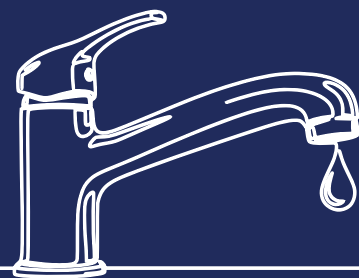


CHAPTER VII

INFRASTRUCTURE



INFRASTRUCTURE

Christiansburg's infrastructure systems provide essential services to residents, businesses, schools, emergency services, and visitors through delivery of water, sewer, solid waste and stormwater infrastructure to meet community needs. These services are critical for public health and safety, supporting economic activity and maintaining high quality of life. Infrastructure also includes systems such as electricity, natural gas, broadband, telecommunication and other utilities that may be privately owned, operated, or provided. This element primarily focuses on infrastructure systems that are provided, operated, maintained, or funded by the Town. It recognizes the importance of broadband and other utility networks that support residents, businesses, and economic competitiveness.

Potable Water

The Town of Christiansburg currently owns, operates, and maintains a distribution system serving Town residents. The Town's potable water system provides water for both residential and non-residential purposes, including fire-fighting demand. The Town has historically been able to provide adequate potable water service to meet the demand within the Town's boundaries and to a portion of unincorporated Montgomery County adjacent to the Town limits.

The Town purchases all its potable water from the NRV Regional Water Authority (Authority). The Authority draws water from the New River and filters and disinfects the water at its filtration plant located west of Christiansburg along Peppers Ferry Road NW (Route 114). The Town's transmission mains, distribution mains, pump stations, and water storage facilities are interconnected with and operate in concert with the Authority's facilities. The current permitted capacity of the Authority's water treatment plant is 12.4 million gallons per day or MGD. In 2025, the average daily amount of water delivered to the Authority members was approximately 7.5 MGD. In 2025, Christiansburg purchased

approximately 980 million gallons of water which equates to approximately 2.69 MGD of water per day. The Town is collaborating with other localities and water suppliers throughout the New River Valley region to update the Regional Water Supply Plan as required by the Code of Virginia's Local and Regional Water Supply Planning Regulation (9VAC25-780).

The Town of Christiansburg water system is comprised of three main pressure zones, nine subzones associated with booster stations or pressure reducing valves, four storage tanks, and four booster stations.

It has approximately 165.14 miles of water distribution mains ranging from 2 inches to 16 inches in diameter within the Town's service area. The Town has an effective storage volume of approximately 3.7 million gallons.

The Town's Engineering Department is responsible for planning, technical studies, modeling, and system analysis, while the Public Works Department oversees the day-to-day operation, maintenance, and management of utility infrastructure. Capital improvement planning is conducted by both departments.

The Town's water system requires ongoing maintenance, rehabilitation, and replacement as infrastructure ages. The Town continues upgrading metering infrastructure, replacing aging water meters, inspecting water storage facilities, and evaluating rehabilitation and replacement needs throughout the system.



Technical studies and system modeling are being used to identify capacity constraints, fire flow concerns, water quality considerations, and opportunities for future expansion. These efforts are intended to support capital improvement investment decisions and improve system performance.

Some of the challenges are aging infrastructure, water loss, and securing funding opportunities to support system improvements. As infrastructure ages, the Town needs to rehabilitate, replace, and maintain critical water infrastructure while identifying funding strategies to ensure reliable service. Protecting water supply sources, groundwater resources and water quality are also important considerations for protecting public health and the environment.

Sanitary Sewer

The Town's sanitary sewer service area includes the entire Town boundary and portions of unincorporated Montgomery County (Water and Sewer Map attached). The majority of the Town's sewage collection system collects and conveys wastewater by gravity; however, some areas are not tributary to the wastewater treatment plant and require pumping to the primary gravity system. The primary gravity system ultimately conveys wastewater to Christiansburg's wastewater treatment plant located west of town along Crab Creek Road.

The Town's wastewater treatment plant has a capacity of 6 million gallons per day (MGD), and average daily inflow is approximately 2.1 MGD. The wastewater system also includes 17 Town-owned pump stations that support the collection and conveyance of wastewater throughout the service area. Sanitary sewer facilities are operated and maintained by the Town's Public Works Department.

The Town's sanitary sewer system requires ongoing planning, maintenance, rehabilitation, and replacement to ensure reliable service and regulatory compliance. Aging infrastructure and infiltration and inflow (I&I) are ongoing challenges. Excess infiltration and inflows reduce system capacity and can contribute to sanitary sewer overflows during wet weather events.

The Town continues implementing infrastructure improvements including rehabilitation and replacement projects, sewer pipe and manhole improvements, and other system/equipment upgrades intended to reduce excess flows, improve reliability, and extend the life of existing infrastructure. Ongoing efforts to reduce I&I and sanitary sewer overflows (SSOs) remain important for maintaining system performance and regulatory compliance.

The Town continues to evaluate opportunities for infrastructure expansion and coordination with neighboring jurisdictions in areas of mutual interest to support long-term water and sanitary sewer planning.



Solid Waste

The Town of Christiansburg provides solid waste collection services for single-family residences and businesses, which includes curbside garbage and recycling collection. Residents may also use the County's consolidated collection sites to drop off their recyclables.

Solid waste and other refuse collected within the Town is transported to the Montgomery Regional Solid Waste Authority (MRSWA) transfer station. MRSWA was formed by the Towns of Blacksburg and Christiansburg, Montgomery County, and Virginia Tech. The five-member MRSWA Board consists of one appointed representative from each jurisdiction and one jointly appointed at-large representative. Participation in the MRSWA is funded through tipping fees and levies on particular services determined by the members.

Stormwater Management

The Town has established a public drainage system that is operated and maintained through a stormwater utility. Stormwater systems on private property are the responsibility of the property owners. New development is not expected to negatively impact existing systems, since each new development must provide its own on-site stormwater management system.

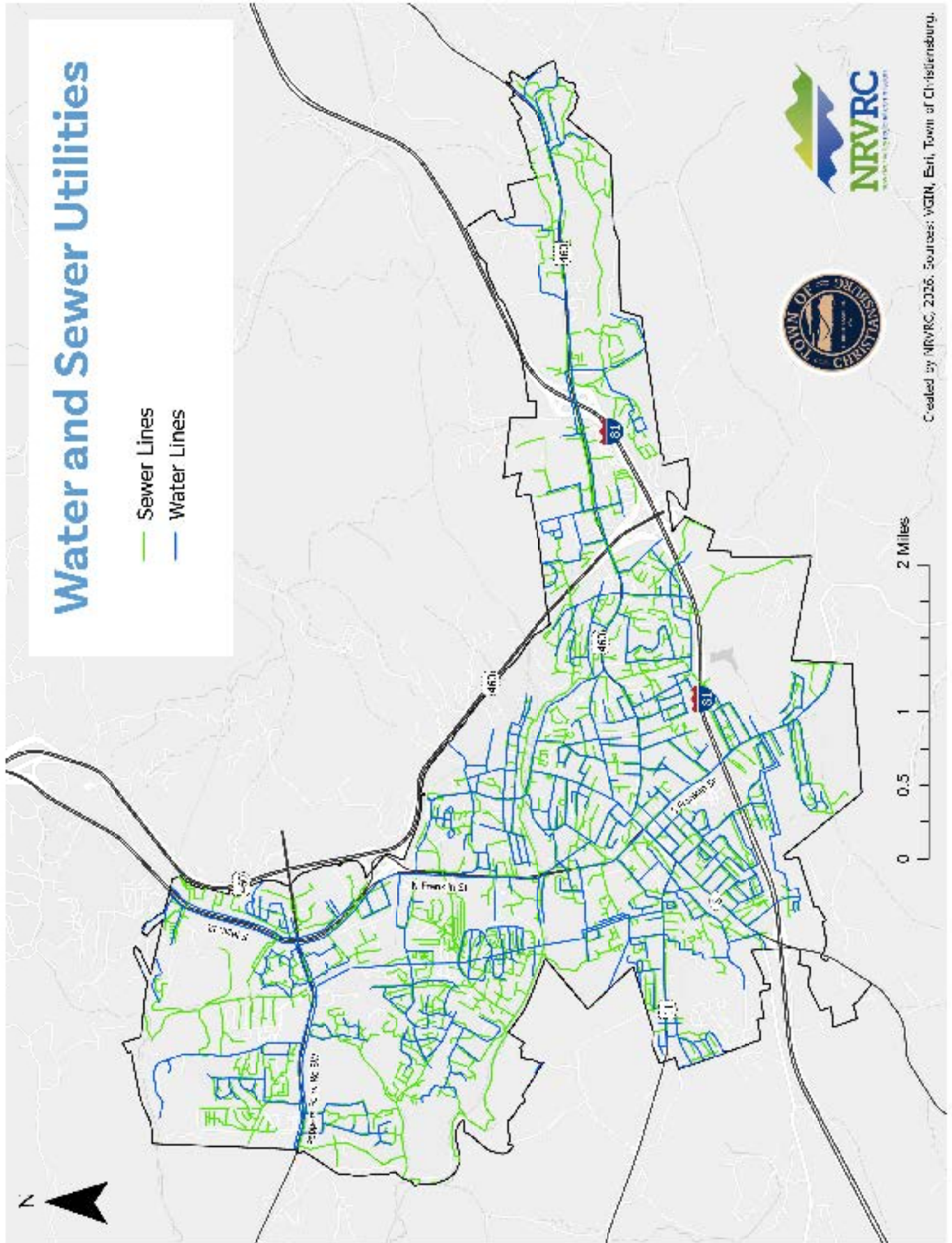
While the Town currently does not utilize a comprehensive stormwater model, future needs may increase the need to evaluate system capacity, watershed impacts, and opportunities for more comprehensive or regional stormwater modeling efforts. The Town has developed a Downtown watershed study and resiliency plan to better understand and address existing and future stormwater challenges. These plans review existing conditions, project future stormwater generation, and provide recommendations to address stormwater management needs and improve long-term system resiliency.

Effective stormwater management controls flooding and erosion, protects water resources by decreasing contamination, reduces habitat destruction, and limits infrastructure damage. Stormwater management encompasses both green infrastructure practices and traditional piped infrastructure. To achieve these outcomes, it requires planning, infrastructure investments, and implementation of Best Management Practices (BMPs) designed to reduce runoff and improve water quality. These practices can include features such as bioretention areas, vegetated swales, tree plantings, permeable surfaces, and other approaches designed to improve water quality, reduce runoff impacts, and promote beautification.



Water and Sewer Utilities

- Sewer Lines
- Water Lines



Created by NRVRC, 2026. Sources: VGIN, Esri, Town of Christiansburg.

The Town continues to adapt its stormwater management practices to meet federal and state requirements, including Municipal Separate Storm Sewer System (MS4) permit requirements, erosion and sediment control regulations, stormwater management requirements, and water quality initiatives related to Total Maximum Daily Loads (TMDLs). Implementation and maintenance are critical components of the Town's stormwater program. Coordination between Engineering, Public Works, and development review processes helps ensure stormwater infrastructure is properly maintained and performs effectively, accommodates future needs and protects water resources.

Broadband Infrastructure

Broadband access has become an essential component of infrastructure as it supports education, healthcare, business operations, public safety, remote work and access to government services. Reliable high-speed internet connectivity is increasingly important to maintaining quality of life and supporting economic competitiveness.

The Federal Communications Commission (FCC) officially defines basic fixed broadband as an internet connection with minimum download speeds of 100 Mbps and minimum upload speeds of 20 Mbps.

According to inMyArea.com, an interactive website used to determine the internet service providers (ISP) in your area, there are fourteen (14) providers for Christiansburg, although this may not represent an exhaustive list of all providers in the Town.

Network Gaps are defined by unserved and underserved in the community (geographic zone). The FCC definition of unserved is speeds under 10/1 Mbps and the FCC definition of underserved is speeds under 100/20 Mbps. Based on the information in the table above, the only ISP's that serve 100% of the Town have satellite connections.

While FCC classifies satellite internet as a viable broadband option, it is not considered to be as reliable as a physical connection (fiber or cable) due to line of sight issues (topography, trees or vegetation and buildings), latency (signal delays), network congestion, weather vulnerability, and data caps.



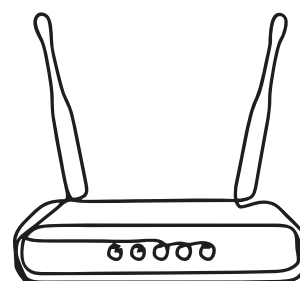
PROVIDER	CONNECTION	DOWNLOAD SPEEDS UP TO:	AVAILABILITY %
AT&T	5G Internet	300Mbps	75%
Starlink	Satellite	400Mbps	100%
Viasat	Satellite	150Mbps	100%
Xfinity	Cable, Fiber	2 Gbps	78%
T-Mobile	5G Internet	498 Mbps	67%
Mint Mobile	5G Internet	415Mbps	37%
Verizon	DSL, 5G Internet	300Mbps	57%
EarthLink	5G Internet	425 Mbps	48%
XNET	Fixed Wireless	2 Gbps	65%
All Points Broadband	Fixed Wireless	50 Mbps	53%
Shentel	Cable, Fiber	2Gbps	82%
UScellular	Fixed Wireless	25 Mbps	68%
HughesNet	Satellite	100 Mbps	100%
Citizen's	Fiber	1Gbps	1%

Since providers offering physical ground-based broadband connections, such as fiber and cable, serve no more than 82% of the Town, additional analysis would be necessary to determine whether all residents have access to reliable broadband service. Ground-based technologies such as fiber-optic and cable networks generally provide more reliable and higher-capacity service where available.

In addition to availability, affordability is an important consideration. According to inMyArea.com each ISP has multiple speed and pricing tiers and there is at least one provider offering 600 Mbps of fiber internet service at \$30.00 per month to at least 82% of Town. The availability and/or affordability of high-speed internet service is important for ensuring residents and businesses can fully participate in the digital economy.

Some factors to consider when evaluating for future broadband needs include:

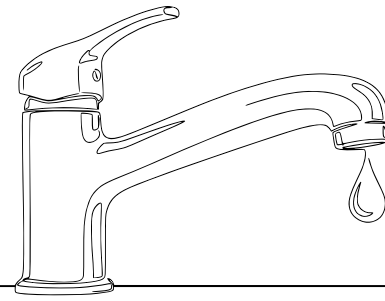
- 1. Capacity and Scalability** - Will the current infrastructure be able to handle future speed and growing data requirements, and emerging technologies?
- 2. Infrastructure Resilience** - Is there sufficient redundancy within the network and how well does the current infrastructure hold up to severe weather events and natural disasters?
- 3. Digital literacy** - Are there educational opportunities offered to help residents with utilization of all the benefits available with broadband services?



INFRASTRUCTURE

Goals, Objectives, & Policies:

Goal I.1: *Provide a high level of service, safeguard the quality, and conserve the quantity of potable water.*



Potable Water

Objective I.1.1:

Enhance or replace existing water infrastructure according to an adopted and updated capital improvement program to support future development while ensuring high level of service and reliability.

Policy I.1.1.1:

Maintain and continue to develop a comprehensive water system model.

Strategy I.1.1.1.A:

Utilize the water system model to assess system capacity and capability to ensure water service for both current and future customers and developments within the service area.

Strategy I.1.1.1.B:

Explore ways to incorporate demand forecasting into the model.

Strategy I.1.1.1.C:

Analyze need for modifications and expansion of water infrastructure to meet existing and future demand.

Strategy I.1.1.1.D:

Utilize the water system model to analyze fire protection capabilities and identify areas where improvements are needed.

Policy I.1.1.2:

Maintain a capital improvement program for aging infrastructure developed through modeling, Supervisory Control And Data Acquisition (SCADA) systems, and other assessment tools.

Policy I.1.1.3:

Continue to support the New River Regional Authority and its efforts to produce and deliver high quality drinking water to its members.

Policy I.1.1.4:

Protect all watersheds within the Town's corporate limits, recognizing that they are the ultimate source of drinking water for Christiansburg and other downstream public water systems.

Policy I.1.1.5:

Coordinate with New River Regional Authority to protect the quality and reliability of the regional water supply system.

Policy I.1.1.6:

Maintain standards and specifications for design and construction of water infrastructure.

Policy I.1.1.7:

Actively oversee and inspect construction of new water infrastructure.

Policy I.1.1.8:

Examine the water utility rate structure to ensure alignment with cost of service and equitable distribution to all user classes or tiers.

Policy I.1.1.9:

Adhere to the Regional Water Supply Plan and recommend updates to address needs and concerns.

Strategy I.1.1.9.A:

Ensure the Regional Water Supply Plan accounts for estimated quantities and impacts of outside demand for Town water supplies in the future.

Sanitary Sewer

Goal I.2: *Strive to deliver a high level of service and reliability.*

Objective I.2.1:

Improve and replace existing sanitary sewer infrastructure according to an adopted and updated capital improvement program while meeting the level of service and reliability of existing infrastructure.

Policy I.2.1.1:

Maintain and continue to develop a comprehensive sanitary sewer system model.

Strategy I.2.1.1.A:

Utilize the sanitary sewer system model to identify system capacity and capability to provide sewer services for both current and future customers and developments within the service area.

Strategy I.2.1.1.B:

Assess the need for modifications and expansion of sanitary sewer infrastructure to meet existing and future demand.

Strategy I.2.1.1.C:

Explore ways to incorporate demand forecasting model.

Policy I.2.1.4:

Continue the infiltration and inflow reduction program.

Policy I.2.1.5:

Maintain standards and specifications for design and construction of sanitary sewer infrastructure.

Policy I.2.1.6:

Actively oversee and inspect construction of new sanitary sewer infrastructure.

Policy I.2.1.7:

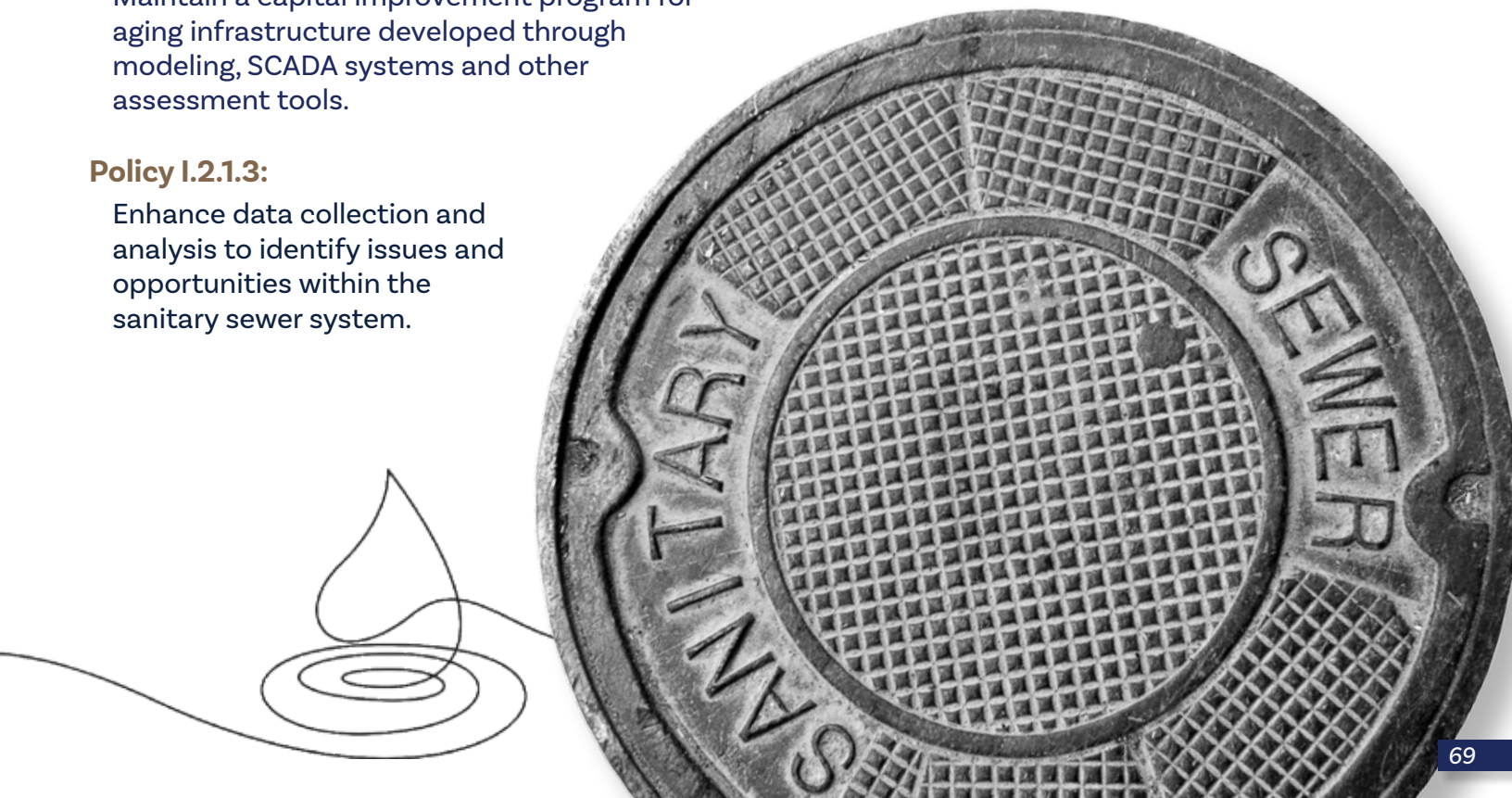
Examine the sewer utility rate structure to ensure the cost of service is fairly distributed to all users.

Policy I.2.1.2:

Maintain a capital improvement program for aging infrastructure developed through modeling, SCADA systems and other assessment tools.

Policy I.2.1.3:

Enhance data collection and analysis to identify issues and opportunities within the sanitary sewer system.



Solid Waste

Goal I.3: Provide reliable, efficient, and environmentally responsible solid waste and recycling services through Town collection services and coordination with regional solid waste authorities.

Objective I.3.1:

Ensure safe, efficient, and environmentally responsible collection, transfer, and disposal of solid waste.

Policy I.3.1.1:

Maintain reliable curbside collection of household solid waste and recycling services for Town residents.

Policy I.3.1.2:

The Town will coordinate and participate with the Montgomery Regional Solid Waste Authority (MRSWA) and the New River Resource Authority (NRRA), in the transfer, recycling, and disposal of solid waste generated within the Town.

Policy I.3.1.3:

Support regional solid waste disposal through partnership with the New River Resource Authority (NRRA) Regional Landfill to ensure adequate long-term disposal capacity.

Policy I.3.1.4:

Encourage waste reduction, reuse, and recycling through public education.

Policy I.3.1.5:

Promote proper disposal of household hazardous waste and other special materials through regional collection programs.

Stormwater Management

Goal I.4: Protect natural water resources and assets.

Objective I.4.1:

Improve water quality by reducing the quantity of stormwater runoff, flooding and stormwater pollution.

Policy I.4.1.1:

Continue to implement the MS4 Program Plan in accordance with the state permit, including all Minimum Control Measures and Total Maximum Daily Load Action Plans.

Policy I.4.1.2:

Construct new stormwater management infrastructure to reduce stormwater runoff, reduce stormwater pollution, and protect the environment.

Policy I.4.1.3:

Educate community members and developers about existing and updated stormwater regulations.

Strategy I.4.1.3.A:

Encourage existing development to utilize current stormwater standards.

Strategy I.4.1.3.B:

Develop incentives to encourage development to adopt higher stormwater standards through the use of Best Management Practices (BMP).

Strategy I.4.1.3.C:

Encourage on-site water infiltration systems using natural vegetation and natural filtration systems for new developments.

Policy I.4.1.4:

Maintain current standards and specifications for design and construction of stormwater management infrastructure.

Policy I.4.1.5:

Actively oversee and inspect construction of new stormwater management infrastructure.

Policy I.4.1.6:

Create comprehensive watershed-based stormwater models to assess infrastructure needs and analyze the benefit of regional stormwater management strategies.

Strategy I.4.1.6.A:

Utilize the watershed models to identify system gaps and analyze proposed modifications and improvements to system infrastructure.

Policy I.4.1.7:

Reduce stormwater runoff and prevent flooding at areas within Town susceptible to flooding issues by requiring upgrades during redevelopment.

Policy I.4.1.8:

Implement the Resiliency Plan to prevent flooding in areas within Town that have been identified as being susceptible to flooding.

Policy I.4.1.9:

Encourage improvements to stormwater facilities for existing neighborhoods through BMPs such as bio-retention, rain gardens, and rain barrels.

Policy I.4.1.10:

Expand the use of natural plantings on critical slopes to reduce erosion and runoff and promote water quality.

Policy I.4.1.11:

Preserve and improve water quality and protect the quality and reliability of the regional water supply system.

Strategy I.4.1.11.A:

Continue stream restoration projects.

Strategy I.4.1.11.B:

Restore streams and creeks and investigate potential for daylighting them in areas of Town.

Policy I.4.1.12:

Maintain a capital improvement program, accounting for system needs identified by modeling, improvements to reduce existing flooding, and improvements needed as a result of aging infrastructure.

Policy I.4.1.13:

Seek funding for stream restoration and healthy streams projects.

Policy I.4.1.14:

Delineate areas that are prone to flooding or susceptible to flood damage and designate them as special flood overlay districts that require additional attenuation measures.

Policy I.4.1.15:

Educate citizens regarding techniques to reduce stormwater runoff.

Policy I.4.1.16:

Develop incentives to assist Town residents in their conservation efforts to reduce stormwater runoff.

Broadband

Goal I.5: Support the availability of reliable, resilient, and high-quality broadband infrastructure to meet the current and future needs of residents, businesses, education, healthcare, public safety, and economic development.

Objective I.5.1:

Encourage the expansion of broadband infrastructure to improve connectivity throughout the Town.

Policy I.5.1.1:

Encourage investment in broadband infrastructure to reduce service gaps and improve access to reliable high-speed internet throughout the community.

Policy I.5.1.2:

Encourage access to affordable broadband services for residents and businesses.

Policy I.5.1.3:

Encourage opportunities for residents and businesses to develop the skills needed to effectively utilize broadband services and digital technologies.

