Property/ROW*		*Moderate*	*Assigned*													
			Closed System - Storm			*Consultant*	*Call*	*DOT ROW*		*Severe*	*Closed-Completed*													
			Open System - Stream/River				*Geoform*	*Unknown*		*Unknown*														
			Open System - Ditch																					
			Yard																					
			Driveway																					
			Closed System - Storm Drainage Infrastructure																					
			Other																					

Appendix A - Part 2 - Existing database structure for: SWAP

SWAP															
Existing database houses stormwater area plan (SWAP) polygons and data															
Fields		**SWAPID**	**SWAP_Plan_Name**	**ProjectSource**	**Note**	**ReferenceLink**	**CostEstimate**	**GlobalID**	**Creator**	**CreationDate**	**Editor**	**EditDate**	**Shape__Area**	**Shape__Length**	**Attachments**
Description		ID field	Name of SWAP	under what project developed or from staff	note about SWAP	link to relevant docs	can be used to sum all projects in SWAP	assigned	assigned	assiged	assiged	assiged			attachments
Example Entry		2	Swannanoa River Corridor Plan (Southern)	2022 SWMP Update	Swannanoa R. Master Plan proposes GI including water harvesting/reuse, streambank restoration, flood storage & floodplain easement activities in coord with NCDOT, private landowners and on Town and Montreat College land			7df54444-16e8-450c-817d-5678ad97d6b4	ashevillePM	8/9/2022, 2:01 PM	ashevillePM	8/10/2022, 8:52 PM	16776315.71	19412.1	
Data Units/Type		integer	integer	text	text										
Data Collection Method															
Domain Name															
Domain Picklist Options															

Appendix A - Part 2 - Existing database structure for: stormwater projects

TOBM - Stormwater Projects

Existing database houses project data

Field Name	OBJECTID	Project ID	ID_OLD	ProjectStatus	StatusNote	ProjectSource	AssetClass	PrimaryType	SecondaryType	Project Name / Desc	GreenInfra_Status	CIP_Status	CIP_Type	DesignType	Note1	Note2	LastEditBy	OriginalEntryBy	PriorityOLD	ImplementationDate	ImplementationDesignPDF	ImplementationAsbuiltPDF	ImplementationProjectID	ImplementationEngCostEst	ImplementationActualCost	ReferenceLink	CIP_ReviewDate	Ownership_Coord_Status	Ownership_Note	EntryNote	SWAP ID	SWAP_Status
Description	originally assigned ID	use as primary identifier		status is level of development, see report section 4.5.2.1 table	status description if warranted	where project was originally identified	type of asset project pertains to	primary type of project	secondary type or components	brief name and/or description	is it primarily GI (major), has GI component/aspect (minor) or no	Is it a CIP or is it a					initials of entry personnel	initials of entry personnel		date project implemented	design plans	asbuilt plans	optional new ID once complete	final design estimate	construction cost actual	other link users choice	future use to track review of CIP projects	pick the most appropriate ownership situation	note about ownership		ID for associated SWAP	0 if not part of swap, 1 if project is part of swap
Example Entry	141	141		Identified		2022 Master Plan Update	SCM	New SCM	N/A	Potential stormwater treatment in depressional area	Major	CIP Project Structural	Other / Not Prioritized in CIP	Other				jpm										Private-major coordination			0	0
Example Entry	146	146		Preliminary Design		2022 Master Plan Update	Closed System	Stormwater Pipes and Collection	N/A	Town Hardware Bypass System - Cherry Street and Alternatives, see detailed project description and plan	N/A	CIP Project Structural	CIP-Short Range	Primary				jpm										Other	NCDOT and Private Major but proposed pipe alignment is through mostly Town ROW		1	1
Data Units/Type	system field			Domain text		Domain text	Domain text		Domain text	Domain text	Domain text	Domain text	Domain text															Domain text				Domain text
Data Collection Method																																
Domain Picklist Options				*Identified*		*2009 Master Plan*	*Closed System*	*Stormwater Pipes and Collection*	*Stormwater Pipes and Collection*		*Major*	*CIP Project Structural*	*CIP-Short Range*																*All town owned*				*0*
				Writeup		*2022 Master Plan Update*	*Outfalls Only*	*Collection system only*	*Collection system only*		*Minor*	*CIP Project O&M*	*CIP-Mid Range*																*Private-major coordination*				*1*
				Concept		*2016 USRWMP*	*Open System (Ditches)*	*Outfall Stabilization or repair*	*Outfall Stabilization or repair*		*N/A*	*Not a CIP Project*	*CIP-Long Range*																*Private-minor coordination*				
				Preliminary Design		*Staff*	*SCM*	*Single pipe or cross drain*	*Single pipe or cross drain*				*Other / Not prioritized in CIP*																*NCDOT-major coordination*				
				Design Alternate		*Other*	*Stream Restoration*	*Culvert or bridge road crossing*	*Culvert or bridge road crossing*																				*NCDOT-minor coordination*				
				Design		*Unknown*	*Other Green Infrastructure*	*Closed System O&M*	*Closed System O&M*																				*Railroad*				
				Final Design Complete			*Easements and Land*	*Open System O&M*	*Open System O&M*																				*Unknown*				
				in Construction			*Non-asset O&M*	*Stream Stabilization*	*Stream Stabilization*																				*Other*				
				Complete			*Other*	*Stream Restoration*	*Stream Restoration*																								
				Abandoned Concept				*New SCM*	*New SCM*																								
								SCM Retrofit or Rehabilitation	*SCM Retrofit or Rehabilitation*																								
								Acquisition	*Acquisition*																								
								Flood Mitigation	*Flood Mitigation*																								
								Wetland Restoration	*Wetland Restoration*																								
								Riparian Management	*Riparian Management*																								
								Other Green Infrastructure	*Other Green Infrastructure*																								
								Maintenance	*Maintenance*																								
								Other	*Other*																								
								N/A	*N/A*																								

Appendix A - Part 2 - Existing database structure for: project drawing objects

PrjDrawPnts, PrjDrawLines, PrjDrawPoly

Existing database houses drawings objects points, lines and polygons. This allows you to draw the component parts of the project and give each part an ID. The PID value ties components to the project.

Fields	OBJECTID	Project ID	ComponentID	Description	ToScale	DrawnBy	Notes	SWAP ID	Design Type	ID_OLD	GlobalID	Creator	CreationDate	Editor	EditDate	Shape__Area	Shape__Length	Attachments:
Description																		
Example Entry	13	55	1	Other	Unknown	MRTaylor	Project includes water quality treatment measures for more frequent flow events. Floodbenching along the northern bank will reduce bank erosion along the southern bank and facilitate design of nature-based streambank stabilization	2	Other		85a7bb55-fe66-47d0-be18-f1d8bae4c574	wlasheville	8/9/2022, 10:10 AM	ashevillePM	8/10/2022, 10:27 PM	1696042.6	11360.1046	
Data Units/Type																		
Data Collection Method	system field																	
Domain Name						**ComponentDescription**	**ToScale**				**DesignType**							
Domain Picklist Options						*Mapping area*	*Yes*				*Primary*							
						Design footprint	*No*				*Secondary*							
						Pipe	*Approximately*				*Alternative*							
						Structure	*Unknown*											
						Outfall	*N/A*											
						SCM												
						Other												

Appendix A - Part 2 - Existing database structure for: newly identified stormwater pipes that have not been qa/qc'd

TOBM - SW Pipes				
Existing database houses SW pipes for new field or remote addition of assets. This is an option for temporary documentation of new found assets. Note that it doesn't include ownership and other fields suggested for long term data collection.				
Fields	**Diameter**	**Material**	**Condition**	**GlobalID**
Description	Diamater of pipe	Pipe material	Pipe condition description	ESRI unique ID system field
Example Entry	18	Plastic		9259e613-a937-4ffa-a16e-ff41e0ce3489
Data Units/Type	inches	type	text	system field
Data Collection Method	Measure down from invert	ID in field	Assess in field	
Domain Picklist Options		*Galvanized*		
		Plastic		
		PVC		
		Concrete		
		Terracotta		
		Steel		

Appendix A - Part 2 - Existing database structure for: newly identified stormwater features that have not been qa/qc'd

TOBM - SW Features														
Existing database houses SW features points for new field or remote addition of assets. This is an option for temporary documentation of new found assets. Note that it doesn't include ownership and other fields suggested for long term data collection.														
Field Name	**Inv_Depth**	**Inl_Mat**	**Outlet_To**	**Photo**	**Diameter**	**Material**	**Condition**	**Watershed**	**InletNum**	**Type**	**HUC**	**OutfallNum**	**Out_Diamet**	**Source Positional Accuracy**
Description	Inlet depth to bottom of box	Inlet material	Pipe out cardinal direction, size, material	link to photo hosted on Land of Sky's website	Outfall pipe diamter	Outfall Pipe material	Outfall condition	Watershed that inlet or outlet drains to	Inlet ID	Type of structure	Watershed HUC code	Outfall ID	Outlet diameter	How was data developed
Example Entry	60	Concrete	s 36 p	http://www.landofsky.org/jpg/5516IN				Camp Branch	19	Inlet		0		
Example Entry														
Data Units/Type	inches	domain text	cardinal direction, inches, type	Text link	inches	domain text	domain text	domain text	numeric	domain text	HUC code	numeric	inches	domain text
Data Collection Method	Measure up from inlet invert	ID in field	Determine direction w/ compass, measure up from pipe invert, ID material in field		Measure up from pipe invert	ID in field	Assess in field	Desktop analysis	Assign	ID in field	Desktop analysis	Assign	Measure up from outfall invert	varies
Domain Picklist Options		*Concrete*				*Galvanized*	*Needs Improvement*	*Camp Branch*		*Inlet*				*Field Located*
		Brick				*Plastic*	*Good*	*Swannanoa River*		*Outfall*				*Remote Sensing/Manually Digitized*
		Block				*PVC*	*Fair*	*Tomahawk Branch*		*Junction Box*				
		Concrete Block				*Concrete*		*Flat Creek*						
		Rock				*Terracotta*								
		Other				*Steel*								

Appendix A - Part 3 - Proposed database structure for: stormwater pipes

TOBM - SW Pipes (Proposed dbase - draft)																				
Proposed draft database for stormwater pipes																				
Category of Fields	**General**		**Geometry Level 1**			**Ownership**		**Physical Condition**					**Photo/Data**	**QC**	**QC**	**Geometry Level 2**			**Lifecycle Data**	
Fields	**ObjectID**	**AssetID**	**Diameter_in**	**Shape**	**Assettype**	**Owner**	**Maintenance**	**DryWeatherFlow**	**Lining**	**Condition**	**ConditionNotes**	**ConditionSource**	**Attachment**	**Inlet_from**	**Outlets_to**	**Upstream Elevation**	**Downstream Elevation**	**Shape_Length**	**Install Date**	**In service**
Description	Diamater of pipe	Pipe material	Pipe condition description				who maintains	assess presence of base flow	Is the pipe lined with asphalt or other coating for protection			Describe condition assessment method, remote, field, video, etc	Allow for attachment of more than 1 photo, pdf, etc. (could be used to capture condition info, field assessment notes, etc)	enter assetID of inlet or outfall	enter assetID of inlet or outfall			length in feet		Is the asset in service
Example Entry	18	Plastic																		
Data Units/Type	inches	type	text																	
Data Collection Method	Measure down from invert	ID in field	Assess in field						pick (Y/N)	pick		text	cloud link					autogenerate		pick (Y/N)
Domain Picklist Options		*Galvanized*		*circular*	*High Density Polyethylene - HDPE (Smooth)*	*Town*	*Town*	*Yes*	*Yes*	*good*										
		Plastic		*ellipse*	*Corrugated Plastic - CPP*	*NCDOT*	*NCDOT*	*No*	*No*	*average*										
		PVC		*arch*	*Plastic Other (PVC*	*Railroad*	*Railroad*		*Unknown*	*poor*										
		Concrete		*box*	*Other)*	*Private*	*Private*			*other*										
		Terracotta		*other*	*Corrugated Metal - CMP*	*Other*	*Other*			*unknown*										
		Steel			*Other Metal*	*Unknown*	*Unknown*													
					Concrete															
					Clay															
					Other															
					Unknown															

Appendix A - Part 3 - Proposed database structure for: stormwater features

TOBM - SW Features (Proposed dbase - draft)																								
Proposed draft database for stormwater features																								
Category of Fields			**Asset Mgmt ID**											**Ownership/Maintenance**			**Physical Condition**							
Field Orig	Diameter	HUC			InletNum	OutfallNum		Type			Material	Inv_Depth(?)										Condition	Inl_Mat	
Field New	**NOT APPLICABLE**	**NOT APPLICABLE**	**ObjectID**	**AssetID**	**LOS_Inlet**	**LOS_Outfall**	**Assettype**	**LOS_Type**	**Inlettype**	**Box Desc**	**LOS_Mat**	**BoxInv_Depth_in**	**Box Note**	**Owner**	**Maintenance**	**BoxAccess**	**Cond_inlet_outlet**	**Cond_Pipe_if_visible**	**Cond_Grate**	**Cond_Box**	**Condition_Notes**	**Condition_LOS**	**Inl_Mat_LOS**	**DryWeatherFlow**
Description												user enter measuredown reading of inches to invert of box, 1 decimal max			who maintains	assess accessibility					if pipe condition, which one?			assess presence of base flow (dry weather flow)
Example Entry																								
Data Type							pick		pick, multiple	pick			text				text	pick	pick	pick	text			
Data Collection Method					import from existing dbase	import from existing dbase		import from existing dbase		import from existing dbase	import from existing dbase	may be possible to migrate from LOS "Inv_Depth"		visual								import from existing dbase	import from existing dbase	
Domain Picklist Options							*grate inlet*			*precast box*				*Town*	*Town*	*Lidar*	*Good*	*Good*	*Good*	*Good*				*Flow present in dry weather*
							open throat curb inlet			*brick box*				*NCDOT*	*NCDOT*	*blind box*	*Fair*	*Fair*	*Fair*	*Fair*				*No flow present*
							grate and open throat combination inlet			*precast manhole*				*Railroad*	*Railroad*	*no lid*	*Poor*	*Poor*	*Poor*	*Poor*				*Unknown*
							open throat yard inlet			*other*				*Private*	*Private*	*lid too heavy*	*Unknown*	*Unknown*	*Unknown*	*Unknown*				
							multistage inlet (SCM)							*Other*	*Other*	*other*	*N/A*	*N/A*	*N/A*	*N/A*				
							other inlet							*Unknown*	*Unknown*		*Other*	*Other*	*Other*	*Other*				
							junction																	
							outfall																	

Photo/Data		Datum			Geometry																			QC		Lifecycle Data	
	Photo																			Out_Diamet		Outlet_To				Watershed		
Attachment	LOS_Photo	Inv_invbasis	DatumElev	Datum	BoxInv_Depth_ft	BoxInv_elev	BoxDim_ft	Pipe1_dia_in	Pipe1_mat	Pipe1_measdwn_in	Pipe1_invelev	Pipe2_dia_in	Pipe2_mat	Pipe2_measdwn_in	Pipe2_inv	Pipe3_dia_in	Pipe3_mat	Pipe3_measdwn_in	Pipe3_inv	Pipe4_LOSinfo	Pipe4_out_mat	NOT APPLICABLE	Pipe4_measdwn_in	Pipe4_invout	NumIncomingPipes	NOT APPLICABLE	Install Date	ServiceStatus
Allow for attachment of more than 1 photo, pdf, etc. (could be used to capture condition info, field assessment notes, etc)		basis for absolute elevation	NAVD88 elevation of datum	basis for measuredown depths (top of grate, gutter invert, top of manhole lid cover,…)	calc inches to feet, 2 decimal places	absolute elevation NAVD88, datum minus box depth ft if based on measure down & lidar	approximate dimensions of box in feet x feet	diameter pipe 1, inches	material	user enter measuredown reading of inches to invert of pipe	absolute elevation NAVD88=DatumElev - depth in feet	diameter pipe 2, inches	material	user enter measuredown reading of inches to invert of pipe	absolute elevation NAVD88	diameter pipe 3, inches	material	user enter measuredown reading of inches to invert of pipe	absolute elevation NAVD88	diameter and material of pipe 1 out			user enter measuredown reading of inches to invert of pipe	absolute elevation NAVD88	enter # of incoming pipes			Is the asset in service
cloud link		Pick	number	Pick	calculation	calculation	text	integer		number, nearest 0.25"	calculation or entry	integer		number, nearest 0.25"	calculation or entry	integer		number, nearest 0.25"	calculation or entry	integer			number, nearest 0.25"	calculation or entry	integer			pick (Y/N)
	import from existing dbase									1 decimal (nearest 1/4 to 1/2 inch)										import from existing dbase							
		QL1 LiDAR																	*in service*							*Camp Branch*		*in service*
		Survey Grade GPS																	*out of service*							*Swannanoa River*		*out of service*
		Traditional Survey																								*Tomahawk Branch*		
		Plat or Design Plans																								*Flat Creek*		
		Other																										

Appendix A - Part 3 - Proposed database structure for: ditches

TOBM - SW Ditches (Proposed dbase - draft)																							
Proposed draft database for ditches																							
Type	**Asset Mgmt**				**Geometry and Design Data**										**Photo/Data**	**QC**	**Lifecycle Data**	**Physical Condition**					
Fields	**ID**	**Owner**	**Maintenance**	**Type**	**ApproxDA_Acre**	**Elev_Start**	**Elev_End**	**Approx_Slp**	**AvgW_Ft**	**AvgD_Ft**	**Length_Ft**	**Width_or_Dia_Ft**	**Note1**	**Note2**	**Photo**	**EntryBy**	**ServiceStatus**	**DryWeatherFlow**	**Lining**	**Condition**	**ConditionNotes**	**ConditionSource**	**Issues**	**IssueNote**
Description	ESRI ID system field	owner	who maintains	type of feature	rough drainage area in acres	autogenerate from lidar?	autogenerate from lidar?	calculation										assess presence of base flow				Describe condition assessment method, remote, field, video, etc		
Example Entry																								
Data Units/Type	system field	domain text	domain text																					
Data Collection Method																						text		
Domain Picklist Options		*Town*	*Town*	*Ephemeral Drainage*													*in service*	Yes	*concrete*	*Excellent*			*flooding*	
		NCDOT	*NCDOT*	*Town Maintained Ditch*													*not in service*	No	*grass*	*Good*			*discontinuity*	
		Railroad	*Railroad*	*Private Maintained Ditch*															*other vegetation*	*Average*			*driveway culverts*	
		Private	*Private*	*Driveway Pipe*															*soil*	*Poor*				
		Other	*Other*	*Outfall*															*rock*	*Other*				
		Unknown	*Unknown*	*Other*															*other*					

Appendix B – Nonspatial Data References

1. **Citizen Stormwater Survey**
2. **Citizen Stormwater Survey Results 2020 – 2021**
3. **Flooded Structures**
4. **Work Orders from iWorQs 6/1/21 – 3/4/22**
5. **Compiled Public Input 2020-2021 on Stormwater Program Services and Specific Concerns (Organized by Topic)**

CITIZEN STORMWATER SURVEY

The Town of Black Mountain wants to know more about your stormwater concerns. All citizens are invited to participate in this short survey. The feedback from this survey will help us to better evaluate and address stormwater issues.

Stormwater is water runoff generated when rain and snowmelt events flow over land, structures or other impervious surfaces and does not percolate into the ground.

1. How often does stormwater collect on or run through your property? *Check only one.*

   ○ **Always** – almost every storm, including the smallest events, which results in stormwater on my property.

   ○ **Sometimes** – only above average precipitation events result in stormwater on my property.

   ○ **Never** – even the largest storms **do not** result in stormwater on my property.

2. Describe the stormwater issues on your property. *Check all that apply.*

   ○ Stormwater pools on a portion of my property

   ○ Stormwater runs through a portion of my property
   Front yard ____ Side Yard _____ Rear Yard _____

   ○ Stormwater accumulates quickly and is slow to leave

   ○ Stormwater accumulates inside my house in the _____ area of my home.
   Garage _____ Basement _____ Main House _____

   ○ The amount of stormwater on my property is significant

3. How would you charcaterize stormwater on your property as a concern? *Check only one.*

   ○ It is a non-issue

   ○ A small concern

CITIZEN STORMWATER SURVEY

○ A moderate concern

○ A serious concern

4. Do you have stormwater controls on your property? *For example, sump pump, rain barrels, French drains, stormwater pond, etc.*

   ○ Yes ○ No

   If yes, list the stormwater controls on your property: _____

   _____

   _____

5. If there are stormwater controls on your property, did you install them yourself?

   ○ Yes ○ No

6. Describe the stormwater issues on Town of Black Mountain roads that impact you. *Check all that apply.*

   ○ Stormwater pools on certain Town of Black Mountain Roads

   ○ Stormwater runs across certain Town of Black Mountain roads.

   ○ Stormwater accumulates quicky and is slow to leave from certain Town of Black mountain road.

7. Please list in order which specific roads are impacted by stormwater.

   Most Impacted Road: _____

   Second Most Impacted Road: _____

8. In your experience, what other public property is impacted by stormwater? *Check all that apply.*

   ○ Sidewalks

   ○ Parking Lots

CITIZEN STORMWATER SURVEY

- ○ Parks
- ○ Other: _____

9. How would you characterize stormwater issues in the Town of Black Mountain as a whole? *Check only one.*

   - ○ It is a non-issue
   - ○ A small concern
   - ○ A moderate concern
   - ○ A serious concern

10. Do you have any concerns with stormwater drains, ditches, or outfalls being properly maintained in your area?

    ○ Yes ○ No

    If yes, please describe the concern: _____
    _____
    _____

11. How do you rate your current stormwater rate of service? *Check only one.*

    - ○ Very Poor
    - ○ Poor
    - ○ Average
    - ○ Above Average
    - ○ Excellent
    - ○ I Don't Know

CITIZEN STORMWATER SURVEY

12. Do you recall receiving education directly from Town staff (by mail, in person or at an event) about stormwater issues or how the land next to a stream should be maintained?

○ Yes ○ No

13. Are you aware that the Town has a Stormwater Helpline (828-419-9300, ext. 680) that citizens can use to contact Town staff to report stormwater pollution, erosion problems or ask questions?

○ Yes ○ No

14. Are you aware that the Town has a website dedicated to stormwater? (https://townofblackmountain.org/2064/Stormwater)

○ Yes ○ No

15. How often do you visit the Town's website? *Check only one.*

○ Daily

○ Once or twice a month

○ Yearly

○ Never

16. Which of the following stormwater programs would you be interested in participating? *Check all that apply.*

○ Rain barrel workshop

○ Rain garden installation training workshop

○ Drainage Assistance Program

○ Adopt-A-Stream

○ Stream clean-up events

CITIZEN STORMWATER SURVEY

- ○ Training for how to manage property with creeks, streams, and rivers

17. Would you be interested in a Drainage Assistance Program if you had to grant an easement to the Town?

    ○ Yes ○ No

18. What is your preferred method of communication regarding the stormwater program?

    ○ Email

    ○ Visit Town website

    ○ Social media

    ○ Mailed materials

19. In the last 12 months, have you visited the Town's stormwater website?

    ○ Yes ○ No

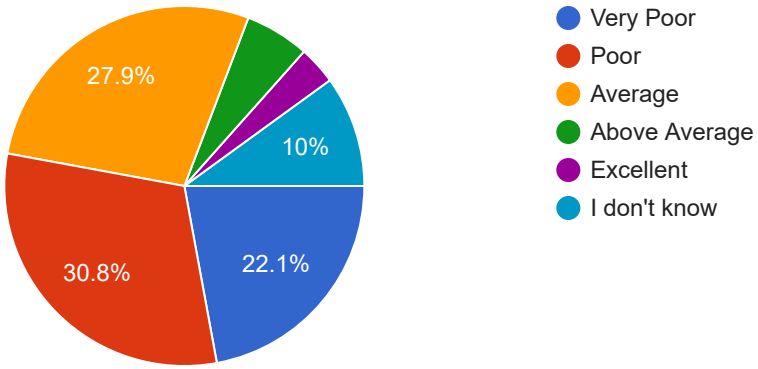
Completed surveys may be returned to the Planning Department at 160 Midland Avenue, Black Mountain, NC 28711 or may be emailed to anne.phillip@tobm.org.

Stormwater Utility Survey 2020

380 responses

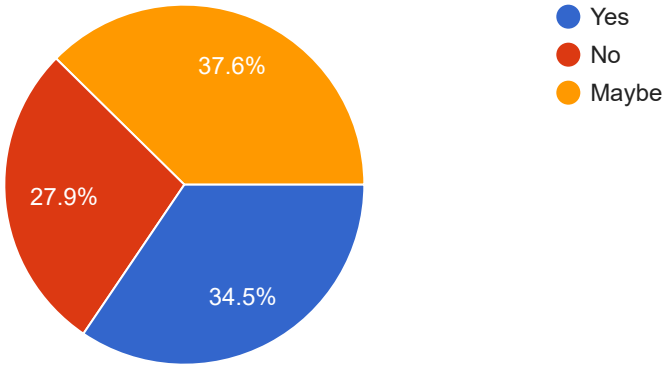
How do you rate your current stormwater rate of service?

380 responses



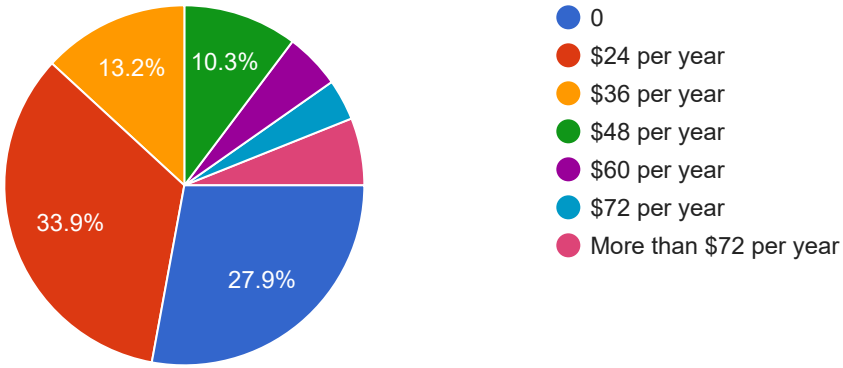
Would you be willing pay an annual stormwater fee to support improving the stormwater rate of service?

380 responses



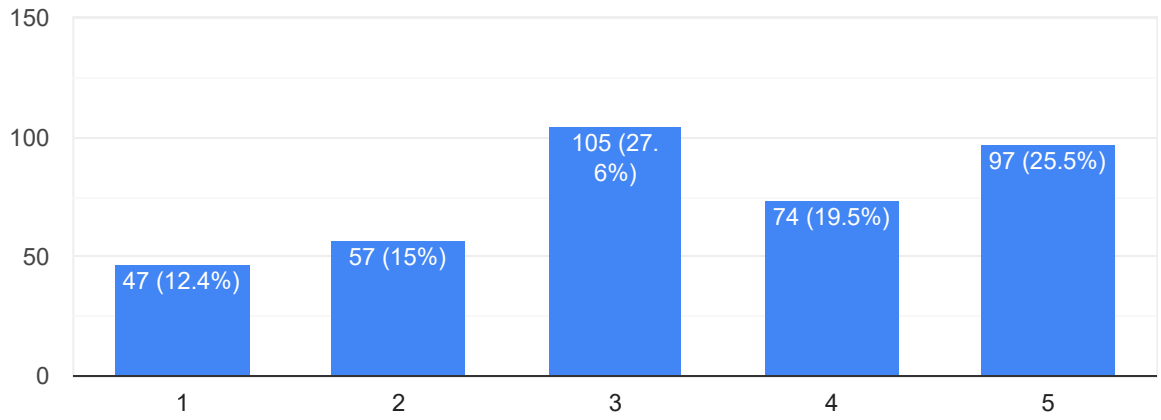
For a single residential dwelling, what would you consider paying to improve the stormwater rate of service?

380 responses



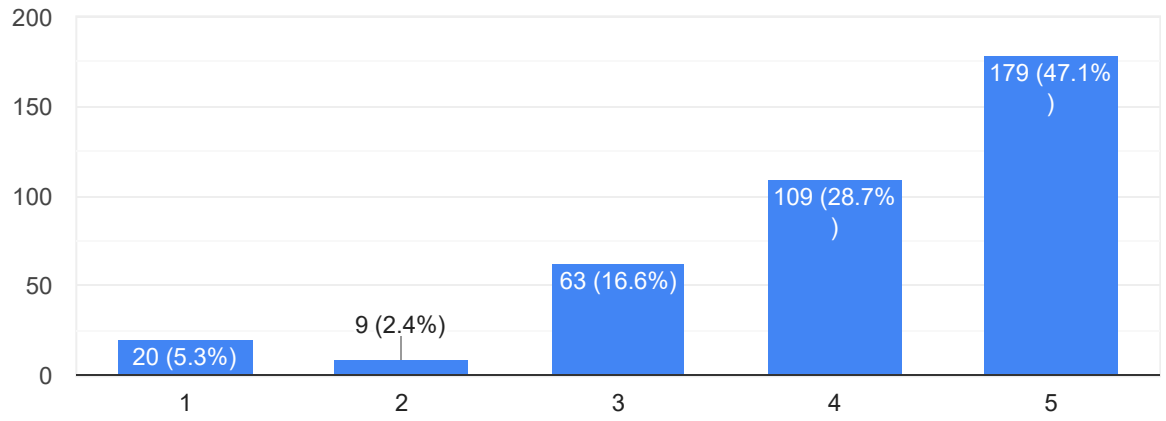
How important would you rank street sweeping as part of the stormwater program?

380 responses



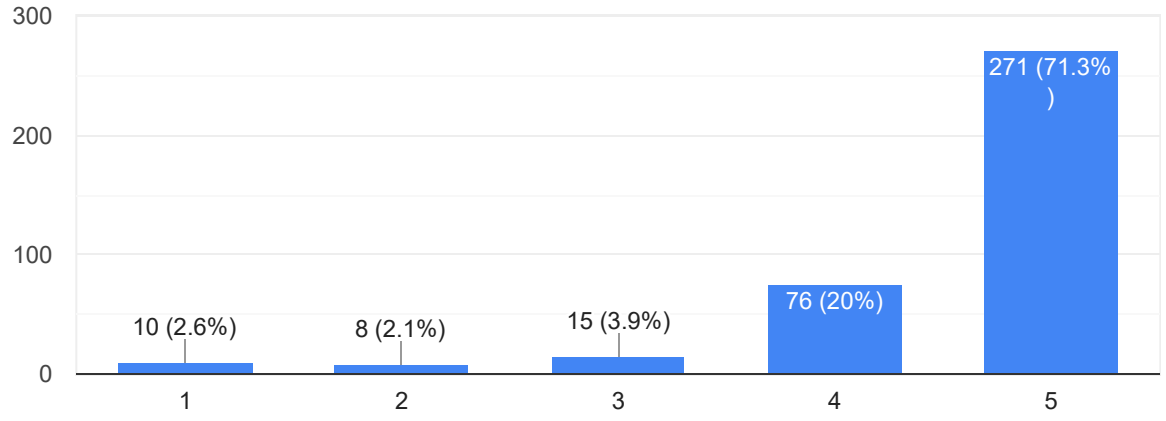
How important would you rank inspecting outfalls as part of the stormwater program?

380 responses



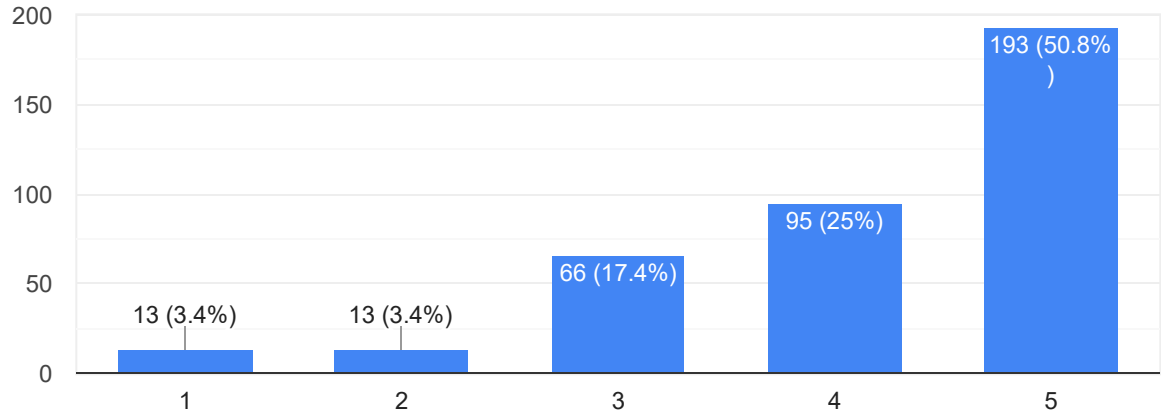
How do you rankcleaning out drains/inlets as part of the stormwater program?

380 responses



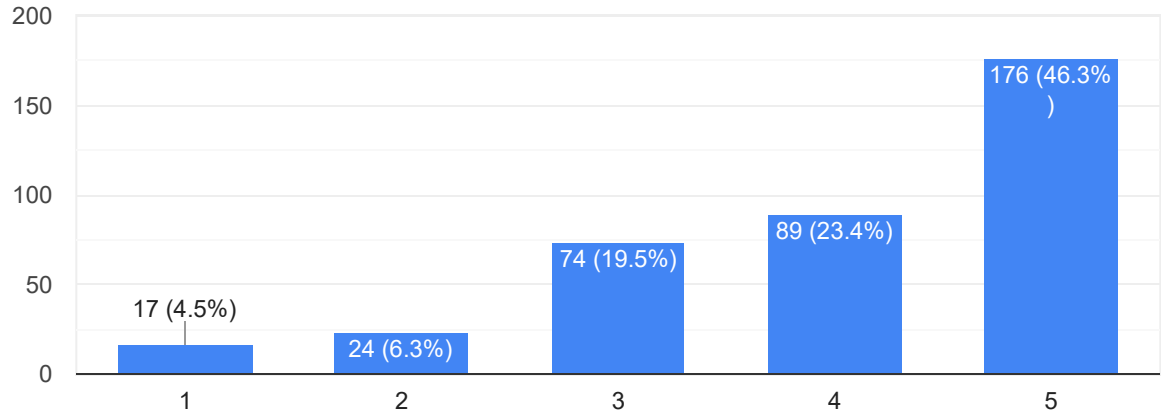
How do you rank replacing small stormwater pipes with larger pipes as part of the stormwater program?

380 responses



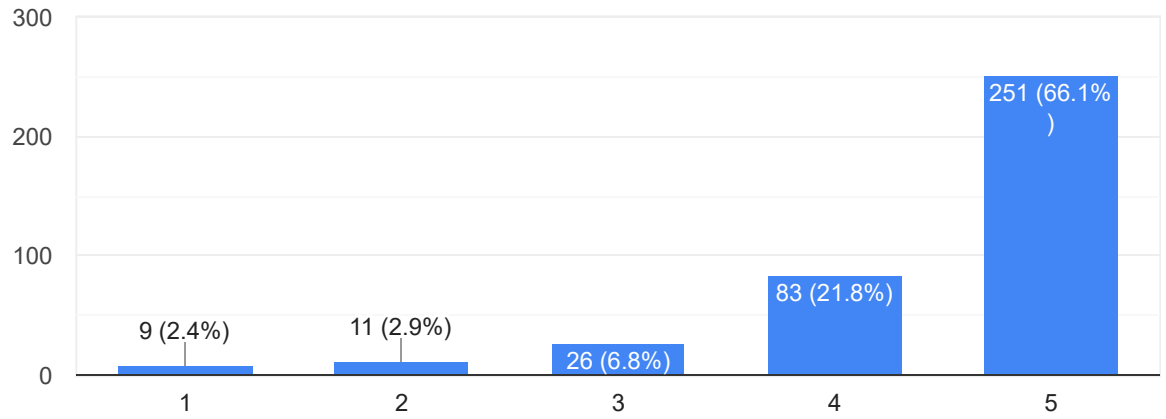
How do you rank adding additional underground stormwater pipe networks as part of the stormwater program?

380 responses



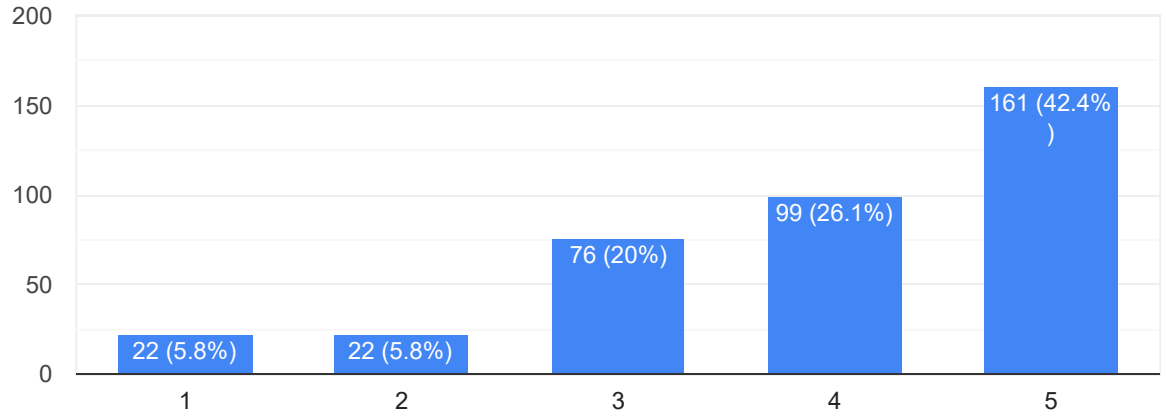
How do you rank cleaning out existing ditches as being part of the stormwater program?

380 responses



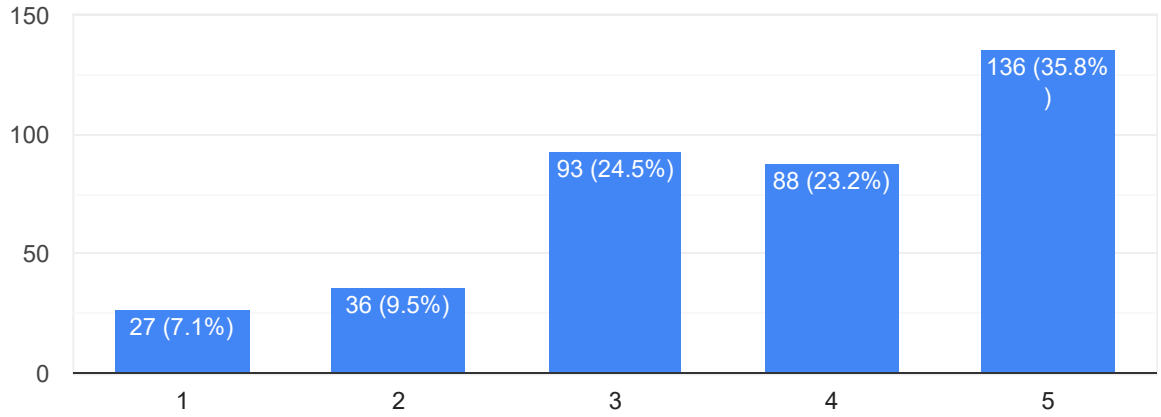
How do you rank adding additional ditching in the public right-of-way as being part of the stormwater program?

380 responses



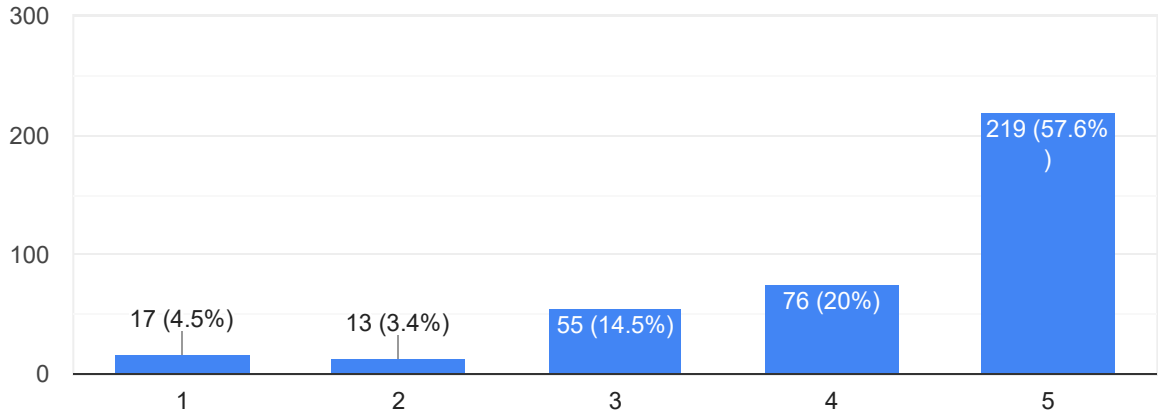
How do you rank community education programs as being part of the stormwater program?

380 responses



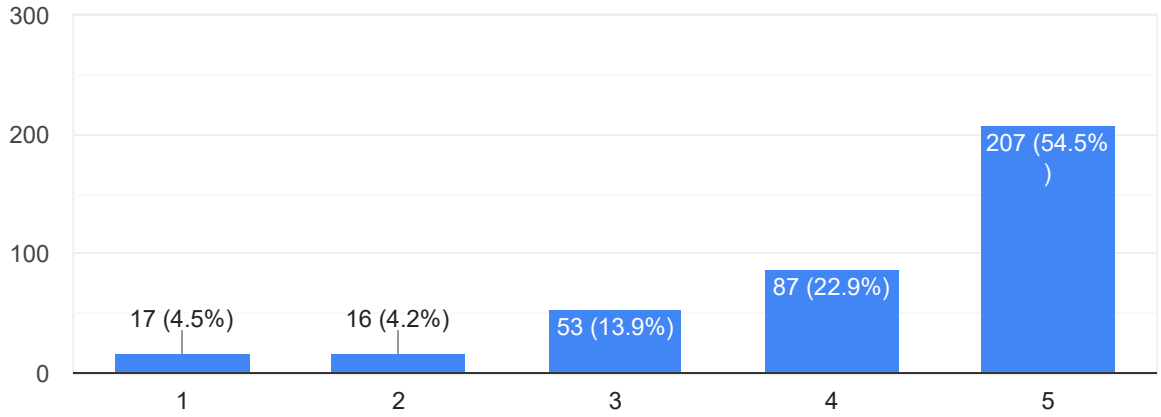
How do you rank post-construction stormwater regulations as being part of the stormwater program?

380 responses



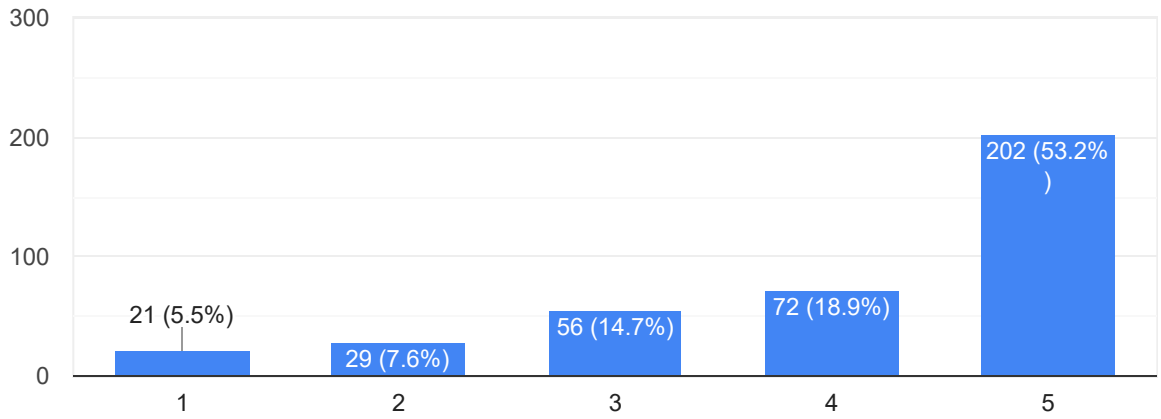
How do you rank illegal dumping nspection and monitoring as being part of the stormwater program?

380 responses



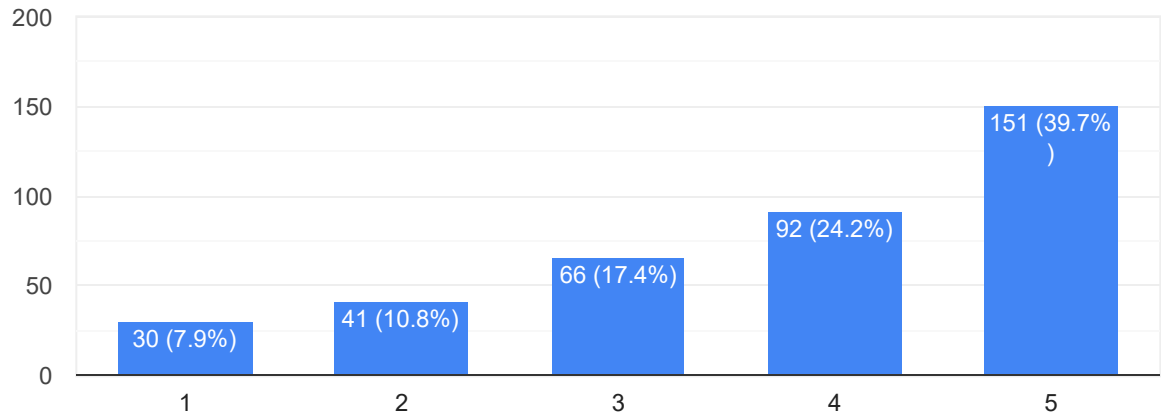
How do you rank adding "green infrastructure" such as rain gardens, bio-cells, and other environmentally sensitive stormwater control measures on public property, as being part of the stormwater program?

380 responses



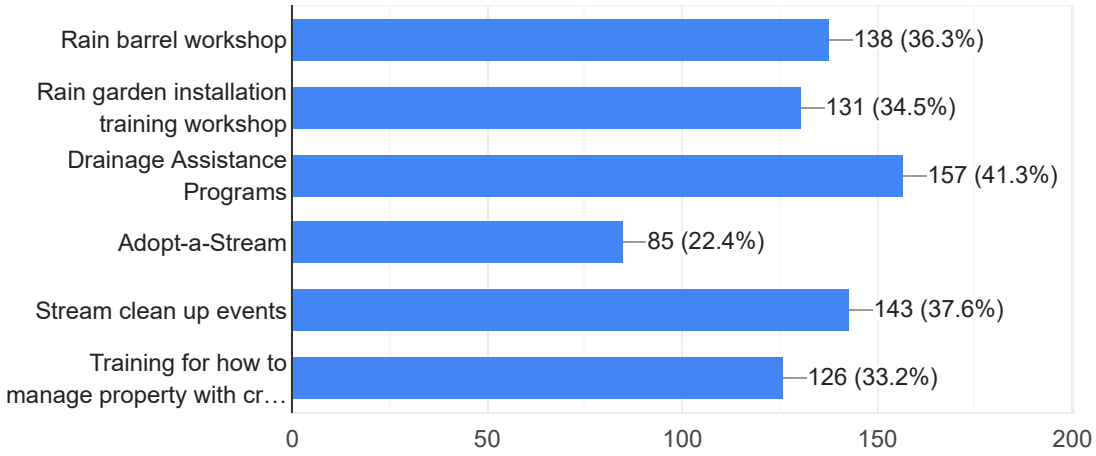
How do you rank adding "green infrastructure" such as rain gardens, bio-cells, and other environmentally sensitive stormwater control measures on private property if is has been identified in the stormwater master plan as a high-impact project and the private property owner donates a maintenance easement to the town, as being part of the stormwater program?

380 responses



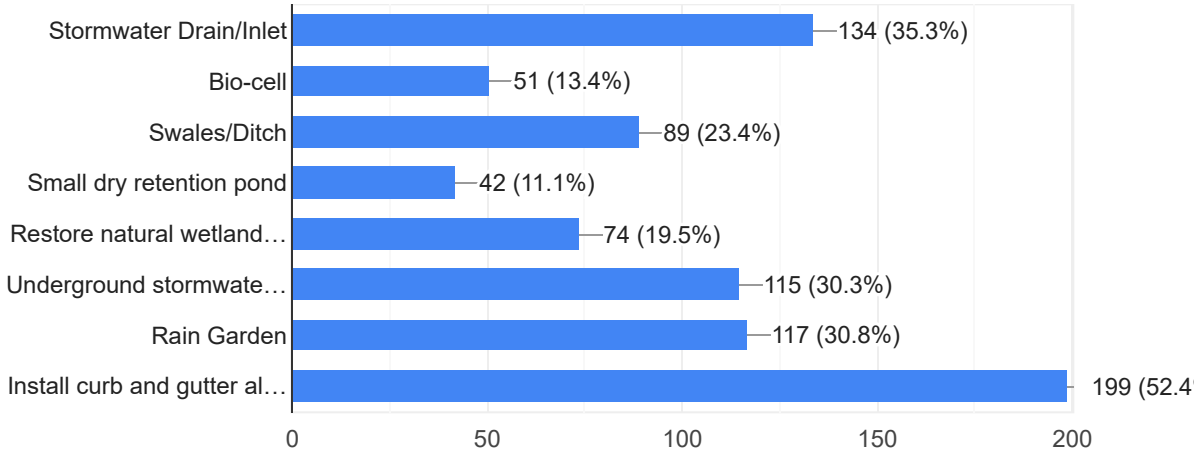
Which of the following stormwater programs would you be interested in participating?

380 responses



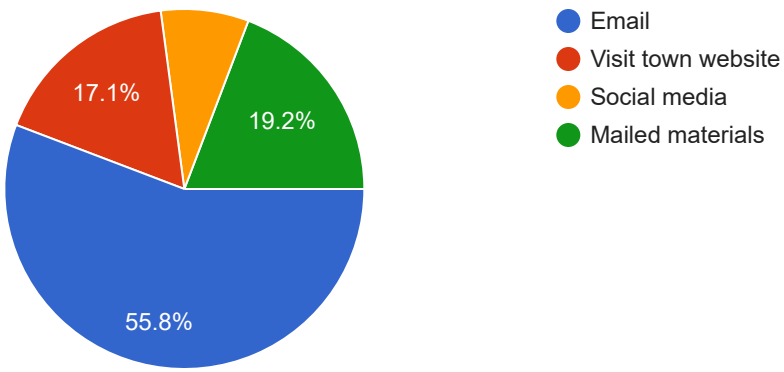
Would you be interested in donating a stormwater easement to the town for the purpose of installing any of the following?

380 responses



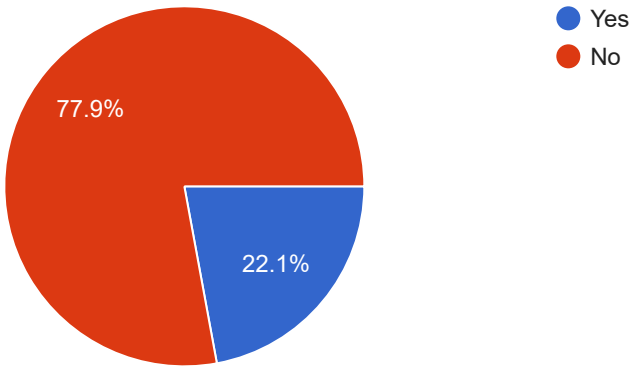
What is your preferred method of communication regarding the stormwater program?

380 responses



In the last 12 months, have you visited the town's stormwater website?

380 responses



How do you think the town can improve stormwater service?

380 responses

Not sure

My property is affected by runoff drainage and I'd like help to build a rain garden or dry pond. I'm willing to help with the installation but would need a professional plan.

There is storm water damage on 7th street as we speak!!! Help us fix it ... thank you

Cleaning current ditches including water n Montreat rd and fixing road run off that flows into yards.

We have spent thousands of dollars on storm water management on our residential lot because we receive a majority of the storm water from our entire street/block. We are paying to fix the town's failure to plan/construct drains and gutters on our street. You can begin by assessing the issue on a street by street basis.

Clean out and repair existing stormwater drains.

Quit allowing development that exacerbates already existing storm water problems.

CITIZEN STORMWATER SURVEY 2021

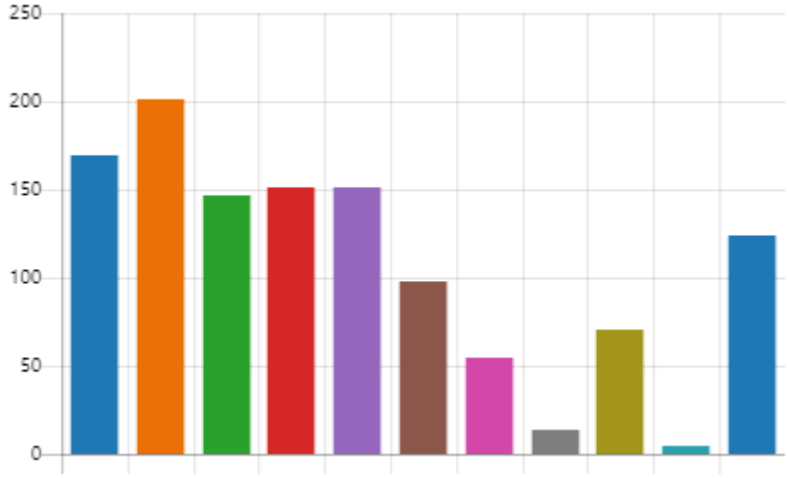
337	07:14	Active
Responses	Average time to complete	Status

1. How often does stormwater collect on or run through your property? *Check only one.*

Always - almost every storm, i...	168
Sometimes - only above avera...	123
Never - even the largest storm...	40

2. Describe the stormwater issues on your property. *Check all that apply.*

Stormwater pools on a portio...	169
Stormwater runs through a po...	201
Front yard	147
Side yard	151
Rear yard	151
Stormwater accumulates quick...	98
Stormwater accumulates insid...	54
Garage	14
Basement	70
Main House	4
The amount of stormwater on ...	124



3. How would you characterize stormwater on your property as a concern? *Check only one.*

It is a non-issue	42
A small concern	46
A moderate concern	103
A serious concern	135

4. Do you have stormwater controls on your property? *For example, sump pump, rain barrels, French drains, stormwater pond, etc.*

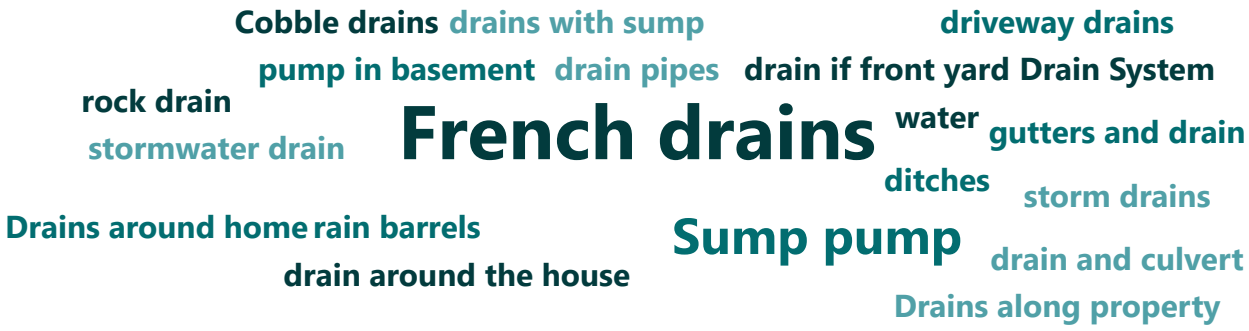
Yes	200
No	127

5. If yes to question number 4, list the stormwater controls on your property.

199
Responses

Latest Responses
"*French drains, Pipes*"

75 respondents (**41**%) answered **French drains** for this question.



6. If there are stormwater controls on your property, did you install them yourself?

Yes	120
No	127

7. Describe the stormwater issues on Town of Black Mountain roads that impact you. *Check all that apply.*

Stormwater pools on certain T...	185
Stormwater runs across certai...	226
Stormwater accumulates quick...	138

8. Please list in order which specific roads are impacted by stormwater.

274
Responses

Latest Responses

"*Flat Creek Road*"

"*North Fork, Montreat Rd. Live on a State road- live in Town limits*"

"*Old 70 by Dolphin Auto*"

52 respondents (**21**%) answered **Rd** for this question.

9. In your experience, what other public property is impacted by stormwater? *Check all that apply.*

Sidewalks	66
Parking Lots	92
Parks	140
Other	58

10. How would you characterize stormwater issues in the Town of Black Mountain as a whole? *Check only one.*

It is a non-issue	11
A small concern	38
A moderate concern	117
A serious concern	156

11. Do you have any concerns with stormwater drains, ditches, or outfalls being properly maintained in your area?

Yes	238
No	84

12. If yes to question number 11, please describe the concern below.

235
Responses

Latest Responses

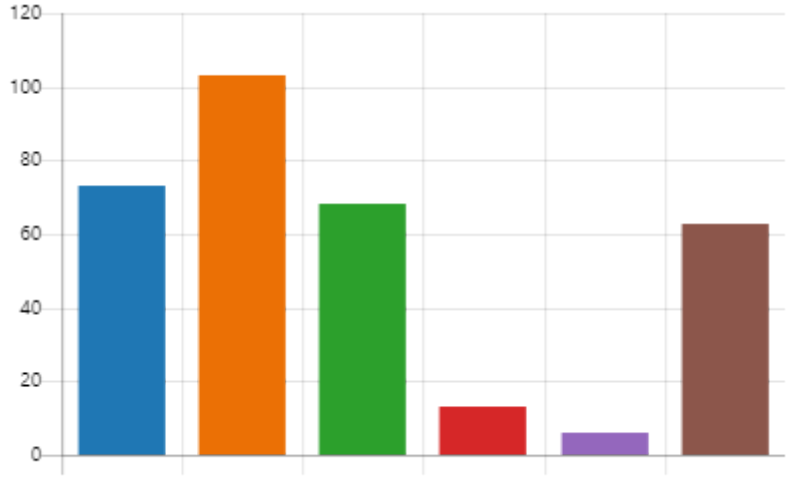
"water stays in ditch & road long time and is eating my ditch out from...

"ditches overflow - water on property"

79 respondents (**37**%) answered **ditches** for this question.

13. How do you rate your current stormwater rate of service? *Check only one.*

Very Poor	73
Poor	103
Average	68
Above Average	13
Excellent	6
I don't know	63



14. Do you recall receiving education directly from Town staff (by mail, in person or at an event) about stormwater issues or how the land next to a stream should be maintained?

Yes	57
No	270

15. Are you aware that the Town has a Stormwater Helpline (828-419-9300, ext. 680) that citizens can use to contact Town staff to report stormwater pollution, erosion problems or ask questions?

Yes	71
No	254

16. Are you aware that the Town has a website dedicated to stormwater (https://www.townofblackmountain.org/2604/Stormwater)?

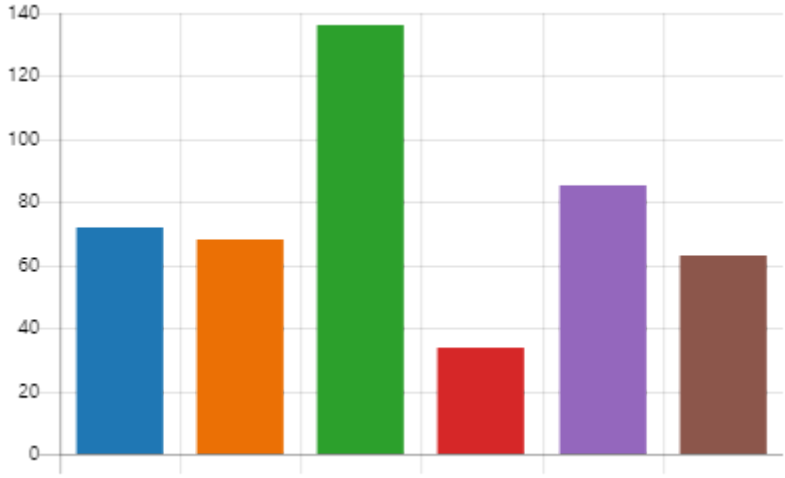
Yes	79
No	245

17. How often do you visit the Town's website? *Check only one.*

Daily	4
Once or twice a month	190
Yearly	87
Never	46

18. Which of the following stormwater programs would you be interested in participating? *Check all that apply.*

Rain barrel workshop	72
Rain garden installation traini...	68
Drainage Assistance Program	136
Adopt-A-Stream	34
Stream clean-up events	85
Training for how to manage pr...	63



19. Would you be interested in a Drainage Assistance Program if you had to grant an easement to the Town?

Yes	152
No	126

20. What is your preferred method of communication regarding the stormwater program? *Check all that apply.*

Email	219
Visit Town website	71
Social media	48
Mailed materials	116

21. In the last 12 months, have you visited the town's stormwater website?

Yes	86
No	243

Flooded Structures (highlighted are entered in AGOL map)

The town does not have a map of flooded structures.

In the last four years flooding has occurred with the greatest frequency along Flat Creek in the following locations:

- Mobile Home Park – Portmanvilla, Armory Drive (off of Blue Ridge Road), Armory Drive (off of Blue Ridge Road)
    - Flood waters in flash flooding events have required evacuation and swift water rescue at least once in the last four years.
- Ole Guacamole 401 E State St
    - Part of the asphalt parking lot was carried away in 2018 flooding from tropical event
    - They generally sandbag the building and I think they have been pretty successful at keeping water out.
- Swannanoa Valley Friends Meeting neighboring structures 137 Center Ave
    - In the last four years, I believe the water has filled the fairly high crawl space, and been just shy of entering the building.
- The Flood Gallery
    - This is on the Swannanoa River. It has a flood gate of some sort around it. This building/shopping center will likely be taken by NCDOT in the development of the interchange project with Blue Ridge Road.
- Downtown buildings
    - Major runoff from Church Street onto State.
    - Behind Grace Jewelers and Town Hardware is the “geyser”
    - Bottom of S. Richardson between the back of Henson’s and the small medical office building
- A Black Mountain Storage - 1196 Old US Hwy 70, Black Mountain, NC 28711
    - Endre Pacztor- Endre experiences flooding during major rain events like Fred this year. He said that two storage units were flooded during Tropical Depression Fred. He dug a ditch at the back of his property to divert stormwater and says he has no issues during average rain events, the ditch does a good job. He is concerned about large rain events overwhelming his property. He requested that the Town extend the ditch he had made in back of his property so that the water can be drained better, and his property won’t flood.
- 191 and 197 Old US 70 Hwy (197 Old US Hwy 70 E, Black Mountain, NC 28711)
    - Flooding issues at intersection of these properties and Padgettown Road

Residential flooding complaints – report of basement flooding (highlighted are entered in AGOL map)

- 514 S OCONEECHEE AVE – The Hyde Residence
- 104 LAUREL CIRCLE DR – Courage Residence – just spoke with her this morning and she said that her basement floods when it rains heavy
- 206 Laurel circle Dr
- 200 Ash St-
    - Charmaine Sullivan - When it rains the water from Goldmont runs down the entire width of my property, washes away all the mulch, soil, and floods my basement. I have to go down and remove the water with buckets. My concrete driveway has to be constantly pressure washed. Since purchasing the property in 2007, I have spent more than $6,000 installing underground drains, railroad timbers, ballast gravel next to the driveway, 3 swales, a drain with a plastic liner and river rock bordering Ash. Unfortunately, none of these interventions have done much to manage this erosion and runoff problem. In addition, the constant water runoff has eroded the roots of 20 mature trees and other bushes with tree removal costs exceeding $8,000. At the back of my property there is an easement owned by the town that has a drain that floods over and spills all over my property. All this water flow washes away the top soil causing erosion and makes trying to grow any grass near impossible. In summary due to the lack of runoff control on Goldmont and Ash, the damage to my property and associated expenses described above have been significant.
    - Back of property is not owned by town, but there is a large ditch created by ephemeral stream that is continuously eroding
- 502 Rhododendron Ave (**crawlspace**)
    - Bob Sondergrath just purchased his home and is concerned about recent flooding of his crawl space (up to floor joists) that has happened twice in past year. He is concerned that construction of the duplex between N and S Park will increase flooding as it will increase impervious surface. He wanted to know if it would be possible for the Town to install an asphalt bump at the edge of the road between road and the garages to divert some sheetflow before it gets to his property. He also wanted to know if the drainage system could be upgraded from the undeveloped property to the lake, since the pipe that directs water is at a right angle and could be blocked or just undersized.
    - Bob said the issue is the inadequate culvert and related storm water drainage between North and South Park Lanes. In addition there is a planned development on the land between these two streets. He provided pictures of the culvert/storm drain. He mentioned the possibility of an asphalt bump coming down the west edge of North Park Ln. in order to direct the flow of water away from The Lakeview Condos, whose crawl spaces have flooded, requiring mitigation by a water removal company, twice within a year's time span.
- 498 Rhododendron Ave (**crawlspace**)
    - Randy Fosgard - Provided video of flooding to his property during Tropical Depression Fred on August 17. Also provided photos from October 29, 2020. There was another major flood event in August 2020 before he purchased the condo. The August 2020 rain flooded the crawlspaces in both condo buildings and took out the furnaces. They had to

replace the furnaces, A/C units and perform some major crawlspace remediation work. He is very anxious to hear of a proposed solution.

- 53 Goldmont Street – basement floods during heavy rains
- 54 Goldmont Street – basement floods during heavy rains
- 49 Goldmont Street – basement floods during heavy rains
    - 54 and 49 did not start flooding until after the Gold Leaf Walk Way Development.
- 127 Fairway Dr- had to install french drains around house because stormwater came in and destroyed the foundation; Believed to be a result of new construction further upslope.

Residential flooding complaints – garages (highlighted are entered in AGOL map)

- 496 Rhododendron Ave
  - Margaret Lawton- Asked for the Town to dig ditches or provide other stormwater infrastructure to alleviate flooding experienced by the condos (she is the HOA treasurer). She said that in the last two years, the HOA has spent about $15,000 in addition to replacing two furnaces, two air conditioning units and cleaning mud out of their garages.
- 110 Fourth St and 106 Second St
  - Jim Johnson- During heavy rains, the ditch across from the property backs up with the amount of water from the street and Unitarian property. The water backs up across the street and into their property, flooding the garage. He says that the problem is that the ditches and pipes conveying the water are undersized. He asked if he can enlarge the ditch on his own.

Flooding Concerns – To our knowledge these buildings have not taken on water, but have reported flooding on their property, particularly in the 2018 events, the flash flood in August 2020 and August 2021 during tropical storm Fred. (highlighted are entered in AGOL map)

- 500 Rhododendron Ave.
  - Un-named trib that is piped in different locations, daylights at this property before piped to the lake. Backs up in larger events.
- 752 Hiawassee Ave.
  - Ephemeral stream that begins along the slope in the Tudor Croft neighborhood, goes to Tomahawk Branch
- 505 S. Oconeechee Ave.
  - Ephemeral stream (same as the one impacting the Hyde property)
- 100 Portman Villa Rd- Kiersten Hall
  - ephemeral stream behind the house that carries significant water to Flat Creek. In the past the town has attempted to improve conditions at this location. The owner reports that the town is "turning water" onto their property.
- 313 Flat Creek Road - residence
  - The banks collapsed during the 2018 tropical events.
- 214 Blue Ridge Road
  - High risk, banks have collapsed, and house is one big storm away from being in the water.
- 10 White Pine Drive- Elaine Metcalf
  - Stormwater runoff from road is impacting her property. When it rains, her septic field is flooded and her system is backed up. Says that the Town is not taking care of the road in front of the Fire Station #2 and there are issues with visibility on the road because of the trees planted along road.
- 100 S Park Lane
  - Hugh Ashcraft - The storm drain on the southern edge of Oakland Dr just north of the condos where Hugh lives is often clogged. During Tropical Depression Fred, the backyard area behind the condos became a large river.
  - Duane Repman - He said that adding the asphalt and drain enclosure has increased the velocity of the water coming out the drain onto their property. I asked if he could fill out the stormwater survey and he said he did. I brought up the possibility of adding plantings in the backyard area to take up the flow and reduce flooding. He was receptive. He is the president of the HOA and said he can bring that up at their next meeting. I said I had some nonprofit contacts he could get in touch with for expertise and help. He said maybe I could come to their meeting. I said I can send links even if I can't make it. He is very upset about the proposed development adjacent and thinks the city is complicit with the owner in some way. Mentioned history of the land being labeled as not developable and the owner did not pay taxes on it for ten years or more. Now he can develop it. Dwayne is worried that the land will not be developed well, and the flooding issues will be worse. He also is worried that the owner will have all the trees taken down.
  - Had some fill work done about 20 years ago. Soggy low point, stream in the area going to Lake Tomahawk

- 107 Hilltop Rd
  - Jay Parmar- Jay said the storm drain at intersection of Hilltop and Byrd gets clogged with leaves and debris frequently, causing stormwater to back up in the ditch down Hilltop.
  - Intersection of Hilltop & Fairway is on the list of inlets cleaned before storms.
  - The culvert pipe under his driveway has been partially collapsed due to gravel washed away off top of driveway and car weight on culvert.
- 211 S Park Ln
  - Ann Lutz – Provided photos of stormwater generated from Tropical Depression Fred on her property and behind the townhomes on S Park Lane on August 17, 2021. Duane Repman is the photographer and is the president of the HOA of the condos. Water flowed from area between N and S Park Ln toward lake and also over 211 S Park Ln toward the lake.
- Montreat and Laurel circle
- 506 SOUTH Oconeechee subdivided properties
- Azalea Ave whole street
- Concerns about SW runoff from Tudor Croft development
- Parking lot behind Town hardware and Mountain realty where the SW drains get clogged, washes out gravel parking lot, and cars parked there get flooded.
- West side of Broadway
- 103 W State St- water comes under doors at Town Hardware. SW drains at Montreat and State St get clogged, water comes in to store and back parking lot, not enough drainage on Montreat road and piles up on State street, cars push water into Town hardware building. Drain in parking lot the pipe leading into and from the drain are not aligned and starts vortex and geyser. Flooding due to drains clogged with gravel floods cars. In the past, the town said this is a private property issue, but the Town has cleaned out drain and pipe. Is this a Town SW drain?
- North fork going towards golf course on left side past Lynx condos, bridge there is always a danger, hydroplane possible and dark there, it always gets flooded.
- 602-604 Tomahawk Ave- crawl spaces flood when ditch across Tomahawk Ave fills and spills over into their property

Areas with flooding issues – list from building inspector: (highlighted are entered in AGOL map)

- In front of Ingles Warehouse
- Center Avenue
- backside of Atkins and Belle Street (on the backside of Portman Villa Manufactured Home Park).

entries entered into AGOL map

Work Order Detail Report

06/01/2021 - 03/04/2022

Work Date	Work Order #	Main Status	WO Asset	Request Type		Street Address	Maintenance Type	Comments	Any visible damage?	Water visibility	Flow	Inspection findings	Clean out needed?	Any damage to the inlet box or structure?	Condition of secondary containment	Evidence of standing water?	Grate in good condition?	Date Completed	How much Material was taken away
3/3/2022	93	PENDING		1. Internal		601-603 Tomahawk Ave	Cleaned out ditch	Clean the leaves out of the ditches on Hiawassee, and Tomahawk											
3/2/2022	92	COMPLETE		1. Internal		7th st. and Portman Villa	Blocked Culvert					Leaves	Yes	No		Yes		3/2/2022	1 cubic yard
2/24/2022	91	COMPLETE		1. Internal		Around town	Tree limbs and Debris	Storm drain weekly runthrough	No			Leaves	Yes				Yes	2/24/2022	1 cu yd
2/11/2022	90	COMPLETE		1. Internal		S Cherokee & Tomahawk Ave	*Other	repaired storm drain											
2/16/2022	89	PENDING		2. Complaint		127 Hilltop Rd	Blocked Culvert	received request to clean culvert at 127 Hilltop Rd											
2/10/2022	88	COMPLETE		2. Complaint		106 Seventh St	Blocked Culvert												
2/8/2022	87	COMPLETE		2. Complaint		102 Seventh St - on Portmanvilla	Blocked Culvert	received a call about a blocked culvert at 102 7th St, Portmanvilla side											
2/4/2022	86	COMPLETE		1. Internal		Around town	Storm Drainage Walkthrough	Storm drain weekly runthrough	No			Leaves	Yes	No			Yes	2/4/2022	3.5 cubic yards
1/28/2022	85	COMPLETE		1. Internal		S. Cherokee & Tomahawk Ave	*Other	worked on storm drain											
2/4/2022	84	PENDING		2. Complaint		107-109 Fourth St	Blocked Culvert	received request to clean culvert & ditch between 107-109 Fourth St											
1/25/2022	83	COMPLETE		2. Complaint		Sutton & S Ridgeway	Install Culvert	repaired culvert & installed drain box											
2/3/2022	82	COMPLETE		1. Internal		Around town	Tree limbs and Debris	Storm drain weekly runthrough damage at south cherokee and tomahawk, and newbern and connally	Yes			Leaves	Yes	Yes				2/3/2022	2 cu yds
2/3/2022	81	PENDING		1. Internal		S.Cherokee	*Other	Bent drain cover, and broken box					No	Yes		No	Yes		
1/27/2022	80	COMPLETE		1. Internal		Around town	Storm Drainage Walkthrough	Storm drain weekly runthrough	No			Leaves		No		No	Yes	1/27/2022	1 cubic yd
1/25/2022	79	COMPLETE		1. Internal				install storm drain box											
1/25/2022	78	COMPLETE		1. Internal		Around town	Tree limbs and Debris	Storm drain weekly runthrough											
1/25/2022	77			1. Internal		Around town	Tree limbs and Debris	Storm drain weekly runthrough											
1/11/2022	76	COMPLETE		1. Internal		206 Chapel Rd	Cleaned out ditch									No	Yes		
1/7/2022	75	PENDING		1. Internal		718 Padgettown	Cleaned out ditch			N/a	Light								
1/7/2022	74	COMPLETE		1. Internal		65 Blue Ridge Assembly	Cleaned out ditch	Clean the ditch at 65 blue ridge assembly and ditches above as needed	No		Light	Leaves	Yes	No		No		1/12/2022	10 cu yds
1/3/2022	73	COMPLETE		1. Internal		Around town	Storm Drainage Walkthrough	Storm drain weekly runthrough	No			Leaves	Yes	No				1/3/2022	3 cubic yards
12/30/2021	72	COMPLETE		1. Internal		Craggy Rd	Cleaned out ditch		No			Mud	Yes	No				12/29/2021	2 yards
12/30/2021	71	COMPLETE		1. Internal		808-812 Lakey Gap Rd	Cleaned out ditch		No			Leaves	Yes	No				12/29/2021	1 cubic yard
12/21/2021	70	COMPLETE		1. Internal		Church St public parking	Accumulation of Litter						Yes				Yes	12/21/2021	1 Cu yd
12/21/2021	69	COMPLETE		1. Internal		114 Cragmont rd	Accumulation of Litter						Yes	No		No	Yes	12/21/2021	3 cu yds
12/6/2021	68	COMPLETE		1. Internal		Around town	Tree limbs and Debris	Storm drain weekly runthrough					Yes						
12/3/2021	67	COMPLETE		2. Complaint		24 carolina heights	Cleaned out ditch	clean upper ditch - see Chris											
11/24/2021	66	COMPLETE		1. Internal		110 Fourth St	Blocked Culvert	Water weasel culvert											
11/24/2021	65	COMPLETE		1. Internal		106 Second St	Blocked Culvert	Water weasel culvert											
11/18/2021	64	COMPLETE		1. Internal		across from 214 portmanvilla	Blocked Culvert	water weasel											
11/18/2021	63	COMPLETE		2. Complaint		Lookout Terrace	Cleaned out ditch	Ditch the whole road	No		Light		Yes						
11/18/2021	62	COMPLETE		1. Internal		204 Crestview	Blocked Culvert	Water weasel culvert											
11/18/2021	61	COMPLETE		1. Internal		11 W. Cotton Ave	Blocked Culvert	Water weasel culvert											

Work Order Detail Report

entries entered into AGOL map

06/01/2021 - 03/04/2022

Work Date	Work Order #	Main Status	WO Asset	Request Type		Street Address	Maintenance Type	Comments	Any visible damage?	Water visibility	Flow	Inspection findings	Clean out needed?	Any damage to the inlet box or structure?	Condition of secondary containment	Evidence of standing water?	Grate in good condition?	Date Completed	How much Material was taken away
11/18/2021	60	COMPLETE		1. Internal		860 Lakey Gap	Blocked Culvert	Water weasel culvert											
11/18/2021	59	COMPLETE		1. Internal		207-208 S.Oconeechee	Blocked Culvert	Water weasel culvert											
11/18/2021	58	COMPLETE		1. Internal		78 Goldmont	Blocked Culvert	Water weasel culvert											
11/18/2021	57	COMPLETE		1. Internal		816 Lakey Gap	Blocked Culvert	Water weasel culvert											
11/18/2021	56	COMPLETE		1. Internal		Hickory and Tomahawk Ave	Blocked Culvert	Water weasel culvert											
11/18/2021	55	COMPLETE		2. Complaint		808 laurel Ave	Blocked Culvert	Water weasel culvert											
11/18/2021	54	COMPLETE		2. Complaint		407 Judy Dr	Blocked Culvert	Water weasel culvert					No						
11/18/2021	53	COMPLETE		2. Complaint		808 Lakey Gap	Blocked Culvert	Water weasel culvert	No		Light					No			
11/18/2021	52	COMPLETE		2. Complaint		Craggy St	Cleaned out ditch	Clean out Ditch	No				Yes			No	Yes		
11/18/2021	51	COMPLETE		2. Complaint		Seventh St/ Portmanvilla side	Cleaned out ditch		No		Light		Yes						
11/18/2021	50	PENDING		2. Complaint		785 Lakey Gap	Blocked Culvert	Water weaseled Ditches	No		Light		No			No			
11/15/2021	49	COMPLETE		2. Complaint		820-822 lakey gap rd	Blocked Culvert	received request to clean out culvert and possibly ditch at 820-822 Lakey Gap											
11/12/2021	48			1. Internal		7 old lakey gap	Blocked Culvert	received request to clean culvert (and possibly ditch)											
11/3/2021	47	COMPLETE		1. Internal		606 Hiawasee	Install Culvert	2 15" smooth wall culverts installed (20' sticks)										11/3/2021	
10/28/2021	46	COMPLETE		1. Internal		Around town	Storm Drainage Walkthrough	Storm drain weekly runthrough	No			Leaves	Yes	No				10/28/2021	3 cubic yards
10/20/2021	45	COMPLETE		1. Internal		416 S Cherokee		culvert pipe has split apart, needs to be repaired											
10/20/2021	44	COMPLETE		1. Internal		123 E College - on Ash St side		JB reported that the ditch was washed out near 123 E College St on Ash St side and water lines were exposed											
10/8/2021	43	COMPLETE		1. Internal		Around town	Storm Drainage Walkthrough	Storm drain weekly runthrough	No			Leaves	Yes	No			Yes	10/8/2021	4 cubic yards
10/8/2021	42	COMPLETE		1. Internal		Around town	Storm Drainage Walkthrough	Storm drain weekly runthrough	No			Leaves	Yes	No			Yes	10/7/2021	3 cubic yards
10/8/2021	41	COMPLETE		1. Internal		Around town	Storm Drainage Walkthrough	Storm drain weekly runthrough	No			Leaves	Yes	No			Yes	10/6/2021	4 cubic yards
10/5/2021	40	COMPLETE		1. Internal		Around town	Storm Drainage Walkthrough	Storm drain weekly runthrough	No			Leaves	Yes	No			Yes	10/5/2021	2 cubic yards
9/21/2021	39	COMPLETE		1. Internal		Around town	Storm Drainage Walkthrough	Storm drain weekly run through	No			Leaves	Yes					9/21/2021	.25 yards
9/21/2021	38	COMPLETE		1. Internal		Around town	Storm Drainage Walkthrough	Storm drain weekly run through	No			Leaves	Yes					9/21/2021	.5 yards
9/21/2021	37	COMPLETE		1. Internal		Around town	Storm Drainage Walkthrough	Storm drain weekly run through	No			Leaves	Yes					9/21/2021	2 yards
9/14/2021	36	COMPLETE		1. Internal		End of West Greenbriar	Cleaned out ditch						Yes					9/14/2021	
9/9/2021	35	COMPLETE		2. Complaint		107-109 FOURTH ST	Blocked Culvert	RECEIVED CALL TO CLEAN CULVERT BETWEEN 107-109 FOURTH ST											
9/9/2021	34	COMPLETE		2. Complaint		122 EAST ST	*Other	RECEIVED A CALL TO CLEAN DITCHES ALONG EAST ST. SPECIFICALLY 122 EAST ST											
9/1/2021	33	COMPLETE		1. Internal		107 Hilltop Rd	*Other	received request to clean ditch in front of 107 Hilltop Rd											1/4 yd
8/27/2021	32	COMPLETE		2. Complaint		305 E State St	Install Culvert	Replace culvert and added a Storm box	Yes	N/a	Light	Silt and sand	Yes	No			Yes	8/26/2021	8 yard

Work Order Detail Report

entries entered into AGOL map

06/01/2021 - 03/04/2022

Work Date	Work Order #	Main Status	WO Asset	Request Type		Street Address	Maintenance Type	Comments	Any visible damage?	Water visibility	Flow	Inspection findings	Clean out needed?	Any damage to the inlet box or structure?	Condition of secondary containment	Evidence of standing water?	Grate in good condition?	Date Completed	How much Material was taken away
8/27/2021	31	COMPLETE		1. Internal		Hickory St	Blocked Culvert	cleaning debris		N/a	Light								2 yds
8/26/2021	30	COMPLETE		2. Complaint		101 7th st	*Other	received a request to clean out the ditch at 101 7th St , on the PortmanVilla side of the property											2 yd
8/23/2021	29	COMPLETE		2. Complaint		275 Allen Mountain	Blocked Culvert	Received a call reporting the culvert that runs under the road at 275 Allen Mountain is completely block and water pours across the road											
8/23/2021	28	COMPLETE		2. Complaint		805 Lakey Gap Rd	Blocked Culvert	Culvert is stopped up and overflowing. Starting to go under the paved road											
8/20/2021	27	COMPLETE		1. Internal		Around town	Tree limbs and Debris	Storm drain weekly runthrough	No			Leaves	Yes	No			Yes	8/20/2021	5 cubic yards
8/19/2021	26	COMPLETE		1. Internal		305 E State St	Blocked Culvert	Replace culvert			Light								
8/19/2021	25	COMPLETE		1. Internal		603 Tomahawk Ave	Blocked Culvert	Replace culvert			None		Yes					9/2/2021	8 tons (dirt)
8/19/2021	24	COMPLETE		1. Internal		Village Way Bridge	Tree limbs and Debris	cleaning debris	No	Murky	Heavy	N/a						8/18/2021	8 yard
8/19/2021	23	COMPLETE		1. Internal		East St Bridge	Tree limbs and Debris	cleaning debris	No	Clear	Heavy	Leaves	Yes	No				8/18/2021	8 yard
8/19/2021	22	COMPLETE		1. Internal		Flat Creek Bridge	Tree limbs and Debris	cleaning debris	No	Clear	Heavy	Leaves	Yes	No		No		8/18/2021	32 yard
8/19/2021	21	COMPLETE		1. Internal		Around town as needed	Blocked Culvert	Flood prevention work				Leaves		No		Yes		8/17/2021	5 cubic yards
8/19/2021	20	COMPLETE		1. Internal		Around town	Tree limbs and Debris	Storm drain weekly runthrough	No	Murky	Heavy	Leaves	Yes	No			Yes	8/17/2021	6 cubic yards
8/3/2021	19	COMPLETE		1. Internal		Around town	Tree limbs and Debris	Storm drain weekly runthrough				Leaves	Yes	No			Yes	8/3/2021	3 cubic yards
7/30/2021	18	COMPLETE		2. Complaint		E2 @ Lynx	Accumulation of Litter	Need to blow leaves and debris out of ditch above E2	No			Silt and sand	Yes					8/3/2021	
7/26/2021	17	COMPLETE		2. Complaint		31 Laurel Ln	Tree limbs and Debris	Received a request to clean out the ditch in front of 31 Laurel Ln											
7/20/2021	16	COMPLETE		2. Complaint		204 Crestview	Tree limbs and Debris	Received a call for stopped up drain at 204 Crestview. I am not sure if its an actual drain or the culvert											1/2 yd
7/14/2021	15	COMPLETE		2. Complaint		Art studio	Vegetation	Clean the ditch out and pull the car stops out and set back	No	N/a	N/a		Yes			N/a			
7/14/2021	14	COMPLETE		2. Complaint		108 Walker St	Sediment	Clean out ditches all the wat down	No	N/a	Light		Yes						
7/14/2021	13	COMPLETE		1. Internal		Nine South	Sediment	Need to move some rock at the top culvert to let water flow	No	N/a	N/a		N/a	No	N/a	No			
7/14/2021	12	COMPLETE		2. Complaint		95 S. Park Lane	Install French Drain		N/a	Clear	Heavy	N/a	N/a	N/a	N/a	Yes	N/a	7/14/2021	25 Tons of dirt
7/8/2021	11	COMPLETE		1. Internal		Around town	Tree limbs and Debris	Storm drain weekly runthrough	No			Leaves	Yes	No			Yes	7/8/2021	1/2 cubic yard
7/1/2021	10	COMPLETE		1. Internal		Around town	Tree limbs and Debris	Storm drain weekly runthrough	No			Leaves	Yes	No			Yes	7/1/2021	2 cubic yards
7/2/2021	9	COMPLETE		1. Internal		Around town	Tree limbs and Debris	Storm drain weekly runthrough	No			Leaves	Yes	No			Yes	7/2/2021	1 cubic yard
6/30/2021	8	COMPLETE		2. Complaint		7 W. Cotton Ave	Sediment	Clean out Ditch			Light		Yes						
6/30/2021	7	COMPLETE		1. Internal		11 West Cotton	Sediment	Clean out Ditch			Light		Yes						1 ton
6/30/2021	6	COMPLETE		2. Complaint		21 John Myra	Vegetation	Ditch needs to be cleared of vegetation	No	N/a	Light								
				Complaint=28				Weekly=18											

Total Records: 88

3/4/2022

Compiled Public Input 2020-2021 on Stormwater Program Services and Specific Concerns

2020 survey 2021 surveys Address info

Town summary of common comments from 2021 survey

- Debris
  - Ditches, storm drains, and culverts are filled with debris and do not drain correctly.
  - Blocked ditches and culverts cause water to overflow, causing private property flooding.
  - Town should clean ditches, drains and culverts more frequently and not rely on property owners to clean out stormwater infrastructure.
- New Development
  - New development has increased volume of stormwater entering private property.
  - The Town does not hold developers to the stormwater infrastructure standard necessary to limit flooding problems for existing residents.
- Lack of
  - The Town is not supportive in creating stormwater infrastructure that would relieve private property and road flooding.
  - More ditches, culverts, and stormwater infrastructure of all kinds is needed.
- Condition and Performance
  - A number of storm drains are broken or non-functional.
  - Some stormwater culverts and ditches are undersized for stormwater volume.

The comments below are copy and pasted from the 2020 and 2021 surveys and organized by topic or geospatially. Organization by Wildlands Engineering.

New Development

- Acknowledge there is a problem and some of it is caused by poorly planned new development with slope and insufficient greenspace to counter
- All the new development !!!
- The town should make developers do more stormwater control.
- The post-construction stormwater program isn't enough
- For new construction enforcement of addition of long term stormwater control measures. Existing properties, addition of rain gardens, bio-cells, and other environmentally sensitive stormwater control measures on private property. Addition of installations of curb and gutter along street frontage.
- There is no mention of dry river beds. There is no mention of any regulations when a neighbor uphill changes their water management and causes flooding into homes below them. Right now it is just deal with it.
- By requiring new developments to provide funds that allow for improved drainage since the loss of green space being filled with concrete contribute to drainage problems

Compiled Public input on stormwater program services

2020 survey 2021 surveys Address info

- For New Construction - Pre construction excavation permitting and engineer approved storm run off. Engineer approved impervious ground calculations for any construction.
- Monitoring runoff from construction, maintaining existing drainage, creating natural drainage pathways

Lack of Infra

- Putting in a stormwater system.
- The lack of curbing and oversize of new housing projects is a serious cause for concern.
- There really aren't any controls to speak of.
- No drains, and ditches are insignificant
- Fill in ditches with larger pipes and make cemented walkways
- Curb and gutter
- Update crumbling infrastructure. Hire engineer to size new drainage service, then implement. Educate community on its importance so people don't balk at the cost/disruption.

Flooding

- Better control of stormwater during heavy rains. Direct water away from steep slopes to better contol erosion. Add riprap to outlets of culverts to slow down water as it travels down hill.
- Develop adequate drainage in flood prone areas
- Whatever preparations can be made to handle heavy rains without washing out the roads and flooding creeks. Bigger pipes cleaning drains etc.

Better Planning / Design

- Being observant of runoff areas and try to resolve the issue
- Coming up with a comprehensive plan to improve infrastructure instead of just digging ditches wherever the boys feel it needs one.
- General expression of prevention vs correction

Runoff from Roads onto private property

- Fix roads so homes don't catch all the run off from other peoples homes or put French drains where needed
- Public roads / right of way that requires private maintenance and investment
- Desire for the town to prevent runoff from the roads
- Desire for town to direct water away from private property

Compiled Public input on stormwater program services

2020 survey 2021 surveys Address info

Provide Education/Assistance

- More education of public
- Advertise Leaf pick up services (mad so many rack leaves to curb and just leave them to blow away).
- General support to educate people on what they can do on their own property to contribute to improve runoff.
- Interest in improving property to reduce stormwater impact to their homes.
- Identifying the areas where stormwater runoff is most detrimental to homeowners and businesses and correcting those problems so that their money can be spent making improvements elsewhere.

Other

- Underground storm pipe system is a cost that I feel to to High for this community. But improvements need to be made. Increase pipe size, maintenance, clean up etc.
- Sides of roads are washing away and making it dangerous to walk on. Attempts to fix wash away or are poorly done.
- Desire for improvements to stormwater conditions downtown
- Chemicals used on the golf course running off and getting into waterways and groundwater.

Storm Drains clogged / broken

- Lots of the corner inlets get broken from large vehicles making the turn and crushing the concrete.
- Storm drains are filled with debris, culverts over flow
- Stormwater drains frequently become full of sediment and weeds. Water collects in them if they are not properly maintained. One such storm drain near us actually had tadpoles breeding in it this summer.
- All street drains in town. Lack of regular cleaning out of ditches and drains
- Storm drains are all clogged on all major intersections near me
- Culverts need to be kept clean
- The street drains are continuously full of leaves, debris…
- Drains get blocked and are not properly cleaned
- Culverts from road to driveways always clog with debris, then run over the top into yards, etc.
- Need to maintain and enlarge many ditches, drains and culverts.

Compiled Public input on stormwater program services

2020 survey 2021 surveys Address info

Storm + Ditch

- Anything? It seems like a once a year drive by for the ditches in our neighborhood, then it is up to us.
- upkeep and maintenance on existing drainage installations
- Frequent request for ditches and culverts to be cleaned out or repairs, but often these are NCDOT roads.
- Desire for increased inlet cleaning, ditch cleaning throughout town especially before big rains)
- Storm Water grates are so covered up in debris you can't even tell they are there, drainage ditches cut dangerously low, eroding edges of the roads, debris left in road piled so high you can't use the road driving or walking, watching beautiful masonry and land jobs erode be repaired but continual erosion even encroaching on their private property

Ditches

- The town can improve on cleaning out ditches, cleaning up fallen trees and debris.
- Need to maintain and enlarge many ditches, drains and culverts.
- Ditches
- Keeping road ditches clear
- Ditches need to be better maintained for better drainage.
- Ditches fill up with debris and arrow difficult to maintain
- Ditches do not drain.
- Ditch cleaning on Goldmont St.
- Culverts are needed, and ditches need to be cleaned on a regular basis not left up to the people who live in the neighborhood to keep up
- The drain/ gulch dug by the town several years ago is essentially nonfunctional.., water doesn't drain into it!
- Ditches along roads never addressed by town.
- Ditches are not cleaned out, Pipes are not big enough that creeks run thru
- Ditches need cleaned out new drains need installed
- Very poor ditch drainage
- Leaves & small tree branches in ditches
- Ditches need to be kept clean

Compiled Public input on stormwater program services

2020 survey 2021 surveys Address info

Specific Areas

- **LOC?** Backed up and overgtown
- **LOC?** Mud and water running through my property
- **LOC?** Drains don't work. Curbs are destroyed by Town garbage vehicles, so all water finds a path from neighbors to our yard, which is constantly damaging our property. These are all water quality issues, too.
- **LOC?** Lots next to me have been graded to create even more storm water run off, and when they build,and crest impervious surface it will get even worse.
- **LOC?** The town directs and turns large volumes of stormwater until the town directed water is dumped on our private property into our ditch that flows down to Flat Creek. We tried in 2016 to pipe the ditch but were stopped by the town. Ron Sneed later told Matt Settlemeyer that we were able to pipe that ditch. We have to much storm water directed at us and all the new houses built around our streets has doubled the volume in storms. No help from the developers or the town. We have already done everything in question 18.
- **LOC?** There has been little to no (effective) storm water alleviation in our neighborhood
- **LOC?** Water breaches the small birm in front of our house and undercuts our driveway, flood's basement and flows through our backyard
- **LOC?** Storm ditch behind our property is not maintained and neighbors dump leaves blocking it.
- **LOC?** I have tried to create a berm to prevent the water from running into my yard with little success. I called and tried to set up a meeting to see what could be done but it was January and different things came up so we were not able to connect.
- **LOC?** All the ditches on our street drain Into our backyard
- **LOC?** the drain under the end of my driveway needs or should be cleaned out
- **LOC?** A run off ditch behind the property hasn't been maintained which led massive amounts of water into our yard and the front has so much run off from the highway we have put in our own drains to the cost of ~8000.00
- **LOC?** We have spent thousands of dollars on storm water management on our residential lot because we receive a majority of the storm water from our entire street/block. We are paying to fix the town's failure to plan/construct drains and gutters on our street. You can begin by assessing the issue on a street by street basis.

- Along fairway, hiawassee and tomahawk

- Downtown
    - Midland
        - Culverts on midland Avenue not cleaned out

Compiled Public input on stormwater program services

2020 survey 2021 surveys Address info

- Neighbors property on either side of midland alley and midland constantly flooded and have to drive through standing water

- Padgettown
  - Padgettown Road, Avena Road (DOT < but NOT maintained
  - roads flood due to lack of care of ditches, overflow from Flat Creek when it overflows it's banks and on Flat Creek road when the ditch on west side of Tractor Supply overflows. I have contacted NCDOT many, many, times
  - Padgett town
  - The ditches are not cleaned out and we have repeatedly told the town about the water that runs directly across Padgettown Rd into our yard.
  - multiple locations across the east side of Town, especially on roadways near/along Flat Creek, e.g., Ole Guacamoles lot, and the Greenway upstream

- Blue Ridge
  - N Blue Ridge|Hwy 70
  - The bridge under Blue Ridge Rd. Where the creek goes from First Christian Church to Meadowbrook Church had huge debris piled up against the supports.

- 6th Street
  - The drain at top of 6th St is busted, as is the drainpipe that runs under my property, water spouts like a geyser and runs like a river
  - The stormwater drain that is buried along the south side of Sixth Street has been completely blocked since before 2017 when I bought the house at 105 Sixth St and every heavy rain inches (2++) of storm water fill sixth street. I think repairing or replacing the storm drain under the south side of sixth street would certainly help the problem.
- Flat Creek Rd
  - The stormwater drain in the 300 block of Flat Creek Rd. is always blocked which makes water pool up on the curb and road of Flat Creek Rd. Several inches of water is standing in the road causing driving concerns.

- North Fork
  - Ditch along golf course in N Fork is full of debris, blocking drainage so water overflows across street
  - The drainage ditches and downed trees along North Fork don't seem to be addressed/maintained
  - clean ditches on North Fork Rd. & Montreat Rd.
- the creek off Portmanvilla floods the road and our homes extensively
- Montreat Road

Compiled Public input on stormwater program services

2020 survey 2021 surveys Address info

  - And it would be really good to have the State DOT do more on Hwy 9 Montreat Rd
  - I live on Montreat Road and witness flooding and runoff for most rains, the drain systems are not adequate for the road. The existing storm drains are always blocked by leaves and debris. The drain in front of the Baptist Church/Bank causes ice when the water freezes.
  - Ditches along Montreat road. Especially 809
  - Install drainage pipes on Montreat Rd.,
- 3rd and 4th
  - 4th st drainage needs attention. 3rd st crossover needs repair
  - pipes under neighbors driveway constantly are blocked causing overflow on 4th st water runs from 9th st to Montreat rd to 4th st and onto 3rd St. All this water is flooding and eroding my property.
  - Using 4th street as an example, the water running down from 2-3 blocks only to meet at a collapse drainage pipe.The swales on 3rd and 4th have been neglected to the point they serve no purpose.
  - The ditch system in 4th street is not large enough to control the water, making it run across the street into our ditch in front of the house which routinely overflows into our driveway and garage
  - Water from 3rd and 4th street overflowing what ditches there are.
- Temple road is washing out on shoulders severely and attempts to do anything about it are poorly done. If not addressed, there will be bigger problems with having to repair the road. Montreat Rd from Corner Store to past yoga studio floods badly, East Street residents near Flat Creek have had to evacuate their homes, esp. when Montreat releases water
- Laurel Circle had a drain installed incorrectly so that storm water has to flood before going into drain to go into ditch
- Ditches on Hiawassee on my property are not maintained at all.
- N/S Park Lane
  - Developer of condos on South Park Lane was supposed to install measures to prevent flooding and run-off. What was provided is inadequate and not functioning properly. In 2020 there was a serious sinkhole as a result as well as exacerbating storm runoff issues.
  - Potential construction on S Park Ln
  - The culvert which sits between North Park and South Park off Laurel Creek Circle is grossly inadequate to handle a large rain event.
  - The drain on the wetlands between North and South Park Lanes is not adequate to handle the flow of water. Also there should be a ditch or drain to handle the water flow from both North and South Park Lane.

Compiled Public input on stormwater program services

2020 survey 2021 surveys Address info

  - We live in the condos on S. PARK Lane and have serious concerns about stormwater turning the rear of our property into a swamp. We are very concerned that new construction on S. Park Lane will make it even worse.
  - The culvert at N. Park and S. Park is blocked and the ditch overflows. The overflowed ditch runs into our crawlspace.
- The storm water drain on Connolly street is always broken. It is being run over by tractor trailers delivering to the red rocker. Just noticed yesterday is completely covered in leaves. It is in the front yard of the gray beard rental at the back of the red rocker. I have also noticed that the stormwater drains around town are broken. There is one at the end of first Street by the corner of the elementary school that was completely broken to
- Large catch basin at east end of Pearl St (at McCoy Cove Road) is filled with silt. As a result, overflow runs west down Pearl, flowing south across field behind and under house at 207 Ruby. A second Pearl Street flow occurs between the east side of Kerlee Baptist Church and house at 205 Ruby Avenue. Both of these runoff sources end up in front of 202 Ruby Avenue. Thank you to Town of Black Mountain for raising my roadside berm. It has helped, along with the $$$ I've put into flood remediation. The source of the problem is up on Pearl Street, though, and remediation at the source will go a long way to helping all of us on the lower end of the problem.
- Tudor Croft Area
  - tudor croft development
  - In front of my home 507 Hiawassee Ave after a very fast moving storm with lots of rain. It runs down from Tudor Croft. The home across the street 506 Hiawassee has had significant flooding in the back.
- drains on W Cotton Ave get clogged easily
- The town NEVER maintains our main drainage on Hilltop Road. Living at the base of it, we get a lot of run-off from homes above and it clogs our drain leading to the destruction of our front driveway.
- There are NO appropriate drains, ditches, or outfalls to handle runoff from Walker Street, Blue Ridge Apartments, and adjoining areas above Old US Hwy 70 West.
- Public parking lot across from Recreation and Parks
- Need a culvert on Goldmont St to help stop huge amount of water that drains down my property on all sides. In additon to runoff flooding my front and back yards, there is a ditch adjacent to a blind alley on Ash St. that overflows it's bank onto my property washing away soil, killing trees and bushes. I noticed that neighbors below me on Ash St have house calls from the Awful Crawful Space Co. I have spent more than $6,000. in drains etc. and have lost many mature trees with removal costs at $8,000.
- Genesis Circle

Compiled Public input on stormwater program services

2020 survey 2021 surveys Address info

  - Genesis Circle is not properly graded and most downspouts pour water out onto the road and eventually down to my property and the two houses on either side of me. We have requested help on the issue several times, but it needs addressing more seriously please.
  - In Genesis Circle we need help with the flooding because of poor drainage. Would like to discuss with the Town again to see what can be done for those of us at the bottom of the circle who continue to get everyone's run-off.
- Ditches on Hiawassee not maintained at all
- There are a lot of pipes that are old and corroded and need to be replaced. Also there's a lot of debris in our water ways that causes the storm water to leave the banks and flood homes and businesses such as our business Burton's Place. Something needs to be done because our businesses (Kim's Cut, Osteen's Laundry and Burton's Place) are getting flooded and the parking lot is getting ruined.
- Someone should go behind utility contractors and inspect work. Gas company trenched in a line in a drainage ditch in front of my house and never cleaned out the excess soil the drain pipe under my driveway is still blocked
- At 333 Mccoy cove Rd all of above streets run off water comes down thru a valley then into drain ditch line all stopped up now runs down street in to my drive way all way washing it out in heavy rain need fixed thank for your time
- Our neighborhood is in need of improvements to an existing ditch which parallels South Cotton St. - possibly the addition of riprap. Heavy rain events are resulting in erosion from our property as well as erosion of the earth supporting Cotton Street.
- Most streets, like 7th Street and North Blue Ridge Road have completely inadequate if not nonexistent storm water drainage systems; culverts, inadequte culverts, no drainage ditch....the system is not in place and what partial system is in place, the Town does not clean/maintain the system, ie. cleaning out culverts, ditches
- On Chapel Road behind us on Bethel Drive, the water needs to be diverted into the creek on south side of Chapel Road. Water comes down from Blk Mtn Estates, crosses Chapel, goes into a ditch that continues to fill drains. There is a creek on the other side that should carry the water. Also please do not put any gravel in the ditch. It washes out with the first rain. Diverted water would solve most of this problem. Cannot volunteer anymore. If any of our property would help, we would consider the town use, of course.
- The highway department has used my property to handle all of the stormwater runoff from Blue Ridge Apartments, new builds on Walker Street, and all property north of me. There exists an area that should be a retention pond on the Highway 70 side of the lot occupied by the gas utility, beside the convenience store. There also exists an underground pipe from that area into the existing storm water system. The highway right of way is built up along that property, channeling all the runoff into my small creek instead of into the existing stormwater system. I have struggled to stop erosion of my yard, spent much money replacing soil and bushes. My yard continues to erode, and with bad storms, my basement floods and my foundation is damaged. Water should be routed into the area I described, and channeled into the existing storm drain system. I

have complained about this problem before, and my written statement, photos, and copies of my communication with the highway department were provided to your office last year. I hope the town will address this matter, so I won't have to hire an attorney.

- **Flat Creek**
    - Not sure...learning Sure seems to be a problem alongFlat Creek road with flooding; I am on the other side of the creek on Montreat Road. when it floods on Flat Creek it seems very haphazard re clean up...needs a plan; it will continue to flood
    - We own a house on a lot that includes Flat Creek (across Montreat Road from Camp Merrimac). If the last 4 years are any indication, climate change is resulting in more spring, summer and fall rainfall that increases the chances of flooding, and damage to the creek's streambed and the flora on both sides of the creek. My understanding is that maintaining a free-flowing and healthy streambed is solely the homeowner's responsibility. With the risk of flooding and damage possibilities increasing due to circumstances beyond the homeowner's control, this seems inappropriate to me. I would be interested to learn about an option to grant the Town a stream maintenance easement to assist or implement streambed and floodplain changes that will enable Flat Creek to continue contributing to the local ecosystem's native plants and wildlife.

WILDLANDS
ENGINEERING

APPENDIX C. TECHNICAL MEMO

TO:	Town of Black Mountain Stormwater Utility
PROJECT:	Town of Black Mountain Stormwater Master Plan Update
PROJECT NO.:	005-20259
SUBJECT:	Recommended Level of Service Metrics
DATE:	30 August 2022

The Town of Black Mountain created its Stormwater Utility in 2021 in order to comply with State and Federal regulations and to better address drainage, flooding, and stormwater infrastructure performance and resilience. The Utility is an enterprise, authorized to collect fees and expend funds necessary to meet its responsibilities. Thus, it is a business and like all businesses needs to clearly establish its goals and objectives in a measurable manner. This is usually referred to as documenting a Utility's Level of Services (LOS).

Defining and documenting a Level of Service (LOS) can be a difficult process, yet it can be of great benefit in communicating with the public and with municipal officials, with providing benchmarks of the Utility's performance over time, and with developing a rational and defendable capital improvement planning process. Often a stormwater utility's LOS is defined by three sets of metrics:

- Permit Compliance: These directly relate the terms of the Utility's MS4 permit with the metrics selected to document compliance and progress towards addressing any deficiencies identified in a permit audit.
- Community/Customer Service: These consist of concise statements of community goals for the Utility and measurable items that indicate progress towards obtaining those goals. The metrics are often publicly reported to demonstrate the Utility's effectiveness and to manage expectations.
- System Performance: These are concise statements of the goals for stormwater system's performance (both quantity and quality) and metrics that document the system's performance over time. These metrics often reflect a community's stormwater and street design standards, floodplain management goals, and expectations for water quality. The same metrics are often used to evaluate and prioritize capital improvement projects.

The following sections discuss the three areas of LOS metrics and provide recommendations of the metrics to be tracked and, ultimately, the LOS to be provided by Black Mountain's Stormwater Utility. These sections will guide the Town's development of policy or implementation planning as the Utility moves forward, understanding that the ultimate adoption or implementation of these LOS metrics is dependent on the Utility's financial and staff resources.

Permit Compliance and Natural Resource Protection

Under the authority of the Clean Water Act, Black Mountain is a designated Municipal Separate Storm Sewer System (MS4) community. The Town received that designation because it meets the criteria of:

- Discharging stormwater runoff to sensitive waters
- Having a relatively high population density as well as high rates of population growth or potential growth
- Being contiguous to a recognized "Urbanized Area"
- Being a significant contributor of pollutants to Waters of the United States.

Under the MS4 designation, Black Mountain applied for and received a National Pollutant Discharge Elimination System (NPDES) MS4 permit. That permit requires the Town to implement and maintain a comprehensive stormwater management program to reduce pollutants in stormwater runoff to the Maximum Extent Practicable (MEP). The MEP is based upon implementation of six Minimum Control Measures (MCMs) throughout the Town's jurisdictional area:

- Public Education & Outreach
- Public Involvement & Participation
- Illicit Discharge Detection & Elimination
- Construction Site Runoff Controls
- Post-Construction Site Runoff Controls
- Pollution Prevention & Good Housekeeping for Municipal Operations

Since formation of the Stormwater Utility, Black Mountain has come into compliance with its NPDES permit and has established programs meeting the MCMs. Following an audit conducted by the North Carolina Department of Environmental Quality (NCDEQ), the Town established a list of 74 specific compliance items that it will complete annually through the duration of its current NPDES permit (renewal required in 2026). The compliance list is attached as an appendix to this memorandum. Documenting completion of the annual compliance items and meeting the terms of the Town's NPDES MS4 permit must be considered a primary metric of the Stormwater Utility's LOS. Failure to maintain permit compliance can expose the Town to significant liability and financial penalties. The penalties are potentially large enough so as to hinder the ability of the Utility to perform its additional responsibilities to better address drainage, flooding, and stormwater infrastructure performance and resilience.

Minimum compliance with its NPDES MS4 permit does not relieve the Town of all liabilities associated with the Clean Water Act nor does it fully embody the community's expectations with respect to its waterways and environment. Within Black Mountain's jurisdiction, there are miles of streams that NCDEQ and the U.S. Environmental Protection Agency (USEPA) have recognized as "impaired."

"Impaired" means that degradation of water quality and stream habitat has occurred to the degree that the waterbody does not satisfactorily provide for its designated use. Provisions of the Clean Water Act require NPDES permittees to identify and seek reduction (or elimination) of discharges that contribute to impairments. In addition, reasonable public expectations are that the Town seek ways to protect, restore, and maintain the community's waterways.

The following are additional permit-related metrics recommended to define the Utility's LOS:

- Annually tabulate, and publicly acknowledge, the impaired waters within the Town's jurisdiction. The purpose of this metric and public disclosure is to increase public awareness and maintain support for the Utility expenditures supporting pollution reductions. This metric would be supported by providing a link on the Utility's webpage to the NCDEQ impaired waters list and interactive mapping tool.
- Annually, review water quality planning documents and identify water quality-related goals and initiatives to be implemented during the upcoming period. Where necessary, develop more detailed subwatershed plans such as those proposed in Tomahawk Branch to target sediment and other pollutant sources with projects and O&M activities. The metric would be documentation of annual watershed planning targets and completion of targets. Provide for public awareness of on-going watershed efforts.
- Collaborate with other governmental agencies (e.g., Buncombe County, NCDEQ) to develop mitigation and restoration plans for impaired waters that originate outside of, but extend into, the Town's jurisdiction.
- Annually document the Utility's funds expended on water quality improvements that are beyond minimum compliance with the NPDES MS4 permit. These expenditures could be the costs of additional measures and events focused on water quality improvement beyond those detailed in the 74 compliance criteria. They also could be the costs of implementing, or cost-sharing on the design, implementation and long-term stewardship of of Stormwater Control Measures (SCMs), streambank stabilizations, and stream and riparian area restorations.
- Annually document the amount of public and private grant money applied for, received, and expended for the purposes of restoring impaired waters and reducing water pollution. The recorded metrics should include funding organization, targeted waterbody(ies), type of project, requested funding, Utility funds committed for grant cost-sharing, funds received, and funds expended.

Tracking the above recommended LOS metrics will provide a clear understanding of the performance and progress of the Town's Stormwater Utility in terms of its primary responsibilities to maintain and restore clean water. Public and transparent disclosure of the metrics will help to build and maintain community understanding and support for the Utility's mission. Finally, tracking the metrics over time, along with a proactive stormwater management program, will serve to reduce the accumulating liabilities associated with the Clean Water Act and the Town's NPDES MS4 permit.

Community/Customer Service

This set of recommended LOS metrics focus on the Utility's responsibilities to better address drainage, flooding, and stormwater infrastructure performance. They include statements of community goals for the Utility and measurable items that indicate progress towards obtaining those goals. The metrics are often publicly reported to demonstrate the utility effectiveness and manage expectations. The recommended metrics are:

Public Expectations

- The Utility provides for residents to report a concern or complaint via a monitored phone number and its website. The reports can be filed at any time. The recommended goal is that Utility staff respond (via telephone, email, and/or site visit) to greater than 90% of stormwater complaints within a 24-hour time period. Reports and responses should be tracked by date and time.
- The Utility should track the percentage of complaints that result in a work order and, conversely, the percentage of complaints where the Utility does not have legal (or policy) authority to address. It can be important to differentiate between legal and policy barriers to problem resolution. Documenting these barriers to effective stormwater management is important to improving public policy.
- As a future tool, the Utility may consider implementing an Extent of Service (EOS) policy to more specifically address jurisdiction over stormwater infrastructure.

Flood Hazard Mitigation

- Document the location and number of road closures due to flooding. This metric often divides roads into classes: residential, secondary, and primary and includes the duration of closing for each event.
- Obtain and maintain Class 8 rating in the National Flood Insurance Program (NFIP) Community Rating System (CRS). In the future, the Town may consider adopting higher regulatory standards for floodplain management or implementing or engaging in any of 19 creditable activities, organized under four categories: (1) Public Information, (2) Mapping and Regulations, (3) Flood Damage Reduction, and (4) Warning and Response in order to receive increasingly higher discounts. Annually document the number, and total value, of insurable structures within the 100-year floodplain that are within the Town's jurisdiction.
- Annually document the locations of all critical infrastructure within the 500-year floodplain that are within the Town's jurisdiction. Critical infrastructure should include public safety buildings (fire, police, ambulance), hospitals and public health care facilities, and Town facilities that are essential to emergency management and providing emergency care.
- In the future, the Utility may consider developing improved documentation of stream-road crossing assets (bridges & culverts), including factors that that affect flooding such as Level of Service, condition and maintenance information, including but not limited to debris removal events.

System Performance

Mapping and Condition Assessment

- Use available Geographic Information System (GIS) tools to continually improve data related to the location, ownership, and condition of the community's stormwater infrastructure. The goal is to use available technology to continually improve the understanding of the community's stormwater system and to reduce the long-term maintenance, planning, design, and capital construction costs. The system mapping should attribute the infrastructure (ditches, inlets, pipes, junctions, outlets) that are within the public right-of-way (both the Town and NCDOT) and those where the Utility has maintenance responsibility, and may include attribution of Private infrastructure to better understand existing conditions in public areas of concern and in areas that influence future CIP projects.
- Develop mapping and attribute information for the Town's ditch network. Currently, no data is available for Town maintained ditches.
- Annually conduct a systematic condition assessment of 10% of the stormwater infrastructure for which the Utility is responsible. The condition should be included in the system's GIS mapping and the number (and types) of deficient components reported. This LOS metric will provide the Town with a better understanding of its short- and long-term fiscal requirements and allow improved planning and scheduling of capital improvement projects.
- Make improvements to non-conforming assets or substandard assets, particularly those associated with areas of concern or risk. Target to make improvements to non-conforming assets on the order of 5-10% of identified need (per footage and/or number) annually. Recorded metric is the number (and linear footage) of improvements made annually. The Utility's GIS mapping shall subsequently be updated to reflect improvements.

Design Standards

The sections above describe the recommended metrics to be used by the Utility to measure and document how effectively it is meeting its regulatory and other responsibilities. There are many additional factors that impact how residents evaluate the performance of the community's stormwater system and the Town's responsibilities to protect public safety and property. Many of those factors relate to the Town's development ordinances and regulations and how the Town prioritizes and implements capital improvements. The following are recommendations on the standards to be applied for private development that has public impacts and for the design of public stormwater management facilities.

- Drain systems shall be designed, at minimum, on the basis of the 10-year storm for inlet spacing, the 25-year storm for drainage pipe sizing, the 50-year storm for cross-street drainage, and the 100-year storm for flood plain areas. Pipes shall be designed at full flow with a maximum allowable capacity 7/8 full.
- Inlet structures shall be used to collect surface water through grated openings and convey it to storm drains, channels, or culverts. Curb inlets must be located such that the gutter flow spread does not exceed 6 feet during a 2-year storm event with a maximum spacing of 250 feet.

- For land development, the stormwater system shall be designed to limit the 2-year and 10-year developed peak discharge rates to pre-developed peak discharge rates using a duration of 24-hours with an NRCS Type II design storm.
- All components that store runoff on a temporary or permanent basis shall be designed to safely pass the 50-year, 24-hour event (except in flood fringe areas where the system must safely pass the 100-year, 24-hour event).
- The design of stormwater quality control devices shall be based on retaining the first 1.5-inch of runoff from a storm for a sufficient period of time to settle out 85% of suspended solids and attached pollutants (such as metals, organics, and nutrients).

Many of these factors are considered in another technical memorandum that provides recommendations on how the Utility should prioritize, schedule, and implement Utility-funded capital improvements.

Appendix - NCS000422 BLACK MOUNTAIN 2026 ANNUAL SELF ASSESSMENT

NCS000422 BLACK MOUNTAIN 2026 ANNUAL SELF ASSESSMENT

Line No.	Reporting Year (Jan 1 - Dec 31)	BMP Ref.	Measurable Goal	Reporting Metric	Comments
6	5	2.B.2.	Did Black Mountain submit a self-audit of any stormwater program components not audited by EPA or NCDEQ?		
7	5	2.B.3.	Did Black Mountain submit a stormwater permit renewal application at least 180 days prior to permit expiration?		
8	5	2.B.3.	If so, what was the date the permit renewal application submittal was received by DEQ?		
15	5	3.B.4.	Did Black Mountain implement funding mechanism(s)?		
20	5	4.B.2.	Did Black Mountain maintain the stormwater web site?		
24	5	4.B.3.	Number of stormwater web page hits?		
33	5	5.B.1.	Did Black Mountain update/maintain existing hotline?		
34	5	5.B.1.	Did Black Mountain assign a staff person to check hotline calls?		
40	5	5.B.3.	Did Black Mountain promote the hotline in materials developed for the stormwater program and on stormwater website?		
45	5	6.B.5.	Did Black Mountain post about fecal coliform to social media?		
51	5	7.B.3.	Did Black Mountain implement two education / outreach programs to focus on residential and construction audiences?		
56	5	8.B.2.	Did Black Mountain evaluate stormwater feedback survey and update as needed?		
60	5	8.B.3.	Did Black Mountain report stormwater survey findings to Town Council and Staff?		
66	5	11.B.1.	Did Black Mountain promote volunteer opportunites for citizens?		
80	5	12.B.2.	Did Black Mountain coordinate semi-annual volunteer litter cleanup of public areas?		
81	5	12.B.2.	Number of volunteers participating in semi-annual litter clean up events?		
82	5	12.B.2.	Number of trash bags filled during semi-annual litter clean up events?		
89	5	14.B.1.	Did Black Mountain add new outfalls, inlets or pipes to the MS4 map?		
93	5	14.B.2.	Did Black Mountain update attributes information for inlets, outfalls and/or pipes?		
98	5	14.B.2.	Total number of mapped major outfalls		
109	5	16.B.3.	Did Black Mountain inspect at least one group of major outfalls (at least 20%)?		
110	5	16.B.2.	Total number of outfall inspections performed?		
115	5	17.B.2.	Did Black Mountain maintain and implement the IDDE plan for investigations of illicit discharges and illegal dumping?		
119	5	18.B.1.	Did Black Mountain have an annual evaluation meeting with IDDE program staff?		
123	5	18.B.2.	Did Black Mountain review IDDE reports and identification of “repeat offenders” and or “hot spots” areas?		
136	5	18.B.2.	Number of potential illicit discharges identified		
137	5	18.B.2.	Number of potential illicit discharges verified		
138	5	18.B.2.	Number of potential illicit discharges resolved		
139	5	18.B.2.	Number of potential illicit discharges enforcement actions		
148	5	21.B.1.	Did Black Mountain train municipal staff on proper handling of construction site runoff control complaints?		
149	5	21.B.1.	Number of municipal staff trained on proper handling of construction site runoff control complaints?		
154	5	23.B.2.	Did Black Mountain maintain legal authority to require construction site operators to control waste?		
163	5	24.B.1.	Did Black Mountain distribute the construction waste management fact sheet with all issued building permits?		
164	5	24.B.1.	Number of construction waste management fact sheets distributed?		
185	5	25	Did Black Mountain track the number of low-density and high-density plan reviews performed?		
186	5	25	If so, how many low density project reviews were performed?		
187	5	25	If so, how many high density project reviews were performed?		
188	5	25	If so, how many low density project reviews were approved?		
189	5	25	If so, how many high density project reviews were approved?		
194	5	25	Did Black Mountain maintain a current inventory of low-density projects and constructed SCMs, including SCM type or low-density acreage, location, last inspection date and type of enforcement action (if any)?		

199	5	25	How many high density non-municipally owned SCM inspections were performed?		
204	5	25	How many low-density inspections were performed?		
209	5	25	How many post-construction enforcement actions were issued?		
219	5	29.B.2.	Did Black Mountain distribute a brochure on septic maintenance to new construction that cannot connect to public sewer?		
220	5	29.B.2.	Number of brochures on septic maintenance distributed to new construction that cannot connect to public sewer?		
241	5	30.B.5.	Did Black Mountain review/update the inventory of town-owned facilities with stormwater pollution potential to include new/closed/modified facilities?		
242	5	30.B.5.	Number of modifications to the inventory of town-owned facilities with stormwater pollution potential to include new/closed/modified facilities?		
250	5	31.B.2.	Did Black Mountain perform annual facility inspections for all town owned facilities?		
251	5	31.B.2.	Number of annual facility inspections performed for town owned facilities?		
260	5	33.B.3.	Did Black Mountain provide annual spill response training to staff?		
261	5	33.B.3.	Number of staff trained in spill response?		
265	5	33.B.4.	Did Black Mountain replace / update spill kits?		
275	5	34.B.3.	Did Black Mountain provide general stormwater education and training for pollution prevention to at least 20 town employees?		
276	5	34.B.3.	Number of employees trained on general stormwater education and pollution prevention?		
284	5	35.B.2.	Did Black Mountain implement the MS4 Inspection and Maintenance SOP, including inspection schedules, standard documentation, staff responsibilities, and proper maintenance training?		
285	5	35.B.2.	Number of routine MS4 inspections performed in accordance with the SOP?		
294	5	35.B.3.	Did Black Mountain verify, document, and prioritize MS4 maintenance activities identified by inspections or citizen reports?		
295	5	35.B.3.	Number of MS4 maintenance activities performed?		
305	5	36.B.1.	Did Black Mountain develop an inventory of town-owned/operated SCMs, including the location and type of SCM?		
306	5	36.B.1.	Number of town-owned / operated SCMs in the inventory?		
315	5	36.B.2.	Did Black Mountain perform annual inspections of town owned / operated SCMs?		
316	5	36.B.2.	Number of annual inspections of town owned / operated SCMs performed?		
325	5	37.B.1.	Did Black Mountain review staff files to ensure that pesticide and herbicide certifications and training requirements are current?		
326	5	37.B.1.	Number of staff with herbicide / pesticide certifications?		
334	5	38.B.3.	Did Black Mountain implement the pesticide, herbicide and fertilizer SOP?		
344	5	39.B.4.	Did Black Mountain inspect town facilities with an industrial stormwater permit?		
345	5	39.B.4.	Number of inspections performed for town facilities with an industrial stormwater permit?		
356	5	40.B.2.	Did Black Mountain perform quarterly inspections of vehicle and equipment facilities using the checklist and notify site manager of any corrective actions needed?		
357	5	40.B.2.	Number of town vehicle and equipment maintenance facilities inspected?		
366	5	40.B.3.	Did Black Mountain perform re-inspections of any vehicle and equipment maintenance facility that required corrective action?		
367	5	40.B.3.	Number of re-inspections of vehicle and equipment maintenance facilities that required corrective action?		
380	5	44.B.2.	Did Black Mountain annually post two times on social media about litter prevention?		
384	5	44.B.4.	Did Black Mountain add at least five trash and recycling receptacles to high litter areas?		
385	5	44.B.4.	Number of trash and recycling receptacles added to high litter areas?		

WILDLANDS
ENGINEERING

APPENDIX D. TECHNICAL MEMO

TO:	Town of Black Mountain Stormwater Utility
PROJECT:	Town of Black Mountain Stormwater Master Plan Update
PROJECT NO.:	005-20259
SUBJECT:	Stormwater Master Plan – Capital Improvement Projects Screening and Ranking
DATE:	8 August 2022

The Town of Black Mountain created its Stormwater Utility in 2021 in order to comply with State and Federal regulations and to better address drainage, flooding, and stormwater infrastructure performance and resilience. The Utility is an enterprise, authorized to collect fees and expend funds necessary to meet its responsibilities. In addition to maintaining compliance with the Town's NPDES MS4 permit and performing routine maintenance and repairs on the Town's constructed stormwater system, the Utility is authorized to construct capital improvements that benefit pollution reduction and habitat improvement, provide improved drainage to the Town's streets and properties, mitigate flooding, and promote public health and safety.

Over past years, a number of capital improvement projects have been recommended to the Utility and the current Stormwater Master Plan contains recommendations for additional projects. Thus, there is a need for developing criteria and a process for screening and prioritizing potential projects. An obvious objective of the screening process is to lead to the implementation of projects that most cost-effectively maintain or improve the Utility's Level of Service (LOS). The recommended criteria and metrics for LOS are presented in a separate memorandum. Additionally, the screening and ranking process should, to the extent feasible, incorporate quantitative, measurable criteria and provide for "transparent" decision-making.

Through discussions with Utility staff and citizen stakeholders, the following factors were developed for potential project evaluation: Project Effectiveness, Direct Community Impacts, Water Quality Benefit, Infrastructure Upgrade, Utilities, Land Ownership, Other Constraints, and Other Benefits. Definitions of each factor are presented in Table 1.

Table 1: Capital Improvement Project Evaluation Factors

Definitions	The project will:
Project Effectiveness	Result in cost-effective mitigation of flooding or other impairment of the public interest and/or improvement of water quality
Direct Community Impacts	Be perceived as providing a safety, aesthetic and/or recreational benefit to the community
Water Quality Benefit	Contribute to the restoration of an impaired water or the prevention of a water becoming impaired
Public Infrastructure Upgrade	Significantly contribute to the operation and useful life of the Town's stormwater infrastructure
Utilities	Be constructed in an area free of utilities that would significantly complicate its completion
Land Ownership	Be on a public parcel and is consistent with the current and planned use of that parcel OR the private landowner is willing to cooperate and/or financially contribute
Other Constraints	Be constructed in an area free of conflicting easements or regulations (e.g. floodplain regulations) that would significantly complicate its completion
Other Benefits	Provide a visual example of good stormwater management practices. Contribute to social equity. Improve or enhance another Town project or initiative.

Potential projects are presented in a matrix with each of the above evaluation factors presented in a column of that matrix. Then, each factor is assigned a color-coded "score" according to the following metrics:

Project Effectiveness:

Significant potential for benefits with respect to issue present
Moderate potential for benefits with respect to issue present
Some (but lesser) potential for benefits with respect to issue present
Minimal or no potential to influence issues present
Effectiveness is unknown or cannot be quantified

Direct Community Impacts:

Significant impacts affecting out of pocket costs, safety, or other community factor at high frequency (every 2 years or more frequent)
Significant impacts affecting out of pocket costs, safety, or other community factor at mid frequency (every 25 years or more frequent)
Minimal impacts not resulting in direct cost savings or addressing safety concerns
No reported community impacts
Unknown or not quantified

Water Quality Benefit:

Significant benefit and/or will significantly reduce pollution discharges to an impaired water.
Moderate benefit and/or the receiving water is not impaired or known to be significantly degraded.
Minimal water quality benefit.
No water quality benefit
Unknown or not quantified

Public Infrastructure Upgrade:

Significant benefit - Needed infrastructure does not exist or is severely undersized or in poor condition
Moderate benefit – Existing infrastructure is functional but does not meet current system design standards
Minimal benefit – The project would extend the functional life of the existing system in average condition
No benefit
Unknown or not quantified

Utilities:

Minimal or no utilities of concern facilitating construction and reducing design and construction costs
Potential small number of utility conflicts, easily and cost-effectively addressed
Likely conflicts but of a number and character to require only moderate complications and increased cost.
High likelihood of significant utility costs, significantly adding to the project's complexity and cost.
Unknown or not quantified

Land Ownership

Town owns the project land and there are no significant conflicting uses
Institutional or cooperative landowners willing to collaborate in project implementation
Multiple landowners (unknown level of cooperation)
Multiple landowners (known cooperation challenges)
Unknown or not quantified

Other Constraints

None identified or expected
Minimal identified and known to be able to be addressed in the project design
Moderate identified and having unknown impacts on project feasibility and design
Significant identified and likely to greatly complicate project design, implementation, or maintenance.
Unknown or not quantified

Other Benefits

Significant benefit contributing to public good such as providing open or recreational space, street safety, and system resilience
Moderate additional benefits not evaluated by other criteria
Minimal additional benefit not evaluated by other criteria
No additional benefits
Unknown or not quantified

An example of the use of the evaluation factors is shown in Table 2. That table represents a preliminary screening of potential projects examined during development of the current Stormwater Master Plan. The matrix was developed by individual members of the Utility and Town staffs considering the conceptual descriptions and very preliminary cost estimates developed by consultants. After individual scoring, the staff had a group discussion where a consensus scoring was developed. The exercise led to a refinement of the conceptual projects and to placing an emphasis on further conceptual development of selected projects.

Table 2. Preliminary screening of conceptual stormwater master plan capital improvements

Project Evaluation								Preliminary - Planning Level Cost Estimates
Project Effectiveness	Direct Community Impacts	Water Quality Benefit	Infrastructure Upgrade	Utilities	Land Ownership	Other Contraints	Other Benefits	Project
								Connally Street, Conveyance, Inlets, Outfall
Effective since w	Water qualit	Improved tre	Green infrastru	No known ut	Town-owned			Douglass Park Bioswales and Constructed Wetland
High impact, rest	Reduction in	Reduction in	Bank restoratio	No known ut	Town owns right bank, Montreat College ow			Douglas Park - Floodplain Bench and Stream Restoration
Diversion of spri	Diversion of	Diversion of	Upgrade would	Some interse	My understanding is this project would be i			Church Street
Significant impac	Significant re	This is a pipe	Very large infra	Potential uti	This would be a collaboration with DOT and			Montreat, Broadway to Sutton to Blk Mtn. Ave to Swannanoa Rive
								First Christian Church - Constructed wetland
								First Christian Church -Bioswale
Increased water	Reduction in	Reducing sh	Existing storage	No known ut	Town-owned			Fire Station - Rainwater Harvesting
								Fire Station - Bioswale
								Fire Station - Rain Garden
								White Pine Drive Inlet, Conveyance, Outfall & Level Spreader
								Constructed Wetland in Partnership with NCDOT
Bank stabilizatio	Possible floo	Reduction in	Green infrastru	No known ut	Town-owned			Swannanoa Riverbank Stabilization – Phase I
Bank stabilizatio	Possible floo	Reduction in	Green infrastru	No known ut	Cooperation of private property owner of e			Swannanoa River Floodbench near Community Gardens
								Rehabilitate Bioretention along Tomahawk Ave
								Complete & Manage Stream Restoration Reaches
								Laurel Circle
If multiple prope	Reduce floo	water retent	Significant gree	Possible util	Multiple property owners- would need sign			Distributed SCM - East side of Lake Tomahawk
If multiple prope	Reduce floo	water retent	Significant gree	Possible util	Multiple property owners- would need sign			Distributed SCM - West side of Lake Tomahawk
If multiple prope	Reduce floo	water retent	Significant gree	Possible util	Multiple property owners- would need sign			Distributed SCM - West side of Flat Creek

A screening matrix for all the currently identified potential stormwater capital improvement projects is included in Appendix E of the Stormwater Master Plan.

Future Efforts

As the number and complexity of potential projects increases, the Utility will eventually need to develop a more quantitative and robust scoring and ranking system. An example of a system that the Utility may want to employ is the Capital Improvement Planning process developed in 2016 by the City of Asheville. The Asheville utility uses a set of evaluation criteria similar to the ones adopted by Black Mountain but evaluates and scores the criteria in a more quantitative manner (see Table 3). A project's cumulative score is determined by the sum of the products of an assigned score (0 to 5) for each criterion and a weight assigned to that criterion. Potential CIP projects are entered into an interactive tool that determines a preliminary rank of alternative projects by the cumulative score and then, to account for project scale and varying cost-effectiveness, computes a Benefit/Cost Index and subsequent ranking.

Table 3. A snippet of Asheville's CIP evaluation matrix

Evaluation Criteria - Alternative			Project Evaluations		
			Sulphur Springs	*Sulphur Springs w/o GI*	*Glendale Ave.*
			Scores (0 -5)		
Maintain/Improve Stormwater System		Weight			
	Currently meets LOS	60	5	5	5
	Area improved	40	3	3	5
	Age of infrastructure/Lack of infrastructure	60	5	5	5
Protect/Improve Water Quality					
	Amount of 1-inch event treated	30	1	1	1
	Opportunity to combine with GI	40	3	1	3
	Proximity to 303(d) stream	10	1	1	1
Meet Customer Service Expectations					
	Addresses known area of flooding concern (public)	50	5	5	5
	Provide aesthetics, recreation, outreach	10	3	1	5
	Proximity to critical facilities	20	5	5	1
Maintain Safety for Community					
	Street type	40	5	5	5
	Hazard addressed	60	5	5	3
Cost Efficiency					
	Operation efficiency	20	3	3	3
	Financial leverage opportunity	20	1	1	1
	Project bundling	20	1	1	1
Preliminary Score			**1860**	**1760**	**1760**
Preliminary Rank			**9**	**16**	**16**
Project Cost			$715,500	$607,500	$1,915,000
B/C Index			26	29	9
B/C Index Rank			**23**	**16**	**38**
Project Feasible by			2018	2018	2019

A memorandum detailing a CIP scoring and ranking procedure similar to that developed by Asheville is attached for future reference.

Appendix - Summary of an Alternative CIP Scoring and Ranking Method

Evaluation Criteria

In 2016, the City of Asheville's (COA's) Stormwater Management Plan identified a combination of cost-effective and feasible projects for its capital improvement program (CIP). During workshops with COA staff and reviewing the City's goals and stormwater related ordinances, the following factors were considered important for evaluation criteria:

- Stormwater conveyance system – improve and maintain function to a measured level of service (LOS) with a focused effort
- Water quality –incorporate water quality improvement and protection elements in the CIP projects, when feasible
- Customer expectations – meet stakeholder expectations addressing areas of known problems as well as create CIP projects that have aesthetic appeal, recreation potential, and/or protect critical facilities such as schools and hospitals
- Community safety – provide protection to the community by removing potential or actual hazards associated with the CIP projects
- Cost efficiency – project creates a level of operational efficiency, has the possibility of leveraging additional, non-City funding sources, or has opportunity of being bundled with another, planned City project (i.e., street paving, sidewalk repair)

The evaluation criteria cover a range of considerations that are important in the implementation of a potential project. By applying the criteria in a systematic method, each potential project may be objectively evaluated and compared.

The following table outlines evaluation criteria and related metrics similar to those adopted by the Asheville Stormwater Utility for project scoring and ranking. There are 10 metrics divided into four categories related to COA goals, and each metric has three associated metrics to consider when scoring. Each criterion has a score varying between 0 to 5, with specific statements that are used to guide scoring. Associated weighting factors allow some prioritization criteria to be more important in project evaluation than others.

Table 1-1. CIP Project Evaluation Criteria						
Goal	Criteria	Score 1	Score 3	Score 5	Weighting Factor	Total Goal Score Range
Manage Stormwater System	LOS system currently meets	Greater than 25-year, 24-hour	25 to 10-year, 24-hour	Less than 10-year, 24-hour	60	0 -750
	Area improved by project (acres) – consider the amount of system improved by the project (u/s and d/s)	< 1 acre	1-10 acres	> 10 acres	30	
	Age of Infrastructure (based on material type).	>50 % remaining useful life remaining	<50% remaining useful life remaining	Past the remaining useful life OR no infrastructure present	60	
Protect/Improve Water Quality	Amount of runoff from 1-inch rainfall event that can be treated	<50%	50-75%	>75%	30	0 -250
	Opportunity to combine with desired GI or treatment train for integrated, cost-effective drainage and WQ solution	No opportunity	Yes, with <50% of required volume for peak discharge reduction	Yes, with >50% of required volume for peak discharge reduction	20	
	Proximity to 303(d) listed stream	Project greater than ½ mile of listed stream	Project within ½ mile of listed stream	Directly drains to listed stream	0	
Meet Customer Service Expectations	Addresses area of known flooding concern	No	-	Yes	40	0-400
	Provide improved aesthetics, recreation potential, or public education opportunity to project area	No	Potential	Yes	20	
	Proximity to Critical Facilities such as schools and hospitals	None within ½ mile	1 or more within ½ mile but not adversely affected by current condition	1 or more within vicinity of project area and affected by problem	20	
Maintain Safety for Community	Street type	Local Access	Secondary (as labeled in GIS)	Primary (as labeled in GIS)	20	0-200
	Hazard risk	No public safety hazard	Minor hazard	Major hazard improved or	20	

Table 1-1. CIP Project Evaluation Criteria						
Goal	Criteria	Score 1	Score 3	Score 5	Weighting Factor	Total Goal Score Range
		improved as part of the project	improved or eliminated – nuisance	eliminated – road closures, flooding inhabited structures		
Cost Efficiency	Operation efficiency	Very little present maintenance costs to remove	Maintenance costs less than $50,000 annually	Maintenance costs greater than $50,000 annually	20	0 - 300
	Financial leverage opportunity	None present	Present with less than 25% total budget with leverage opportunity	Present with greater than 25% total budget with leverage opportunity	20	
	Project Bundling	None present	Present but schedules for two projects more than 2 years apart	Present and schedules for two projects less than 2 years apart	20	
Total Score Range						0-1,900

Methods for Developing Evaluation Criteria Scores

The following section outlines the process to evaluate and assign a score for each evaluation criterion. A continuous scoring method, as opposed to assigning discrete integers, is used to allow a more equitable scoring distribution for proposed projects.

Maintain/Improve Stormwater System

Stormwater drainage includes, but is not limited to, all underground infrastructure, water quality structures, streams, and conveyance swales. As these systems age, size and condition play a large role in how effectively stormwater runoff is conveyed during storm events. The scale and type of improvement on a system directly influences upstream conditions in a watershed, or to adjacent land use areas, and determines how important the improvement can be.

Improving stormwater drainage is scored by considering three metrics, applying a score based on how the project may improve upon the three metrics. The score is lower if the project has a minimal positive impact on all three metrics and higher if the project has a larger positive impact. The three stormwater drainage metrics considered in the project evaluation process include the following:

- Meets LOS – Metric measures what storm event the infrastructure currently meets. A lower score indicates the system already closely meets the LOS of a 25-year, 24-hour storm and isn't considered a large hazard. Weight = 60.
  - Score 1 = Existing system meets 25-year, 24-hour storm
  - Score 3 = Existing system meets between a 10-year and 25-year, 24-hour storm
  - Score 5 = Existing system meets less than a 10-year, 24-hour storm
- Area improved by the project – The larger the drainage area that can benefit/be treated by the project, the higher the score. Weight = 30.
  - Score 1 = Less than 1 acre is improved by the project
  - Score 3 = Between 1 and 10 acres is improved by the project
  - Score 5 = Greater than 10 acres is improved by the project
- Age of infrastructure – Metric measures the remaining useful life based on criticality metrics and material type. A lower score indicates the system has a longer remaining useful life. If there is no infrastructure, then this metric is scored a 5 as well. Weight = 60
  - Score 1 = Existing system has greater than 50% useful life remaining
  - Score 3 = Existing system has less than 50% useful life remaining
  - Score 5 = Existing system has already passed its predicted remaining useful life OR no infrastructure is present at the project location

Each weighting factor is multiplied by each of the three metrics listed above and summed for a total range of 0 to 750.

Protect/Improve Water Quality

Water quality affects our lives in many ways and can be impacted by many factors. Better overall water quality brings cost savings and improvement to life affected by this asset. Water quality can be degraded by many environmental and non-environmental factors and can be monitored and improved through many program and project type implementations. The more improvements a project can bring to water quality, the more important that project becomes to an area. The three water quality metrics considered in the project evaluation process include the following:

- Water quality volume treated – the amount of runoff from the 1-inch rainfall event that can be treated by the project. A lower score indicates a lesser volume that can be treated. Weight = 30
  - Score 1 = The project will treat less than 50% of the runoff from the 1-inch rain event
  - Score 3 = The project will treat less than 50-75% of the runoff from the 1-inch rain event
  - Score 5 = The project will treat greater than 75% of the runoff from the 1-inch rain event
- Bundle CIP project with a green infrastructure (GI) solution – integrate the CIP project with a GI or treatment train opportunity that provides additional improvement for stormwater conveyance as well as water quality improvement. Weight = 20
  - Score 1 = No opportunity exists
  - Score 3 = Yes, an opportunity exists that will provide less than 50% of the required volume for peak discharge reduction

  - Score 5 = Yes, an opportunity exists that will provide greater than 50% of the required volume for peak discharge reduction
- Proximity to 303(d) listed stream segment – proximity to a stream listed on the 303(d) as impaired could provide additional merit for project selected. Currently, the number of stream segments in the City is few, so this score is weighted zero. Weight = 0
  - Score 1 = Project greater than ½ miles from a listed stream segment
  - Score 3 = Project less than ½ miles from a listed stream segment
  - Score 5 = Project directly adjacent to a listed stream segment

Each weighting factor is multiplied by each of the three metrics listed above and summed for a total range of 0 to 250.

Meet Customer Expectation

The Stormwater Utility strives to meet customer/stakeholder expectations by addressing areas of known problems as well as create CIP projects that have aesthetic appeal, recreation potential, and/or protect critical facilities such as schools and hospitals. The three metrics considered in the project evaluation process include the following:

- Known flooding areas – resolving drainage issues that have been reported by the community and/or investigated by Stormwater Services. Weight = 40.
  - Score 1 = Does not address areas of known flooding concern
  - Score 3 = N/A
  - Score 5 = Does address areas of known flooding concern
- Added amenity – project can provide improved aesthetics to the general area through landscaping, streetscaping, etc. Can also increase recreation potential (i.e., paths, connect areas) or provide public education opportunities regarding stormwater management. Weight = 20.
  - Score 1 = Does not provide any added amenities
  - Score 3 = N/A
  - Score 5 = Does provide added amenities
- Proximity to critical facilities – score is higher based on proximity to critical facilities, which could be adversely affected if project isn't completed. Critical facilities include schools, daycare facilities, health care facilities, emergency centers, fire stations, and police stations. Weight = 20.
  - Score 1 = No critical facilities within ½ miles
  - Score 3 = Critical facilities located within ½ mile but not adversely affected by current condition
  - Score 5 = Critical facilities located within ½ mile and potentially adversely affected by current condition

Each weighting factor is multiplied by each of the three metrics listed above and summed for a total range of 0 to 400.

Maintain Safety for Community

The Stormwater Utility strives to provide safety to the community by improving drainage on streets. Higher traffic areas affect more of the community and could be considered a higher safety concern when considering

project locations. In addition, current conditions could be providing a hazard that could injure or harm members of the community.

- Street type – the type and location of the street could affect the potential safety of the community in addition to affect transportation routes if streets are affected by stormwater drainage issues. Weight = 20.
  - Score 1 = Street considered a local access only route
  - Score 3 = Street is labeled as a secondary street by the City for snow removal
  - Score 5 = Street is labeled as a primary street by the City for snow removal
- Hazard risk – hazards such as road flooding, structure flooding, or other safety issue could be present at the project location. Weight = 20.
  - Score 1 = No public safety hazard risk associated with the site
  - Score 3 = Minor hazard risk associated with site – nuisance oriented
  - Score 5 = Major hazard risk associated with site – known street flooding, damaged infrastructure, flooding structures (inhabited)

Each weighting factor is multiplied by each of the three metrics listed above and summed for a total range of 0 to 200.

Cost Efficiency

The Stormwater Services department strives to be budget cautious and select projects that provide benefits to the community for the budget. Additional, implementation of projects that could create cost savings provides increase efficiency for the department. Presently, the Stormwater Services department wants to evaluate projects with the criteria listed below but would like the weighting to be equal to zero until improved mechanisms for evaluation are developed to more accurately apply scores to each project.

- Operational efficiency – amount of maintenance costs reduced or removed from project location if project implemented. Could like to a return to investment metric in the future. Weight = 20.
  - Score 1 = Very little current maintenance costs at the project site to be removed
  - Score 3 = Moderate current maintenance costs at the project site to be removed, listed as a budget item for the department but less than $50,000/annually
  - Score 5 = Major current maintenance costs at the project site to be removed, listed as a budget item for the department and generally greater than $50,000/annually
- Financial leverage opportunity – additional financial resources could be gained from grants, private partnerships, or low/no-interest loans. Weight = 20.
  - Score 1 = No leverage opportunities exist
  - Score 3 = Less than 25% of the project budget can be leveraged through non-City funds
  - Score 5 = Greater than 25% of the project budget can be leveraged through non-City funds
- Project bundling – known, future projects associated with the project location could be combined for a construction bid to create cost-savings for the City. Weight = 20.
  - Score 1 = No bundling opportunities exist
  - Score 3 = Bundling opportunities exist but proposed schedule for two projects more than two years apart
  - Score 5 = Bundling opportunities exist and proposed schedule for two projects less than two years apart

Developing a Benefit/Cost Index

In addition to evaluating projects using the evaluation matrix presented in Section 2, a beneficial index for ranking projects is measuring the benefit per unit cost of the project or developing a benefit/cost (B/C) index. By doing this, the evaluation scores are essentially "normalized" by cost, such that less costly, lower ranked projects could have an increased B/C index or conversely, more costly, higher ranked projects could have a decreased B/C index. The following equation calculates the B/C Index:

B/C Index = Total Evaluation Score/Cost ($10,000s)

For example, a $350,000 project with a total evaluation score equal to 800 would have a B/C index of 22.9. A $50,000 project with a total evaluation score equal to 400 would have a B/C index of 80; therefore the $50,000 project would rank higher based on the B/C index.

Appendix E. SWMP Priority Projects

1.0 Downtown System Evaluation & Improvements Master Plan (Downtown Master Plan, or DMP) – SWAPID#1

Types: Asset Management, Closed Conveyance System Improvements, Green Infrastructure

Scale: Medium to Large with some Small opportunities

Executive Summary: The Downtown Master Plan (DMP) consists of a suite of asset management activities, closed and potentially open conveyance system improvements, and green infrastructure approaches that will help address historic and future anticipated challenges. Two major challenges addressed by the DMP are the prioritization and implementation planning for costly system upgrades in this highly urbanized setting.

The original SWMP identified multiple new "East" and "West" basin pipe systems intended to address two conditions – the lack of collection and conveyance on certain streets, and the general condition of aging pipe systems where existing infrastructure is present. There was little data presented to support prioritization of these proposed systems and costs were simplified to the point of not representing the true cost of major pipe replacement in Black Mountain's urban center.

North of the railroad tracks, the DMP study area is focused on the area of Dougherty Street to Ridgeway Ave, west to east, and runoff originating from Pine and 1st Street on the northern limits down to Sutton Ave along the southern limits at the tracks. South of the tracks, the study area is focused on the area north of the river from Black Mountain Ave to NC9.

While mapping and condition assessment are immediate needs to support decision making and future design activities, closed system conveyance improvements and open channel and green infrastructure supporting elements are the long-term improvements proposed. Priority projects in the DMP have been selected to target areas with overlap of collection and conveyance deficiencies, roadway flooding and safety issues, and erosion and structure flooding. Many of the downtown pipe systems run under and across private property and the history, location and condition of these systems are poorly understood. Due to the widespread nature of impacts to private property in this area, the Town is interested in the potential for new conveyance systems within the public ROW to convey runoff from major downtown streets to a suitable downstream outlet.

Background: The original SWMP identified "East" and "West" basin upgrades were proposed to address aging pipe infrastructure as a general condition as well as a few other concerns, although specifics were lacking as to the rationale and justification. The upgrades were proposed as follows:

Phase 1: East Basin Stormwater Conveyance System (4200 LF), with 2009 cost estimated at $350k

- Richardson Boulevard and Sutton Avenue System
- Ridgeway Avenue System
- First Street/Village Way System

Phase 2: West Basin Stormwater Conveyance System (6400 LF), with 2009 cost estimated at $500k

- Black Mountain Avenue and Sutton Avenue System
- North Dougherty Street System
- Cherry Street and Church Street System
- NC Highway 9 System

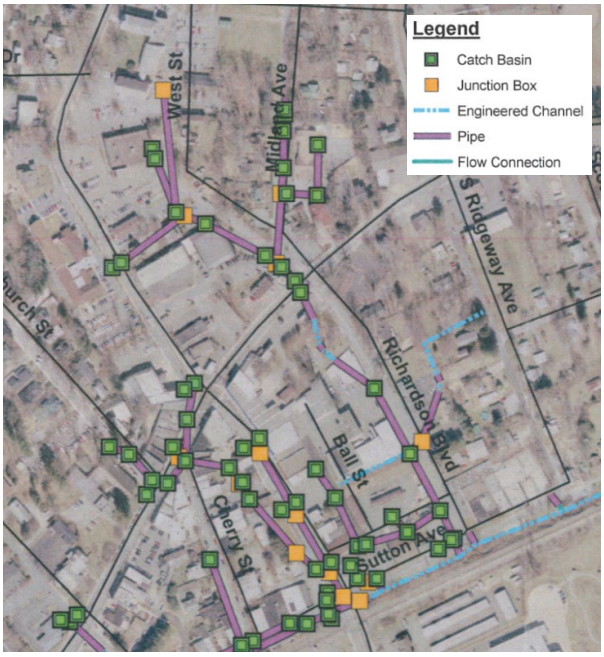
Due to their preliminary nature, the cost estimates likely underestimated the true cost of these replacements in these highly urbanized settings, including costs associated with utility conflicts, road repaving and traffic control and impacts to downtown businesses.

Current Conditions: Based on information collected during the SWMP update, the following conditions were identified in the Downtown Master Plan study area:

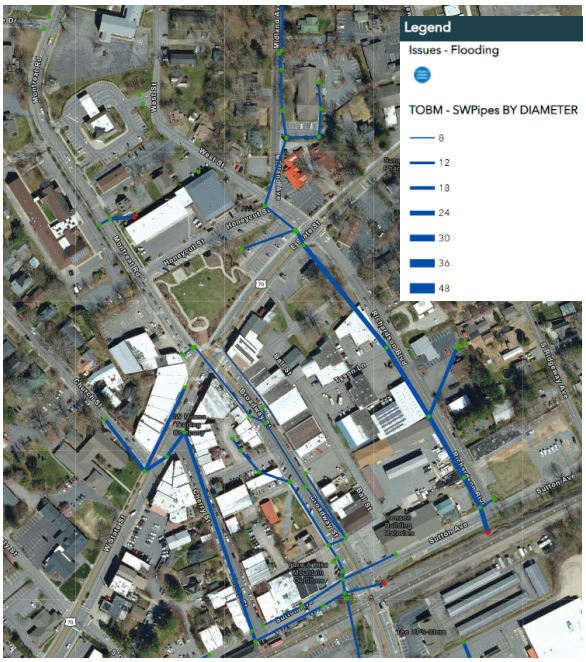
- The existing stormwater network mapping in the basin is of uncertain accuracy and of limited use for planning smaller or larger projects. Recorded plat data and field evaluation were used to improve mapping for certain design activities conducted under this project.
- The condition of pipes in the basin is unknown except as visible at inlets and junction boxes. Prior condition assessment has not been documented, although Public Works maintains some institutional knowledge of certain portions of pipe systems that were camera-surveyed by Buncombe MSD at the request of the Town. MSD was contacted to determine if any video data was available from this effort.
- Multiple systems depart from the public right-of-way and run across parcels, including under buildings. Systems departing the right-of-way are considered private; no historic drainage easements have been located.
- Inlet capacity issues and inlet bypass are present and exacerbated by debris or failing downstream systems that back up water in the system. Bypass results in stormwater not entering the system and entering other downgradient systems or overtaxing downgradient inlets, potentially flooding roads and buildings as a result.

  While generally undesirable, bypass and resulting flow along roadway gutters may take pressure off of existing pipe systems. Increasing inlet capacity on a widespread basis could lead to more rapid deterioration of systems with existing deficiencies, where applicable, or lead to more frequent over-capacity flows in the system. Without further assessment of condition and capacity pinch points, the unintended consequences of inlet capacity upgrades are unknown.
- Systems include piping of perennial springs and streams, such as in the storm systems under the Post Office off of Richardson Blvd and under Town Hardware off East State Street.
- Multiple streets do not have collection and conveyance systems.
- Historically, system capacity issues have been exhibited by manhole lids being blown off by storm flow (e.g. near the intersection of Broadway St. and Sutton Ave., in the gravel parking lot behind Town Hardware).

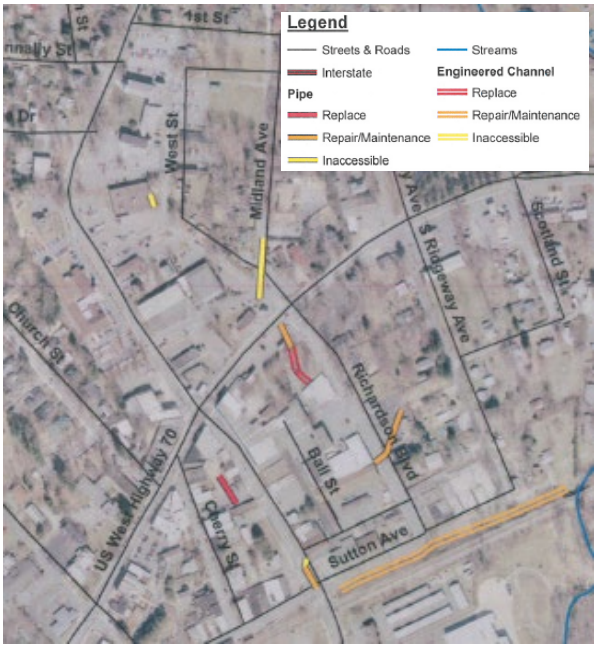
The following maps represent 2009 mapping and evaluation data as compared to current system mapping performed by Land of Sky. 2009 mapping data is not available in digital format and is also inconsistent with more recent data collected; it is not discernable which source is reliable and both data sets are incomplete, particularly with respect to private system components. Condition data available on paper copy maps provides limited insight into issues and does not differentiate between substandard conditions that are structural issues and those caused by the presence of trash or debris.



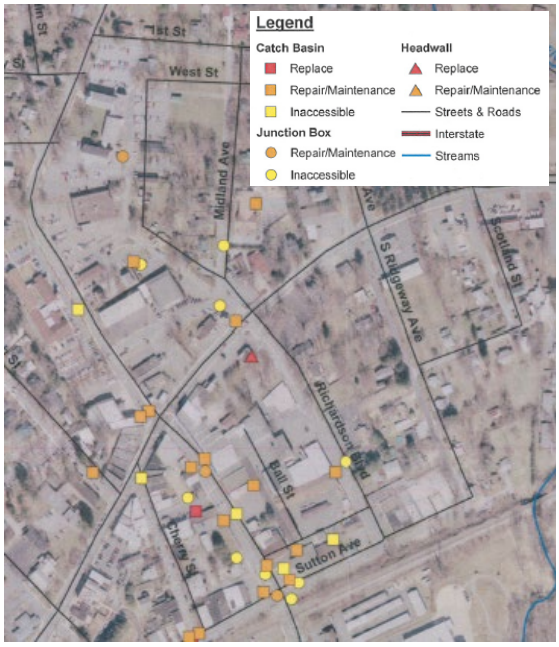
2009 Closed System Map



January 2022 System Map (Land of Sky)



2009 Condition Assessment – Pipes



2009 Condition Assessment – Structures

Project Description (Master Plan): The original East and West Basin projects were difficult to implement due to scope and cost. Project justification was limited and not useful for prioritization. For the proposed Downtown Master Plan, a revised approach was taken to identify the current conditions of most concern in the downtown area and propose specific activities in more manageable pieces (phases). While the desire for new conveyance systems in areas of downtown that do not have collection and conveyance is known (upper Church Street, Dougherty Street, etc.), limited capital funding and deferred maintenance and replacement along with existing system deficiencies mean that there are higher priority upgrades and activities which must take precedent.

The identified projects should serve as the core components and be refined based on additional mapping and condition assessment as well as other design factors identified in subsequent steps of the design process. Green Infrastructure (GI) projects and examples are included in the Downtown Master Plan and integration of GI is an activity that the Town has identified as a priority in prior master planning which can provide additional and complimentary system benefits.

Priority projects in the DMP have been selected to target areas with collection and conveyance deficiencies, suspected age or structural deficiencies, roadway flooding and safety issues, and/or erosion and structure flooding. Many of the downtown pipe systems run under and across private property and the history, location and condition of these systems are poorly understood. Due to the widespread nature of impacts to private property in this area, the Town is interested in the potential for new bypass conveyance systems within the public ROW to reroute runoff from major downtown streets to a suitable downstream outlet. GI projects may be installed on a parallel track with grant funding available to subsidize these improvements.

Projects:

The identified projects of the Downtown Master Plan area are:

- Town Hardware Bypass System – Cherry Street and Alternatives (PID#146)
- Broadway Street (Hwy 9) System Upgrades (PID#147, also related to 146/104)
- Montreat Road, West, Midland & Richardson System – Upper and Lower (PID#104)
- Downtown Green Infrastructure Opportunities (PID#14, 115, 132, 144, 104-3)
- Priority Mapping and Condition Assessment Systems
    - Church Street, Cherry Street and Broadway Street
    - Richardson Blvd
    - Black Mountain Ave

  Note: All downtown systems could benefit from mapping updates and condition assessment
- Other Closed Conveyance (PID#107, 133, 134, 4, 22)
    - Church Street
    - 1st Street
    - Dougherty Street
    - Ridgeway Ave
    - Black Mountain Ave

Overarching considerations for Downtown Master Plan projects include:

Land Ownership / Partnerships: Land ownership varies by project but the DMP has significant overlap and coordination needs with NCDOT and private property. Projects on private property require landowner participation and in most such cases landowner outreach should be considered a next step to determine project viability. For system bypass projects, it is likely that the existing system below the bypass (which is often private) should be left intact to serve local stormwater needs below the bypass collection point. Part of bypass project analysis is evaluating the mapping and condition of private systems and their relationship to existing and proposed public systems. Landowner outreach should be conducted prior to detailed mapping and assessment activities.

Next Steps / Project Phasing and Implementation: The projects above are at various stages of design development from efforts conducted under this project. For more developed projects, the next step should be to provide the mapping, planning and design necessary to produce a Basis of Design Report (BODR). BODRs are recommended for highest priority areas to be implemented as a more detailed level of design is typically necessary to establish a refined project approach and accurate budgeting. BODR may include preliminary planning for other areas with overlap of considerations in order to have a

clearer master plan for phased projects. The Town could support project development by pursuing mapping and assessment of relevant systems, conducting landowner outreach where deemed necessary and observing and documenting wet weather conditions.

Phase 1: Complete Mapping & Condition Assessment

Existing mapping is inconsistent between sources and found to be incorrect or incomplete in some cases. Prior mapping has focused on Town-owned infrastructure, but system evaluation requires more complete understanding of private infrastructure and system connectivity and condition of public and private infrastructure to adequately understand function, deficiencies and design alternatives.

Use data management recommendations to implement system mapping verification and data enhancement, including data fields for ownership, elevation, maintenance events, and other important operations and management attributes.

For the highest priority projects, target system video camera assessment of existing pipe conditions and identify and map deficiencies. The Town will have to coordinate mapping of private systems if the private systems are important to the evaluation of overall system function or to proposed improvement strategies.

Activity	Example Schedule	Cost
Mapping of Downtown Systems using office and field methods	2022-2023[1]	Staff time: 80 hours for Stormwater and GIS Technician staff
Video Camera Assessment of Cherry Street, Broadway Street, Sutton Ave and adjacent private systems, approximately 3,000 LF	2022-2023[1]	$12,000 ($4 per LF)[2]
Video Camera Assessment of Montreat Road-West Street-Midland Ave-Richardson Blvd – Upper System Enhancements, approximately 1,500 LF	2023-2024[1]	$6,000 ($4 per LF)
Video Camera Assessment of West Street-Midland Ave-Richardson Blvd - Lower System Enhancements, approximately 1,500 LF	2023-2024[1]	$6,000 ($4 per LF)
Video Camera Assessment, Black Mountain Ave & other misc. areas, approximately 1,500 LF	2024-2025[1]	$6,000 ($4 per LF)

[1] Dates provided are an example of how work could be spread over multiple years.

[2] The Town may also elect to buy a robotic video camera unit such as the Pipe Trekker A200 - cost is approximately $50,000, or pole camera – cost is approximately $15,000 and camera has high power zoom but is not mobile and can only document straight pipe segments visible from accessible catch basins.

Phase 2: Develop Implementation Planning for System Enhancements to Address Known Deficiencies

Identify feasible and phased closed system enhancements for short and mid-term implementation to target specific known issues. Primary examples are:

- Town Hardware Bypass System – Cherry Road and Alternatives
- Montreat Road-West Street-Midland Ave-Richardson Blvd - Upper System Enhancements
- West Street-Midland Ave-Richardson Blvd - Lower System Enhancements
- Broadway Street Enhancements (Stand Alone)

Identify maintenance activities that can improve system management or function.

- Evaluate inlet capacity issue severity through wet weather observation and post-storm evaluation of debris clogging of inlets; identify potential candidate locations for upgrades where feasible.
- Identify inaccessible boxes and furnish replacement covers where feasible.
- Track known or new localized issues within target improvement areas to ensure that larger proposed projects attempt to accommodate and address these adequately.

Activity	**Example Schedule**	**Cost**
Basis of Design Report for top three downtown projects	2023-2024[1]	$10k for survey and $25-30k for engineering
Evaluate inlet capacity through drainage area delineation and wet weather evaluation	2022-2024[1]	Staff time: 20 hours for Stormwater Technician and 20 hours for Public Works
From mapping and condition assessment, identify high priority feasible system maintenance upgrades and costs	2023-2024[1]	Staff time: 20 hours for Stormwater Technician and 20 hours for Public Works; possibly consultant assistance ($5-10k)
Implement system maintenance upgrades	2024-2025[1]	in-house or as part of design CIP project construction contract
[1] Dates provided are an example of how work could be spread over multiple years.		

Phase 3: Implement Highest Priority Projects

Once Phase 2 enhancement options are identified, use mapping and condition assessment as well as more detailed existing conditions evaluation to determine larger system considerations that should be factored into final project planning. Considerations may include other minor issues, upstream and downstream condition and capacity, and opportunities for complimentary green infrastructure.

Activity	**Example Schedule**	**Cost**
Priority 1 Project – Design and Construction	(TBD) 2026-2028[1]	$500k-$1m
Priority 2 Project – Design and Construction	(TBD) 2030-2032[1]	$500k-$1m
Basis of Design Report or Update to BODR for Project 3	(TBD) 2029[1]	$15-20k
Priority 3 Project – Design and Construction	(TBD)	$500k-$1m
[1] Dates provided are an example of how work could be spread over multiple years. The Town does not currently have sufficient funding available to take on multiple large projects in the next 5-10 years.		

Related Efforts / Considerations: Other projects in the downtown area warrant consideration with respect to planning closed system new and replacement projects. The Flat Creek Greenway Connector (sidewalk connection from Flat Creek Greenway to Hwy 9) is a consideration for the approach to and prioritization of targeted activities on or adjacent to Richardson Blvd. Previous parking and road improvement studies involve potential areas of overlap with green infrastructure stormwater improvements.

Budget: See budgets for individual project areas and projects for more information.

1.1 Town Hardware Bypass System – Cherry Street and Alternatives (PID#146)

Type(s): Closed Conveyance Replacement

Scale: Large

Background: Excessive system flows cause manhole blow-off at the bottom of Broadway Street. Excessive system flows cause overflow of boxes in a graveled parking lot behind Town Hardware. Pipes carry stormwater from NCDOT and City streets under buildings. The history of how this system came to be in its existing configuration is unknown but results in erosion and roadway safety issues as well as flooding risk to buildings. The source of the spring flow present in the box behind Town Hardware is still undetermined and may not be able to be identified, nor critical to the final design of the replacement system.

System mapping was evaluated. The inaccessible manhole at the southeast corner of State Street (US70) and Cherry Street was photographed from the curb opening to determine adjacent pipe configurations. This and other visual evaluation demonstrate that systems on State Street from Montreat Road to Church Street all run under Town Hardware contributing runoff from Church Street, State Street and Montreat Road north of State Street. In addition, a captured spring whose source is unknown first appears in the box behind Town Hardware. This system ultimately returns to NC9 where accounts of semi-frequent manhole blow-off suggests the system may be undersized. In recent years, this condition has occurred less frequently according to Town staff, perhaps the result of downstream ditch maintenance or other change in conveyance conditions.

Project Description:

The proposed project is to reroute stormwater down publicly maintained road ROW (along Cherry or Broadway Street), effectively bypassing the private system. The Cherry Street Bypass option was the focus of evaluations to date, although an alternative may be to route the bypass system east to NC9 and then south, either replacing or paralleling existing stormwater systems on NC9.

Upon completion of survey data collection, a more thorough evaluation of the Broadway Street bypass may be warranted. Currently, insufficient data exists to produce a thorough comparison. The systems would be of similar length and primary decision-making factors may be related to utility conflicts, jurisdiction (NC9 is NCDOT, Cherry Street is Town), or other factors such as traffic or business impacts.

In order to create more detailed cost estimates for the project, plats from downtown were digitized and field evaluation was conducted to improve the accuracy of existing stormwater system mapping and understand property ownership and other utility considerations. QL1 Lidar and sanitary sewer elevation data from MSD as-builts were also utilized for the design. Proposed stormwater system alignments and profiles were developed to provide a detailed evaluation of anticipated project costs and contingencies for likely or potentially utility conflicts.

<u>Cherry Street Bypass Option</u>

Approximately 14-15 acres consisting of residential, roadway and downtown business land uses drains from Chruch Street, Montreat Road, and State Street to the blind box at the top of Cherry Street. A new bypass pipe system could intercept runoff near the intersection of State Street and Cherry Street and be routed down the middle of Cherry Street and east along Sutton Ave to the existing railroad ditch.

On Cherry Street, which is one way, the center of the roadway was chosen for the pipe alignment. This avoids impacts to historic brick sidewalks as well as to sewer infrastructure on the western side of the street. For the first several hundred feet, the line is proposed to be offset below the sewer pipe profile so that sewer laterals may pass over the top of the stormwater pipe without conflict. Further down Cherry Street, the storm line profile is proposed to cross and then run above the sewer pipe profile in a section with no known service laterals. This is to accommodate the low slope that is available along

Sutton Ave. Adjustments to the profile or alignment may be necessary once utility elevations are identified. It is important to identify the elevation for water and other utilities such as gas or fiber optic, if present. Two known water mains of 6" and 10" are present along Sutton Ave. Another concern is that the depth of the proposed stormwater lines accommodates very little cover over the top of pipe. Detailed survey is required to verify that the road section and any minimum pipe cover can be accommodated. Reinforced concrete pipe has been assumed for all proposed pipe due to the minimal depth of cover and requirement to support traffic loading. The proposed system would daylight into the ditch along Sutton Ave east of Broadway Street. It is anticipated that allowing the ditch to remain uncovered may provide capacity and maintenance advantages, but more detailed pipe modeling should evaluate performance under both free flowing and backwater (from downstream riverine flooding) conditions.

There is an optional approach to tie the South Dougherty Street stormwater pipe system into this system. Flooding is experienced by private landowners south of the railroad tracks on Black Mountain Ave and this bypass system would likely alleviate conditions that are causing flooding in this location.

Broadway Street Bypass Option

As an alternative to the Cherry Street bypass, the same approach could be used to divert flow east to Broadway along State Street and south on Broadway to the Sutton ditch. Contrary to current Town mapping, none of the stormwater from north of State Street continues along Broadway – it is currently routed west and under Town Hardware and/or other businesses. This system would likely include the abandonment of the existing main line down the center of Broadway in favor of an upsized and new system. If desired, the new system could tie into Town-owned property mid-block (PINS 0619353989, 0619353907, and 0619352993). Underground detention could be explored on Town-owned parcels. Overall, this option does not involve the addition of new flow to the lower Broadway system since all of these flows already rejoin the lower Broadway system at the mid-block tie-in of the private system coming from behind Town Hardware. If video camera and other mapping and assessment indicate that the publicly owned Broadway Street system has structural deficiencies, the Broadway Bypass option may provide a remedy to those issues as well as addressing the broader need. It is known that much of the existing Broadway system is 12" terracotta pipe. Furthermore, there may be less complexities with sanitary sewer conflicts along Broadway than along Cherry since it is anticipated that the stormwater pipe can remain consistently above the deeper sewer along Broadway. The overall system lengths and costs are anticipated to be comparable, although if Broadway infrastructure upgrades as necessary long-term, the Broadway Street Bypass may be a more economical choice. It should be kept in mind that reducing flows down Broadway as a result of the Cherry Street Bypass could also for allow for pipe bursting as a replacement option for aging Broadway Street terracotta pipe.

Discussion of Private System

The existing system downgradient of the inaccessible box on State Street and Cherry Street flows onto private property and at that point is private. It emerges behind Town Hardware and is private until it enters Town-owned parcel (PIN 0619353989) and then returns to being private as it goes under the next downhill property and building. If a new system is run down Broadway Street, an effort could be made to provide a diversion of this public-private system from off of Town PIN 0619353989 into the new system. A diversion of the existing system may also be possible, although the complexity and cost would be high for the benefit of avoiding flow under one building (located on PIN 0619354904) and would not address many of the other issues and the root cause.

If either the Cherry or Broadway Bypass is implemented, flow will no longer enter the private system from public roads and only captured spring flow and rooftop and parking lot runoff will flow in the system. This may alleviate capacity issue in this system; however, the Town should explore options to

allow for diversion into new or existing systems where feasible and should share any condition assessment data of private systems with private landowners. The condition of this private system is poorly understood except in limited areas where it can be observed at existing inlets.

Land Ownership / Partnerships: The existing system components that would be replaced or rehabilitated are all NCDOT or Town-owned. Private property coordination may be necessary for mapping and condition assessment work for design evaluation, for abandonment of existing pipes, as applicable, and other coordination needs will be evaluated as part of subsequent design efforts but are anticipated to be minimal. Opportunities to pursue win-win public-private partnerships to improve the overall system will be explored if identified and could include green infrastructure or new private tie-ins with private investment with economy of scale benefits from the larger effort.

State Street and Broadway are NCDOT-maintained and work in NCDOT ROW will require encroachment agreements and/or other coordination. It is uncertain whether NCDOT would be able to share the cost burden or assist on the project in other ways. Of the 17 acres of drainage collecting at the analysis points on State Street, approximately 2 acres is from NCDOT maintained roads (State Street and Montreat Road, accounting for approximately 15% of the flow in the pipe system where it goes under Town Hardware).

Next Steps: See Phase 1 and Phase 2 efforts and schedule discussed under the DMP to map and assess the system and design and plan implementation of major and minor improvements. The Town is encouraged to plan and implement an outreach plan that will evaluate stakeholder concerns, including traffic and pedestrian impacts to implement on the project.

Related Efforts: Urban Green Infrastructure could be evaluated during subsequent design efforts for their applicability within the proposed project improvement area and cost-benefit considerations.

Budget: The Town Hardware Bypass system for the Cherry Street option is estimated to be a $1.0 million dollar investment. Phasing of the Cherry Street option for bypass may be challenging. The Broadway Bypass option may yield greater flexibility as the existing private system tie-in mid-block is a natural halfway point for the project. Phasing should be further evaluated during the BODR phase and include a greater understanding of current condition of the downstream system components and validation of design concepts and costs with more accurate survey and design information. The overall anticipated cost of the bypass project is anticipated to be $1m and may involve 2-3 phases of work within this corridor if financial planning efforts cannot support undertaking fewer phases with a likely greater economy of scale and reduced length of overall impact to the downtown business area.

1.2 Broadway Street (Hwy 9) System Upgrades (PID#147, also related to 146/104)

Type(s): Closed Conveyance Evaluation and Potential Upgrades

Scale: Medium

Background: Background issues are discussed in the DMP and Town Hardware Bypass descriptions.

Project Description:

The purpose of this project is to refine mapping and complete condition assessment of the pipe system along NC9 and to consider pipe upgrades that are potential components of the referenced PID's, particularly #146. This system has historically blown off a manhole cover lid at the bottom of Broadway Street and several corrugated metal and clay pipes are present. Many of the pipes in the system are only 12" in diameter and size, material and condition are likely to vary considerably throughout the public and private systems that contribute to the public system from the upper part of Broadway down to Sutton Ave.

If flow is reduced in the system through bypass, replacement efforts may become a lower priority, depending on pipe condition assessment findings. It is recommended that video camera assessment be performed by the Town or NCDOT to evaluate the pipe system and complete mapping and condition assessment of this part of the system, ideally to include portions of private systems in order to better understand factors affecting system performance and connectivity.

Of further consideration is the relationship of the adjacent system to the north and east that runs along Montreat-West-Midland-Richardson to any system upgrades and replacement on Broadway. It is possible that one solution for issues in this system is to upgrade the Broadway Street system and to divert stormwater flows from Montreat Road up to 1st Street or beyond into the upgraded system. This option should be further evaluated under the Montreat Road, West Street, Midland Ave, Richardson Blvd Richardson BODR that will look more closely at issues and options in the upper and lower portions of that system.

Land Ownership / Partnerships: The existing system components of interest for this project are NCDOT-owned pipes and structures along Broadway and potentially continuing north on Montreat Road. Adjacent private and public systems may have relevance due to their relationship to the primary trunk system.

Next Steps: See Phase 1 & 2 mapping, assessment and BODR preliminary design activities under the DMP.

Budget: Phase 1 & 2 costs are estimated earlier in the document. The cost to upgrade the system along NC-9 is unknown and highly dependent on identified need and components. In addition, NC-9 is NCDOT owned so the budget is dependent on NCDOT's role in potential improvements.

1.3 Montreat Road, West, Midland & Richardson System – Upper and Lower (PID#104)

Type(s): Closed Conveyance New and/or Replacement, possible Green Infrastructure

Scale: Medium to Large, and possibly Small

Background: Stormwater from Hwy 9 north of US70, and multiple highly impervious sites (1st Baptist, Fifth Third Bank), is routed towards West St via pipes traversing private property. Runoff aggregates from these, from Midland Ave which receives 1st Street and additional portions of Montreat Road, as well as from Honeycut Street and subsequently E State Street (US70) before the system daylights (comes out of an existing pipe) upstream of the post office where it flows in an open channel briefly before reentering a pipe that flows under the building. The pipe system eventually returns to the right of way of Richardson Blvd and outlets into the ditch along the railroad, flowing east from there to the river. Flooding issues exist at the bottom of Midland, along the sidewalk at the Post Office (with associated erosion), and much of the system originates on public roads and then flows through private property with variable accessibility. There are few or no inlets along West Street and other collection system components likewise have inlet capacity, access concerns, or condition or configuration concerns.

Project Description: This project may be best undertaken as a multi-phase project to address existing deficiencies that include lack of infrastructure, undersized or inadequate collection and conveyance infrastructure, and aging infrastructure flowing under buildings. The two highest priority components of the overall project are described, and their order of implementation should be based on further evaluation.

Upper System Enhancements

The first component is to complete replacement and/or upgrades to address Hwy 9 inlet capacity concerns along with addressing the flow of pipes through inadequate systems (condition poor or undersized) or inaccessible systems.

Lower System Enhancements

The second component is to address issues that are resulting in flow entering the post office property from Richardson Road and, if possible, reroute some or all of the flow out of the existing system into a replacement system along the upper half of Richardson.

Additional components may include new inlets and piping along West Street, evaluation of improvements along Midland Ave, and evaluation of condition and upgrades in the lower portion of Richardson Blvd.

Overall, this project could involve construction of 1200-1800 LF of new pipe system and associated collection components (inlets and junction boxes), and may also include inlet capacity upgrades along Hwy 9 and other upgrades to substandard system components.

Potential Green Infrastructure in this area includes ditch to bioswale conversion at the top of Midland Ave, parking lot retrofits at the Baptist Church discussed in Section 1.4, and on-street green infrastructure associated with proposed sidewalk project on Richardson Blvd (lower half in particular). In addition, given the alley configuration on the backside of building on the west side of Richardson, street reconfiguration and stream daylighting could be a possibility. This may favor a more pedestrian friendly corridor if traffic needs allow.

Land Ownership / Partnerships: The top of this network collects water off Hwy 9 and routes it across various private properties to West St. The system also flows across private property and post office south of US70. The proposed BODR should identify necessary easements. Where possible, the primary conveyance system would be relocated to Town or NCDOT ROW.

Next Steps: Map and understand condition of existing system through video camera assessment. Complete BODR in order to prioritize system upgrades and replacement, prepare preliminary design of the highest priority components and any understand future components well enough to phase the project in a sensible way. Conduct landowner outreach where necessary to develop projects.

Related Efforts: Other projects in the downtown area warrant consideration with respect to planning closed system new and replacement projects. The Flat Creek Greenway Connector (sidewalk connection from Flat Creek Greenway to Hwy 9) is a consideration for the approach to, and prioritization of, targeted activities on or adjacent to Richardson Blvd.

Budget: Target to divide projects into phases of <=$500k per phase. This may involve 3-4 phases of work within this corridor. Where possible, seek grant funding for complimentary green infrastructure work.

1.4 Downtown Green Infrastructure Opportunities (PID#14, 115, 132, 144, 104-3)

Type(s): Green Infrastructure (Downtown)

Scale:

Background:

Project Description:

Parking Lot Retrofit (PID#115)

Town parking lot south of RR tracks- retrofit existing depression, with possible bank add-on – an existing sinkhole was identified on Bank property. This area may get overflow from flow along tracks during high events. Need to explore drainage system leaving this low point in Town parking lot. Possibility for volume storage enhancement, especially if the grass swale in front of bank was added to project.

Estimated Cost: $50,000 – 125,000 (depending on activities and whether in-house or contracted out)

Parking Lot Retrofit Maintenance & Engineering Building (PID#14)

Part of existing funded EPA 319 project. Will improve safety by creating entrance/exit. Will treat parking lot stormwater runoff.

Estimated Cost: $118,000

Downspout Disconnection Maintenance & Engineering Building (PID#132)

Part of existing funded EPA 319 project. Will redirect runoff to rain garden and create stable outlet to Swannanoa River.

Estimated Cost: $10,000

Other Green Infrastructure or Conveyance (PID#144, 104-3)

Opportunities for Green Infrastructure include treating impervious areas high up in the watershed (such as 1st Baptist Church or Fifth Third Bank parking lots) with parking lot retrofit or underground detention. The potential for water harvesting at the Fire Station and reuse for washing operations or for irrigation in the adjacent park square could be explored. Other ultra-urban stormwater SCMs could be explored in the downtown corridor such as urban bioretention, tree boxes and trash/solids capturing devices. The

Land Ownership / Partnerships: Projects can be completed mostly on Town property but coordination with adjacent landowners will likely be necessary for either temporary access or to improve upstream or downstream routing of flow in and out of the proposed system improvements.

Next Steps: Develop concept for parking area near railroad tracks. Talk to adjacent owners about participation in project. The other projects are funded and in design and should be completed in 2023. Town could engage Warren Wilson students to identify suitable locations and types of urban SCMs/GI. Also, future BODR studies could identify complimentary GI applications that fit with proposed traditional infrastructure upgrades.

Related Efforts: DMP (all downtown projects)

Budget: TBD

1.5 Other Closed Conveyance (PID#107, 133, 134, 4, 22)

Types: Closed Conveyance Replacement

Scale: Medium to Large with some Small opportunities

Executive Summary: The West Basin Master Plan consists of potential closed system replacement and upgrades with some ancillary Green Infrastructure opportunities. The planning area covers several subwatersheds in the downtown area north of the railroad tracks and west of Hwy 9. While mapping and condition assessment are immediate needs, the priority project areas target areas with overlap of collection and conveyance deficiencies, undesirable access related to flow of pipes across private property and under buildings, and safety, flood or other risk to roadways and structures. In addition, management of perennial flow in the system is a concern. Prioritization also takes into account cost-benefit considerations. High priority projects have been described in detail.

Background: The "East" and "West Basin" projects were originally identified in the 2009 SWMP. They consisted of a series of new pipe systems running in road right-of-way to address the lack of existing collection and conveyance and/or undersized and aging pipes, some of which run through private property.

Project Description: Implement new pipe systems where there is a demonstrable need. Currently, none of the projects listed are of sufficient priority to develop beyond documentation of prior identification as potential systems of interest.

They include:

- Upper Church Street (PID#107)
- 1st Street to Charlotte Street Diversion (PID#4)
- N Dougherty Street (PID#133)
- Ridgeway (PID#22)
- Black Mountain Ave (PID#134)

Upper Church Street (PID#107)

Most of Church St has no collection and conveyance system. A green infrastructure street retrofit was explored under a previous EPA 319 project but found to conflict with existing waterlines running along the streetside of the curb. In addition, stormwater is understood to flow down the middle of the street rather than the curbline owing to the shape of the existing roadway. The main issue is that the collection system at the lower end of Church Street as well as captured spring (from unknown location) are thought to be part of the system routed under Town Hardware and as such contribute to system issues in that system which comes out onto Hwy 9 further down the slope. Improve mapping and locate spring upgradient of US70. Determine potential options to resolve issues (new system tie in down Cherry Street, or new system tie in on Hwy 9).

1st Street to Charlotte Street Diversion (PID#4)

There are 10-15 acres which could be diverted out of the existing stormwater systems that flow towards downtown to relieve those systems. In addition, flows onto 2-6th Streets from Montreat Road and west could potentially be diverted with a larger system installation effort. There are records of complaints along some of these streets associated with inadequate conveyance.

portions of Pine St (an estimated 10-15 acres total). It may be possible to divert further flow from the 1st Baptist Church (northern half). Diversion reduces stress on other East Basin subsystems but may or may not result in substantial benefit to these. Known challenges for the 1st St to Charlotte St new pipe system include sewer and water conflicts and traffic control (roadway closure). There is sufficient grade

drop down 1st Street to set a deeper system and reduce utility conflicts although requiring greater excavation depths. The Project is entirely in Town or NCDOT ROW (with minimal NCDOT overlap at Hwy 9 only), unless additional water is diverted from the Baptist parking lot.

There is potential for some overlap with a proposed sidewalk project between Village Way and US70 and potential for exploring options to incorporate flood storage in the existing ball field.

N Dougherty Street (PID#133)

In the original SWMP (2009), a new system was proposed to serve Dougherty St. No significant issues were identified in this area at the time of the SWMP update, however there is understood to be no or minimal stormwater collection and conveyance along Dougherty St. The Black Mountain Ave system starts at the bottom of Dougherty St.

Ridgeway (PID#22)

From remote recon using streetview, appears that stormwater flows onto S Ridgeway Ave from US70. Historically ditches present on both sides of road to mid-block. Mid-block, stormwater crosses from east side of road, including collection off Center Ave, to west side of road and travels via private property towards Richardson. This connection across private property has not been evaluated/observed during the SWMP update. There is a ditch system on the west side of Ridgeway that is small – existing conditions make improvements to this ditch challenging and installing cross drains for a rehabilitated ditch system on the east side of the road may be more effective. Related: Building inspector noted flooding on Center Ave but location was not certain whether at Ridgeway or near Scotland Ave.

The bigger project is to construct a new pipe system down S Ridgeway Ave to capture runoff from portion of Center Ave and likely including stormwater from US70.

Alternate or complimentary activities may be to (1) minimize stormwater contribution from US70 onto Ridgeway Ave through addition or improvement of inlets, (2) restore ditch system along east side of Ridgeway north of Center, route new inlets into ditch, then complete a new pipe system from Center Ave down to the railroad ditch.

Parcel identified as potential SCM/treatment area for acquisition in upper 1/3 of Ridgeway Ave, east side adjacent to large impervious lots. This could be done as compliment or alternate to other improvements, with secondary WQ benefit.

Black Mountain Ave (PID#134)

Issues identified in this subcatchment include flooding around the railroad tracks, lack of mapping to show how the existing depression in the Town parking lot east of Hwy 9 is tied into the existing system, likely aged terracotta and galvanized piping of unknown condition and potential inlet capacity and bypass issues. If the galvanized pipe system is deteriorated, replace existing pipe system along similar alignment (in ROW of Black Mountain Ave) to address deficiencies in condition (based on type=galvanized) and capacity (existing system is 18" throughout and has significant contributing area). Before moving forward, condition assessment and pipe connectivity mapping is warranted to determine need and benefits. In addition to mapping, flow conditions during flooding warrant investigation – visit Dougherty St at the railroad tracks during heavy rainfall to better understand flow conditions. The Town met with the railroad to discuss needs and coordination of improvements in May 2022. Most of the system is in Town maintained street ROW. It is possible that temporary easements and coordination may be required. Reevaluate after additional preliminary design work completed.

Land Ownership / Partnerships: The proposed improvements may involve Town maintained roads, NCDOT maintained roads, and potential overlap with private property.

Next Steps: Understand severity of issues between Ridgeway and Richardson. Develop with LiDAR a preliminary plan for ditch and pipe improvements to locate and quantify. Mark utilities and evaluate preliminary costs and challenges.

Preliminary ideas for the East Basin are to complete additional mapping and assessment, develop BODR for highest priority areas. BODR may include preliminary planning for other areas with overlap of considerations in order to have a clearer master plan for phased projects. Conduct landowner outreach where deemed necessary. 2022 SWMP update provides a discussion of land ownership considerations. Projects on private property require landowner participation and in most such cases landowner outreach should be considered a next step to determine project viability.

Related Efforts / Considerations: Other projects in the downtown area warrant consideration with respect to planning closed system new and replacement projects. The Flat Creek Greenway Connector (sidewalk connection from Flat Creek Greenway to Hwy 9) is a consideration for the approach to and prioritization of targeted activities on or adjacent to Richardson Blvd.

Budget: Budgets not developed for new pipe system projects

2.0 Swannanoa River Corridor Green Infrastructure Master Plan – SWAPID#2

Type(s): Green Infrastructure, Closed Conveyance System Improvements

Scale: Small, Medium, and Large

Background: Through its entire course within Black Mountain, the Swannanoa River is a source of flooding and is recognized as an impaired water. Previous studies have identified opportunities to mitigate some of the flood risks and water quality problems, including bank erosion. Some of those opportunities no longer exist, some remain. Bank erosion is an ongoing issue along certain reaches and can cause a serious threat to private and public infrastructure. Urban impervious surface development and other non-forested land use can be contributing factors to impairments to biological life and water quality. Implementation of stormwater management and stream and floodplain restoration projects on public and private property in the corridor can improve conditions and reduce undesirable consequences from development of watersheds and encroachment on water courses.

Project Description: This proposed area plan draws on that prior work and new investigations into the opportunities and constraints for improvement projects in the Swannanoa River Corridor, defined in a series of project areas or projects. This "plan" is conceptual and preliminary. It has a number of components, some of which are overlapping. Several components may be interdependent in that their final design, implementation, and the benefits that they produce will vary by which, and how many, of the other plan components are implemented.

Projects:

- Swannanoa River near confluence with Flat Creek (PID#136)
- Swannanoa River Stream Restoration at RR (near S. Ridgeway Avenue) and Riverwalk (Dog) Park Stormwater Retrofits (PID#130, 16, 135)
- South Bank of Swannanoa east of Dog Park between Railroad and I40 (3 Options) (PID#3)
- Highway 9 and Blue Ridge Road – First Christian Church (PID#50)
- North Bank of the Swannanoa River from Hwy 9 to I-40 near Community Gardens (PID#55)
- White Pine Drive, Fire Station & Community Gardens Rainwater Harvesting (PID#97)
- White Pine Drive, Fire Station & Community Gardens Bioswale (PID#143)
- White Pine Drive, Fire Station & Community Gardens Rain Garden (PID#149)
- White Pine Drive Conveyance System: Inlet, Conveyance, Outfall & Level Spreader (PID#56)
- Swannanoa Riverbank Stabilization – Phase I (PID#57)
- Swannanoa River Floodbench near Community Gardens - Phase II (PID#55)
- NCDOT Partnership: Constructed Wetland (PID #57)
- Douglas M. Brock (Veterans) Park and Downstream (PID #99, 100, 150, 21)
- River Corridor from Blue Ridge Road to South Blue Ridge Road (PID#51)

Land Ownership / Partnerships: Land ownership varies by project. Projects on private property require landowner participation and in most such cases landowner outreach should be considered a next step to determine project viability.

Next Steps: Develop BODR for high priority component projects that are not interdependent upon the remaining components. Conduct landowner outreach where areas are privately owned. Prepare an overall hydraulic impact, constructability, and impacts study.

Related Efforts / Considerations: NCDOT upgrades are proposed for Blue Ridge Road downstream of Veterans Park.

Budget: To fully implement this plan is estimated to cost between $7.2 million and $9.8 million exclusive of land and/or conservation easement acquisition. Due to the scope and cost of the plan, the recommended next step is to conduct a planning, feasibility, and constraints study. That study would include hydraulic floodplain modeling, estimation of potential flood damage reduction benefits, quantification of expected erosion reductions and reduction of bacteria contributing to the impairment of the Swannanoa River. The expected cost of that study is $150,000 to $200,000 with significant in-kind contributions from the City's Planning and Stormwater Management staff.

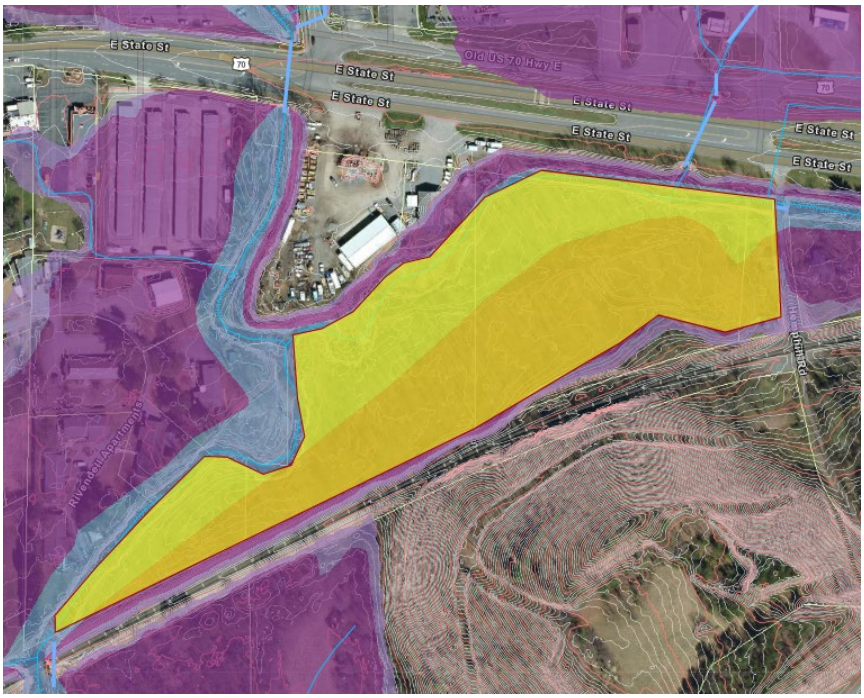
There are approximately $400,000 worth of improvements that are not interdependent with other components of the plan and that require very little additional study to document the construction constraints and expected benefits. The following pages present an overview of the components of the plan and the estimated costs for the individual project areas and projects.

2.1 Area: Swannanoa River near confluence with Flat Creek (PID#136)

Type(s): Floodplain Bench, Riverbank Stabilization, Constructed wetlands for water quality Improvement

Scale: Large

Background/Project Description: Approximately 7.25 acres lie in the regulatory (1%) floodplain along the south bank of the Swannanoa River west of Hemphill Road to the railroad trestle south of the Rivendale Apartments. Grading this area to establish a floodplain bench would reduce the erosive forces along the north bank and provide for water quality treatment during more frequent storms. The project would reduce the requirement for "hard" bank stabilization measures on the north bank. Water quality benefits will incur from establishing a floodplain bench and those benefits can be increased by incorporating off-channel pocket wetlands into the design.



Land Ownership / Partnerships: On Private Land. There are three parcel owners whose cooperation and participation would be necessary to complete this project: Religious Society of Friends Swannanoa Valley Meeting, Two Creeks Properties, and Black Mountain Ventures, LLC. Projects on private property require landowner participation and in most such cases landowner outreach should be considered a next step to determine project viability.

Next Steps: Discussion with Landowners, Conceptual Design and Basis of Design Report

Related Efforts: Implementing this project will impact the design and impacts of the Swannanoa River near Ridgeway Avenue project.

Budget: Planning Level – These estimates do not include the costs of land or conservation easement acquisition. $1,240,000

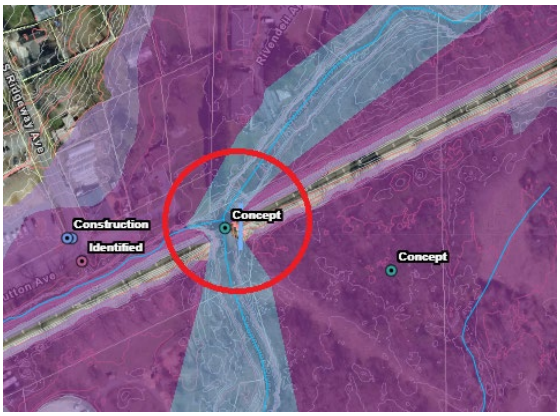
2.2 Swannanoa River Stream Restoration at RR (near S. Ridgeway Avenue) and Riverwalk (Dog) Park Stormwater Retrofits (PID#130, 16, 135)

Types: Riverbank Stabilization, Flood Mitigation

Scale: Medium to Large

Background/Project Description:

Stream Restoration



The 2009 Stormwater Master Plan recommended a project to improve the hydraulic flow conditions beneath the existing railroad trestle. The project included the removal of an abandoned sewer line running parallel to the river and the removal of rock rubble that was apparently placed in the river to protect the (now) abandoned sewer line. The project and implementation plan are described on pages 5-1 through 5-11 of the 2009 report. The project was not verified as to whether it is still relevant or viable.

Dog Park Stormwater Retrofits (PID #16, 135)

Both are labeled as "identified" but have been field verified to be viable. The approach proposed is to expand treatment of large grocery store parking lot by connecting existing SCMs together. Erosion issues are present downstream of private property SCM. SCMs are from early 2000's and private SCM can provide additional treatment through conversion – both SCMs could be expanded. Work is scalable and some benefit could be derived from expansion of stormwater facility on Town property alone. All expansion is within the 100-year floodplain and some of expansion area could be in floodway. If grading is proposed in floodway, no-rise will be required. It may be worth it for the additional space – decide based on SCM size calculations.

Land Ownership / Partnerships: On Town and private land, including railroad for stream restoration. The stormwater retrofit project 135 is understood to be owned by Ingles at the time of this report. Buy-in from private owners will be necessary for the projects to be viable.

Next Steps: Design

Related Efforts: There are proposed flood mitigation and riverbank stabilization projects immediately upstream and downstream of this project on river left. Implementing those projects should have no detrimental impact on this proposed project. However, the detailed design and benefits of this project are related to those upstream and downstream efforts.

Budget: Planning Level – Stream Restoration: $50,000,

Planning Level – Stormwater Retrofits: $125,000 – 250,000

2.3 South Bank of Swannanoa east of Dog Park between Railroad and I40 (3 Options) (PID#3)

Types: Flood Mitigation, Riverbank Stabilization, Riparian Area Restoration, Water Quality Treatment

Scale: Large

Background/Project Description: The 2009 Stormwater Master Plan (citation), recommended a project that would involve floodplain benching and the construction of a roughly 6.5-acre wetland in the area along the south bank of the Swannanoa south of the railroad and north of I-40. Recent investigation has changed the recommended project to include construction of a floodplain bench and a constructed wetland between 1- and 3-acres. The project would improve the connection between the river and its floodplain and result in diverting of flows from the more frequent storm events into the constructed wetland for water quality treatment.

Land Ownership / Partnerships: On Private Land. There are two landowners: Black Mountain Ventures, LLC and Ingles Black Mountain Exchange, LLC. Projects on private property require landowner participation and in most such cases landowner outreach should be considered a next step to determine project viability.

Next Steps: Preparation of an updated concept and cost estimate, followed by a Basis of Design Report.

Related Efforts: There are proposed flood mitigation and riverbank stabilization projects immediately upstream and downstream of this project. Implementing those projects should have no detrimental impact on this proposed project. However, the detailed design and benefits of this project are related to those upstream and downstream efforts.

Budget: Planning Level: The 2009 project cost estimates (including land acquisition) was $883,000.
Current estimates (exclusive of land and/or easement acquisition)
Flood bench construction: $291,000
Flood bench and 1-acre constructed wetland: $757,000
Flood bench and 3-acre constructed wetland: $1,662,000

2.4 Highway 9 and Blue Ridge Road – First Christian Church (PID#50)

Type(s): Green Infrastructure / SCM

Scale: Small to Medium

Background/Project Description: There is already some storm water storage in the north lawn of the church. This could be significantly increased with only the addition of a riser structure. A constructed wetland at this location would require some excavation, would provide storm water treatment, and would be an aesthetic amenity for the church. To sustain a constructed wetland may require redirection of some of the runoff from NC-9 and Blue Ridge Road into the wetland.

The stream west of the church (Camp Branch) enters partially blocked culverts under Blue Ridge Road. The Church has a nice streamside prayer garden. An infiltration/bioswale constructed west of the church could provide treatment and improved drainage.

Components:

1. SCM Retrofit, 0.5 Ac
2. Infiltration/bioswale, 200 LF

Land Ownership / Partnerships: Project is on private land. Projects on private property require landowner participation and in most such cases landowner outreach should be considered a next step to determine project viability.

Next Steps: Discussion with parcel owner.

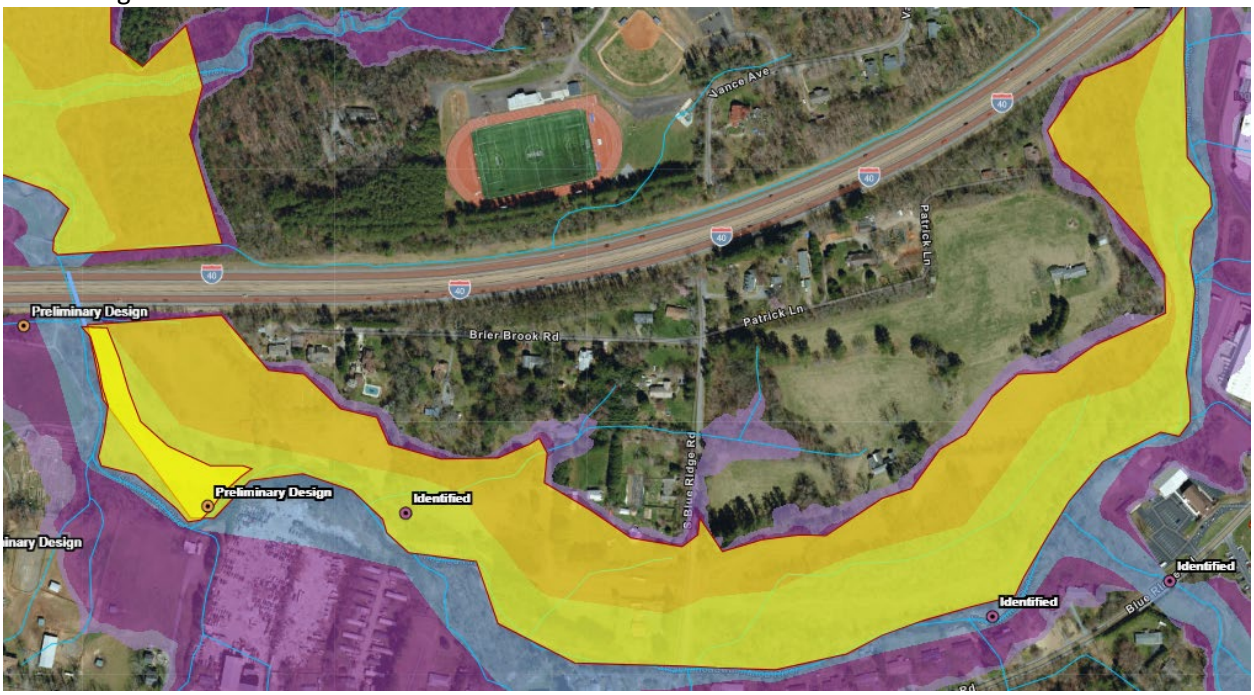
Related Efforts:

Budget: Concept Level: SCM Retrofit with 0.5 acre constructed wetland: $28,000
Infiltration/bioswale: $10,000

2.5 North Bank of the Swannanoa River from Hwy 9 to I-40 near Community Gardens (PID#55)

Type(s): Floodplain Benching, Flood and Streambank Erosion Mitigation, Stream/Riparian Restoration, Water Quality Treatment

Scale: Large



Background/Project Description: There are over 40-acres of mostly undeveloped land in the regulatory (1%) floodplain along the north bank of the Swannanoa through this reach of the river. The south bank of the river is heavily developed, has many structures within the floodplain, and has several reaches with moderate to severe bank erosion. Grading the area north of the river to establish a floodplain bench would mitigate flood risks along the reach and downstream, reduce the erosive forces along the south bank, and provide for water quality treatment during the more frequent storms. The project would reduce the requirement for "hard" bank stabilization measures on the south bank, enabling more nature-based solutions. Water quality benefits will incur from establishing a floodplain bench and those benefits can be increased by incorporating off-channel constructed wetlands into the design.

Land Ownership / Partnerships: The are eight private parcels within the identified project boundary. For a successful project, three or four of the property owners (owning over 75% of the land) would need to cooperate and participate. Projects on private property require landowner participation and in most such cases landowner outreach should be considered a next step to determine project viability.

Next Steps: Feasibility and Constructability Study.

Related Efforts: This project overlaps with recommendations for bank stabilization near the Community gardens. The final design potentially could be dependent on the designs of the flood bench and constructed wetlands upstream of I-40.

Budget: Feasibility, Impact, and Constructability Study: $200,000

Planning Level Estimate (exclusive of land and/or conservation easement acquisition)

Engineering, Permitting, Construction of floodplain bench: $3,581,000

Engineering, Permitting, Construction of floodplain bench and constructed wetlands: $4,747,000

2.6 White Pine Drive, Fire Station & Community Gardens Rainwater Harvesting (PID#97)

Type(s): Green Infrastructure, SCMs

Scale: Small to Medium

Background: This site includes the Fire Station, Community Gardens, Disc Golf Course, and the Swannanoa River. There are several opportunities for improved storm water management, with each of those improvements serving as a highly visible demonstration and education practice.

Project Description:

Fire Station Rainwater Harvesting

Rainwater harvesting & Disconnecting Impervious Surfaces for the station roof. There is an existing harvesting system off the Gray Eagle bldg. with about 4500 gallons storage and a distribution system from this storage to the community gardens. The system is operated on a fill & spill basis, that is rainwater fills the tanks and if they are not drawn down by irrigation demand, the next rainfall spills out of the tanks. The gardens are also served by a river pumping system. This project would expand the rainwater harvesting to include the entire roof area of the fire station, adding approximately 10,000 gallons of storage and connecting it to the existing distribution system. The system then be operated as more of a storm water management facility, draining about half the total storage in 72-120 hours. This would be accomplished by putting a pressure release valve on the lower end of the distribution system. The project also would improve the signage in the community garden area noting the rainwater harvesting and stormwater management features and better noting non-potable water.

Land Ownership / Partnerships: On Town land. Some grant potential as a demonstration project.

Next Steps: Determine source of additional storage tanks and how to best replace the existing tankage and where the current smaller tanks can be used. Design.

Related Efforts: Fire Station Infiltration/Bioswale described below.

Budget: Planning Level: $25,000

2.7 White Pine Drive, Fire Station & Community Gardens Bioswale (PID#143)

Project Description:

Conversion of asphalt walk and drainage to an infiltration/bioswale. With a total length of approximately 400 feet, this project would treat runoff from the parking area behind the fire station and mitigate erosion on the embankment leading down to the community garden. A level-spreader would be constructed at the downstream end of the swale and step-pool channel.

Land Ownership / Partnerships: On Town land. Some grant potential as a demonstration project.

Next Steps: Design.

Related Efforts: Rainwater harvesting, described above.

Budget: Planning Level: *$20,000*

Alternate Option: Fire Station Infiltration / Bioswale Extension

The bioswale could be extended through the community garden to serve as both an attractive amenity and supplement irrigation. If this is incorporated into its design, then the storage release valve should discharge into the upper end of the swale system, converting the entire system into a (longer flowing) ephemeral stream.

Land Ownership / Partnerships: On Town land. Some grant potential as a demonstration project.

Next Steps: Design.

Related Efforts: Rainwater harvesting and bioswales as described above.

Budget: Planning Level: *$20,000*

2.8 White Pine Drive, Fire Station & Community Gardens Rain Garden (PID#149)

Project Description:

A detention SCM (rain garden or constructed pocket wetland) just southwest of the station would treat parking runoff and reduce the cause for complaint from homeowner across the street.

Land Ownership / Partnerships: On Town land. Some grant potential as a demonstration project.

Next Steps: Design.

Related Efforts: White Pine Drive Conveyance System described below.

Budget: Planning Level: *$3,000*

2.9 White Pine Drive Conveyance System: Inlet, Conveyance, Outfall & Level Spreader (PID#56)

Project Description:

The drainage in this area is poorly defined. A collection and conveyance system in White Pine Drive could be used to convey runoff northward to a level spreader constructed above the Disc Golf Course. Alternatively, there is a City-owned parcel (23 Heron St) across from the fire station that may be used for future parking. Perhaps the rear of this property could be developed as an SCM.

Land Ownership / Partnerships: On City Street and land.

Next Steps: Preliminary design.

Related Efforts: Fire Station Rain Garden described above.

Budget: Planning Level: $209,000

2.10 Swannanoa Riverbank Stabilization – Phase I (PID#57)

Project Description:

This recommendation involves bank stabilization of up to 500 feet along the river and riparian buffer planting. The current greenway will eventually need to be moved unless, at least localized, stabilization occurs.

Land Ownership / Partnerships: Left bank on Town load, right bank private

Next Steps: Basis of Design Report

Related Efforts: Floodplain Bench described below.

Budget: Planning Level: $100,000

2.11 Swannanoa River Floodbench near Community Gardens - Phase II (PID#105)

Project Description: Cooperation with owner of the east bank could significantly improve this project.

Grading the area within the Swannanoa Floodway along the east bank to establish a floodplain bench would reduce the erosive forces along the west bank and provide for water quality treatment during more frequent storms. The project would, overall, be more effective and would reduce the requirement for “hard” bank stabilization measures on the west bank.

Land Ownership / Partnerships: On Private Land. Projects on private property require landowner participation and in most such cases landowner outreach should be considered a next step to determine project viability.

Next Steps: Discussion with Landowner, Conceptual Design and Basis of Design Report

Related Efforts: Swannanoa Riverbank Stabilization – Phase I described above.

Budget: Planning Level: $520,000

2.12 NCDOT Partnership: Constructed Wetland (PID #98)

Project Description: There is an opportunity to partner with NCDOT to build an approximately 1-acre constructed wetland within their right-of-way and in the lower part of the Disc Golf Course. The wetland would treat roadway runoff for I-40 and from the Town's parcel as well as serve as an aesthetic amenity to the Garden Greenway Trail. It would reduce the estimated pollutant loadings to the Swannanoa River by: TN, TP, TSS, Fecal bacteria

Land Ownership / Partnerships: On NCDOT and City land. Requires partnership with NCDOT and could be considered as a part of their new intersection project.

Next Steps: Discussion with NCDOT, Conceptual Design and Basis of Design Report.

Related Efforts:

Budget: Planning Level: $230,000

2.13 Douglas M. Brock (Veterans) Park and Downstream (PID #99, 100, 150, 21)

Type(s): Green infrastructure, Flood Mitigation, Stream Restoration

Scale: Small to Large

Background: Stream restoration work has been previously completed in this area. More opportunities toward lower end of the park.

Project Description: The Swannanoa Flood Risk Project recommended reduced conveyance at/above Blue Ridge Road to store more flood water in the park. NCDOT plans to replace the Blue Ridge Road Bridge will likely increase the conveyance locally. Examine opportunities to counter this impact.

Construction of infiltration/bioswales along existing gravel parking lots and a constructed pocket wetland would provide treatment, improved drainage of the nearby field areas, and be highly visible demonstration sites.

Components:

- Parking Lot Bioswales & Constructed Wetland
- Swannanoa River Floodplain Bench and Stream Restoration

Land Ownership / Partnerships: Bioswales & Constructed Wetland are on City property. The River Floodplain Bench and Stream Restoration would occur on both public and private land, including land owned by Montreat College. Projects on private property require landowner participation and in most such cases landowner outreach should be considered a next step to determine project viability.

Next Steps: Basis of Design Report for Bioswales; Discussion with adjoining landowners for Floodplain Bench and Stream Restoration.

Related Efforts: Swannanoa Riverbank Floodplain Bench – Phase II near the Community Gardens

Budget: Planning Level (exclusive of land and/or conservation easement acquisition)

Parking Lot Bioswales & Constructed Wetland: $150,000

Swannanoa River Floodplain Bench and Stream Restoration: $750,000

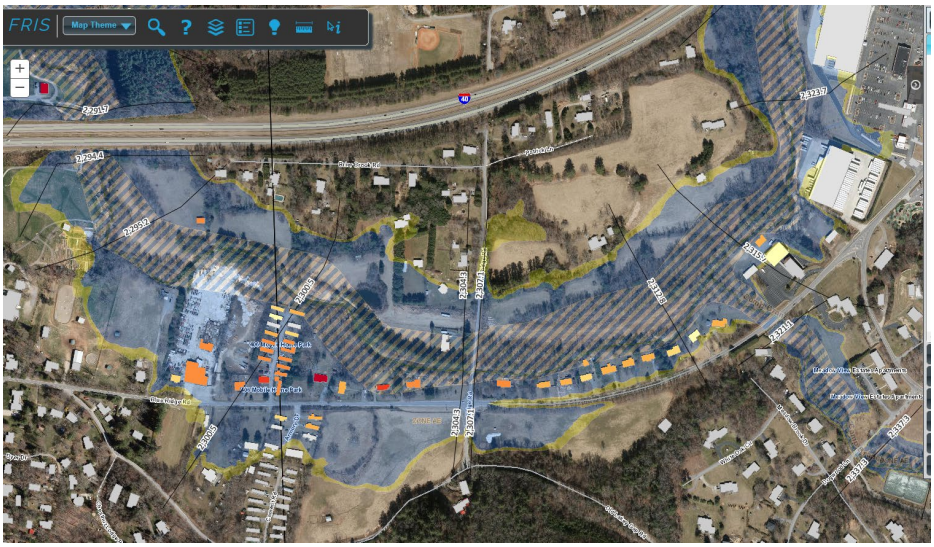
2.14 River Corridor Study from Blue Ridge Road to South Blue Ridge Road (PID#51)

Type(s): Stream and Riparian Restoration

Scale: Medium to Large

Background: In this reach of the river, there are several homes in the 1% floodplain, one very close to river with a severe erosion hazard.

Project Description: There is some opportunity for bank stabilization and reconnecting the river with the floodplain on the opposite (north) side of the river.



Land Ownership / Partnerships: Projects are on private lands. Projects on private property require landowner participation and in most such cases landowner outreach should be considered a next step to determine project viability.

Next Steps: Use current floodplain model to develop preliminary conceptual plan and hydraulic analysis. Contact landowners on both banks of the river regarding willingness to participate. Develop a Basis of Design Report that summarizes the flood and erosion damage reduction benefits as well as water quality and habitat benefits.

Related Efforts:

Budget: Planning Level:

Floodplain Analysis and BODR: $35,000

Design and Permitting:

Construction:

3.0 Open and Closed Conveyance Upgrades – Padgettown Road/Old 70/US70 Stormwater Area Plan – SWAPID#3

Type(s): SCM, Pipe Replacement, Flood Mitigation, Other Green Infrastructure

Scale: Medium-Large depending on components implemented

Background: Area experiences nuisance flooding routinely and more significant flooding during larger magnitude events. Multiple issues are likely contributing to this, including:

- Tributary 35 to the Swannanoa River has culverted crossings under Old State ten Rd (Town), Padgettown Rd (Town), through/under the parking lot of the private gas station on the corner of Padgettown and Old US70, Old US70 (NCDOT) and US70 (NCDOT). The culvert systems under Padgettown Rd and downstream private gas station property are likely undersized (consisting of two 3-foot diameter CMP culverts with a junction box and hard turn in pipe direction where the Town crossing meets private property) and were observed to be clogged with woody debris during site visits. The culvert under private property is collapsing with associate caving of pavement in the parking lot.
    - Unfortunately FEMA HEC-RAS modeling for this area is incomplete with only two of the four culverts modeled and the accuracy of the culvert data that is modeled in question (e.g. the roadway elevation provided for Padgettown Rd appears to be 3' higher than the QL1 Lidar shows which would give a false impression of better performance for this crossing)
- High concentration of large impervious areas, almost 7 acres, draining from private parking lots and building towards Old US70
- Other significant drainage area contributes to this vicinity, including:
    - It is possible that some of 20-30 acres of drainage from Padgettown Rd to Flat Creek Rd north to Beachtree Dr or beyond, drains down the Flat Creek Rd ditch and bypasses the pipe across Flat Creek Rd near Village way which is the primary outlet for this system – this cross drain is an important maintenance point and wet weather conditions should be observed in this vicinity.

    - Any bypass, plus stormwater that flows off half of the Elementary School, Flat Creek Rd and Tractor supply flows to the outlet at the corner of Flat Creek and Old US70 where a sinkhole and undersized and non-standard inlet were observed – inlet capacity may be an issue. Flat Creek Rd is NCDOT maintained. Before overtopping either Flat Creek Rd or Old US70, the flow is all funneled to the entrance to Tractor Supply and to

the gas station to the east. Also, when Flat Creek is high, the backwater could affect performance of the pipe draining to the river from the nonstandard inlet.

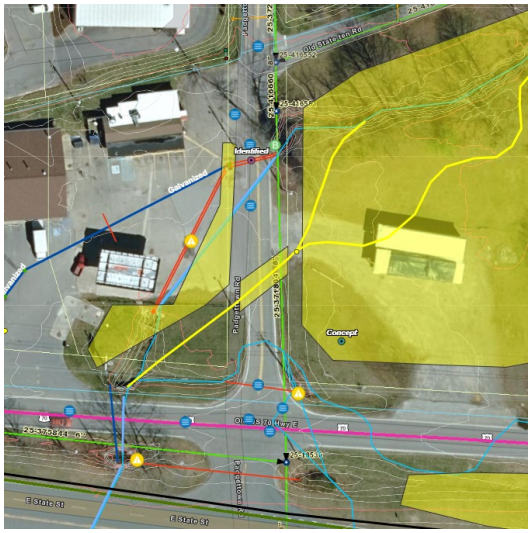
- Approximately 6 acres from NCDOT median areas, parcels between Old US70 and Old State ten Rd.

- At least 3-4 acres from Padgettown Rd and possibly two to three times this amount, including areas north of Avena Rd, depending on how continuous the ditch network along Padgettown Rd isIt should be noted that backwater from Swannanoa River was thought to be a potential contributing factor, and that this was evaluated using FEMA HEC-RAS modeling for Tributary 35 to Swannanoa R. The boundary condition for Tributary 35 was modified to reflect backwater and resulted in limited effect on performance of box culvert under Old US70 & Hwy 70. This disproves the notion that backwater has a significant effect on flooding in this area and points instead to multiple collection and conveyance system components that need to be upgraded.

Project Description: A better understanding of contributing factors to flooding is needed. Improved understanding from system mapping verification and correction, wet weather observations, interviews and high water mark information, and possibly through more complex mixed flow modeling (open and closed system modeling using a program such as PC SWMM) are suggested and potential next steps.

Look at the following potential improvements which are a mix of open and closed system upgrades as well as green infrastructure:

- Sinkhole Repair and Collection System Evaluation (PID #73)
- Padgettown Road Culvert Replacement (PID #72)
- Avena Road Bypass Cross Drain Pipe (PID #118)
- Flat Creek Road Observation, Evaluation and Ditch Network Improvement (Not a CIP Project)
- Watershed SCM Retrofits (PID #47, 48, 148)
- Flood Mitigation Park off Padgettown and Old State ten Roads (PID #109)



3.1 Sinkhole Repair and Collection System Evaluation (PID #73)

Type(s): Open System O&M, Collection System O&M

Scale: Small to Medium

Background: Town and consultant observed sinkhole in NCDOT ROW in area with other adjacent runoff and potentially substandard infrastructure issues.

Project Description: Address sinkhole at intersection of Old US 70 and Flat Creek Road and look at the outlet structure sizing for the contributing drainage area – efforts should be made to confirm the contributing watershed area. It is likely that the outlet structure is inadequate and that this contributes to water flowing east towards the Padgettown Rd intersection when the outlet is overwhelmed.

Next Steps: Ask NCDOT to evaluate sinkhole and ditch issues (some of the issues are related to driveway pipes and may require private property upgrades). Observe outlet structure performance during high flows.

Related Efforts: May improve floodplain conditions to east

Budget: Estimated cost of repairs in this area is $20,000 – 40,000, and could exceed the upper estimate depending on the findings and potential solutions.

3.2 Padgettown Road Culvert Replacement (PID #72)

Type(s): Closed System, Culvert/Bridge Replacement

Scale: Medium to Large

Background: See area plan description of need for this project.

Project Description: Replace the 2x3' culverts (14 square feet opening when not clogged) conveying Trib 35 under Padgettown Road with a culvert of comparable size to those under Old US70 and US 70 (approximately 50 square feet opening). Assume a 40' long skewed culvert with headwalls. A short-term improvement may be to increase the headwall/embankment height on Padgettown Road to decrease frequency of road flooding due to overtopping of the road which is low. Maintenance need is to keep the upstream face of culverts at Padgettown Rd free of debris. (PID#72).

Next Steps: May want to conduct outreach to adjacent landowner whose section of culvert is failing and collapsing. Could explore floodplain buyout option and move flood storage to this site instead of across the road.

Related Efforts: Flood Mitigation Park project described below.

Budget: Estimate $335,000 for replacement cost and utility conflicts.

3.3 Avena Road Bypass Cross Drain Pipe (PID #118)

Type(s): Closed and Open System Upgrades, cross pipe for ditch stormwater diversion

Scale: Small

Background: Identified bypass to reduce flow in downstream ditch and pipe networks.

Project Description: Evaluate the Avena Rd bypass pipe project and determine if this would reduce runoff in the Padgettown ditch network south of Avena Rd,
Next Steps: Observe flow during rainfall event(s). Coordinate with NCDOT on jurisdiction issues.

Related Efforts: Reduces downstream flows in planning area.

Budget: Estimated cost of upgrade is $35,000 including a new pipe, pavement cut and repaving – assumes contracted out; in-house cost likely half.

3.4 Flat Creek Road Observation, Evaluation and Ditch Network Improvement (Not a CIP Project)

Type(s): O&M, Observations

Scale: Small

Background: Identified bypass to reduce flow in downstream ditch and pipe networks.

Project Description: Evaluate the efficacy of collection and conveyance systems near the corner of Flat Creek Rd and Village Way to assess whether bypass of stormwater that is flowing north to south on Flat Creek Rd occurs here. If bypass is occurring, evaluate ways to increase diversion of stormwater flow down the ditch on Village Way. Estimated cost is unknown based on need for and/or type of improvements.

Also, closer to US70 (upstream of PID#73), NCDOT/Private could invest in improvements to ditch network and driveway pipe crossings along east side of Flat Creek Road for approximately 500' going north of Old US70 intersection (no PID) to reduce road and parking lot flooding.

Next Steps: Observe flow during rainfall event(s). Coordinate with NCDOT on issues identified.

Budget: Estimated cost is $5,000 – 15,000 for ditch and driveway repairs.

3.5 Watershed SCM Retrofits (PID #47, 48, 148)

Type(s): SCM

Scale: Medium

Project Description: Implement SCM retrofits for parking areas and in the median strip between US70 and Old US 70 to reduce runoff and treat water quality. Implement SCM retrofits for impervious areas on the Black Mountain Elementary school property to reduce runoff and treat water quality. (PID#47, #48, #148).

Next Steps:

Related Efforts: See ArcGIS online SWAP for Old US70 and Padgettown.

Budget: Estimated cost is $50,000 – 100,000 per SCM.

3.6 Flood Mitigation Park off Padgettown and Old State ten Roads (PID #109)

Type(s): Stream Restoration and Flood Mitigation

Scale: Large

Project Description: Implement stream realignment and flood storage for flood reduction at Old US 70 at Padgettown Rd. Approximately 2 acre-feet of storage are anticipated to be possible. This would likely have a significant impact on flooding and would be complimentary to the culvert replacement proposed. The area could be developed as a pocket park to serve adjacent neighborhoods. Evaluation of roadway realignment options in this area of the frontage road and the various turnoffs could be considered in as well as bike/pedestrian upgrades.

Land Ownership / Partnerships: Mix of private and NCDOT as well as Town-maintained right-of-way. Multiple property owners.

Next Steps: Identify grant funding opportunities, discuss landowner outreach approach, evaluate

Related Efforts: See ArcGIS online SWMP for Old US70 and Padgettown – related closely to culvert replacement project.

Budget: $657,000 not including 2.5 acres of land acquisition (mostly floodplain)

4.0 Lake Tomahawk Neighborhoods Plan – SWAPID#4

Type(s): SCM retrofit/rehabilitation, New Closed System Pipes, Drainage System O&M and Minor Replacement, Other Green Infrastructure

Scale: Small to Large

Background: This area is fairly dense residential with ongoing infill. Innovative neighborhood approaches have been proposed to reduce runoff from impervious surfaces on private property. Pipe systems have been identified as new conveyance systems. For the Tudor Way system, this addresses ongoing flooding concerns along the ditch network that flows through multiple private properties. Existing bioretention areas may be improved with rehabilitation efforts. Some in-house efforts in 2022 may have addressed issues along West Laurel Circle as best they reasonably can be given utility constraints.

Projects:

- Connally Street, Conveyance, Inlets, Outfall (PID#78)
- Tudor Way to Laurel Circle New Closed Conveyance System (PID#102)
- Neighborhood Approach: Distributed Stormwater Control Measures (PID#103, 106)
- Circle Lane and Laurel Circle Green Infrastructure (PID#93)
- Rehabilitate Bioretention along West Laurel Circle (PID#69)
- Rehabilitate Bioretention along Tomahawk Ave (PID#152)
- East Laurel Circle Drive / Park Lane Drainage Improvements (PID#71)

4.1 Connally Street, Conveyance, Inlets, Outfall (PID#78)

Background: There are inlets and two 12' diameter galvanized pipes that divert water off of Connally Street down to the small (0.47 acre) Town-owned parcel between Circle Lane and South Laurel Circle. There is a proposed SCM for that parcel. The condition of the galvanized pipe is unknown. This project would eliminate the diversion of stormwater from Connally Street and allow for a more effective SCM design. The street runoff would be conveyed in a new pipe system down Connally Lane to Tomahawk Branch or, alternatively, to a new pipe system constructed down North Dougherty Street.

Project Description:

Alternative 1: Disconnect the Connally Street inlets from the existing 12" pipe and reconnect to a 24" system running down Connally Street (1500 feet). Install two new inlets.

Alternative 2: Disconnect the Connally Street inlets from the existing 12" pipe and reconnect to a 24" system running down North Dougherty Street to connect with the proposed piping system starting at Prospect Street. Total of 580 feet of pipe required to Prospect Street.

Land Ownership / Partnerships: Public right-of-way

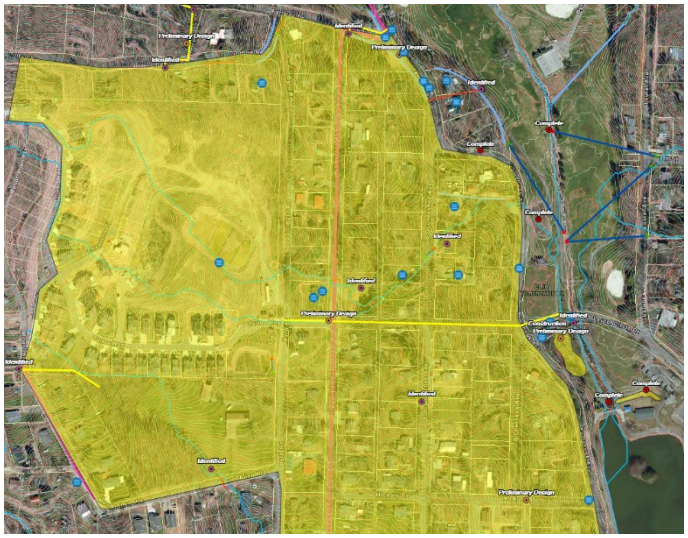
Next Steps:

Related Efforts: Circle Land and South Laurel Circle SCM; Dougherty Collection and Conveyance System.

Budget: Planning Level

Alternative 1: $678,000

Alternative 2: $250,000 (does not include costs of Dougherty system below Prospect Street).



4.2 Tudor Way to Laurel Circle New Closed Conveyance System (PID#102)

Type(s): Closed Conveyance - New

Scale: Medium

Background: Significant structure flooding issues and costly repairs reported along existing ditch network. System overwhelms existing bioretention.

Project Description: Implement pipe system to divert natural drainages and Tudor Croft overflow out of the ditch network and in a more direct route to Tomahawk Br paralleling the existing sanitary sewer. There is 15-30 feet of width typically between the sewer and the parcel boundary (per GIS). It is likely that no permanent easements and no or minimal temporary easements would be required. Opportunity to make drainage improvements at intersection with Laurel Circle. Vegetative clearing would be required as part of project.

Land Ownership / Partnerships: The project is proposed through an unopened road. Many of the property owners in the corridor likely use the unopened road as an extension of their property and/or derive privacy or other benefits. Landowner outreach and potential temporary access agreements should be anticipated to successfully plan and implement the project.

Next Steps: Do property research on unopened road. Evaluate impacts to vegetation, evaluate for presence of jurisdictional wetlands or streams. Look into utility conflicts, particularly at and below intersections with Laurel Circle. Look at alternative design to provide open channel (e.g., regenerative stormwater conveyance) downhill of S. Oconeechee Ave – the sanitary sewer skirts the southern edge of the unopened road in this area and an open channel may be feasible, however steep. Complete additional preliminary design and prepare a basis of design report for the project with an outreach component further evaluate feasibility and potential utility conflicts and landowner coordination aspects of the project.

Related Efforts: See project description for West side of Lake Tomahawk SCMs. Also, drainage issues discussed as stand-alone West Laurel Circle project near system outlet could be addressed as part of project. Takes pressure off existing bioretention and allows for potential future rehab project at bioretention.

Budget: The proposed Utility budget for this area is $716,000.

4.3 Neighborhood Approach: Distributed Stormwater Control Measures (PID#103, 106)

Type(s): Green Infrastructure

Scale: Small to Medium

Background: As the amount of area covered with impervious surfaces increases the amount of local and frequent nuisance flooding, streambank erosion, and polluted runoff increases. As a rule-of-thumb, significant problems begin to emerge in a watershed when the impervious area exceeds ten percent (10%). Most of the neighborhoods with Black Mountain exceed that threshold and with the continued development, and in-fill development, the impervious percentage is growing. The result is increasingly frequent flooding of public and private assets, streambank erosion and subsequent sediment deposition in our streams and lakes, and an increase in the amount of our waters that are recognized by the State as impaired. Without the availability of large areas that can be used to capture, detain, and treat stormwater runoff, Black Mountain must look to a partnership with its neighborhood landowners.

In Black Mountain, a SCM developed to the State's minimum design standaRoads and sized to capture and treat 1000 square feet of impervious area (such as roof tops, roads, driveways, parking lots) for the first 1.5 inches of rainfall will reduce[1]:

- Annual storm runoff: 69%
- Total Nitrogen in the runoff: 84%
- Total Phosphorus in the runoff: 77%
  Total Suspended Solids in the runoff: 85%
- Fecal Bacteria in the runoff: 60%

Most Black Mountain neighborhoods exceed 20% impervious area. This proposed project aims to partner the Utility with neighborhoods and landowners to mitigate the adverse impacts of impervious areas by "disconnecting" them from the stormwater collection and conveyance systems (driveways, sidewalks and roads, roadside ditches, stormwater inlets and pipes). The neighborhoods will benefit by realizing cost-effective mitigation of the increasing expensive problems caused by storm water runoff. Individual landowners will benefit by the addition of attractive landscaping features on their properties and the mitigation of storm water and erosion problems caused by runoff coming from upstream neighbors. All of us will benefit by reduced, frequent flooding that cause public health and safety concerns, by a better protected and improved environment, and by reducing our cost of complying with water quality laws and regulations.

The proposed public/private partnership will have the following components:

- Education: The Utility will provide workshops on how to design and implement SCMs that disconnect private impervious areas from the stormwater collection system.
- Cost-Sharing: The Utility will provide no-cost technical design assistance to landowners interested in selecting sites, determining size and characteristics of the SCM, and how to construct, replant, and maintain the area. The Utility will assist in seeking grants and group discounts for program participants.
- Private Land: Neighborhood groups, Homeowners Associations, and individual landowners who register and commit to a target of disconnecting, at minimum, 10% of their impervious area will

[1] Reductions estimated by NCDEQ Stormwater Nitrogen and Phosphorus (SNAP) model, the pollutant loading factors developed for Asheville's watershed restoration plans, and the median pollutant removal efficiencies of the infiltration-based SCMs documented in the State Stormwater Model.

be eligible for the cost-sharing program (example: transitioning from 20% effective impervious area to 18% effective impervious area over the program period).

- Public Land: The Utility will prioritize the identification and implementation of projects that capture and treat stormwater runoff from public roads in the areas participating in the program.

Three areas have been selected as targets for the demonstration and proof-of-effectiveness stage of this project: Two neighborhoods that drain into Lake Tomahawk and a neighborhood that drains into Flat Creek. The following sections further discuss those particular areas.

Project Description: Due to the terrain, development characteristics, and financial constraints, the Black Mountain Storm Water Utility has very limited opportunities to implement large scale SCMs that can capture, detain, and treat runoff from large areas. A more promising approach is to develop storm water management plans based on shared public and private interests and responsibilities. A recommended component of this 10-year stormwater master plan is to develop and cultivate such an approach, using three pilot neighborhoods as a means of developing the procedures and demonstrating the cost-effectiveness of this approach.

Project Areas and Projects:

- East side of Lake Tomahawk, approximately 50 acres.
- West side of Lake Tomahawk, approximately 80 acres.
- Flat Creek neighborhood, approximately 50 acres.

Land Ownership / Partnerships: Land ownership varies by project. Projects on private property require landowner participation and in most such cases landowner outreach should be considered a next step to determine project viability.

Next Steps: Develop preliminary participation agreements and small project ranking criteria. Conduct neighborhood and landowner outreach.

Related Efforts: See Stream and Riparian Corridor Projects. See routine management efforts, Green Infrastructure Inspection & Maintenance.

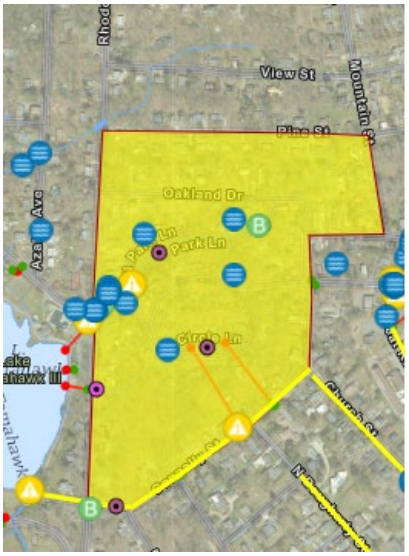
Budget: See budgets for individual project areas and projects.

Lake Tomahawk Eastern Shore Neighborhood Approach (Distributed SCMs): (PID#103)

Type(s): SCM; Programmatic support

Scale: Small to Medium

Background: This, roughly 47-acre, area has an overall impervious percentage between 20 and 25 percent. There have been numerous complaints of public and private flooding, as well as slope and streambank erosion. The area delivers nutrients, sediment, and bacteria to Lake Tomahawk that degrade water quality and decrease the lake's depth. The roadside ditches, ephemeral drainages, and small streams are generally steep and provide very limited opportunity for storm water runoff to infiltrate. This project addresses each of these problems.



East of Lake Tomahawk Distributed SCM Demonstration Area

Project Description: Although infeasible, fully disconnecting the impervious area in this neighborhood would reduce the direct stormwater runoff into Lake Tomahawk by an estimated 26 acre-feet (1,132,560 cubic feet), decrease the nitrogen and phosphorus delivered to Lake Tomahawk by approximately 100 pounds and 13 pounds, respectively. It would also reduce the sediments and bacteria delivered to the lake by estimated 85% and 60%. The feasible goal of this project over the next 5 years is to achieve 10% of the above estimated reductions through the implementation of XXXXX project types.

Components:

- Rainwater harvesting systems, rain Gardens and infiltration basins on private property
- Diversion and detention of street runoff within publicly owned areas.

Land Ownership / Partnership:. Projects on private property require landowner participation and in most such cases landowner outreach should be considered a next step to determine project viability.

Next Steps: Develop preliminary participation agreements and small project ranking criteria. Conduct neighborhood and landowner outreach.

Related Efforts: See Stream and Riparian Corridor Projects. See routine management efforts, Green Infrastructure Inspection & Maintenance.

Budget: The proposed Utility budget for this area is $50,000 over the program period. The expected private investment is estimated to be $250,000[2]. The result would be a reduction of approximately 50,000 square feet of effective impervious area, an amount equal to about the effective impervious area of nearly 50 homesites.

Cost estimate is based on 2021 construction costs of six projects that disconnected impervious areas in Asheville at an average cost of under $5 per square foot plus an allowance for Utility costs of education, technical assistance and SCMs constructed on public lands

ake Tomahawk Western Shore Neighborhood Approach (Distributed SCMs): (PID#106)

Type(s): SCM; Programmatic support

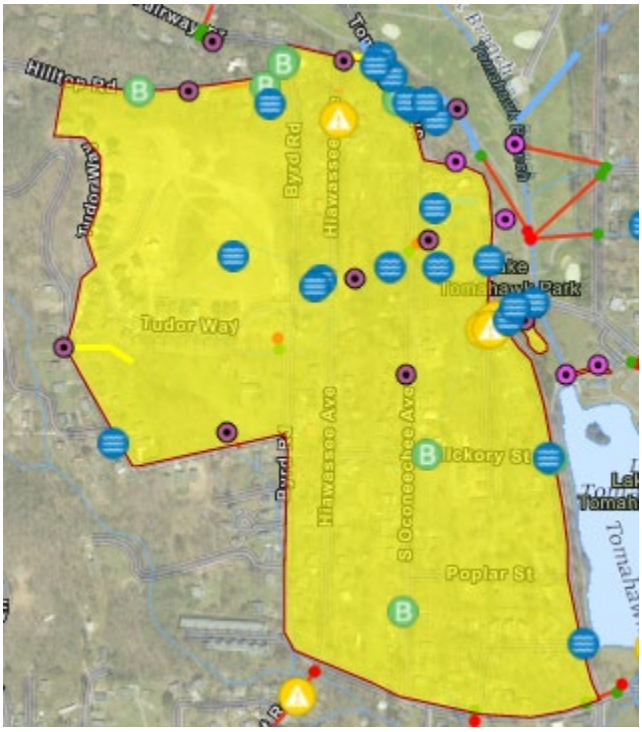
Scale: Small to Medium

Project Description:

This approximate 80-acre area shares many of the characteristics of the proposed demonstration area on the east side of Lake Tomahawk. There are a few of significant differences, including: There are opportunities on publicly owned land adjacent to Lake Tomahawk where larger SCMs are feasible, and there are several private parcels where larger SCMs could be developed as neighborhood initiatives.

Components:

- Rainwater harvesting systems, rain Gardens and infiltration basins on private property
- Diversion and detention of street runoff within publicly owned areas.



West of Lake Tomahawk Distributed SCM Demonstration Area.

Land Ownership / Partnerships: Projects on private property require landowner participation and in most such cases landowner outreach should be considered a next step to determine project viability.

Next Steps: Develop preliminary participation agreements and small project ranking criteria. Conduct neighborhood and landowner outreach.

Related Efforts: See Stream and Riparian Corridor Projects. See routine management efforts, Green Infrastructure Inspection & Maintenance.

Budget: Programmatic Estimate: The proposed Utility budget for this area is $80,000 over the program period. The expected private investment is estimated to be $400,000. The result would be a reduction of approximately 80,000 square feet of effective impervious area.

Cost estimate is based on 2021 construction costs of six projects that disconnected impervious areas in Asheville at an average cost of under $5 per square foot plus an allowance for Utility costs of education, technical assistance and SCMs constructed on public lands

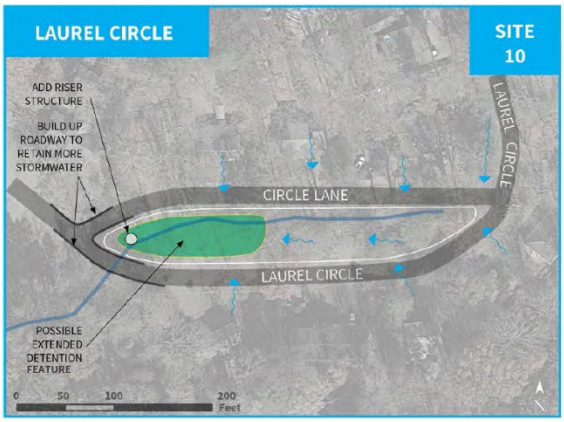
4.4 Circle Lane and Laurel Circle Green Infrastructure (PID#93)

Types: Green Infrastructure, SCM

Scale: Small

Background: A potential extended detention or bioretention SCM was identified for this location in the 2016 Upper Swannanoa River Watershed Management Plan. The project remains feasible.

Project Description: This project would construct an extended detention or bioretention area between the roadways and buildup the roadway near its downstream end to increase the available detention volume. Upstream of the detention area, the incoming channel would be reconstructed into a series of step pools. The 2016 estimates were that this project would annually remove 180 pounds of TSS, 6.6 pounds of Total Nitrogen, and 0.3 pounds of Total Phosphorus from flowing into Lake Tomahawk. Approximately 60% of the incoming fecal bacteria would also be deactivated by this project.



Land Ownership / Partnerships: Project is on public land.

Next Steps: Basis of Design Report

Related Efforts: East Tomahawk Neighborhood Distributed SCMs; Connally Street Conveyance System.

Budget: Planning Level (inflation adjusted from 2016 estimate): $35,000
Planning Level (step pool channel above detention area): $10,000

4.5 Rehabilitate Bioretention along West Laurel Circle (PID#69)

Types: Green Infrastructure

Scale: Small to Medium

Background: There are issues with roadway flooding, spring flow on roadway (high water table), and loss of function in existing rain garden. Public Works has conducted recent efforts to improve various issues and this project may no longer be as effective for this reason.

Project Description: If utilities and recent drainage improvements allow, lower rain garden. Dig up and transplant existing vegetation to the extent practicable. There is potential to expand rain garden and provide better treatment at a lower elevation and also to improve the outlet to creek.

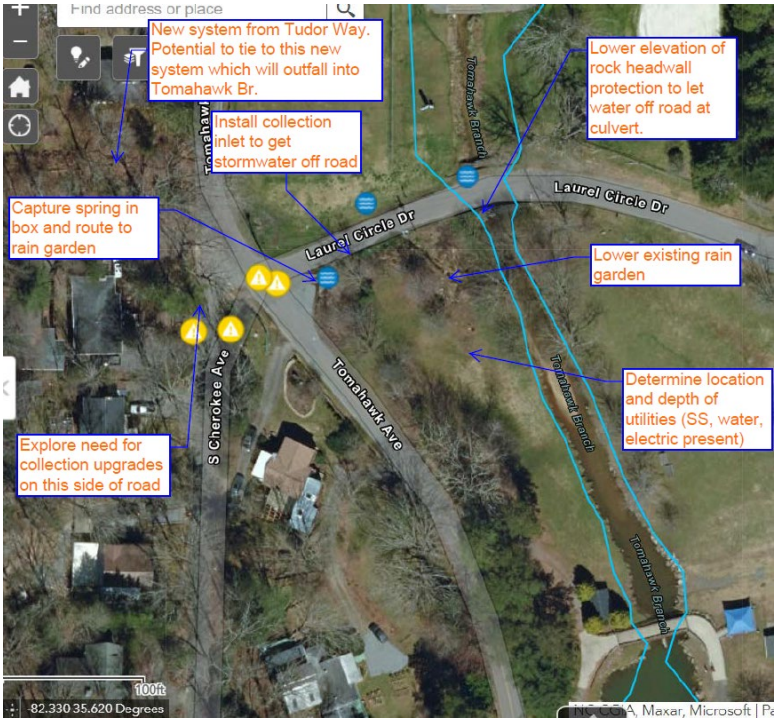
Lowering the rain garden will allow for water to be collected and routed off the road with an inlet or concrete flume with positive slope and drop of at least 9" into the rain garden reducing vegetation maintenance to prevent water from backing up on the road.

In addition, currently the rain garden is primarily a pass through for stormwater (not a treatment feature); it is also fed by natural seepage in the area.

Land Ownership / Partnerships: Most of this work is on Town maintained roads or ROW. Potential coordination with landowners to the west for any collection system upgrades or tie-ins required.

Next Steps: Identify any remaining issues or opportunities in this area after recent improvements, map utilities and viable options for project, given groundwater seepage, investigate whether any of the area is classified as jurisdictional wetland.

Related Efforts: Proposed new system from Tudor Way along unopened road ROW could interrelate to improvements here.



Budget: $20,000+ depending on activities.

4.6 Rehabilitate Bioretention along Tomahawk Ave (PID#152)

Types: Green Infrastructure

Scale: Small to Medium

Background: Bioretention constructed ~2010 is full of sediment and has lost volume storage and treatment potential. Source of sediment should be fairly stable and bioretention rehab would renew effectiveness of practice.

Project Description: Rehabilitate practice following guidance from inspection report provided in geodatabase including: remove sediment, locate and cap underdrain cleanouts, refurbish inlet to maintain stability, vegetation management and replanting. The practice could also be retrofit to provide additional volume storage and to expand the footprint with minimal additional design.

Land Ownership / Partnerships: Town-owned.

Next Steps: Allocate funding, create rehabilitation plan and execute. Identify sediment waste location or plan to haul to permitted fill site.

Related Efforts: Proposed new system from Tudor Way along unopened road ROW will remove contributing drainage to practice and allow for more appropriate drainage area to practice size ratio. The practice was likely significantly undersized to treat watershed area.

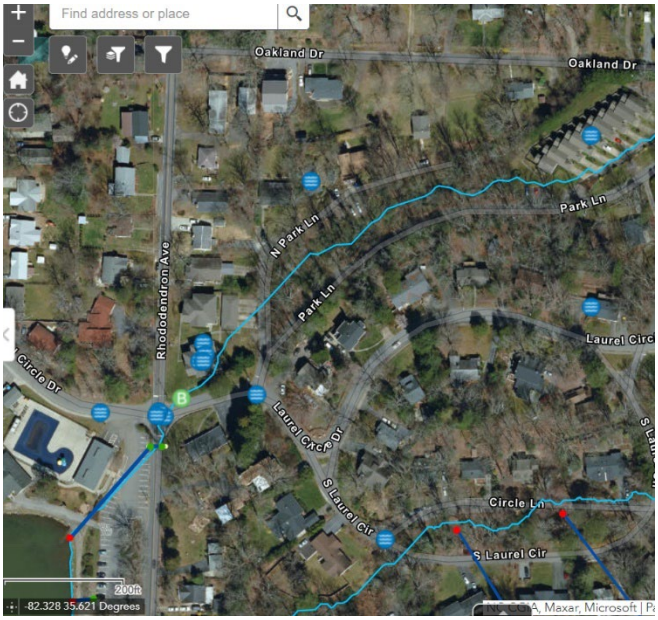
Budget: $20,000 depending on activities and whether performed in-house or outsourced.

4.7 East Laurel Circle Drive / Park Lane Drainage Improvements (PID#71)

Type(s): Open and Closed System Upgrades and possible Pipe Replacement

Scale: Small-Medium

Background: The existing open channel conveyance between N Park Ln and Park Ln overtops the road where it enters an unmapped closed system. This overtopping has flooded downhill structures. In addition, a concrete flume on Laurel Circle just uphill of Rhododendron Ave is clogged with sediment and is not evacuating stormwater off the roadway before the intersection as it should. The Town is looking at pipe replacement options under the intersection of Laurel Circle Dr and Rhododenron. The Town also recently completed work at the pipe entrance where the pipe and headwall were in disrepair. It is anticipated that this will have subtantial benefits in reducing the risk of flooding by increasing pipe capacity.



Project Description: Additional options to further reduce risk include raising the embankment at the start of the pipe system to reduce overtopping. Conducting curbing or similar diversion to route overtopping flows away from pathways causing flooding of structures. Conduct drainage system upgrades and maintenance to get water off of road into open and closed system. Look at whether pipe replacement under Rhododendron Ave provides flood benefit, or addresses condition deficiencies (further assess condition of existing pipe and ditch networks).

Land Ownership / Partnerships: Projects are on Town maintained roads and also likely involve private property unless all work can be performed in existing ROW. Existing ROW limits are unknown at the time of this writeup.

Next Steps: Evaluate options for system upgrades and for replacement. Map unmapped components of system. Evaluate condition of existing pipes.

Related Efforts: Area: Circle Lane and Laurel Circle Green Infrastructure

Budget: The proposed Utility budget for this area is $20,000.

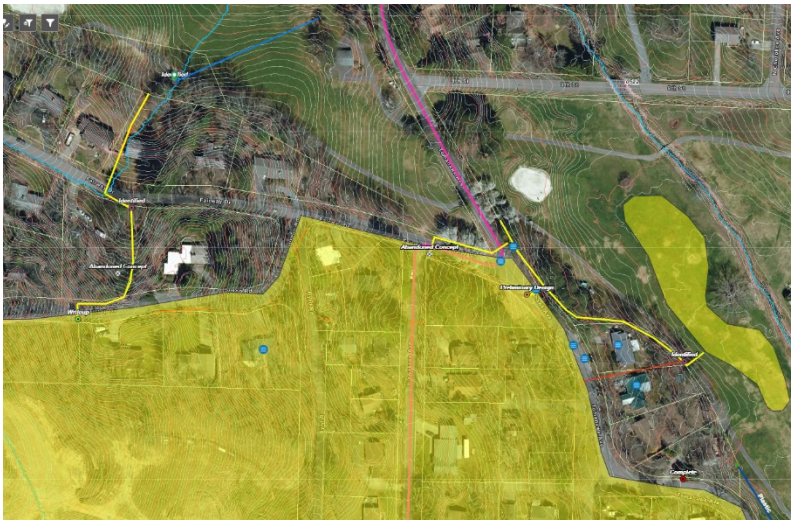
5.0 Fairway Drive / Tomahawk Ave to Golf Course Ditch Diversion with Potential Flood Storage (PID#35)

Type(s): Diversion, Pipe Replacement

Scale: Small-Medium

Background: This ditch has complaints of blockage and flooding and has recently been dug deeper along Hiwassee Ave (appears to be associated with residential home construction) which could pose a potential safety concern and/or erosion control issue. The ditch carries approximately 12-acres draining to it, including runoff from Hiwassee Ave, Byrd Road, Hilltop Road, and adjacent upland areas. It outlets to a pipe system that crosses Tomahawk Ave just north of S Oconeechee Ave, crossing under private property before it outlets into the golf course. The outlet has sedimentation issues and appeared to be submerged during site inspection. The Town has subsequently worked on the area.

The system also gets an additional estimated 2.5 acres from the north side of Fairway Drive which crosses Tomahawk Ave in an existing pipe (NCDOT) at the intersection of Fairway Dr. It then enters a ditch on the golf course side of the road that terminates at the pipe outlet discussed in the first paragraph. During larger events there is overtopping (or was, prior to ditch excavation) at Tomahawk Ave where runoff exceeds ditch capacity and the road overtops which has resulted in erosion on Town golf course property.



Project Description: Install a pipe diversion under Tomahawk Ave on the south side of Fairway Dr to route flow out of the existing ditch network and onto golf course. Maintain, but reconfigure, the existing roadside ditch for less runoff and to eliminate any safety or water quality concerns. Determine the limits, condition and elevation of the existing pipe outlet behind residential homes and completely map pipe system to final outfall. Rehabilitate the existing 400-foot long swale through the woods on east side of Tomahawk Ave on golf course property by either diverting the swale onto the golf course (to ponding storage) or by addressing the deficiencies at the current end of the swale where no outlet seems to exist.

Components:

- 30 LF 24-30” CMP or RCP
- Ditch rehabilitation and/or extension, up to 400 LF rehab and 100-200 LF of new ditch or water quality swale
- Potential flood storage grading on golf fairway 0.5 – 1 acre-foot to treat 1-3” of rainfall; situate most of storage in areas that will least affect play on golf course – flood study may be required for this component of project. This component would make entire project eligible for various water quality grant funding.

Land Ownership / Partnerships: Diversion is in presumed right-of-way (Town). Some potential overlap with NCDOT maintained road. City of Asheville water department may be able to advise on the water main that runs down Tomahawk Ave (not in Town GIS). Coordination with private property and golf course staff required for other project activities.

Next Steps: Improve/verify pipe mapping and outfall locations. Conduct pipe condition video camera condition assessment. Map utilities and evaluate conflicts and associated implications for design and cost. Discuss project with NCDOT to understand jurisdictional boundaries on Fairway Dr and Tomahawk Ave. Conduct more detailed design evaluation and prepare Basis of Design Report with design and cost estimate information.

Related Efforts: PID #67 is to perform O&M activities necessary to keep drainage functioning at the pipe outlet that currently conveys open channel ditch drainage.

Runoff reduction options include the potential to reduce drainage area by implementing a diversion of ditch flow along Hilltop Road into the natural drainage connecting to Fairway Dr (PID #43).

Budget: The proposed budget for this area is $120,000 – 166,000 depending on whether water quality / flood storage is implemented into design.

6.0 Green Infrastructure Projects

6.1 Various Stream & Riparian Corridor Improvements

Type(s): Stream/Riparian Restoration

Scale: Small, Medium and Large

Background: Many streams are eroding or lack buffers and contribute sediment and other pollutants to the Swannanoa River. Many sensitive and rare species are found in the Swannanoa River and French Broad Rivers and projects to restore biological integrity and reduce sediment, thermal and other impacts are important restoration activities to help buffer species against other stressors including fragmentation of habitat, climate change and others. Multiple projects were identified remotely or otherwise under the USRWMP or under this SWMP update. Projects can be eligible for grant funding if the right site conditions exist. Other opportunities outside of those that have been identified may exist and be higher priority based on erosion or feasibility.

Project Description:

Stream and riparian corridor improvement opportunities should be further evaluated and existing opportunities in USRWMP revisited. The Town could benefit from a project to walk streams and map erosion and sediment contribution and/or from GIS analysis of projects to identify projects with fewer landowners or projects along Town corridors or proposed greenways. Warren Wilson college students have often had an interest in completing watershed-related research, planning or design projects in Town.

Riparian project opportunities could also entail public volunteer projects if identified, such as tree planting and invasives removal.

Here is an example of a brief project summary for a reach identified under the SWMP update to give an example of relevant project information:

Reach: Swannanoa Trib 35 from Avena Road to Old State 10

This is a 1700-2000 LF segment of stream with existing buffer but LiDAR is suggestive that stream is incised. MSD SS parallels stream but in most places but there appears to be sufficient additional width for streamwork to be minimally constrained by this. Opportunity may exist for priority 1 stream restoration where stream is raised although this may entail map revision. The cost of map revision is far less than the cost of the additional earthwork and loss of tree canopy and should be considered a reasonable trade-off in some cases, potentially such as this. The stream is FEMA studied but has no structures in the SFHA and therefore a rise is base flood elevation would be permissible. This would also increase flood storage during higher frequency storm events and thereby help to reduce downstream flooding. If sufficient flood storage was gained, it could have a positive impact on flooding at Old US70. There is potential to continue project upstream of Avena Road on two separate tributaries. There are a lot of private property owners (>10) in the corridor and this would be a primary challenge of the project.

Land Ownership / Partnerships: Projects are often on private land. Projects on private property require landowner participation and in most such cases landowner outreach should be considered a next step to determine project viability.

Next Steps: Stream, riparian, wetland restoration project development were not a significant effort of the SWMP update. Many of the previously identified projects warrant revisiting to evaluate viability (landowner status, economy, need) and potential funding options.

Projects on private property should be led by local watershed groups or natural resource agencies unless there is a connection to Town property, stormwater management or flood risk reduction.

Next steps on these two projects would be site reconnaissance and landowner outreach if projects have merit. It is suggested that a more comprehensive prioritization of stream and riparian projects occur prior to investing time in the project identified.

Related Efforts: N/A

Budget: Stream and riparian corridor efforts vary substantially based on site conditions, economy of scale, … Projects can range from $2,000 – 20,000 for small scale vegetative focused work to $25,000 - $1m+ for larger scale projects. Generally, larger projects are phased to fit within grant funding limitations which are typically on the order of $500,000 per project. Grant funding is discussed in the SWMP update narrative.

6.2 Tomahawk Branch Sediment Reduction Phase 2

Type(s): Planning, SCM, Stream Restoration, Outfall Stabilization, Open Conveyance enhancement

Scale: Small, Medium and Large

Background: Forebay was rehabilitated for Lake Tomahawk in 2019~ with proposed Phase 2 effort to identify watershed sources of sediment and address through various project types.

Project Description: Evaluate and implement water quality and erosion reduction projects in Tomahawk Branch watershed to reduce sediment delivery to Lake Tomahawk.

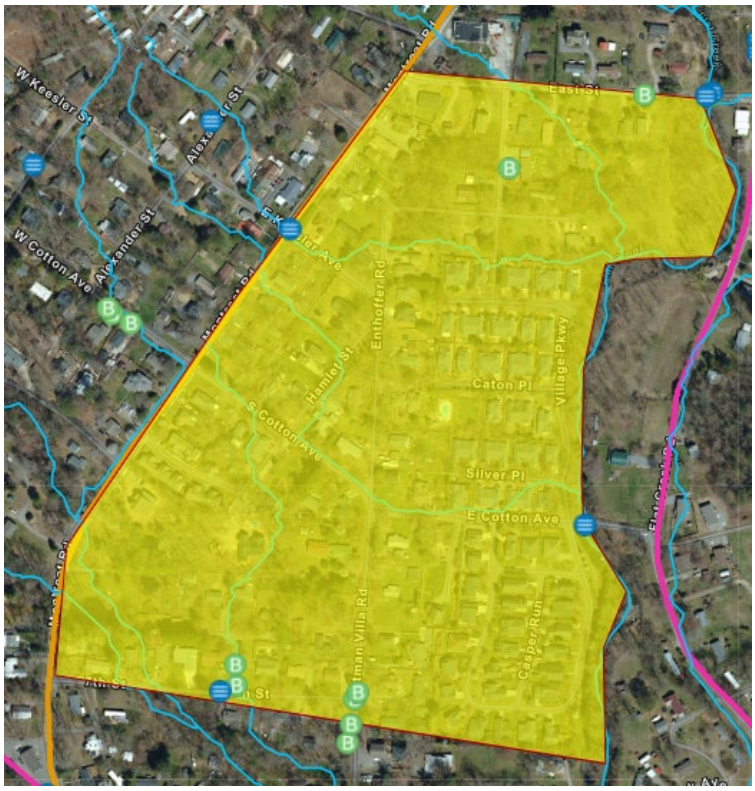
Land Ownership / Partnerships: Varies, opportunities still exist on golf course and opportunities exist in road ROW and ditch networks to reduce erosion

Next Steps: A grant application was prepared and submitted in 2020, but withdrawn due to Covid and funding concerns. Consider resubmitting application to complete assessment and concept designs and budgeting. Or use internal staff or volunteer time to identify issues and add to projects database.

Related Efforts: Project is watershed scale with other potential related efforts.

Budget: Planning study cost was on the order of $30,000. Project design and implementation costs vary but generally would be eligible for 319 or other water quality funding.

6.3 Flat Creek Neighborhood Approach: Distributed Stormwater Control Measures (PID#156)



Type(s): SCM; Programmatic support

Scale: Small to Medium

Project Description:

See Section 4.3 for overview of approach. This approximate 50-acre area is bounded by Montreat Road, East Street, Flat Creek on the east, and 7th Street on the south. While the overall project plan is similar to the distributed SCM pilot areas near Lake Tomahawk this area has some important distinctions, including:

- Higher percentage of effective impervious area
- Lower average slopes
- Groundwater tables closer to the ground surface
- Immediate proximity to the impaired waters of Flat Creek and the Swannanoa River

Parts of this area would be served by the proposed East and West Basin plans that are part of this master plan. Those plans, when implemented, will address many of the street and other nuisance flooding issues in the area, allowing the distributed SCM initiative in this neighborhood to work with those drainage plans and to focus on water quality improvements. In particular, SCMs implemented in this neighborhood should focus on reducing sediment and bacteria delivered to Flat Creek, two constituents responsible for the impairment of Flat Creek and the Swannanoa River.

Components:

- Rainwater harvesting systems, rain Gardens and infiltration basins on private property
- Diversion and detention of street runoff within publicly owned areas.

Land Ownership / Partnerships: Projects on private property require landowner participation and in most such cases landowner outreach should be considered a next step to determine project viability.

Next Steps: Develop preliminary participation agreements and small project ranking criteria. Conduct neighborhood and landowner outreach.

Related Efforts: Section 4.3

Budget: The proposed Utility budget for this area is $50,000 over the program period. The expected private investment is estimated to be $250,000.

Cost estimate is based on 2021 construction costs of six projects that disconnected impervious areas in Asheville at an average cost of under $5 per square foot plus an allowance for Utility costs of education, technical assistance and SCMs constructed on public lands.

6.4 Western Carolina State Veterans Cemetery, Tabernacle Road, Neuro Medical Treatment Center (PID# 83, 84, 85, 124, 125, 85, and potentially others not yet identified)

Types: Stream Restoration, SCMs, Other Green Infrastructure

Scale: Small, Medium, and Large

Background: This is an institutional land use area with somewhat more open space available but larger building and parking lots. A similar land use continues to the east along Tablernacle Rd and Wagon Trail. There are multiple areas where streambanks appear from aerials to need work. There are opportunities for new SCMs and also to evaluate if any existing SCMs would be suitable for expansion or conversion (upgrade). Reduction of runoff from this basin, if sufficient, could alleviate flooding at US70 as multiple reports of flooding existing in the vicinity where meet and parallel 70. It is unclear whether this flooding is related to backwater or overbank flooding, roadway inlet capacity or a combination of factors.

Project Description: In the short term a stormwater master plan for the area could be developed to identify and prioritize opportunities. Little or no mapping is present for this area and mapping would help evaluate and identify potential improvements. Reforestation or other simple activities could be effective over these larger areas where development appears to have removed most forest cover.

Project Areas and Projects:

- Multiple projects have been identified or written up in the Project Application.

Land Ownership / Partnerships: Land ownership varies but will likely involve a few key parcels to make certain projects work. Master planning should identify parcel owners and conduct preliminary outreach to evaluate fatal flaws related to interest and willingness to participate.

Next Steps: Grant funding would likely be available for planning, design and construction of facilities.

Related Efforts: N/A

Budget: N/A

SWMP Master List of Project Evaluation and Cost Estimates

Town of Black Mountain SWMP Update

CIP Project Prioritization Data (See Appendix D)

Town of Black Mountain SWMP Update

CIP Projects and Cost Estimates

ID	App A Section	Project Effectiveness	Direct Community Impacts	Water Quality Benefit	Infrastructure Upgrade	Utilities	Land Ownership	Other Contraints	Other Benefits	Project	Primarily Town Owned/Maintained	Primarily GI?	Trad-itional	Cost Estimate Method	Estimated Cost	Estimate Cost to Utility	Estimated Grant Funding	Include?	Utility Capital Cost	Annual Maintenance	Bond @6% - 10years	Estimated Total Annual Cost
	1.0	**Downtown Master Plan**																				**Downtown Master Plan**
146	1.1						Town and NCDOT ROW, mostly Town			Town Hardware Bypass System – Cherry Street and Alternatives	Y	N	1	Engineering Planning	$1,012,000	$1,012,000		1	$1,012,000	$30,360	$137,498	$167,900
147	1.2			Minimal or none	Degrades aging 12" clay lines to property sized modern pipe		Project is mainly NCDOT maintained area			Broadway Street Upgrades	N	N	1	Planning	$559,000	$559,000		1	$559,000	$16,770	$75,950	$92,700
104	1.3			Minimal or none			Town and private property			Montreat Road, West Street, Midland Ave (Upper System Improvements)	Y/N	N	1	Planning	$602,000	$602,000		1	$602,000	$18,060	$81,793	$99,900
104	1.3			Could incorporate ultra-urban SCMs			NCDOT and private property involved			West Street & Richardson Blvd Bypass (Lower System Improvements)	Y/N	N	1	Planning	$670,000	$670,000		1	$670,000	$20,100	$91,032	$111,100
14,115,132, 144,104-3	1.4						most are town owned or in ROW		grant funding available	Downtown Green Infrastructure Retrofits (3-5 Installations)	Y/N	Y	0	Concept	$532,000	$252,000	$280,000	0	$0	$0	$0	$0
107,133,134 4,22	1.5			Minimal or none						Other New Pipe Systems - written up but not costed out	TBD	N	1	N/A (Placeholder)	$3,000,000	$3,000,000		0	$0	$0	$0	$0
	2.0	**Swannanoa River Corridor Plan**																				**Swannanoa River Corridor Plan**
136	2.1				No known benefit to public infrastructure			Floodplain permitting and LOMR required		Swannanoa River near confluence with Flat Creek	N	Y	0	Planning	$1,236,000	$741,600	$494,400	0	$0	$0	$0	$0
130	2.2							Floodplain permitting and LOMR required	Unknown	Swannanoa River Stream Restoration at RR (near S. Ridgeway Avenue)	N	Y	0	Concept	$50,000	$30,000	$20,000	0	$0	$0	$0	$0
16/135	2.2							Floodplain permitting and LOMR required		South Bank of Swannanoa east of Dog Park between Railroad and I40 (3 Options)	N	Y	0	Planning	$291,000	$174,600	$116,400	0	$0	$0	$0	$0
3	2.3						Owned by church, thought to be a willing partner			Highway 9 and Blue Ridge Road – First Christian Church Constructed Wetland & (Optional) Bioswale	N	Y	0	Concept	$38,000	$16,800	$11,200	0	$0	$0	$0	$0
55	2.5							Floodplain permitting and LOMR required		North Bank Swannanoa River Floodbench between Hwy 9 and Community Gardens and Wetlands	N	Y	0	Planning	$4,747,000	$2,848,200	$1,898,800	1	$2,848,200	$85,446	$386,979	$472,400
97	2.6						Town-owned	Unknown		White Pine Drive, Fire Station & Community Gardens Rainwater Harvesting	Y	Y	0	Concept	$25,000	$15,000	$10,000	1	$15,000	$450	$2,038	$2,500
143	2.7						Town-owned			White Pine Drive, Fire Station & Community Gardens Bioswale	Y	Y	0	Concept	$20,000	$12,000	$8,000	0	$0	$0	$0	$0
149	2.8						Town-owned			White Pine Drive, Fire Station & Community Gardens Rain Garden	Y	Y	0	Concept	$3,000	$1,800	$1,200	0	$0	$0	$0	$0
56	2.9							Unknown		White Pine Drive Conveyance System: Inlet, Conveyance, Outfall & Level Spreader	Y	N	1	Planning	$209,000	$125,400	$83,600	1	$125,400	$3,762	$17,038	$20,800
57	2.10						DOT and Town-owned	Unknown		Swannanoa Riverbank Stabilization - Phase I	Y/N	Y	0	Concept	$100,000	$60,000	$40,000	1	$60,000	$1,800	$8,152	$10,000
105	2.11		Possible flood storage benefit?		Green infrastructure upgrade	No known utilities.	Town-owned		Unknown	Swannanoa River Floodbench near Community Gardens - Phase II	Y	Y	0	Planning	$521,000	$312,600	$208,400	1	$312,600	$9,378	$42,472	$51,900
98	2.12		Possible flood storage benefit?		Green infrastructure upgrade	No known utilities.			Unknown	Constructed Wetland in Partnership with NCDOT	Y/N	Y	0	Planning	$227,000	$136,200	$90,800	0	$0	$0	$0	$0
100	2.13						Town-owned	Unknown		Douglass Park Bioswales and Constructed Wetland	Y	Y	0	Planning	$151,000	$90,600	$60,400	0	$0	$0	$0	$0
150	2.13		Unknown		No known benefit to public infrastructure		Owned by Town and Montreat College			Floodplain Bench and Stream Restoration	Y/N	Y	0	Concept	$750,000	$450,000	$300,000	0	$0	$0	$0	$0
21	2.13									Stream Restoration Repairs - Hurricane Fred	Y	Y	0	Engineering Planning	$340,000	$88,000	$252,000	1	$88,000	$2,640	$11,956	$14,600
51	2.14									River Corridor Study				Concept	$35,000	$35,000		1	$35,000	$1,050	$4,755	$5,800
	3.0	**Open and Closed Conveyance Upgrades – Padgettown Road/Old 70/US70**																				**Open and Closed Conveyance Upgrades – Padgettown Road/Old 70/US70**
73	3.1	Possible flood storage benefit?		prevents later issue		unknown	ncdot			Sinkhole Repair and Collection System Evaluation	N	N	1	Concept	$20,000	$20,000		1	$20,000	$600	$2,717	$3,300
72	3.2			prevents flooding of gas sta	long term need to replace culverts	sewer/water				Padgettown Road Culvert Replacement	Y/N	N	1	Planning	$335,000	$335,000		1	$335,000	$10,050	$45,516	$55,600
118	3.3	low cost project that can be done in house				water, no sewer	ncdot coord			Avena Road Bypass Cross Drain Pipe	Y/N	N	1	Planning	$35,000	$35,000		1	$35,000	$1,050	$4,755	$5,800
N/A	3.4									Flat Creek Road Observation, Evaluation and Ditch Network Improvement (Not a CIP Project)	N	N	1	Concept	$10,000	$10,000		1	$10,000	$300	$1,359	$1,700
47,48,148	3.5	may vary by site								Watershed SCM Retrofits	N	Y	0	Concept	$225,000	$125,000	$100,000	0	$0	$0	$0	$0
109	3.6	reduce flooding	reduce flooding, create park		good GI upgrade project	none known	private land			Flood Mitigation Park off Padgettown and Old State ten Roads	N	Y	0	Planning	$657,000	$432,000	$225,000	1	$432,000	$12,960	$58,695	$71,700
	4.0	**Lake Tomahawk Neighborhoods Plan**																				**Lake Tomahawk Neighborhoods Plan**
78	4.1								Unknown	Connally Street, Conveyance, Inlets, Outfall	Y	N	1	Planning	$678,000	$678,000		1	$678,000	$20,340	$92,118	$112,500
102	4.2									Tudor Way Unopened Road ROW Pipe System	Y	N	1	Engineering Planning	$716,000	$716,000		1	$716,000	$21,480	$97,281	$118,800
103	4.3						Possible utility conflict/crossing			Lake Tomahawk Eastern Shore Neighborhood Approach (Distributed SCMs)	N	Y	0	Planning-NO UNIT COSTS	$300,000	$50,000	$250,000	1	$50,000	$1,500	$6,793	$8,300
106	4.3						Possible utility conflict/crossing			Lake Tomahawk Western Shore Neighborhood Approach (Distributed SCMs)	N	Y	0	Planning-NO UNIT COSTS	$330,000	$80,000	$250,000	1	$80,000	$2,400	$10,869	$13,300
93	4.4									Circle Lane and Laurel Circle Green Infrastructure	Y	Y	0	Concept	$45,000	$30,000	$15,000	0	$0	$0	$0	$0
69	4.5					No known utilities.	Town-owned			Rehabilitate Bioretention along West Laurel Circle	Y	Y	0	Concept	$20,000	$20,000		0	$0	$0	$0	$0
152	4.6					No known utilities.	Town-owned			Rehabilitate Bioretention along Tomahawk Ave	Y	Y	0	Concept	$20,000	$20,000		0	$0	$0	$0	$0
71	4.7									East Laurel Circle Drive / Park Lane Drainage Improvements	Y	N	1	Concept	$20,000	$20,000		0	$0	$0	$0	$0
		Other Projects																				**Other Projects**
35	5.0									Fairway Drive / Tomahawk Ave to Golf Course Ditch Diversion with Potential Flood Storage	Y	N	1	Planning	$166,000	$106,000	$60,000	1	$106,000	$3,180	$14,402	$17,600
N/A	6.2									Sediment Reduction Studies Tomahawk Br and Flat Ck	N/A	Y	0	Planning	$50,000	$25,000	$25,000	1	$25,000	$750	$3,397	$4,100
N/A	6.1, 6.3, 6.4									Green Infrastructure Projects (Other)	TBD	Y	0	N/A (Placeholder)	$1,000,000	$500,000	$500,000	1	$500,000	$15,000	$67,934	$82,900
										Total			**14**		**$19,745,000**	**$14,434,800**	**$5,300,200**	**23**	**$9,314,200**	**$279,426**	**$1,265,501**	**$1,545,200**

Appendix F – Guidance on Major Stormwater Project Types

1.0 Closed System Upgrades and Management

Scale: Small, Medium, and Large

Background: The Town operates a system of closed system collection, conveyance and outfalls. Primary issues identified in the system are:

- Incomplete or inaccurate mapping
- Lack of condition data
- Overflows / inadequate conveyance
- Inlet clogging/bypass
- No infrastructure or inadequate spacing or sizing

Project Type Description: Project types below are for the purpose of addressing primary or other issues identified above. A projects database has been developed to track projects that have been identified. This database can house O&M activities but is generally for other projects or significant O&M efforts. Projects are sorted by asset class – Close System assets have the following project type options in the database:

- Closed System O&M
- Collection System Only
- Stormwater Pipes and Collection

Mapping –

Improving mapping is a need to improve the ability of staff to inventory assets, understand system issues, and plan system improvements. The Town should systematically update mapping to verify accuracy and completeness and to collection additional data that will allow for more functionality for assessing and modeling conveyance and evaluating upgrade opportunities (projects).

Observation and Condition Assessment –

In many cases, better understanding dry or wet weather conditions may help identify more effective management of areas of concern. The Town should identify priority issue areas and conduct one or more site visits during or after wet weather events to better understand high flow conditions. Conditions should be documented with date, weather conditions, timing (during/after storm), description of observations, and photos or mapping of observations, if relevant.

The Town has very limited condition assessment data. Condition data can be collected through visual observations at structures, through pole mounted cameras which can be used at structures to light and zoom up straight sections of pipe, and through CCTV camera mounted on remote vehicle setups.

Collection System Only: Inlet Type & Capacity Upgrades –

The Town has many grate or curb only inlets. In some cases, these have been modified by paving, or are non-standard resulting in low capacity (small total opening area or insufficient width perpendicular to the flow). The slope of the street or debris can be significant factors. Grates are designed to be installed with the main opening parallel to the flow - if they are installed with the main opening perpendicular performance is adversely affected increasing the risk of bypass. Inlet bypass can result in downstream inlets or streets being overwhelmed and flooding. Where inlets are located in low points o, capacity during ponding is proportional to the opening area. The Town should consider the following types of upgrades where inlet capacity and bypass issues are present:

- Replacement of single inlet types (grate or curb only) with combination inlets that have both grate and curb openings;
- Enhancement of curb inlets by lengthening opening available for stormwater to enter or adding 2nd grate to grate inlet configuration;
- Prevent or remediate curb inlets where paving has narrowed the inlet area opening severely limiting capacity;
- Replacement of non-standard grates with larger grates or grates with larger openings (where box size permits);
- Replacement of narrow grates with wider grates (placement for more width extending out from the curb is typically better for efficiency than placing a second grate along the curb)
- Addition of inlets where inlet density/spacing is inadequate due to runoff with consideration of debris; and
- Where bicycle considerations are a factor, consider parallel grate design with tranverse bar rods for bicycle safety, tilt bar or curve vane grates in lieu of diagonal bar grates which are much less hydraulically efficient (this video by FHWA describes the types of grates and their performance: https://www.youtube.com/watch?v=-TLP3uBB55o).

Stormwater Pipes and Collection

The following are some brief discussions on approaches and considerations in new and replacement pipe and collection systems:

Bypass Approach – where parts of the system leave public right of way and become private and then return to public right of way further downgradient bypass options are potential realignments through public right of way that would tie upper and lower systems together.

Diversion Approach – where ditched or piped systems extend past natural drainage divides and pathways, consideration of introducing new diversions and outfalls into natural drainage pathways should be considered. Releasing water into natural drainage ways which have greater capacity to handle high flows than constructed open and closed systems can be an effective way to reduce or eliminate downgradient issues in maintained systems. While some may view this as dumping water onto private property, natural drainage pathways are an environmentally, cost efficient and logical choice for expanding stormwater management options. Diversions will not always be appropriate if excessive upslope runoff has been collected or if downstream infrastructure would be threatened.

New Systems – based on the current financial capabilities of the Town, it seems prudent that the Town focus on the condition and maintenance or replacement needs of existing systems prior to consideration of new systems. This is particularly true in mostly built-out areas of Town where no major safety or structure flooding issues are resulting from periodic nuisance street flooding. In cases where flooding of structures is present, alternatives should include new system evaluation. In areas of Town that are not built out, new systems may be more effectively established prior to subsequent projects or building that would impact system options and this may be a relevant consideration.

2.0 Open System (Ditch) Upgrades and Management

Types: Open System, Closed System, Green Infrastructure

Scale: Small, Medium, and Large

Background: Black Mountain maintains an extensive open channel network of ditches. Maintenance activities include leaf removal, ditch opening and clearing prior to anticipated large storm events (e.g. tropic systems), sediment removal, and other activities.

Various concerns exist associated with ditches, including:

- Conveyance concerns:
  - Contributing drainage area excessive for ditch size,
  - Lack of ditch continuity, and
  - Pipes along ditch network clogged or cannot convey all of ditch flow;
- Safety concerns from temporary or permanent ditch digging;
- Water quality concerns from erosion in ditches; and
- The Town has had difficulty in getting public residents to help keep debris and leaves out of ditches, or not intentionally place materials in ditches.

Project Description: The Town would like to have best practices and options for addressing concerns and deficiencies in ditch networks. The first step in this process is to obtain a better map and understanding of Town-maintained ditches. Multiple opportunities exist to improve ditch networks though maintenance, rehabilitation and retrofit of ditches. In general, ditches are lower cost and higher capacity than closed systems and can have flow attenuating and water quality benefits when properly maintained. The Town should use new mapping tools to help with ditch maintenance strategy-strategies should consider drainage area, ditch size, slope and condition, obstructions and pipes within the ditch network in order to select the best approach. In many cases utility conflicts or existing infrastructure may limit ditch maintenance choices. The severity of the associated issue(s) may drive whether a larger rehabilitation project with utility work is appropriate.

Ditch Mapping

As part of the SWMP, a slope coverage was created from QL1 LiDAR to help with future ditch mapping. This coverage “Slope Surface (QL1 LiDAR)”, the QL1 LiDAR 1-contour mapping also created, and google street view coverages should allow for effective preliminary mapping of ditch networks using remote methods. A mapping coverage was also obtained which designates NCDOT-maintained roads (“NCDOT_StateMaintainedRoadsQtr”). With these data sets, the Town can do preliminary mapping of Town-maintained ditch networks. This mapping will yield the following information:

- Quantification of the Town’s maintenance burden associated with open channel ditches
- Ditch network discontinuity
- Ditch network obliteration and diversion opportunities (see associated retrofit project description)

It may be appropriate to develop a point coverage for ditch features and issues. Examples of features and issues include: vegetation blockage, sediment blockage, driveway or other pipes, ditch network discontinuity points, abrupt slope or size changes in network, etc. Detail on driveway pipes and road cross drains and their condition would be valuable to identify repair and replacement needs that would improve ditch function.

Maintenance

Ditch Dredging & Steepening

These activities have potential safety and water quality consequences and should be evaluated in the context of long-term sustainability. Some ditch networks do not have good alternative options, but when more width, retrofit options, or adjacent gradient exist, ditch dredging and steepening should consider how to achieve desired conditions as follows:

- Stable side slopes (2:1 or flatter, or use of hardened side slopes such as rock) – this reduces erosion concerns and may increase safety what a flatter slope can be obtained
- Safe depth based on adjacency of roadways, sidewalks, etc. Safe depth should also be considered relative to the steepness of ditch side slopes. Steeper or vertical drop offs should be <30", and this may still be unsafe in certain situations, or result in erosion issues.

Retrofitting – Pipe Upgrades

In some cases, ditches overtop and flow onto roadways or into other undesired areas due to clogged, undersized or embedded or damaged pipes across driveways, roadways and other ditch crossings. Embedded situations require more extensive assessment of the cause of sedimentation which may be a lack of positive gradient or an upstream sediment source or excessive ditch roughness, or a combination. These situations require more assessment of options which may include ditch steepening or lowering (see maintenance description for these).

Retrofitting – Diversions

In some cases, ditches collect water and bypass natural drainage ways conveying the collected water further down slope than necessary. When possible, ditches should be outlet to natural drainage ways which typically have greater conveyance capacity. Consideration of downslope conditions along natural drainage pathways must be considered, as often times these pathways have been developed and may contain structures or other infrastructure that could be adversely affected. Diversions vary from obliteration in that more concentrated flows are subsequently directed and associated efforts may be required, such as drainage easement agreements, outfall stabilization, or existing drainage way improvements such as check dams.

Retrofitting – Ditch Obliteration

In some cases, ditches collect water unnecessarily from adjacent roads and could be removed allowing water to flow in its natural pathway on the landscape. Consideration of downslope conditions along natural drainage pathways must be considered, as often times these pathways have been developed and may contain structures or other infrastructure that could be adversely affected. The relative additional drainage area and runoff contribution should be considered when evaluating ditch obliteration opportunities.

Retrofitting – Green Infrastructure Conversion

In some cases, ditches may be candidates for conversion to bioswales that have a sand based media bed of 18-36" in depth. Candidate areas should have no or deeper utilities, sufficient width for construction and limited constraints and costs to improve the cost-benefit of such retrofits. Bioswales can have various surface conditions ranging from grassed, to native vegetation, to rock. Check dams can be used in bioswales to reduce velocities and increase infiltration into the media bed during less intense rainfall events.

3.0 Stormwater Control Measures - Retrofits, Expansion, Rehabilitation & Conversion

Type(s): Green Infrastructure

Scale: Small, Medium, and Large

Background: Pre-dating the early 2000's, most development in Black Mountain was done without stormwater management and SCMs to treat volume and discharge. Lack of stormwater management results in high volumes of runoff and pollutants entering streams and rivers. In addition, improvements to design since the early 2000's means that many of these may not function consistent with current design standards, and may be targets to the various retrofit options described below. SCMs can also function poorly over time due to lack of maintenance and upkeep.

he USRWMP identified a number of SCM retrofit opportunities to treat areas historically developed without stormwater management. Many identified projects are located on private property and would require landowner engagement and willingness to allow proposed measures. The Town has implemented multiple SCM retrofits during this same time period (early 2000's – present), and most recently has obtained EPA 319 funding to address water quality and runoff concerns on Town-owned property including the Town Library, Golf Course and Lake Tomahawk. Older Town-owned facilities could be considered for the opportunities listed associated with existing SCMs (expansion, rehabilitation, and conversion).

Project Description: These types of projects are for retrofitting areas with no stormwater management ("retrofits"), or for implementing expansion, rehabilitation or conversion of existing SCMs whose function could be improved or increased.

SCM Retrofits – Fitting SCM's to existing developed areas to treat or increase treatment of stormwater, particularly off impervious surfaces

SCM Expansion – Increasing the size of an existing SCM as a low-cost option for increasing treatment

SCM Rehabilitation – Major or minor maintenance of existing SCM to restore functions, often appropriate where SCM is aged or neglected, but sometimes

SCM Conversion – Conversion from one type to a more effective or otherwise suitable type

More information is available on these types of activities from NCSU, Center for Watershed Protection, Chesapeake Bay Network, and others. According to NCSU researchers, existing practices that were installed using now-outdated designs, as well as neglected practices that are no longer working as intended and often be addressed with simple approaches and modifications to improve and restore performance. Activities can range from costly to inexpensive.

Land Ownership / Partnerships: Land ownership varies by project. Projects on private property require landowner participation and in most such cases landowner outreach should be considered a next step to determine project viability.

Next Steps: Identify older SCMs that may have been undersized, use methods that have been improved upon since the time of implementation, or have additional adjacent area that could be used for expansion. Track potential projects in projects database. Consider developing programmatic framework for evaluating older and under-functioning private SCMs and how these could be upgraded

using the methods described to improve performance. Look into grant funding for innovative stormwater for this type of activity.

Budget Considerations: This project type can be cost effective by piggy-backing on existing infrastructure and improving or expanding it for greater performance. Grant funding is available through EPA 319 and sometimes through other programs for stormwater projects and the Town is generally familiar with the various programs that typically provide funding and their associated requirements. Land of Sky Regional Council of Government, watershed groups and consultants are resources to support grant applications for the Town. The conversion or expansion of SCMs may also be considered "innovative" for the purpose of LWF's innovative stormwater grants as these activities and how they can be successfully applied are of broader regional interest in the mountains and beyond.

4.0 Stream & Riparian Corridor Enhancement & Restoration Projects

Types: Stream Stabilization, Stream Restoration, Wetland Restoration, Riparian Management

Scale: Small, Medium, and Large

Background: The Town has a lot of experience with implementing these types of improvement projects. Documentation of existing projects as well as inspection and long-term maintenance and management of projects could be improved. Several projects were identified by the original SWMP and implements, and also in the more recent USRWMP with some of these having been implemented. The remaining projects in the USRWMP were reviewed. Due to the limitations of the USRWMP planning project, many of these site were only evaluated remotely and in many cases there is not sufficient information to help with prioritization, justification and cost evaluation of remaining projects. Other projects exist and some of these have been identified under the SWMP Update.

Project Description: Projects types can vary widely in size and complexity. Often times, very small projects can be difficult to implement due to economy of scale issues, and big projects likewise have their challenges. Continue to implement of various types of stream, riparian and wetland projects, with a preference for natural channel design rather than hard engineering stabilization projects, where possible. Consider development of long-term inspection and maintenance program to help manage projects as well as perception of projects.

Projects in this category can also be anticipated to have short term maintenance needs and budgeting for typical levels of short term maintenance to support project establishment should be a consideration of pursuing projects and funding.

The Town is encouraged to prioritize and implement projects that:

- Reconnect streams to floodplains or flood benching appropriate to their stream type whenever possible;
- Allow for robust riparian reestablishment planning in order to revegetate stream corridors for stream shading, aquatic habitat, filtration of upland runoff among other benefits;
- Provide infrastructure protection; and
- Provide other benefits such as education, safety and serve as public amenities.

Land Ownership / Partnerships: Projects are on public and private land.

Next Steps: The Town should use the new projects database to identify and prioritize projects and project reaches based on land ownership, erosion, and other factors discussed above. The Town should identify remaining erosion areas in the golf course and Tomahawk Branch to help protect Lake Tomahawk from sediment. Educational efforts should continue and help from RiverLink and other groups can be used to further education and project development. The importance of buffers and riparian canopy are poorly understood and appreciated but critical to biological integrity as well as protection of the land for human uses.

Budget Considerations: Grant funding is typically available for stream restoration projects and the Town is familiar with the various programs that typically provide funding and their associated requirements. Land of Sky Regional Council of Government, watershed groups and consultants are resources to support grant applications for the Town.

5.0 Flood Reduction Projects and Planning

Types: Various ranging from buy-out to flood storage

Scale: Medium and Large

Background: With increasing flooding from climate change impacts, flood reduction and planning is a significant topic that must be considered. The Town has infrastructure and residents that are affected by flooding. FEMA floodplain mapping can be effective at identifying risk to infrastructure and residents. Flood reduction can be achieved through planning, design and implementation of flood reduction and mitigation activities, including education. While riverine flooding was not a focus of the SWMP update, some flood reduction opportunities have been identified as projects within the SWMP Update, and the topic is discussed here, as well as in the Level of Service (LOS) memo recommendations to serve as a reference for future efforts that focus more squarely on this issue.

Project Description: Flood risk reduction and mitigation projects can take many forms, including the following examples:

- Flood storage and reduction projects which can be combined with open space planning;
- Flood proofing and flood mitigation of structures;
- Flood risk warning systems;
- Buy-out of floodprone and repetitive loss structures; and
- Policy and regulation development.

One recommendation from the LOS memo is for the Town to enter into the Community Rating System (CRS) which provides flood insurance premium reductions to rewards communities for implementing local mitigation, floodplain management, and outreach activities that exceed the minimum NFIP requirements with the purpose of flood damage reduction to insurable property and more comprehensive floodplain management approaches.

Land Ownership / Partnerships: Many of the projects are on private land. On publicly maintained roads, structure (culvert/bridge) replacements should be evaluated for their ability to reduce upstream flooding – it should be noted that upsizing structures can also increase downstream flooding where undersized structures are providing significant storage.

Next Steps: Evaluate higher regulatory standards during update to floodplain ordinance in order to reduce community flood risk. Evaluate CRS requirements and determine whether CRS framework and benefits are a good fit for the Town and whether the reporting requirements are within the Town's current capabilities to take on (Community Rating System, 19 creditable activities). Conduct outreach and identify grants and opportunities to pursue flood reduction activities. Conduct more detailed design development for flood storage and reduction projects. Improve mapping, issue tracking, and life cycle replacement timing associated with road crossing structures, particularly those under Town maintenance. Identify debris prone and undersized structures and identify structures that result in significant backwater impacts and flooding – evaluate upsizing structures and relief structures as potential approaches in areas of concern.

Related Efforts: Multiple projects in the Swannanoa River Master Plan suite of projects have a flood reduction focus. Depth grid and building elevation data, as well as flood risk of buildings has been obtained from FEMA and provided to the Town under the SWMP update project.

TOWN OF BLACK MOUNTAIN TOWN COUNCIL
REQUEST FOR COUNCIL ACTION
Meeting Date: September 12, 2022

SUBJECT: Parking Space Policy

AGENDA INFORMATION

Agenda Location:	**NEW BUSINESS**
Item Number:	8B
Department:	Administration
Contact:	Josh Harrold, Town Manager
Presenter:	Josh Harrold, Town Manager

BRIEF SUMMARY: The Town Manager received a request to close a parking space in a Town owned parking lot located off of Broadway Street. The parking space affronts a business owned by John Richardson, who is making the request to make access to the business easier. Manager Harrold presented a list of suggestions to guide the decision making process at the August 8, 2022 Regular Meeting and has expanded those into a policy format.

MOTION FOR CONSIDERATION: To approve the policy as presented.

FUNDING SOURCE: N/A

ATTACHMENTS: Parking Space Policy

MANAGER'S COMMENTS AND RECOMMENDATIONS:

TOWN OF BLACK MOUNTAIN
PUBLIC PARKING SPACE CLOSURE POLICY

I. OVERVIEW

The Town of Black Mountain provides convenient, safe, clean, and accessible public parking options. This document constitutes a Town-wide policy intended to outline the criteria that must be met before a public parking space is permanently closed. This policy empowers the Town Manager, or their designee, to review requests for parking space closings and to close the space if the following criteria are met.

II. EMPLOYEE RESPONSIBILITIES

The Town Manager of Black Mountain, or their designee, will review requested parking space closings, which are to be submitted in writing or via email. Requests will be evaluated on the following criteria:

- Space leads to and, if closed, provides access to a pedestrian or vehicular travel way;
- The pedestrian travel way does not connect to a sidewalk.
- The vehicular travel way does not have another access point for vehicles, or the creation of a new access point by closing the parking space will create a safer access point for vehicles.
- The pedestrian or vehicular travel way is the only legal access to properties, or the pedestrian or vehicular way is the most practical or safest access to properties or amenities.
- Closing of the parking space will not create a hazardous condition.
- Once the parking space is closed, nothing shall be placed in that space as it is intended to provide unobstructed access to the pedestrian or vehicular travel way.
- Parking space closings pursuant to this policy are to be used for no purpose other than those set out.
- The Town of Black Mountain reserves the right to reopen the parking space at any time should it be in the best interest of the town or public.

The Town of Black Mountain will be committed closing public parking spaces only when the criteria is met in the interest of maintaining convenient and safe public parking.

TOWN OF BLACK MOUNTAIN TOWN COUNCIL
REQUEST FOR COUNCIL ACTION

Meeting Date: September 12, 2022

SUBJECT: Acceptance of Comprehensive Recreation Master Plan Firm

AGENDA INFORMATION

Agenda Location:	**NEW BUSINESS**
Item Number:	8C
Department:	Recreation
Contact:	Josh Henderson, Recreation Director
	Josh Harrold, Town Manager
Presenter:	Josh Henderson, Recreation Director

BRIEF SUMMARY: Staff recommends McGill & Associates from Asheville, to complete the comprehensive recreation master plan.

MOTION FOR CONSIDERATION: Approve the acceptance of the selected firm to complete the comprehensive recreation master plan.

FUNDING SOURCE: Capital Improvement Project budget

ATTACHMENTS:

MANAGER'S COMMENTS AND RECOMMENDATIONS:

TOWN OF BLACK MOUNTAIN BOARD OF ALDERMEN
REQUEST FOR BOARD ACTION
Meeting Date: September 12, 2022

SUBJECT: Water Policy Updates

AGENDA INFORMATION
Agenda Location: **NEW BUSINESS**
Item Number: 8D
Department: Administration
Contact: Josh Harrold, Town Manager
Presenter: Josh Harrold, Town Manager

SUMMARY: Staff would like to amend the water policy to provide authority to the Town Manager or his/her designee to waive certain fees due to unforeseen circumstances. I've also heard a few concerns from citizens regarding our billing due dates as well as when we disconnect customers for non-payment.

MOTION FOR CONSIDERATION: To direct staff to draft amendment for subsequent meeting

FUNDING SOURCE: N/A

ATTACHMENTS: Current water policy; data from other jurisdictions

MANAGER'S COMMENTS AND RECOMMENDATIONS: Direction on how to proceed

Municipality	Late Fees	Due date	Reconnect Fee	Days till cutoff
Old Fort	$5.00	15th	$100.00	25
Marion	$5.00	15th	$25.00	25
Weaverville	$0.00	20th	$60.00	30
Black Mtn	$10.00	20th	$60.00	35
Asheville	$15.00	15th	$50.00	30

Introduction

The policies and procedures contained in this document are intended to define the relationship between the customer of utility services and the Town of Black Mountain. These policies are, by notification of and available to all customers, made part of the contract for service entered into by the customer. By contracting for service, the customer acknowledges the applicability of these policies and procedures and agrees to abide by them.

Authority

The enactment of standard utility policies requires the approval of the Town Council. As fee schedules, rates and other specific policies are updated, it will be the responsibility of the Utility Customer Service Department to ensure this policy manual is revised in accordance with Town Council action.

Office and Service Hours

The Town Utility Customer Service Department is located at 160 Midland Avenue and is open from 9 a.m. to 5 p.m. Monday through Friday. Routine and regular service work will be performed from 8 a.m. to 5 p.m. Monday through Friday except for Town holidays. Service work for unusual conditions may be arranged at other times upon customer request and may require an additional fee.

A 24-hour drop box is available for customer payments at the Town Hall. Payments made after 8:00 am at the drop box are posted the next business day.

Privacy

Our application/agreement requests that the potential customer provide their social security number in accordance with NCGS § 132-1.10**.** We request this number to verify identity, check credit worthiness, protect sensitive account information, and collect delinquent balances. There is no statutory or other authorityrequiring any customer to provide a social security number. However, when customer billing data is requested, the social security number or Tax ID Number will be used to verify identity prior to any information being given out by staff. Staff members have the authority to request other verifying information to protect the Town as well as Town customers against fraud. Customer billing data is not considered public information. The Town will ensure that customer information, including billing data, is safeguarded against unauthorized use.

A. **Establishing Service.**

All connections to the Town of Black Mountain water system are required to have an active account. New service accounts are required to submit an application along with proper documentation for approval to the Town of Black Mountain Utility Customer Service Department to set up a customer account. Any connection that does not setup an account within a timely manner may be required to pay for all charges from time of

connection to the most recentbilling period prior to opening an account.

1. **Application**. A completed application for service must be received and reviewed for completeness by the Utility Customer Service Department prior to installation of new service or releasing responsibility of prior customer if residence is sold, transferred, or leased to a new tenant. Service is conditioned on satisfaction of all previously owned (and still legally collectible) utility debts to the Town.
    - As part of the application process, the Town requires that the applicant provide a valid government issued photo identification document (driver's license, passport, state identification card, military identification card, etc.) and requests a social security number. A new application must be submitted for every connection, regardless of prior connections to an existing address or customer history.
    - Property Owners shall provide a closing statement or deed to verify ownership. Property owners may have utilities connected at more than one location if all accounts remain in good standing with the Town. Any delinquency for utility services at any location may prevent a property owner from establishing new service. Property owners with rental property may have service automatically revert to them when a tenant requests services to be discontinued in their name. This may prevent the owner from having to apply for service with each occurrence. A separate landlord agreement must be completed before tenants may start service in their name.
    - Non-Property Owners shall provide the Town with a copy of a lease/rental/occupancy agreement and may be limited to one service location at any given time. The non-property owner's utility account may be set up in the name or names specified in the lease/rental/occupancy agreement. In the event any person named in the lease has any outstanding utility debt with the Town, that debt shall be paid in full prior to service connection. Per NC Session Law 2009-302 House Bill 1330, A county or municipality may suspend or disconnect public enterprise services to a customer because of a past-due and unpaid balance incurred by another person who resides with the customer after services have been provided to the customer's household. If a lease/rental/occupancy agreement cannot be provided, the application for utility services may be denied.
    - Multi-Unit Residencies shall provide the Town with verification of ownership listing all units by street address and unit number, if applicable. Owners of the property shall provide the Town with a list of authorized agents who act upon their behalf (e.g. site managers, real estate agents). A federal identification number or social security number may be requested for access to account information and use in the collection of any delinquencies owed to the Town. Multi-unit establishments may have account responsibility automatically

revert to owner establishment when a tenant requests for services to be discontinued in their name. Multi-unit residency owners or agents may have utilities connected at more than one location if all accounts remain in good standing with the Town. Any prior delinquency for utility services at any location may prevent an owner from establishing new service.

- Revert-To-Owner Contract for Continuous Utility Service shall provide property owners and managers the ability to maintain continuous utility service while a rental unit is vacant.
  - A contract must be completed and a listing of all premises (service addresses)must be completed and submitted by the Owner(s)/PropertyManager(s).
  - By signing the contract, the owner(s) or manager(s) areagreeing to be responsible for utility services and related costs between the time service to outgoing tenants is terminated and service to incoming tenants is initiated, including base charges.
  - Service may revert to the owner upon notification by a tenant to discontinue service in their name. As stated in the contract, no notification may be given to the owner/manager in such situation.
  - If service is discontinued by the Town due to non-payment or interference with normal service (i.e. meter tampering), service shall not automatically revert to the owner.
- Once service has been terminated for non-payment or interference with normal service has occurred, service at the premises may be reinstated only if (1) payment in full is received; or (2) proof is provided to the Town of Black Mountain that the non-paying tenant no longer occupies the premises.
- Owner(s)/Property Manager(s)/ Tenants may be denied service in the instance the Owner(s)/ Property Manager(s) are delinquent at any utility service location.
- Town staff must be notified and directed to activate meters at property that is not in use.
- The premise visit charge may be charged to an account if utility service has not been previously established at a premises/service address in the name of the applicant.
- An authorization form to release utility billing information may be completed in order to give additional persons access to account information for the purpose of payment and balance requests.

2. **Reasons for Denial of Service.** Applications for utility service may be denied for any one of the following reasons:
   a. A lease/rental/occupant agreement cannot be provided
   b. Validity of lease/rental/occupant agreement is in question and the property owner cannot be reached
   c. Questionable Identification – inability to provide verifiable or valid identification.

3. **Customer Deposit**. The purpose of a customer deposit is to try to ensure that all utility charges are collected. All new customer accounts are required to pay a deposit. Upon termination of an account, the deposit will be applied to any outstanding balance. Any remaining deposit greater than $5.00, after applying to the outstanding balance, may be refunded. The amount of the deposit shall be set by Town Council (Rate & Fee Schedule).

    - Any current customer that does not have a deposit on the account with the Town of Black Mountain whose service is involuntarily terminated for nonpayment, tampering, or other reasons more than twice in any 12- month period, may be required to pay a deposit in the amount described above.
    - Any person requesting utility service who has previously had an unpaid balance to the Town may be required to repay this amount, plus pay a deposit.
    - The Town has the right to apply the customer deposit to any unpaid utility charges after an account is more than 60 days past due. If all or any portion of a customer deposit is applied to past due charges, and the customer continues to receive utility services, the Town may require the customer to replenish deposit amount that may added to bill upon approval and subject to disconnection for nonpayment.
    - Any customer that elects not to disclose their social security number will be considered a "high-risk," due to our inability to verify identity**.** Deposits will be calculated in the high risk tier.

4. **Refund of Deposit**. The Town reserves the right to retain deposits indefinitely to assure payment of utility charges. No interest may be paid upon deposited amounts. However, the Town may elect to refund deposits in the following situations provided the account is at a zero balance:

    - Deposits on accounts within 24 consecutive months of good payment history (no late fees, insufficient funds penalties, or service disconnections) may be applied to the existing utility account; or
    - Upon customer request for termination of service and Town determination that either the residence or business may remain vacant or another responsible person has applied for service.

    No refunds may be made for amounts less than $5.00.

5. **Voluntary Disconnection of Service.**
    - **Temporary**. In the event a customer will not occupy a residence for an extended period and requests water to be turned off at the meter, utility base charges may be billed during this time. A premise visit may be charged to turn on/off the meter at each property/account.
    - **Termination of Service**. It is the responsibility of the utility account owner(s) to complete and return a disconnection request form at least 2 business days prior to the requested service end date. Failure to

notify the town of needed utility disconnection could result in additional usage and billing fees, for which the account holder will be responsible.

6. **Permanent or Indefinite Disconnection of Services.** In the event a residence is demolished, condemned, or court ordered abandoned, the customer/property owner or legal representative may request that the meter on the property be removed at the currently approved charge per the Fee Schedule. Town approved documentation must be received before meter services may be removed. If the meter is removed, and service discontinued, the base charge may not be applied to the account. If the service is not disconnected and the customer resumes using utility services, the Town retains the right to bill for past services not to exceed two years.

7. **Meter Tampering**. The Town does not allow for any unauthorized person(s) to open a meter box to interfere, alter, tamper with, or bypass a meter which has been installed for the purpose of measuring the use of water or knowingly to use water passing through any such tampered meter or water bypassing a meter provided by the Town for the purpose of measuring and registering the quantity of water consumed. Town of Black Mountain Ordinance 20-21. Any meter or service entrance facility found to have been altered, tampered with, or bypassed in a manner that would cause such meter to inaccurately measure and register the water consumed, or which would cause the water to be diverted from the recording apparatus of the meter, shall be prima facie evidence of intent to violate and of the violation of this section by the person in whose name such meter is installed, or the person or persons so using or receiving the benefits of such unmetered, unregistered, or diverted water. Any person(s) not authorized by the Town operating any valves on the water distribution system, which included the cut off valve at the meter, hydrants, etc. shall be charged with tampering. Per North Carolina General Statute 14-151.1

    - Any person violating any of the provisions may be liable to the Town any losses and shall also be charged for the cost to repair and or replace any damages sustained. A fine may be charged per occurrence per the most recently approved Fee Schedule.
        a. First Occurrence-notification letter to the property owner
        b. Second Occurrence-notification and fine
        c. Third Occurrence-notification, fine which may include any additional civil or criminal charges including recover of water loss or damage to Town property.
    - If water is cut on illegally after disconnection due to nonpayment of a utility bill, this may cause the removal of the water meter and may result in additional charges. Reestablishing services may incur additional charges which may include deposits, fines and payment of all charges on the account before reconnection.
    - The Town may make a reasonable effort to hold tenants responsible for any damages associated, or loss recovery of water usage. However, if the tenant is not available, the landlord or property owners may be responsible for any

fines, damages associated, or loss recovery of water usage.

8. **Waste of water.** Failure to repair utility services within 60 days from first notification, high usage bill or detection by the Town or property owner, may result in the Town disconnection of utility service until the leak has been repaired. Approved Town documentation must be submitted and approved before services may be restored.

B. Utility Billing Procedures

The Town of Black Mountain Utility Customer Service Department bills for Water and Sewer Services

1. Billing

- Bills shall be prepared monthly and are as close to 30 days as practicable.
- Bills are due 20 days from the billing date.
- Payment may be made by check,money order, bank ACH draft, credit card, or in cash. Payments may be made online or in person.
- All bills not paid within 20 days are subject to late penalty of $10.00 or 5% whichever is greater of the unpaid balance.
- If payment is not received and receipted by the 20th day at 5 pm, a late charge may be added to the customer's account.
- All bills not paid within 35 days of billing date are subject to disconnect.
- If payment is not received by the 35th day before 5 pm, a Utility Non-payment Fee, per the most recently approved Fee Schedule, may be added to the customer's account, and the account is subject to disconnection.
- To restore service, the entire account balance, including fees, must be paid in full.
- If a bill is returned to the Town of Black Mountain by the post office or email as undeliverable, the Utility Customer Service Department shall make all reasonable efforts to obtain a forwarding address and correct the address in the Utility records. In the event the bill becomes delinquent, the Utility Customer Service Department shall follow the collection efforts below. Customers are responsible for all billing regardless of receiving a monthly bill.
- Payments may be applied to customer accounts in the following order; fees or miscellaneous charges, water, and sewer charges.
- It is the responsibility of the property owner, account holder, or authorized designee to advise the Town to whom and to what address bills are to be sent (e.g. new owner or renter). A Utility Billing Change Form is available from the Utility Customer Service Department for any changes that are necessary to an update an account. Only an account holder or authorized party can request changes to billing information and statuses.
    - If the Town has overcharged or undercharged a customer for service, the Town may correct this error subject to the following procedures:
        - If the Town has overcharged a customer for service, the

Town may credit the customer's account, without interest, the excess amount and notify the customer by letter. In the event of a significant credit Customers may request a refund of such excess charges if they were previously paid in full. Credit to a customer's account is subject to the following limitations:

- If the time period over which the mistake occurred can be determined, the Town should credit or refund the excess amount charged the account for that entire interval, provided that such time period shall not exceed the statute of limitations as set forth in the N.C. General Statutes.
- If the time frame of the problem cannot be determined, the Town should credit or refund the excess amount charged during the previous 12 months.
- If an overcharged customer owes a past due balance to the Town, the Town will deduct that past due amount from any refund or credit due the customer.

- If the Town has undercharged a customer for service, the Town may collect the additional amount due the Town by billing the account. A payment plan or other payment options may be extended to a customer for repayment of charges billed from prior billing periods. If a customer receives notice of undercharging and does not contact the Town to make payment arrangement for such amount by the subsequent due date, the account may be disconnected for non-payment in accordance with this policy.
- If an undercharge has occurred because of tampering or bypassing a meter or because of other fraudulent or willfully misleading action of the customer, the Town shall collect the entire undercharged amount in a lump sum and seek such other rights and remedies as are permitted by law.

2. Returned payments.

- Payments returned due to insufficient funds, closed accounts, or other issue not related to a Town error may be charged a fee according to the current fee schedule. If the return was due to Town error, the fee may be waived.
- Customers may lose the ability to use a payment method for two years if a payment has been returned due to insufficient funds, closed accounts, or other issue not related to a Town error two times in a 12-month period.
- Customers who do not make good on any returned payment and applicable fees may be considered to have not made any payment and may be subject to procedures for late charges and disconnection of service.
- The Utility Customer Service Department may also send a letter notifying the customer of these events and request replacement funds or alternative payment arrangements.

- Payment return fees may be added to the account and must be paid with other past due charges to continue Utility service.
- Returned payments made by a customer to avoid disconnection on an account may be subject to immediate disconnection. All fees and account balances including a Nonpayment Service Disconnection Charge must be paid before service is reconnected

3. Collection of Past Due Utility Charges.

- *Accounts 20 days past due.* A cut off notice may be mailed when a bill is 20 days past due. If payment is not received by 5 pm on the 35th day, a Utility non-payment fee in accordance with the fee schedule in effect at that time may be added to the customer's account. The account may then be disconnected.
- *Accounts over 90 days*. If payment is not received within 90 days, the Town may take one or more of the following actions, as to the most optimum method of securing payment:

  a. The Utility Customer Service Department may send the name, address, and balancedue to the Town's collection agency or NC Debt Setoff Program.
  b. The terms of the nonpayment may be communicated to any or all nationally recognized credit reporting agencies.
  c. Customer may be denied access to Utility services.
  d. Remaining balances on terminated accounts may be transferred to a customer's active utility account for collection of charges due. These charges may be subject to the disconnection policy and may cause the active account to be disconnected for nonpayment.

4. Extended Payment Option. Payment plans may only be available for past due balances related to leaks or accounts that are back billed for previously unbilled usage. Accounts that have past due charges related to regular monthly billing will notbe eligible for payment plans. The Utility Customer Service Department will review the account to establish a payment plan for the customer. The customer will be required to sign a payment plan form specifying the terms of the payment plan. Customer must continue to pay regular monthly charges plus a portion of the back billing or a leak bill(s). If a customer has any returned, missed, or delinquent payments on the account, the payment plan may be voided, and the balance will be due immediately.

5. Deceased Account Holder/ Estate Account. When an account holder is deceased, a Utility Billing Change Form or New Service Application must be completed in order to transfer an account into the name of the responsible party within 45 days. The Town may request legal documentation including, but not limited to, death certificates, wills, or other legal documents to process the utility billing change request. If the Town of Black Mountain receives notice or determines that an account holder is deceased, notification of account closure may be mailed to the address on record. The letter may

set forth a date in which a Utility Billing Change Form must be received to continue services at the location of the deceased account holder. An Application for Utility Services must be filled out and the application process must be completed in accordance with this policy.

An account may be transferred into the ownership of an estate. A Utility Billing Change Form is required, and the Town may request legal documentation from the executor or the person responsible for administrating an estate. It is the responsibility of the executor or other person administrating the estate to notify the Town of any changes in account status. The Town of Black Mountain may allow an account to remain in the name of an estate for a period of 4 months from the date of service connection. It is the responsibility of the executor or administrator of the estate to either disconnect or transfer ownership of the account into the name of a responsible person prior to this date. If an application has not been processed to transfer ownership of the account in the timeframe specified, services may be disconnected without further notice.

6. **Premise Visit Charge**. A premise visit charge, per the Town Fee Schedule, may be charged for services performed by Town staff that is not deemed necessary by the Town. Such services include, but are not limited to, re-reading of meters, checking a meter for a possible leak, shutting meter off more than two times during any single leak event while leak on the customer's side is being repaired and the testing of meters for accuracy. The Town may charge premise visit fee for services that require multiple visits to a property. Such services include, but are not limited to, leaks, temporary disconnection for repairs or any other services.

C. **Consideration of Credits and Refunds**

1. **Refunds.**
   No refunds less than $5.00 may be made on a customer's account.

2. **Credits.**
   - **Filling Swimming Pools**
     The Town does not allow adjustments for filling pools or spas. Customers can apply for a separate irrigation meter to fill pools or spas which may not charge for sewer usage.

   - **Leak Adjustments**
     The customer is responsible for leakage in the piping on his/her property on his/her side of the water meter and will be charged for water and/or sewer based on water use as indicated on the meter. This is being defined as that point at which the customer's plumbing connects either directly to the meter box or the customers shut off valve connects directly to the meter box. The Town does not repair leaks on the customer's side of the water meter. The Town of Black Mountain may allow credit for utility charges resulting from leaks on the customer's side of the meter.

1. Credit may be extended to the customer's account/property only once every 24 calendar months upon approval.
2. Customer must submit a completed Leak Adjustment form within 60 days of leak detection either by the Town or the customer.
3. Customer must provide to the Town of Black Mountain an invoice from a licensed plumber for repairing the leak(s). This must be accompanied by a statement confirming that a leak (or multiple leaks) had been repaired, and a description describing where the leak(s) occurred.
4. A customer may make their own repairs. If a customer makes their own repairs, all receipts for parts and pictures of the leak site prior to repair and after completion are required to be sent to the Town for approval.
5. Leak adjustments may be calculated based on residential customer's average monthly consumption amount plus 25%. Average monthly consumption is based on the four (4) month average prior to the month showing excessive use. If previous consumption is less than 4 previous months, the Town may require 3 additional months of normal usage before adjustment calculation can be processed.
6. No credit will be applied to the account until water usage returns to normal.
7. No credits or adjustments of $ 5.00 or less may be given unless the cause for the credit or adjustment is an error by the Town of Black Mountain.

TOWN OF BLACK MOUNTAIN TOWN COUNCIL
REQUEST FOR COUNCIL ACTION
Meeting Date: September 12, 2022

SUBJECT: Public Hearing to Amend Text for Residential Uses in the Central Business District
#O-22-07

AGENDA INFORMATION

Agenda Location:	**PUBLIC HEARING**
Item Number:	9A
Department:	Planning and Development Department
Contact:	Jessica Trotman, Planning Director
Presenter:	Jessica Trotman, Planning Director

BRIEF SUMMARY: Currently, the Central Business District allows for residential uses anywhere in the Central Business District. There have been two applications to convert two commercial buildings into residential, with one of those buildings being at street level and the changing the use of the building formally known as the Tressel Building into a single-family residence with the intention of it being a short-term rental.

The Town Council directed the Planning Board to look at amending the table of permitted uses to remove the allowance of residential uses at street level. The Planning Board reviewed the proposed amendment and recommended that single family and two-family residential uses be removed completely while multi-family uses be allowed above street level. The Planning Board voted 7-0 to recommend the amendment.

At their August 22, 2022, meeting, one member of the Planning Board expressed concern about single family houses which would become non-conforming. At the time, the member said he believed there to be 40-50 impacted properties. There was discussion about this issue, but no vote took place nor was there a consensus among the Planning Board.

Staff review finds there are 10 single family dwellings that will become non-conforming. These are concentrated on Vance Avenue and Ridgeway Avenue. These would become legally non-conforming. This means the property owner and any future property owner can maintain the use as a single-family dwelling until they choose to change to something non-residential. Once the property became non-residential (for example: a café or bookstore) it could not become a single-family property again.

Many properties in town are non-conforming either by use, lot size, or by setbacks and height requirements. Living in a municipality with zoning means there is a chance at some point a change in condition will require development regulations to be modified. When the district was mapped in 2010 the single-family residences were not an issue to the economic viability of the district. We have experienced a change in economic pressures which pose a threat to the viability and character of our downtown.

MOTION FOR CONSIDERATION:

1. To open the public hearing for ***Ordinance #O-22-07*** for amendments to the Central Business District for residential uses.

2. To close the public hearing.

3. To adopt ***Ordinance #O-22-07*** as presented [or as amended].

FUNDING SOURCE: N/A

ATTACHMENTS: ***Ordinance # O-22-07***

MANAGER'S COMMENTS AND RECOMMENDATIONS: To approve ***Ordinance #O-22-07*** as presented.

ORDINANCE #0-22-07

AN ORDINANCE TO AMEND APPENDIX A, LAND USE CODE, CHAPTER 4, SECTION 4.7.14, TABLE OF USES BY ZONING DISTRICT

WHEREAS, the Town of Black Mountain Planning Board is charged with reviewing and updating land use planning, zoning and subdivision regulations; and

WHEREAS, the Planning Board made a commitment to the Town Council to review the text of the Land Use Code in the years since its adoption to address any residual inconsistencies in the text and to look for opportunities to clarify or improve text; and

WHEREAS, upon recommendation of the Planning Board, the following text amendment is consistent with the comprehensive plan and reasonable in the public interest because it supports the vibrant economy and the walkable and livable goal and helps further the activities of downtown.

WHEREAS, the Town of Black Mountain has the authority, pursuant to Article 7 of Chapter 160D of the North Carolina General Statutes, to adopt land development regulations, clarify such regulations, and may amend regulations from time to time in the interest of public health, safety and welfare; and

WHEREAS, the Town Council finds that the land use code text amendment is consistent with the comprehensive plan and is reasonable and in the public interest because of the following findings:

- Promotes a livable environment and a viable economy and promotes the general safety and welfare of the community.

WHEREAS, after notice duly given, a public hearing was held on September 12, 2022, as part of the regularly scheduled Town Council meeting at 6:00 p.m. in the Council Room of Town Hall, 160 Midland Avenue.

NOW, THEREFORE, BE IT RESOLVED that Chapter 4, Section 4.7.14 of the Town of Black Mountain Land Use Code, be amended with the following (additions are underlined in bold and deletions are shown as red struck text):

4.7.14 Table of uses by zoning district.

Table of Uses for Zoning Districts

4.7.14 Table of uses by zoning district.

Table of Uses for Zoning Districts

Category	Uses	CR-1	SR-2	TR-4	UR-8	NMU-8	OI-6	CBD	HB-8	LI-8	HI-0
Special Uses	Conservation Subdivision	S	S	S	S	S	S	S			
Special Uses	Cottage Housing Development (CHD)	S	S	S	S	S	S	S	S		
Special Uses	Industrial Park Development								S	S	S
Special Uses	Planned Unit Development (PUD) - Commercial					S	S	S	S	S	S
Special Uses	Planned Unit Development (PUD) - Residential	S	S	S	S	S	S	S	S	S	
Residential	Manufactured Home Parks			S	S				S	S	
Residential	Manufactured Homes on individual lots	A	A	A	A						
Residential	Multi-family residential **all levels**	S	S	S	S	S	S	~~S~~	S	S	
Residential	**Mixed-used residential second floor and above and below street level**							**P**			
Residential	Secondary Dwellings	A	A	A	A	A					
Residential	Shared housing/Community living facilities				P	P	P		P	P	P

Residential	Single-Family Residences	P	P	P	P	P	P	~~P~~	P		
Residential	Two-family Residences (duplex)	P	P	P	P	P	P	~~P~~	P		
Public/Institutional	Government facilities	P	P	P	P	P	P	P	P	P	P
Public/Institutional	Group home					P	P		P	P	P
Public/Institutional	Hospitals								P	P	P
Public/Institutional	Meeting halls for civic, social, and fraternal uses							P	P	P	P
Public/Institutional	Places of worship	P	P	P	P	P	P	P	P	P	P
Public/Institutional	Boarding House	A	A	A	A	A	A	A			
Public/Institutional	Conference Centers					P		P	P	P	
Public/Institutional	Cultural, Community Facilities							P	P	P	P
Public/Institutional	Educational facilities						P		P	P	P
Public/Institutional	Family Care Homes	A	A	A	A	A	A	A	A	A	
Public/Institutional	Public utilities	P	P	P	P	P	P	P	P	P	P

READ, APPROVED AND ADOPTED, by a vote of _____ to _____ on this the 12th day of September 2022.

_____

Larry B. Harris, Mayor

ATTEST:

_____

Savannah Parrish, Town Clerk