

# UTILITIES

## GOAL

Provide all properties within the Town's service area with safe and reliable public utility infrastructure and services, such as water, wastewater, stormwater management, solid waste management and recycling. Facilitate the provision of reliable private utility infrastructure and services, such as electricity, natural gas, and broadband. Public and private utilities should meet demand needs, promote economic growth, and result in a high quality of life for the community.

### **Sustainability Goal**

Provide the above mentioned utility infrastructure and services, plus access rights, through safe, environmentally sensitive, and cost-efficient methods. Partner with state and local governments, utility franchises, and other public and private entities to increase resiliency for critical infrastructure systems. Employ best management practices of new technologies and take active steps to transition Blacksburg to a low-carbon energy future.

### **Citizen Involvement**

Meaningful citizen involvement is key to the Town's ethic of governance. There are a number of standing committees and working groups that advise staff and Town Council on utility topics including the NRV Regional Water Authority, Blacksburg-VPI Sanitation Authority, and the Montgomery Regional Solid Waste Authority. Citizens are also encouraged to attend Planning Commission and Town Council public hearings when utility topics are being discussed.

## OVERVIEW

Utilities available within the Town include **water, wastewater, stormwater management, solid waste collection, electrical, natural gas, and telecommunications services** (telephone, cable television, and internet access). The Town provides infrastructure and services for water, wastewater and solid waste collection in conjunction with regional service authorities as well as providing stormwater infrastructure and services. Private companies under franchise with the Town provide infrastructure and services for electrical, natural gas, technology and telecommunications services. This chapter is divided into **Town Provided Services** and **Privately Provided Services** to accurately reflect how utilities are provided within the Town of Blacksburg.

# TOWN PROVIDED UTILITY SERVICES

## Public Water System

The Town of Blacksburg purchases treated water from the NRV Regional Water Authority. There is inter-jurisdictional cooperation with the Town of Christiansburg, Montgomery County, and Virginia Tech on the water treatment and distribution system through Water Authority membership.

The water source for the water authority is the New River. The capacity of the plant is approximately 12 million gallons per day (MGD). Current daily use by all members is approximately 6.5 MGD, of which 2.5 MGD is used by Blacksburg customers and 1.3 MGD by Virginia Tech. Combining current water usage rates with new water-efficient appliances installed during renovations and new water-efficient building construction standards leaves significant treatment plant capacity available for projected water demand. The water treatment and distribution system is in compliance with all state and federal regulations, as documented in annual water quality reports.

Water reuse is becoming an important component of water resources management. Water reuse can include collection and use of stormwater, reuse of greywater in homes and businesses, and reuse of treated wastewater. Water can be reused for irrigation, vehicle washing, toilet flushing, and industrial purposes. The Town supports water reuse, particularly as a regulatory framework is developed to protect human health and the environment and as public acceptance of this practice grows. Water reuse is consistent with the Town's environmental and sustainability goals.

The Town's water service area includes areas outside the corporate limits. The Town and the Montgomery County Public Service Authority (PSA) have water service area agreements in place that establish the boundaries of the Town's service area outside the corporate limits. Any new areas outside the corporate limits that desire water service must request a boundary line adjustment and become a part of the Town prior to water service being provided.

The Town of Blacksburg and the Town of Christiansburg adopted a Regional Water Supply Plan in 2011, with an update scheduled for 2018. The plan covers the two Towns and Virginia Tech since the campus receives its water supply via the Town of Blacksburg's water distribution system. The plan governing Blacksburg and Christiansburg includes existing water resource information, existing water use information, existing resource information, water demand management, drought response and contingency plan, projected water demand, and statement of need based on existing and future water sources and demands. As part of the plan, the Town adopted an Emergency Water Resource Management Ordinance in case of a significant drought or emergency that threatens the Town water supply.

The Town's water system consists of two separate zones: the "high" elevation zone and the "low" elevation zone. The "high" elevation zone is located along the northern and eastern ridgelines of the Town and serves areas of Town that are at an elevation of 2,190 feet or greater. The "low"

### Greywater

Wastewater generated from domestic activities such as laundry, dishwashing and bathing which can be recycled on-site for uses such as landscape irrigation.

elevation system serves the majority of the Town and areas that are at an elevation below 2,200 feet, including the Virginia Tech campus.

A water storage supply and delivery system equal to 48 hours of use is necessary to enable interim emergency water provisions to be in place. As of 2018, current water storage tanks will provide service to the Town of Blacksburg and Virginia Tech for approximately 48 hours in the event of an interruption in supply.

As discussed in the *Public Safety & Community Facilities Chapter*, the Volunteer Blacksburg Fire Department serves all areas of Town utilizing a combination of fire hydrants and tanker trucks to supply water in emergencies. As waterlines are upgraded or extended into areas of Town not currently served by public water, fire hydrants are installed.

## **Public Wastewater System**

The Blacksburg-VPI Sanitation Authority treats the wastewater from Town of Blacksburg, Virginia Tech, and areas of Montgomery County. The Sanitation Authority Plant is located where Stroubles Creek crosses Prices Fork Road southwest of Town. The current design capacity of the Sanitation Authority Plant is 9 million gallons per day (MGD), which provides adequate treatment capacity for growth projections. The plant has the ability to expand to 12 MGD treatment capacity if necessary for the future. The current averaged daily flow volume at the plant equals 5.8 MGD.

The Sanitation Authority Plant uses best management practices to prevent further impairment of local creeks. While not mandated, the plant also has a nitrification/denitrification process to help improve the quality of the wastewater discharge. This process provides a benefit to the New River, the receiving water body, by helping to preserve its existing river biology. Sludge removed during the treatment process is treated with an Autoheated Thermophilic Aerobic Digestion (ATAD) process, which will produce pasteurized (Class A) biosolids that can be reused, land applied, or land filled. The Town, in partnership with the Authority, administers the industrial pretreatment program, which is effective in protecting the integrity of the wastewater collection system and the treatment plant process.

The Town of Blacksburg owns, operates, and maintains the public wastewater collection system within the Town's service area which includes portions of Montgomery County. As of 2017, this infrastructure includes more than 130 miles of gravity collection lines ranging in diameter from 6 to 24 inches, 14 miles of force main, 21 Septic Tank Effluent Pumping systems (STEP), 162 Septic Tank Effluent Gravity systems (STEG), and 26 wastewater pumping stations. Virginia Tech owns and operates the wastewater lines on the Virginia Tech Campus. Wastewater from Blacksburg and Virginia Tech flows into larger interceptor lines that are jointly owned and operated by the Blacksburg-VPI Sanitation Authority.

Public wastewater service is unavailable to the majority of the land area west of the Route 460 Bypass, including most of Toms Creek Basin. In these areas, the STEP/STEG systems are used and connect downstream to public sewage. This alternative wastewater system is proposed to serve future population growth in designated areas approved by Town Council.

The Town's wastewater service area has expanded both through private development projects and through the cost-share program. The Town is undertaking several approaches to evaluate more effective ways to provide new services while operating and maintaining the wastewater infrastructure as it ages and expands. This includes implementing Environmental Protection Agency (EPA) Asset Management for Water and Wastewater Utilities Framework. To meet these principles, a town-wide data logging program and hydraulic model has been developed to evaluate the effect of rainfall-derived Infiltration and Inflow (I/I) on the system and to develop a strategy to increase capacity within the existing infrastructure.

## EPA Asset Management

Asset management is a process water and wastewater utilities can use to make sure that planned maintenance can be conducted and capital assets (pumps, motors, pipes, etc.) can be repaired, replaced, or upgraded on time and that there is enough money to pay for it.

Asset management is centered on a framework of five core questions, which provide the foundation for many asset management best practices:

1. What is the current state of my assets?
2. What is my required "sustainable" level of service?
3. Which assets are critical to sustained performance?
4. What are my minimum life-cycle costs?
5. What is my best long-term funding strategy?

Source: [www.epa.gov/sustainable-water-infrastructure/asset-management-water-and-wastewater-utilities](http://www.epa.gov/sustainable-water-infrastructure/asset-management-water-and-wastewater-utilities)

Additionally, the Town has proactively embraced the EPA's Capacity, Management, Operations, and Maintenance (CMOM) Program for municipal wastewater systems. The CMOM program seeks to evaluate and correct excessive I/I in the wastewater collection system through enhanced management practices such as root-control and rehabilitating aged or damaged pipes. Town staff works with homeowners to develop alternative discharge points for roof drains and sump pumps and to remove other inappropriate connections that impact the system's limited capacity.

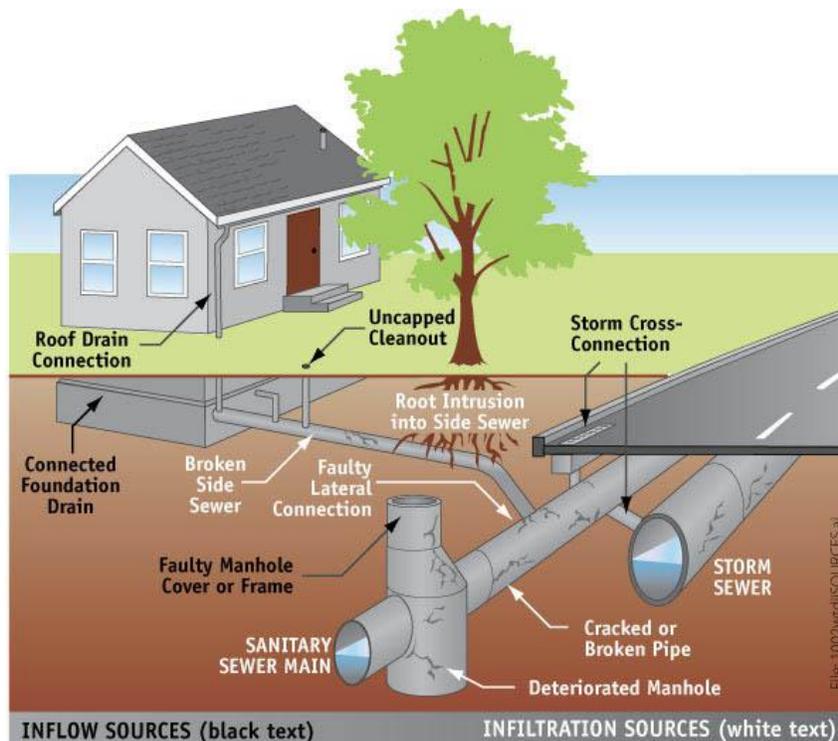


Image Credit: <http://wellington-north.com/government/departments/public-works/water-sewer/inflow-infiltration>  
**Infiltration and Inflow Diagram**

## **Stormwater Management System**

The Town has taken a proactive approach for addressing issues related to stormwater management in order to protect the public health, properties, and downstream waterways from adverse effects that can result from stormwater runoff. To begin addressing these issues, Town council created the Stormwater Management Task Force in 2008 to study, define, and recommend stormwater management programs and practices to resolve and avoid problems, to improve the water quality in Town streams and waterways, and to ensure the health, safety, and welfare of current and future citizens of Blacksburg. *Please refer to the Environment Chapter for additional information on the Town's watersheds, maps, floodplains and MS4 Program Plan.*

The Task Force's final recommendations were made to Council in May 2010. The Task Force recognized the need and opportunity for:

- ❖ Public outreach and education;
- ❖ Modeling of the stormwater infrastructure to facilitate future repair, improvement and expansion;
- ❖ Compliance with the Town's required Municipal Separate Stormwater Sewer System (MS4) Permit;
- ❖ Compliance with required Total Maximum Daily Load (TMDL) on Stroubles Creek and Roanoke River tributaries;
- ❖ Implementation of current and future regulations;
- ❖ District Best Management Practices (BMPs) to facilitate future economic growth in our heavily commercial areas; and
- ❖ Development of "stormwater parks" and regional recreational amenities such as greenways that also manage stormwater volume and quality.

The Stormwater Management Task Force also focused on the financial requirements for the implementation of these stormwater management requirements and opportunities. Further funding research analysis led to a recommendation to adopt a Stormwater Utility Fee. Town Council appointed a Stormwater Stakeholders Advisory Group in August 2012 to continue work on the utility fee as well as to engage and educate the public, further develop the Stormwater Program, recommend spending priorities, and advise Council. The stormwater program would need to continually manage stormwater of the Town in order to improve the health of the waterways and their ecosystems and to provide for additional community amenities.

In January 2014, the Stakeholders Advisory Group completed its work, recommending to Town Council to adopt a Stormwater Utility, with a stormwater fee based upon the amount of impervious surface controlled by landowners. The Stakeholders Group determined that the median impervious area for single family development in Blacksburg was 3300 square feet. This value was recommended to be the unit of billing for the Stormwater Utility, where single residences would all pay a nominal fee for one billing unit. Commercial and non-single family development would pay a charge based upon multiple billing units. The group recommended a delayed January 2015 implementation start date that was approved by Town Council.

The stormwater utility is now in place and multiple stormwater projects are under development with the stormwater utility funding now available. These projects areas are reflective of

Blacksburg's most devastating flooding problems, targeting first areas where residential structures are impacted and areas where water quality measures are needed to help reduce the input of sediment and pollutants into the local water bodies. The funding also provides for proactive maintenance to the existing stormwater system to address the everyday needs of the system, preventing additional stormwater problems from occurring. The funding also aids in the public outreach and education, modeling of the stormwater infrastructure, and compliance with the Town's MS4 and local TMDLs.



**Educational Storm Drain Marker**

## Storm Drain Mural Project

To raise awareness of the water quality impacts of pollution entering our waterways via storm drains the Town of Blacksburg partnered with local artists to install four original murals on selected storm drains in the downtown area.

It is a common misconception that the water that enters a storm drain goes through some type of treatment process. In reality, storm drains are designed to simply direct stormwater away from roads and buildings to prevent hazardous conditions and damage to private property and public infrastructure. This water goes directly underground enabling surface pollution to enter the groundwater. When yard chemicals, automotive fluids, pet waste, sediment, litter, and even natural materials like grass clippings and leaves enter our storm drains they diminish our water quality bit by bit every year. The core message the project wants to convey is "nothing but rain down the drain."



**Storm Drain Mural on Clay Street by Michael St. Germain**

## **Solid Waste Management & Recycling**

Blacksburg is progressive in waste reduction efforts and is environmentally conscious. As part of the Town's Refuse and Recycling Program and its commitment to a sustainable environment, the Town strives to reduce waste and increase recycling.

The Town is a member of Montgomery Regional Solid Waste Authority (MRSWA), which was created in 1994. Member jurisdictions are Blacksburg, Christiansburg, Montgomery County, and Virginia Tech. Through DEQ's Virginia Environmental Excellence Program, MRSWA has an E3 Certification as an Exemplary Environmental Enterprise (E3) community.

Funding for MRSWA is provided solely through tipping fees and recycling revenues. MRSWA is a member of a regional landfill and has constructed a transfer station at the former landfill site. Solid waste is disposed of at the New River Resource Authority in Pulaski County. MRSWA has constructed a regional recycling facility that has recently been converted to accept materials from the New River Valley and beyond, and truck the material to the new single stream processing center in Roanoke. Recycling and Disposal Solutions (RDS) processes the material and sells it to the appropriate markets.

### **Tipping Fee**

The charge levied upon a given quantity of waste received at a waste processing facility. In the case of a landfill, it is generally levied to offset the cost of opening, maintaining, and eventually closing the site.

Efforts to educate the general public about waste reduction and recycling to achieve a higher level of environmental awareness and environmental protection are emphasized in the Town and regionally. Source reduction is the first step, followed by reuse, and then recycling. As part of the Authority, the four jurisdictions now combine their recycling material to be shipped to Roanoke where it is then combined with the recycling materials collected in the Roanoke Valley and beyond. The combined process of collection, sorting, and marketing of recycling products strengthens representation in the recycling industry and enables a much larger volume of materials to be baled.

The Town currently provides curbside recycling for residential customers. Apartment complexes are required by ordinance to provide recycling opportunities similar to those provided curbside and contract privately for these services. In 2011 and again in 2016, the Town revised regulations to proactively promote recycling in residential apartment complexes and increase resident convenience.

The Town provides temporary recycling at major street festivals such as Steppin' Out and is seeking to provide recycling on a daily basis to residents and visitors Downtown. However, providing solid waste collection and recycling for Downtown, especially to businesses, is challenging. The majority of merchants contract privately for refuse and recycling service, and there is no requirement for recycling. Cleaning up alleyways while providing for safe and effective refuse and recycling solutions is a top priority for improving the aesthetic appearance of the area. In conjunction with community partners such as Sustainable Blacksburg and Downtown Blacksburg, Inc., the Town has developed a number of convenient and secure recycling facilities for Downtown businesses. The newest solid waste and recycling site is now

planned for construction in the Church Street parking lot. This site will provide convenient trash and recycling service to an extended Downtown area.

The Town has partnered with the YMCA at Virginia Tech since 2006 to offer a battery, compact fluorescent, and residential electronics re-use and recycling program at the YMCA Thrift Store. For more than a decade, the program has helped ensure that end-of-life electronics are properly recycled and/or disposed of in the landfill.

The Town has an adopted policy to formalize a longstanding internal recycling program within all Town government operated-facilities to reuse or recycle 50% of the solid waste stream. Additionally, Public Works has constructed an inert debris fill site at its facility, which can be used for long-term hauling of construction debris—concrete, pavement and dirt that cannot be recycled. This material would otherwise be hauled to MRSWA and would come at a significant cost to the Town in tipping fees.

## **PRIVATELY PROVIDED UTILITY SERVICES**

All utilities are placed in the street, in rights-of-way, or in public easements held by the Town in trust for the use of the public. These are finite assets that interest multiple users. The value of rights-of-way as a public asset has increased as more utility and communications providers have become interested in serving Blacksburg residents. The Town has an obligation to charge fair compensation for the use and restoration of this asset. The Town also has the duty to manage its rights-of-way and easement assets wisely for the public good. This duty includes, but is not limited to, adopting reasonable regulations for utility separation, the timing and coordination of work in the right-of-way, safety rules and regulations, and preservation of the streets in a condition to best serve the traveling public.

### **Energy Provision and Consumption**

American Electric Power (AEP) Company and Virginia Tech Electric Service (VTES) provide electric service to Blacksburg. Generally, VTES serves the central area of Town, including the Virginia Tech campus, the Corporate Research Center (CRC), the Gables Shopping Center, and several neighborhoods as shown on the following map. The remainder of Town is served by AEP.

Most of the power utility lines within Town are above ground. In new construction, these lines and other utilities are provided underground. Overhead utility lines are more vulnerable to weather events causing service outages. The Town has worked with utility companies to underground lines in the Downtown area. The Town encourages the transition to underground utilities and will continue to work with private utilities for increased safety, increased reliability, and consideration of community character throughout Town.

Atmos Energy currently has a franchise agreement to provide natural gas to customers in most areas of Blacksburg, which is detailed on the following map. Virginia Tech has its own heating system fueled by an onsite coal power plant.

The Town government and residents want reliable and affordable energy, both now and in the future. Existing providers meet the current energy needs for the community. However, there is community interest in renewable energy sources as demonstrated through the Solarize Blacksburg and Solarize Montgomery programs. The Town encourages utility providers to diversify energy options to align with the community's commitment to sustainability.



**Residential Solar Photovoltaic System**

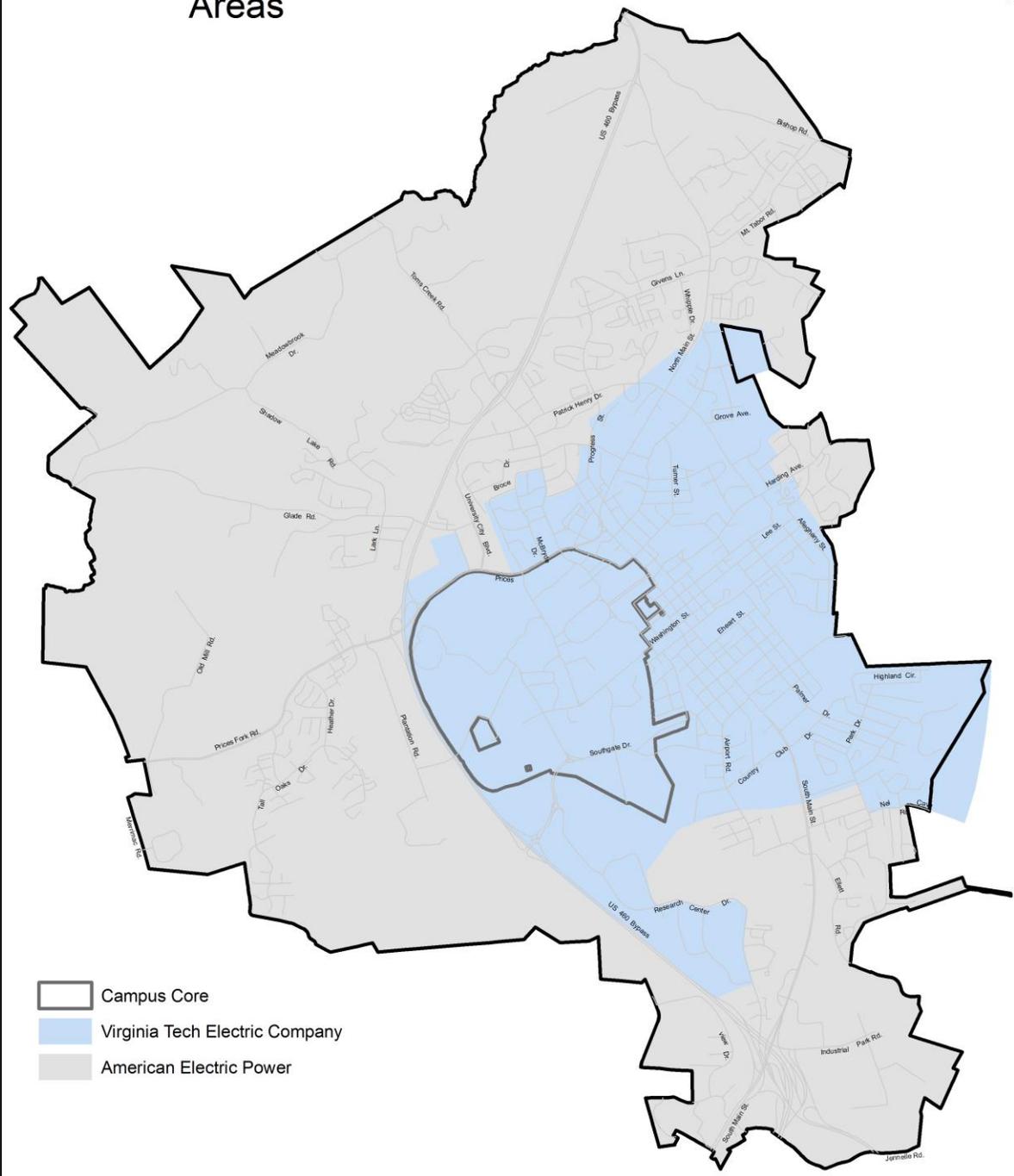
## Solarize Blacksburg

In March of 2014, Blacksburg became the first community in Virginia to launch a **Solarize Initiative**, which resulted in quadruple the amount of residential solar in 6 short months and over one million dollars in local clean energy investment. By the end of 2015, 25 other Virginia communities had followed Blacksburg's lead and launched Solarize initiatives of their own, creating real momentum and demonstrating the enormous amount of untapped consumer demand for clean energy in Virginia. That same year, Blacksburg was awarded the U.S. Conference of Mayors Climate Protection Award for the Solarize Blacksburg initiative.

“**Solarize Initiatives** allow groups of homeowners or businesses to work together to collectively negotiate rates, competitively select an installer, and increase demand through a creative limited-time offer to join the campaign. Ultimately, as the number of residents who participate in the program increase, the cost of the installations will decrease. Additionally, residents benefit from increased political control and are able to make more informed decisions about selecting an installer. Installers also benefit from Solarize by saving on marketing and lead generation costs, therefore reducing the upfront costs of the installations for all involved. Solarize programs simplify solar processes, educate the public, reduce costs, alleviate stress, and promote a strong sense of community.” --Solar Outreach Partnership, US Department of Energy

VTES and AEP own the streetlights within their respective service areas which are then leased to the Town. All of the commercial areas and a number of residential areas within Town have streetlights. Streetlights are required to be installed as new developments are constructed on collector and arterial streets. The addition of streetlights in existing areas can occur through the establishment of lighting districts funded by residents in the area. Streetlighting and other site and security lighting can have negative impacts on the community without regulation. Site lighting is subject to the lighting regulations contained in the Town's Zoning Ordinance. The Town continues to seek ways to balance nighttime visibility and security needs while protecting human health and minimizing disruptions to the natural environment and animal habitats. The Town is supportive of the International Dark Sky Association standards and evaluation of the application of the standards to Town lighting policy is an objective in the *Sustainability Chapter*.

# Electric Utility Service Areas



-  Campus Core
-  Virginia Tech Electric Company
-  American Electric Power

Town of Blacksburg  
Engineering & GIS  
November 15, 2018  
Map is Not to Scale



## **Technology**

Fitting the dynamic nature of technology into the traditional infrastructure planning process is a challenge. Community expectations, both business and residential, are changing and a significantly higher level of service for technology is desired. In particular, broadband infrastructure is a vital utility in the same way as water service or electrical service.

Demonstrating this community interest, 1 in 5 respondents selected improved access to broadband as a goal over the next 10 years in the Comprehensive Plan Survey. Providing the level of service to meet these expectations will only happen through a collaborative public/private effort. At one time, Blacksburg was a technology leader, especially for a town of its size, with the creation of the Blacksburg Electronic Village. Technology has changed and service in the community has not kept pace. Community technology needs are constantly growing as technology is increasingly incorporated into more and more aspects of daily life. Technology service levels should be consistently high regardless of location within Town.

As technology changes, private providers can find themselves at odds with local governments with how and where to build technology infrastructure. There have been successful federal and state legislative efforts to remove local governmental authority from some types of technology infrastructure installations, such as small-cell antennas. The Town and private technology providers need to work cooperatively to provide adequate access to technology infrastructure throughout Town. Often, what is referred to as the last-mile component of the infrastructure is the most difficult to provide. *Please refer to the Economy and Employment Chapter for additional information.*

## Wireless Facility Location Coordination

The increased use of wireless technology requires the construction of many new wireless facilities throughout the Town and in adjacent areas in Montgomery County. Telecommunications towers are difficult to locate, often creating conflicts between citizens and wireless providers; however, the services and technology access provided via the wireless facilities are important to the future of the Town and are discussed further in the *Economy & Employment Chapter*, with siting location factors detailed below.

To help mitigate the impact of wireless facilities, the Town encourages companies to develop new and innovative ways to provide these wireless services by constructing low-impact facilities. These facilities should seek out every opportunity to co-locate on existing structures. These locations may be public structures such as water tanks, light or power poles, or private buildings and structures. These facilities should be inconspicuous in nature, so that citizens are not able to reasonably differentiate between an existing structure and the facilities integrated into them. Other options for placement include within flagpoles and church steeples or fake trees.

Some wireless facilities are utilized solely for public use, promoting the health, welfare, and safety of the general public. If a wireless facility is proposed for public use, due consideration should be given to this factor that is balanced with the Town's desire for construction of low-impact facilities. Every effort should be made to first co-locate public facilities on existing public or private facilities.

In conjunction with Montgomery County and other New River Valley localities, a regional approach to telecommunication and broadcasting facilities has been developed. This regional approach was initiated by Montgomery County to help local governments address the increasing demand for wireless facilities and their associated towers. The key items that are addressed in this regional approach and further defined below are:

1. Uniform definition and approach to **co-location**;
  2. Uniform and consistent **notification** procedures;
  3. Uniform approach to **siting** of new towers;
  4. Uniform **mapping** of tower sites; and
  5. Consistent use of **consultants** to assist jurisdictions in review of requests.
1. **Co-location** refers to the siting of new antennas, dishes, etc. on existing structures. This allows for the best use of existing structures and sites that can eliminate the need for construction of a new tower in an inappropriate area. Potential sites that provide co-location possibilities include, but are not limited to, the following:
- Existing telecommunication or broadcasting towers
  - Buildings
  - Water tanks and other public facilities
  - Electric transmission towers
  - Signs
  - Parks and ball field lights
  - Industrial parks

2. **Notification** of intent to construct a telecommunication or broadcasting facility refers to the written notification required for public hearings pursuant to § 15.2-2204 of the Virginia Code. In addition, the counties of Montgomery and Pulaski, City of Radford, and Towns of Blacksburg and Christiansburg have agreed to provide written notification to the Planning Commissions of each jurisdiction upon receipt of a request for a new communication tower to allow for review and input from neighboring jurisdictions. Comments received from each jurisdiction will be considered by the jurisdiction having authority over the request during the public hearing process.
3. **Siting** of new telecommunication or broadcasting towers in a jurisdiction should be reviewed for its potential effects on surrounding jurisdictions as well as the jurisdiction in which the structure is to be located. Newly constructed towers should be built in locations that will provide the least negative impact to the citizens of each jurisdiction. The Town of Blacksburg encourages the use of "stealth towers" for new sites that require new construction or "new builds." The following locations are listed from most to least preferable when considering the siting of a telecommunication or broadcasting tower:
  1. Property zoned Industrial, Research and Development, or University
  2. Property zoned General Commercial
  3. Property zoned Downtown Commercial
  4. Property zoned primarily for high density residential uses
  5. Property zoned primarily for low density residential uses
  6. Agricultural, Conservation, or Ridgeline areas
4. **Regional Map** - Each jurisdiction has agreed to contribute information necessary to compile a regional map showing all tower/antenna sites and providers using those sites within each jurisdiction. Thus, each jurisdiction will be able to access current information on tower location to better assess the possibilities for alternative sites. This map may also include all government-owned property that may be available for co-location opportunities.
5. **Consultants** may be used from time to time by the jurisdictions to evaluate the possible alternatives and potential impacts of the request on the jurisdiction and the surrounding areas. Wherever possible, the jurisdictions will share resources and collaborate on the request to provide the most beneficial and economically feasible use of a consultant.

## **UTILITIES**

### **Objectives and Policies**

#### **Public Water System**

- U.1. Provide an adequate and reliable water distribution system throughout the Town that meets Town water specifications and standards that strive to limit water loss. This includes construction of new facilities plus maintenance and upgrades of existing facilities.
- U.2. Extend waterlines and upgrade all properties to provide fire protection service, ensuring waterlines are extended and fire hydrants are installed as part of any new development projects that occur in areas of Town not currently served by public water.
  - U.2.1 Ensure that fire hydrants are installed within all existing developments in accordance with Town Code.
- U.3. Ensure the public water system provides adequate water storage facilities to serve Town residents.
  - U.3.1 Maintain water storage supply equal to 48 hours of service to all areas within the Town and its service area.
- U.4. Provide distribution and supply system redundancy.
  - U.4.1 Coordinate with the Water Authority to construct a new transmission main from the treatment plant to the west end of Town along Prices Fork Road.
  - U.4.2 Investigate construction of a new pump station to provide a second feed between the high-elevation system and the low-elevation system.
- U.5. Ensure that all residents within Town limits are served by public utility services that provide adequate and reliable water and wastewater services. Areas outside the corporate limits will not be eligible for Town provided utility services unless a boundary line adjustment is requested and approved and the property becomes a part of the Town prior to services being provided.
- U.6. Require new developments to utilize pipe design and construction of the water system in accordance with Town Code and development standards.
- U.7. Plan regionally with local jurisdictions and authorities for public water needs, infrastructure, and utility extensions across jurisdictions.
  - U.7.1 Work cooperatively with other jurisdictions in the New River Valley to promote water conservation and to supply clean water to residents in the region without degrading the quality or quantity of the Town's water supply.
  - U.7.2 Continue to participate in the New River Valley Regional Water Authority on drinking water issues.
- U.8. Encourage water reuse, including collection and reuse of stormwater and reuse of graywater.

## **Public Wastewater System**

- U.9. Provide a resilient, sustainable and cost-effective public wastewater service that is in conformance with all state and federal regulations.
  - U.9.1 Decrease the amount of inflow and infiltration (I/I) within the system before peak flows exceed pipe capacity.
  - U.9.2 Employ renewable engineering strategies, such as refurbishment, to extend the life of existing wastewater assets.
  - U.9.3 Encourage industrial process water recycling to reduce wastewater volumes and treatment demand.
  - U.9.4 Document existing environmental and ecological conditions prior to the construction of any wastewater system to provide baseline ecological information on any potentially affected creek.
  - U.9.5 Advocate for policies to encourage safe wastewater reuse.
  
- U.10. Continue an ongoing inspection and maintenance program as identified in the CMOM Program for the existing public wastewater system.
  - U.10.1 Use Capital Improvement Program funds to upgrade and replace existing wastewater lines to reduce I/I.
  - U.10.2 Maintain a cleaning and root-cutting program to prevent stoppages.
  - U.10.3 Reduce I/I by disconnecting sump pumps and roof drain spouts from wastewater collection lines and utilizing other best management practices.
  - U.10.4 Explore the feasibility of establishing a program to require inspection of roof drains and sump pumps at the time of real estate property transfers.
  
- U.11. Plan regionally with other local jurisdictions and authorities for public wastewater needs, infrastructure, and utility extensions across jurisdictions. Participate with the Sanitation Authority to evaluate the region's rate of development and project treatment facility upgrade needs.
  
- U.12. Utilize educational campaigns to raise public awareness to help reduce maintenance issues and blockages (e.g. baby wipes, grease, etc.) and ensure waste not suitable for the wastewater treatment plant are disposed of properly (e.g. pharmaceuticals, hazardous waste, etc.).

## **Stormwater Management System**

- U.13. Maintain the Stormwater Program which engages in public outreach and education.
  
- U.14. Continue modeling of the stormwater infrastructure to better address unknown discharges and to effectively plan for future upgrades.
  
- U.15. Continue to support the maintenance of all public and private stormwater management facilities to ensure designed water quality and quantity benefits are achieved.
  
- U.16. Maintain compliance with the Town's Municipal Separate Stormwater Sewer System (MS4) Permit.

- U.17. Continue to meet requirements of the required Total Maximum Daily Load (TMDL) on Stroubles Creek and Roanoke River tributaries.
- U.18. Continue implementation of the Virginia Stormwater Management Permit program.
- U.19. Support the installation of regional Best Management Practices (BMPs) to facilitate future economic growth in our heavily commercial areas.
- U.20. Continue the development of “stormwater parks” and regional recreational amenities such as greenways that also manage stormwater volume and quality.
- U.21. As a part of local or regional climate vulnerability and resiliency planning, assess the capacity of stormwater infrastructure to manage anticipated increases in intensity or frequency of precipitation events. Ensure future infrastructure design and upgrades are built with anticipated climate models as a guide.

### **Solid Waste Management & Recycling**

- U.22. Promote and expand waste reduction, reuse, and recycling locally and regionally by citizens, government and private businesses.
- U.23. Develop a comprehensive Environmentally Preferable Purchasing Policy for all Town government operations to encourage purchase of less toxic, more environmentally friendly items, for example, reduced packaging that contains recycled materials that can be reused locally.
- U.24. Continue to develop and promote long-term waste management and disposal strategies that explore alternatives to landfilling, including food composting and yard debris recycling.
- U.25. As regional waste collection practices become more uniform, contract regionally for collection services to increase cost effectiveness.
- U.26. As technology allows, consider development of a pay-as-you-throw program for refuse disposal whereby fees are based upon the amount of waste generated.
- U.27. Explore feasibility of a joint composting facility with Virginia Tech for municipal brush and leaves, dining hall organics and agriculture.
- U.28. Explore the feasibility of commercial composting.

### **Energy Provision & Consumption**

- U.29. Support the development and maintenance of a highly reliable, efficient, and environmentally sound electrical infrastructure.
- U.30. Regarding underground utilities:
  - U.30.1 Require that new installations of utilities in developments be constructed underground.
  - U.30.2 Emphasize conversion to underground utilities during all franchise negotiations

and encourage Virginia Tech Electric Service and American Electric Power Company to convert overhead lines to underground on a continual basis.

- U.30.3 Convert utility lines to underground service in Town road improvement projects and lay conduit in all Town projects in the right-of-way to provide for future utility relocations.
- U.31. Adopt or maintain reasonable regulations for utility separation, timing and coordination of work in the right-of-way, safety rules and regulations, and preservation of the streets in a condition to best serve the traveling public.
- U.32. Encourage all utility franchisees to implement and maintain Best Available Technology (BAT) practices and infrastructure.
- U.33. During all utility franchise negotiations, include a requirement that all utility companies report service disruptions on an annual basis to the Town of Blacksburg.
- U.34. Work with electrical and natural gas utilities to plan for and implement a transition to a low-carbon energy future by 2050.
- U.35. Support programs for public and private entities to become more energy efficient and utilize renewable energy sources such as solar, wind, or other decentralized technologies.
  - U35.1 Promote the use of Demand Side Management (DSM) to reduce energy use through efficiency improvement devices and peak load reduction strategies.
  - U.35.2 Review and amend the Zoning Ordinance to incorporate clear standards for renewable energy.
  - U.35.3 Pursue a solar-friendly community designation.
- U.36. Coordinate with Virginia Tech Electric Service and American Electric Power Company to ensure a reliable electrical power supply to all areas of the Town and encourage planning and cost-share projects between the Town and utility companies.
- U.37. Provide cost-effective, energy-efficient street lighting in Town and on the Virginia Tech campus and VDOT-maintained roads that is appropriate to the use and character of the area and that considers with International Dark Sky Association standards.
- U.38. Accept alternate street lighting within neighborhoods that is appropriate to the character of the area, available through the electric utility, and where any excess cost is paid by the neighborhood residents or commercial property owners.
- U.39. Support the development and expansion of natural gas service that is reliable, cost effective, properly maintained, and responsive to customer needs. Require the best available safety measures and practices in franchise negotiations and encourage the expansion of natural gas service to new developments in a manner that accommodates anticipated commercial and industrial growth.
- U.40. Support state-wide legislative initiatives to make renewable energy more available and affordable for consumers.

## **Technology**

- U.41. Establish and maintain a vision of and goals for the Town's globally competitive telecommunications infrastructure and technology-related services.
- U.42. Establish public and private partnerships to undertake projects connecting any major public or private facility with fiber optic services.
- U.43. Apply infrastructure and applications to make the municipal workplace and technology services more reliable, faster, and more secure in a manner that is fiscally responsible.
- U.44. Regularly assess the Town's technology infrastructure and applications, monitor performance of infrastructure and services, and adjust activities as necessary.
- U.45. Continue the transition toward paperless communications for all Town of Blacksburg processes, including website upgrades to implement the latest technology advances for on-line registration, payment and tracking of applications for all Town services and programs.
- U.46. Pursue technology initiatives to provide additional access to Town and County services, including an upgrade for online virtual Town Hall meetings and additional meeting space designed for digital recording.
- U.47. Adopt policies that reduce the lifecycle environmental impacts of electronics.

## **Wireless Facilities**

- U.48. Continue to implement the regional approach to siting wireless facilities. Encourage Virginia Tech to carefully consider the placement of wireless facilities on-campus and at the Corporate Research Center.