Chapter 4

Infrastructure

Build high-quality, well connected, and resilient infrastructure.

Danville aspires to provide resilient, well-connected, and high-quality infrastructure to support the evolving needs of the community. Resilient infrastructure ensures long-term stability for a high-quality living experience for residents and visitors while also remaining functional and adaptable in the face of challenges, ultimately contributing to the overall well-being of the community.

PLAN Danville

Infrastructure Policies

IN.1: EFFICIENT & AFFORDABLE ENERGY

ADOPT, IMPLEMENT, AND PROMOTE ENERGY EFFICIENT POLICIES THAT REDUCE CARBON EMISSIONS, CONSERVE RESOURCES, SUPPORT THE DANVILLE ENVIRONMENTAL STEWARDSHIP PLAN, AND PROMOTE SUSTAINABLE PRACTICES CITYWIDE.

IN.1.1 Resilient Power Systems
Develop resilient power systems designed for both current and future needs to decrease Danville's greenhouse gas emissions.

IN.1.2 Energy Efficient Homes
Encourage home weatherization and energy efficient upgrades for renters and homeowners across the city.

IN.1.3 Commercial Energy Optimization
Provide programming for businesses to reduce operational energy demands.

IN.2: QUALITY WATER SYSTEMS

ENHANCE WATER INFRASTRUCTURE ACROSS THE CITY TO HELP HOMES AND BUSINESSES USE WATER MORE EFFICIENTLY.

IN.2.1 Water Efficiency & Conservation
Develop a water efficient community by decreasing the amount of water used per home, business, and industry.

IN.2.2 Adaptable Stormwater Systems
Educate residents and promote practices to fortify Danville's homes and businesses against flooding.

IN.2.3 Modernized Water Distribution
Enhance existing physical infrastructure for better water management and operations.

IN.3: ENHANCED TELECOMMUNICATION

CREATE A PLAN FOR BETTER COMMUNICATIONS BOTH EVERY DAY AND DURING EMERGENCIES, WHICH WILL HELP EMERGENCY RESPONDERS REACT QUICKLY AND KEEP THE PUBLIC SAFE.

IN.3.1 Equitable Emergency Communication
Utilize multiple communication platforms to relay emergency information to residents across the city.

IN.3.2 Expanded Internet Coverage
Expand Internet coverage to ensure residents have access to fast and reliable Internet services

IN.3.3 Digital Literacy Improvements
Encourage and support increased digital literacy for all residents.

IN.3.4 Enhanced Communications Management
Improve communication outlets between community members and city staff.

PLAN Danville

IN.4: **WASTE MANAGEMENT**
OPTIMIZE WASTE DIVERSION, MINIMIZE LANDFILL USAGE, AND PROMOTE RECYCLING AND COMPOSTING TO MINIMIZE ENVIRONMENTAL AND HEALTH IMPACTS.

IN.4.1 **Enhance Recycling Participation Rates**
Improve recycling collection rates by increasing participation in curbside recycling programs.

IN.4.2 **Improve Waste Education**
Provide programming for recycling, compost, and food waste reduction practices.

IN.5: **COMMUNITY HEALTH & EMERGENCY PREPAREDNESS**
INVEST IN HEALTHCARE INFRASTRUCTURE TO PROMOTE COMMUNITY HEALTH AND EXPAND ACCESS TO HEALTHCARE SERVICES.

IN.5.1 **Public Safety**
Continue to work with public safety providers to maintain community trust and provide high quality and prompt delivery of services.

PLAN Danville

> ## "Strong infrastructure is the foundation of our city. The better these systems, the better the quality of life is for our community.
>
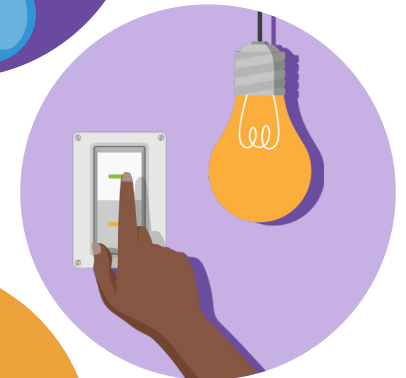> *- 2023 PLAN Danville Infrastructure Roundtable*

Infrastructure

Adaptable, reliable, and enduring infrastructure is essential to move Danville towards its vision for the future. High-quality infrastructure allows cities and neighborhoods to operate at their most optimal level. Infrastructure refers to the physical, social, and economic systems that support important functions in our communities.

To provide Danville with the necessary tools to implement more resilient infrastructure, the comprehensive plan focuses on implementing policies and recommendations that address the following core infrastructure concerns:

- Drinking water, irrigation, sewage, and stormwater systems;
- Electricity infrastructure and external lighting, including substations, cables and conduits that distribute power to homes and businesses;
- Emergency communications and equitable access to phone and internet services; and
- Waste management that reduces the amount of refuse sent to the landfills.

Implementing more resilient infrastructure throughout Danville will provide the city with the necessary framework to handle unforeseen events. Improving infrastructure will also provide efficient utility systems that enable healthy living environments. This means providing buildings, homes, and open spaces with sufficient supply of quality energy and water, effective communications, and streamlined waste management. It is important for these networks to provide flexibility for residents now and to help transition Danville towards a more sustainable future.

Goal 4. Infrastructure
Introduction

> ❝ Resiliency is the ability to continue operations. To bounce back. To accept defeat and rebound. It's the can-do attitude. ❞
>
> – *2024 Resiliency Self Assessment Survey*

Infrastructure Resilience

Like many other cities across the country, Danville has experienced some significant disruptions to essential infrastructure systems. Unprecedented weather events (e.g., storms, power outages, flooding) and enduring public health emergencies such as COVID have exerted lasting impacts on the economy and environment in Danville. Additionally, Danville has some noteworthy land features, including significant topography and the Dan River, which bisects the city. Investments in resilient infrastructure systems are critical to providing Danville with the ability to support community needs and provide critical services even in the event of disruption.

The increased frequency of these disruptive events has prompted a greater since of urgency to upgrade existing infrastructure systems to better respond to these new extremes.

Infrastructure resilience usually means two things:

- New and existing infrastructure systems are designed and upgraded for long-term sustainability that helps shift the city toward a more efficient system.

- Infrastructure systems are adaptable enough to function as short-term solutions to unanticipated disruptions.

There are four different types of infrastructure: hard, green, soft, and natural infrastructure.

Types of Infrastructure

Hard Infrastructure

The **physical** components of a city that are used to support daily life and activity.

- Streets and Roads
- Highways
- Sidewalks
- Transit Systems
- Energy Distribution Network
- Water Systems
- Waste Management
- IT Systems

Green Infrastructure

A variety of best practices that utilize **organic** and **non-organic** materials to mimic natural ecological systems to manage stormwater runoff. These strategies can be used to support community resilience and sustainability.

- Bioretention
- Street Trees
- Rain Barrels
- Cisterns
- Bio-swales
- Rain Gardens
- Biofiltration

Soft Infrastructure

All services required to maintain economic, health, culture, and social standards that include both **physical assets** *(i.e. hospitals, government buildings, schools, rec centers)* and **non-physical assets** *(i.e. governance, communication, law enforcement)*.

- Social Connection
- Education Systems
- Health Care Systems and Facilities
- Telecommunications
- Financial Institutions
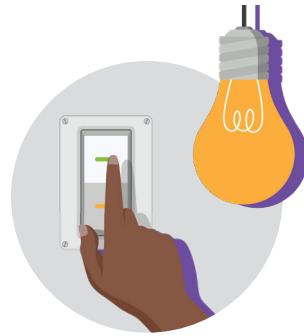- Emergency Services

Natural Infrastructure

Naturally occurring landscape features that support local **ecology** *(i.e. Dan River)*.

- Rivers and Floodplains
- Forest
- Wildlife Habitat
- Topography

Goal 4. Infrastructure
Introduction

Aligning with Public Feedback

High-quality infrastructure has the ability to enhance quality of life for residents, while inadequate infrastructure has a negative effect on the community's ability to meet residents' basic needs. Infrastructure is an issue the cuts across four of the themes the Danville community identified with during public engagement: Infrastructure and Accessibility, Community Engagement and Collaboration, and Economic Development and Opportunity. The community identified infrastructure maintenance and cost of services such as water and electricity as significant challenges related to flooding and related hazards from extreme weather.

IN.1 Efficient & Affordable Energy

Similar to water efficiency, residents shared that electricity cost represents a significant proportion of their utility bills, especially during the summer months when air conditioning costs tend to spike. Further, residents expressed concerns regarding neglected housing stock in need of rehabilitation.

An emphasis on household energy efficiency can address resident concerns regarding utility bills while also allowing homeowners and landlords to re-invest in the livability of their properties. While residents and businesses do their part, the city seeks to reduce emissions by focusing on renewable energy sources, promoting advisors and other educational resources, and ensuring the power grid can withstand major weather events.
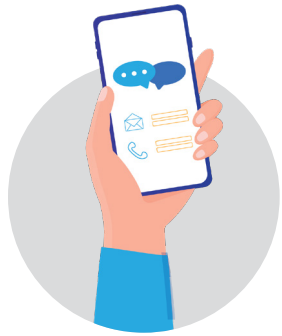

IN.2 Quality Water Systems

Danville residents consistently identified a financial burden related to utility expenses. Improved water efficiency within the community has the potential to reduce this burden. While water conservation within Danville's households can immediately reduce cost by using less water, community-wide initiatives like auditing the city's system to address leaks and inefficiencies can reduce costs system-wide.

Educational efforts related to water efficiency also present opportunities for youth engagement in creation of campaigns and outreach strategies, as well as basic training on installation of water conservation systems like low-flow shower heads and faucet aerators.

Goal 4. Infrastructure
Aligning with Public Feedback

IN.3 Enhanced Telecommunication

Danville residents expressed frustration with a lack of access to economic opportunity and inadequate communication from city officials. Expanded cellular networks will ensure that all residents can access phone and internet services, while new strategies for emergency communication, digital literacy training opportunities, and enhanced communication management by the City of Danville will ensure that residents can take advantage of the new communications options that are available to them.

IN.4 Waste Management

There is strong interest among residents of Danville in more holistic living that reduces the environmental impact of daily activities while also improving overall individual and public health. A waste management system and approach that prioritizes recycling and reuse strategies supports this effort by reducing the amount of refuse that ultimately finds its way into landfills.

Educational opportunities and outreach related to waste management and recycling have historically been extremely popular among youth and present another opportunity for actively engaging youth in activities that contribute to community beautification, resiliency, and sustainability.

IN.5 Community Health & Emergency Preparedness

The prevalence of criminal activity in some neighborhoods and concerns about safety were among the most common concerns raised by residents. This policy addresses these concerns by expanding efforts by first responders to create partnerships between neighborhood residents and public safety officials. Many communities have found success actively engaging youth of all ages in this effort as well, providing a positive outlet while creating new opportunities to engage with public safety officials and contribute toward crime reduction and public safety activities.

Goal 4. Infrastructure
Aligning with Public Feedback

IN.1
Efficient & Affordable Energy

Adopt, implement, and promote energy efficient policies that reduce carbon emissions, conserve resources, support the Danville Environmental Stewardship Plan, and promote sustainable practices citywide.

Energy systems refer to both the energy supply-side sources that generate and supply power from the utility to residents and businesses, as well as the energy demand consumed in heating, cooling, and electricity in all buildings. Keeping energy systems up and running following a disruption is integral to everyday life by

- providing power for heating and cooling systems that keep us warm in the winter and cool in the summer;

- keeping food from spoiling by providing power to refrigeration units;

- running sump pumps so basements do not get flooded in heavy rain events;

- powering critical services and life saving devices like ventilators and defibrillators; and

- keeping lights and computers on so businesses can stay open and workers can continue to do their jobs.

This section addresses how the community can adopt energy efficiency measures to help avoid outages and interruptions to their energy supply, reduce energy demand, reduce energy consumer costs, decrease environmental impact.

Goal 4. Infrastructure
Policy IN.1 Efficient & Affordable Energy

Danville's greenhouse gas emissions are primarily produced by the transportation, residential, and commercial energy sectors.
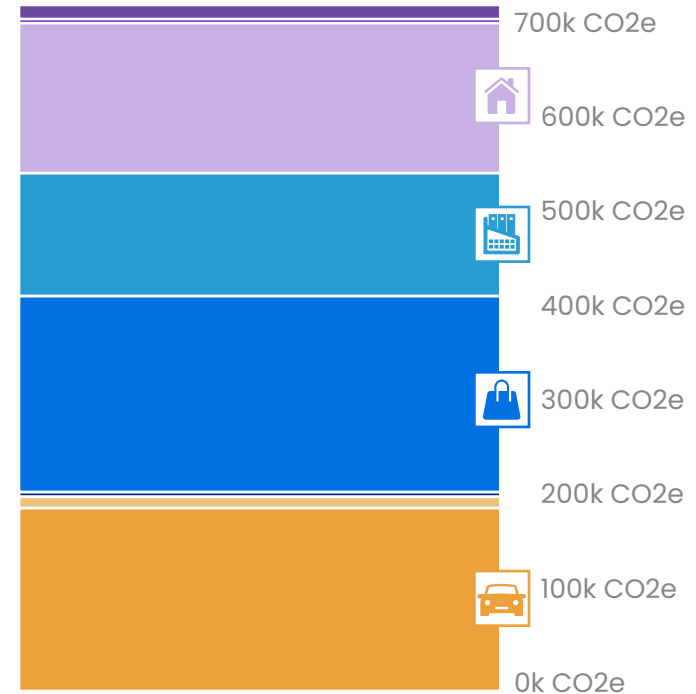
A greenhouse gas (GHG) emissions inventory was completed by George Mason University in early 2022. Findings from this report revealed that Danville produced over 650K metric tons of CO_2e over the reporting year; this inventory included transportation sources, solid waste, water and wastewater, commercial, residential, and industrial energy, process and fugitive emissions, and upstream activity. The greatest impact came from the transportation and commercial energy sectors, followed by residential energy.

What does this mean?

Driving progress toward decarbonization is an important part of Danville's future. Fortunately, this can be achieved by moving away from fossil fuels like natural gas and supporting the electrification of industrial and commercial facilities, improving access to renewable energy resources, improving walkability by funding the expansion of trail and sidewalk networks to reduce emissions from vehicle tailpipes, and enhancing carbon storage and capture through the conservation of greenspace and wetlands.

Danville Emissions by Type

Source: 2022 George Mason University Greenhouse Gas Inventory Memo

700k CO2e
600k CO2e
500k CO2e
400k CO2e
300k CO2e
200k CO2e
100k CO2e
0k CO2e

■ Upstream Impacts of Activities
■ Process & Fugitive Emissions
■ Residential Energy
■ Industrial Energy
■ Commercial Energy
■ Water & Wastewater
■ Solid Waste
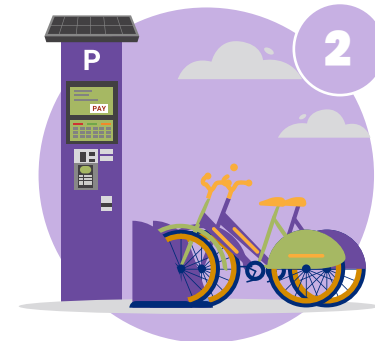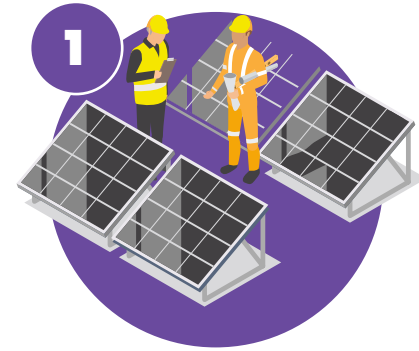■ Transportation & Mobile Sources

Danville taking steps to reduce carbon emissions.

University Collaboration on Decarbonization

George Mason University (GMU) is working with local governments throughout Virginia to conserve energy, save money, and enhance Virginia's resiliency for all. GMU will assist the Danville in three core areas: model greenhouse gas emissions and risk factors for the community; develop energy and resiliency action plan; and assist with implementing actions. In 2024, they completed the Danville Environmental Stewardship Plan.

In the meantime, Danville has already taken actions to reduce emissions including

1. Diversifying energy sources to focus more on solar and renewable resources, such as converting all streelights to LED

2. Reducing transportation related emissions by encouraging carpooling and transit

3. Allowing conservation easements which preserve dense tree canopy areas that serve as carbon sinks

The age of housing stock contributes to higher energy bills, despite supply costs being affordable.

When PLAN Danville engagement was being conducted, several citizens reported high energy bills. Research showed the cost of the energy supplied by the city is cost-competitive, so this high cost would likely be related to ineffecient households using large amounts of energy. It is important to increase energy efficiency. Danville Utilities has assisted homeowners in several ways to upgrade their houses' energy efficiency, and therefore, decrease their total energy consumption; however, many of these programs have been historically underutilized.

At the same time, rental properties are not consistently maintained to high standards, leading to poor housing quality; as such, energy efficiency is often overlooked, resulting in higher utility costs for renters who have little control over the energy efficiency of their homes.

Despite available programs to assist with energy upgrades, there is a gap in landlord participation due to perceived cost implications.

What does this mean?

Danville's aging housing stock and the reported costs of energy bills compared to the average kilowatt-per-hour cost highlight the need for home upgrades. Those who do not regularly visit Danville's website or who are not digitally savvy may have difficulties finding information about how to improve their household energy efficiency.

Source: U.S. Energy Information Administration

Danville has programs to enhance housing and reduce energy bills.

Rental Housing Inspection Program

Danville's Rental Housing Inspection Program helps promote health and safety for residents living in rental housing by requiring that landlords maintain certain minimum standards for their rental properties. Inspections are carried out on new rental properties to determine if any codes are in violation. Violations must be completed within 30 days of notice and re-inspection is carried out every 30 days until corrections are complete.

Time-of-Use Rates Program

Danville Utilities has a Time-of-Use Program that offers lower rates for customers using energy during off-peak hours, saving over $0.05 per kWh. This can be more broadly promoted to help residents understand how to make behavioral changes that reduce their energy bills.

Residential Energy Efficiency Program

Home$ave was a program offered by Danville Utilities that helped residents access home upgrades like insultation, EnergyStar rated HVAC units and windows, smart thermostats, and electric vehicle chargers by offering rebates to its customers.

The initiative was recognized with a bronze medal award for its efforts in improving Viriginia's environment at the 2024 Governor's Environmental Excellence Awards. The rebate program has resulted in a total reduction of 9.5 million kilowatt-hours of energy use since its inception in 2014, the equivalent of 850 homes annual energy use.

While the initiative was removed in 2024 due to new energy efficiency standards, the City of Danville has maintained HVAC repairs and hired an energy advisor to provide services including answering customer questions, performing energy audits, and providing educational seminars.

Source: Danville NewsFlash

See more about Danville's actions to support housing in Chapter 5. Housing.

Commercial energy users are the biggest energy consumers in Danville. Becoming clean energy producers can help all of Danville to transition its energy grid.

Commercial buildings consume a lot of energy due to the size of the buildings, larger equipment and business conducted. Commercial real estate represents almost one third of Danville's energy consumption. Considering energy supply, costs and emissions are all interrelated; the more efficient businesses are, the fewer emissions, and the greater the chances of the city reducing its energy costs. Decreased energy usage not only lowers operational expenses but significantly reduces carbon emissions, contributing to a healthier environment and mitigating climate change.

Source: 2022 George Mason University Greenhouse Gas Inventory Memo

What does this mean?

Reducing energy usage in commercial buildings is important for reducing environmental impact in Danville. As of 2024 there are currently federal and state-level programs that are available through Build Back Better, including grants and tax incentives. Implementing rooftop solar, energy audits, ensuring efficient HVAC systems are in place, and even making sure buildings have sufficient back-up power can help to showcase how technologies, policies, and behavioral reductions can all come together for carbon reductions.

Goal 4. Infrastructure
Policy IN.1 Efficient & Affordable Energy

Danville is diversifying the energy grid.

Commercial Energy Efficiency Program

Danville Utilities has an energy advisor that works directly with commercial and industrial customers, encouraging energy efficiency through auditing services, education and more for their energy needs.

Demand Response Program

Danville participates in a demand response program, CPower, hosted by regional transmission organization PJM. This program rewards businesses for reducing their energy demand during times of stress on the PJM grid. The city has also participated in this program, earning revenue to help fund future projects.

Battery Storage Facility

A pilot energy storage facility began operating in October of 2022. This facility is expected to store 10.5MW, helping to reduce the amount of energy demand of the grid during peak hours and provide emergency power for critical services during severe weather events.

Solar Projects

Danville has several large-scale solar projects, including the Irish Road, Whitmell, and Kentuck Solar Farms. These three farms generate an estimated 20 MW. According to Danville Utilities, this investment has increased the renewable energy percentage of Danville's energy mix from 16% to 21%.

Source: Danville NewsFlash

Goal 4. Infrastructure
Policy IN.1 Efficient & Affordable Energy

RECOMMENDATION

IN.1.1
Resilient Power Systems

Develop resilient power systems designed for both current and future needs to decrease Danville's greenhouse gas emissions.

ACTIONS

1. Implement the Danville adaptation recommendations as outlined in the 2024 Environmental Stewardship Plan.

2. Work to transition power supplies to be more reliant on carbon-free electricity.

3. Continue to collect data and model greenhouse gas emissions to track changes over time.

4. Transition the public service vehicle fleet to be majority-electric by 2035.

5. Streamline permitting and funding assistance application processes for rooftop solar installations.

6. Identify and work with local electricians and clean energy experts to help create educational programs with George Mason University.

7. Ensure all streetlights and lighting in publicly owned parking lots and parks are converted to LED.

8. Transition to an energy efficient building standard for all publicly owned assets including police and fire stations, public schools' libraries and recreation centers.

> **Danville hopes to reduce our community's greenhouse gas emissions 50 percent by 2030 and reach carbon neutrality by 2050.**
>
> *- 2024 Danville Environmental Stewardship Plan*

Goal 4. Infrastructure
Policy IN.1 Efficient & Affordable Energy

RECOMMENDATION

IN.1.2
Energy Efficient Homes

Encourage home weatherization and energy efficient upgrades for renters and homeowners across the city.

ACTIONS

1. Continue to assess energy distribution networks to ensure circuits can handle existing and future demand as part of development review.

2. Encourage homeowners to adopt energy-efficient measures and weatherization techniques, aiming to reduce citywide energy consumption and increase resilience to extreme weather events.

3. Pursue funding for incentive programs to encourage residential energy efficiency.

4. Coordinate with Pittsylvania County Community Action Agency to target neighborhoods with weatherization needs.

5. Launch a public awareness campaign highlighting the benefits of home weatherization and energy efficiency.

6. Create an educational program on the dangers of space heaters, and their impacts on energy bills.

7. Create an educational program on incentives and rebates available for home energy equipment upgrades.

8. Encourage residents to transition from natural gas to electric appliances.

9. Implement stricter transparency requirements for landlords, making it mandatory to report the model and date of installation of windows, HVAC, and appliances.
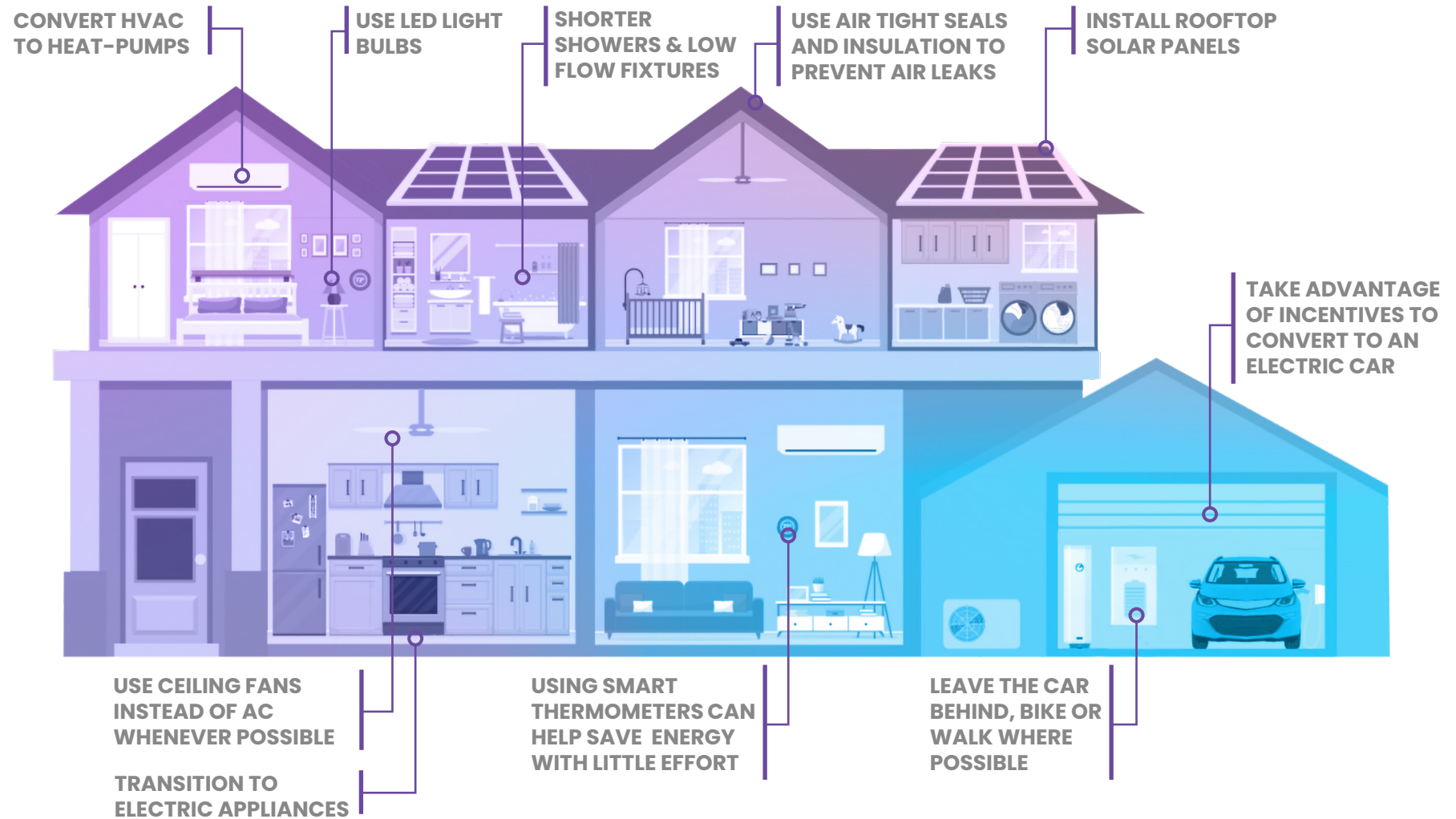
TOOLS

How to Reduce Residential Resource Consumption
Source: Adapted from Todd Trumbull, The San Francisco Chronicle

CONVERT HVAC TO HEAT-PUMPS

USE LED LIGHT BULBS

SHORTER SHOWERS & LOW FLOW FIXTURES

USE AIR TIGHT SEALS AND INSULATION TO PREVENT AIR LEAKS

INSTALL ROOFTOP SOLAR PANELS

TAKE ADVANTAGE OF INCENTIVES TO CONVERT TO AN ELECTRIC CAR

USE CEILING FANS INSTEAD OF AC WHENEVER POSSIBLE

USING SMART THERMOMETERS CAN HELP SAVE ENERGY WITH LITTLE EFFORT

LEAVE THE CAR BEHIND, BIKE OR WALK WHERE POSSIBLE

TRANSITION TO ELECTRIC APPLIANCES

Goal 4. Infrastructure
Policy IN.1 Efficient & Affordable Energy

RECOMMENDATION

IN.1.3
Commercial Energy Optimization

Provide programming for businesses to reduce operational energy demands.

ACTIONS

1. Work with public universities to provide energy audits and plans for businesses to reduce operational energy demand.

2. Encourage existing businesses to upgrade fixtures and appliances to energy efficient technologies and urge new businesses to use energy efficient technologies from the onset.

3. Continue to promote and expand incentives for businesses to reduce energy usage during peak usage hours by expanding the demand response program.

How to Become a 2030 District

The 2030 District is an initiative directed by the U.S.Green Building Alliance for cities aiming to achieve ambitious environmental goals by 2030, particularly focusing on reducing energy use, water consumption, and transportation emissions in downtown areas. It involves public-private partnerships, engaging property owners, businesses, and stakeholders to implement strategies that enhance sustainability, improve building efficiency, promote renewable energy, and reduce overall environmental impact within designated urban districts. It begins with setting targets, collecting baseline data, and creating action plans that reduce energy use, water consumption, and transportation emissions.

Working together to implement energy-efficient technologies, sustainable practices, and education initiatives, stakeholders monitor progress, share knowledge, and celebrate achievements. This program fosters a collaborative environment where community members work together to create high-performance urban districts that serve as models for sustainable development, contributing significantly to mitigating climate change impacts. The goal is to create high-performance, environmentally responsible urban areas that serve as models for sustainable city development and contribute significantly to mitigating climate change

Goal 4. Infrastructure
Policy IN.1 Efficient & Affordable Energy

IN.2
Quality Water Systems

Enhance water infrastructure across the city to help homes and businesses use water more efficiently.

Water is essential for the health and well-being of residents in Danville. Drinking water for the city is sourced from the Dan River and treated; it is then distributed to homes and businesses for showering, flushing toilets, and irrigation. Water systems in Danville encompass all the ways Danville collects, treats, and distributes water, including:

- what happens to rainfall and runoff;
- how the city provides water to homes and businesses;
- how water leaves and re-enters the environment; and
- how it gets recycled through treatment processes.

Desired Outcomes

- Residents and businesses continue to have access to high-quality drinking water
- Increased capacity to obtain funding for projects aimed at enhancing disaster resilience, particularly in communities that are more prone to flooding
- Enhanced management of stormwater on privately owned properties.
- Swift recovery from unexpected disruptions to services due to extreme weather conditions and other challenges

Goal 4. Infrastructure
Policy IN.2 Quality Water Systems

Infrastructure is aging.

Outdated infrastructure along the Dan River and among housing infrastructure poses public health, ecological, and financial challenges. There is some political resistance to removing existing dams. Some residents want to keep the dams for scenic views, but dam removal could alleviate flooding and stormwater issues while providing funding for river resilience.

Danville is experiencing extreme weather changes

Precipitation Patterns

Rain events are occurring more sporadically and with increasing intensity. This is also accompanied by less snowfall, increased winter rainfall, more inland flooding, and decreased summer rainfall. These more severe seasonal changes can impact flooding and agriculture, placing a great deal of strain on existing infrastructure.

Source: Climate Explorer NEMAC

Goal 4. Infrastructure
Policy IN.2 Quality Water Systems

Growing Degree Days

Historically, Danville's economy centered around agriculture with the growth and production of tobacco products accounting for 4.78% of Danville's domestic production in the past. While tobacco is no longer the leading product of Danville, local agriculture has the potential to continue to be a major economic driver for Danville. This is only possible if Danville can address climate related issues such as the number of growing degree days (day of extreme heat or cold).
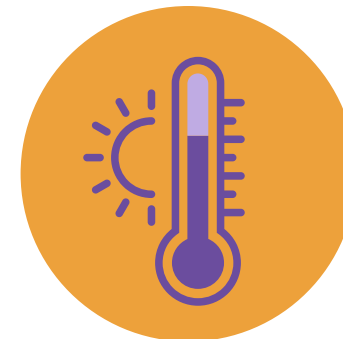
Source: DataUSA.IO

2023 was the 55th
driest year in Danville in over 100 years.

43,055
people in Danville are affected by drought every year.

2023 was the hottest
summer on record and temperatures are projected to continue increasing.

Data Sources: Climate Explorer NEMAC and NASA 2023

Drought and heat impacts make it important for Danville to build a culture of water conservation.

Drought is a scarcity of water. Urban heat refers to when more urban areas experience significantly higher temperatures than surrounding rural areas because roads, buildings, and other structures absorb less heat than natural landscapes.

Drought and the urban heat island (UHI) effect in Danville intensify the necessity for water conservation by increasing water scarcity due to reduced precipitation, higher temperatures leading to increased evaporation rates, and heightened demand for water to combat heat-related issues, emphasizing the importance of conserving and wisely managing available water resources.

What does this mean?

Drought and the UHI effect impact Danville by diminishing water availability, raising costs, stressing local ecosystems, and challenging the resilience of the population.
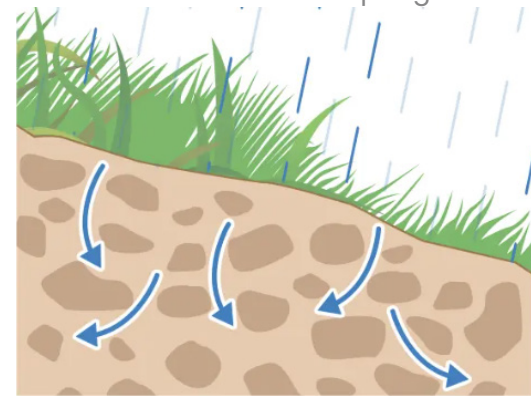
As temperatures across Danville increase, the city experiences reduced rainfall and increased evaporation which contributes to water scarcity.

As soil becomes dryer due to high temperatures, sun exposure, and lack of moisture, it can create a hard surface that acts much like concrete that can damage old pipes; this can exacerbate flooding and runoff during times of intense rainfall.

These conditions place undue stress on local ecosystems and water-dependent habitats, impacting biodiversity and water quality. By promoting water conservation practices through a culture of water-efficiency, Danville can mitigate these impacts, ensuring a more sustainable and adaptable community that is prepared for any changing climatic conditions.
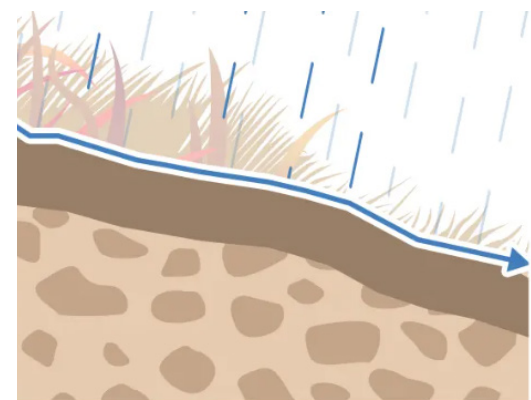
Normal Conditions

Soil absorbs water like a sponge.

Drought Conditions

Hard layer of soil repels water and it runs off the surface.

Source: BBC Research

Goal 4. Infrastructure
Policy IN.2 Quality Water Systems

Danville is working to clean and conserve water.

Water Saving Tips

There are tips for saving water listed on the city's website. Any time people can choose to save water through daily activities (like showering, washing dishes and cars, and even doing laundry!), it helps the city to conserve its water resources. Efficient home technologies like laundry machines, dishwashers, and toilets, can all help to increase the water conservation of Danville.

Partnership for Clean Water

The City of Danville Northside Wastewater Treatment Plant is a Charter Subscriber to the Partnership for Clean Water, an initiative led by the American Water Works Association focused on the optimization of wastewater facilities' operations and performance.
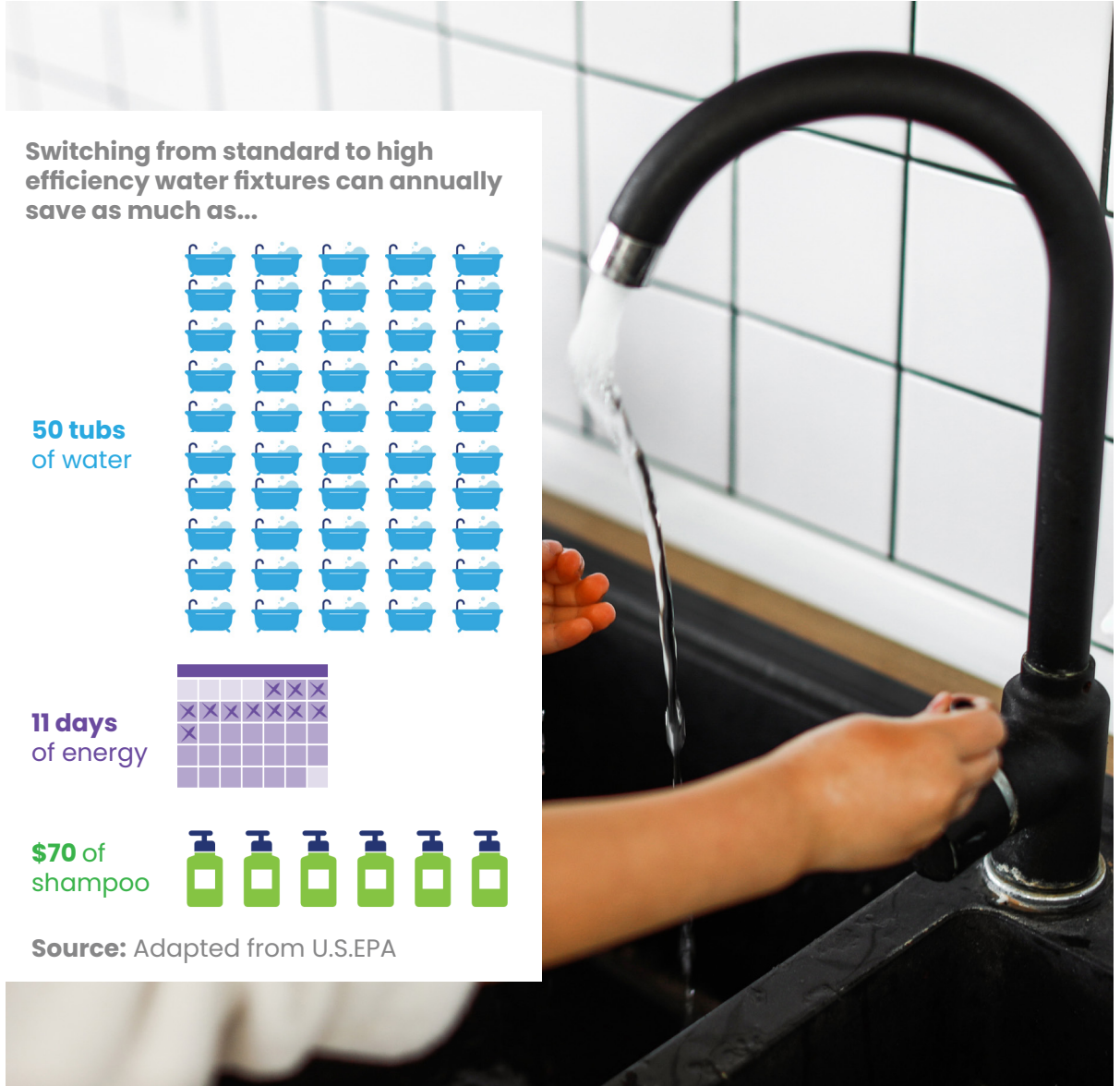
Monitoring Water Efficiency

The City has had an Advanced Metering Infrastructure system since 2009 for electric, gas, and water.

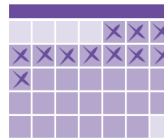**Goal 4. Infrastructure**
Policy IN.2 Quality Water Systems

Switching from standard to high efficiency water fixtures can annually save as much as...

50 tubs of water

11 days of energy

$70 of shampoo

Source: Adapted from U.S.EPA

Danville is experiencing chronic citywide flooding challenges following destructive storms.

Several areas throughout Danville experience flooding during storm events due to excess water runoff, limitations of right-of-way (ROW) access for drain management, and inadequate drainage on private properties. Although the Dan River sometimes causes flooding, the city also is experiencing flooding that is not related to the river.

What does this mean?

This inadequate drainage of current development (often caused by paved surfaces and removal of native plants) has led to water pooling in ways that are difficult for city infrastructure to handle appropriately; this means the city is experiencing flooding that makes it difficult and at times, dangerous, to navigate during storm season and unanticipated storms.

These factors have left the community vulnerable, not only leaving residents on their own to repair damage and resolve system failures due to capacity overload, but the ineffectiveness of these systems also limit the ability to protect these spaces from future events.
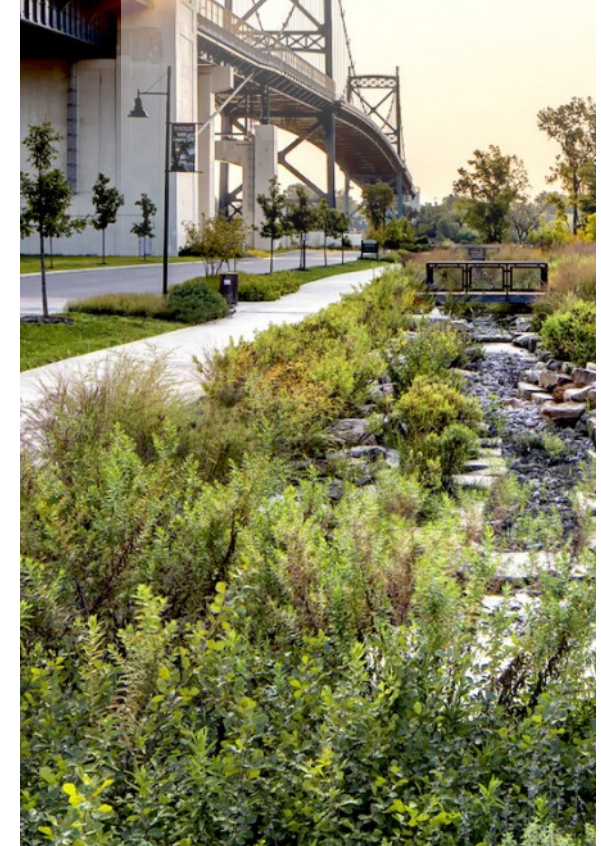
Residents have further expressed uncertainty surrounding responsibility of drain maintenance on private property. It is important for Danville to repair its infrastructure to adapt to any type of water event - this will require implementation of erosion controls and maintaining existing storm drain infrastructure upgrading as necessary, as well as promoting low-impact development and planning drainage systems that integrate green infrastructure to absorb rainfall.

For more details on the flooding audit, see Appendix 2. Flood Preparedness and Resilience Plan.

Just 1 inch of water can cause **$25,000 worth of damage to a home.**

Source: FEMA 2024

Danville is investing in the right places.

Capital Improvement Plan

The 2022 Capital Improvement Plan included $1M for a 5-year special project to install new storm drainage facilities or replace deteriorating systems as requested by Danville residents. Funding of $200,000 per annum is available to assist with flooding and erosion.

Source: 2022 Public Works Introductory Budget

Green Infrastructure

The Danville River District Green Space Plan incorporates green infrastructure throughout many of the focus corridors. Improving green infrastructure will help the city become more "sponge-like" and soak up water, rather than rejecting heavy rainfall into stormwater systems.

Source: Dan River District Green Space Plan

Learn from Leaders

Emergency Watershed Protection Program
Houston, TX

The Emergency Watershed Protection (EWP) Program through the Natural Resources Conservation Service (NRCS) works with communities to help restore watersheds damaged in a storm event and protect them from future disasters. The EWP Program can also assist individual landowners to create a watershed easement on their property. The EWP Program has helped Houston bounce back after the devastating flooding and damage caused by Hurricane Harvey in 2017, providing $13 million in funding, which amounts to more than 80% of the repairs needed, in the Harris County Flood Control District.

Things to keep in mind:

- The EWP Program offers a faster response time than FEMA, allowing projects to be completed immediately or soon after an event
- Natural stormwater management practices are used as much as possible to limit impact on the ecosystem
- The NRCS does not require a disaster declaration from the President or the Governor to receive funding

Danville's infrastructure is aging, contributing to flooding, safety, and water quality concerns.

The city has experienced major flooding in the aftermath of storm events due to culvert and pipe blockages. This is because the system, when it was implemented, was designed to withstand rainfall that was spread out over time. Recent rain patterns show the same amount of rain coming down in concentrated time periods, which can overwhelm older systems. This has led to events such as vehicles trapped in high water on roads both near the river and outside of FEMA flood zones as well as businesses damaged along the riverfront.

There are 6 dams within Danville city limits, several of which are low head dams. While these dams provide many community benefits such as water storage and flood control, residents have underline expressed concerns for safety regarding the dams along the Dan River.

Low-head dams are particularly dangerous to swimmers, paddlers, and boaters, as they create an increased current at the top of the dam and an intense recirculation of water below the dam that can be difficult to escape if caught in the turbulent water.

It is important that these important infrastructure features are made safe for the community while still maintaining much needed flood management benefits.

Further, the Dan River is Danville's drinking water source; surface water resources, such as the Dan River, are susceptible to contamination due to runoff which can affect the taste, smell, and color of municipal water supply.

What does this mean?

While Danville Utilities treats and tests water quality regularly in line with regulations, excessive rain can lead to high velocity runoff, especially in areas with impervious surfaces.

The City has been tracking this and completed a 10-Year Master Plan in 2022 to address system needs. While these are being implemented, the City is also seeking federal and state grant funding to assist with these projects to reduce the cost burden on water ratepayers.

Danville is addressing safety and quality concerns.

Dam Removal

The Long Mill Dam was removed in 2024 to balance out the development of the Riverfront Park in the floodplain and to minimize public safety concerns.

Clean Water

In 2022 and 2023, Danville received the Water Fluoridation Quality Award from the U.S.Centers for Disease Control and Prevention (CDC) for consistently treating drinking water with the appropriate levels of fluoride to prevent tooth decay.

Source: 2022 Danville Utilities Water Quality Report

Community Resiliency Grant

Danville was awarded funding by the Virginia Department of Conservation and Recreation through their Community Flood Preparedness Fund (CFPF) in March 2023. Through this grant, the City was able to complete a Flood Preparedness and Resilience Plan focused on:

- reducing the impacts of flooding across Danville
- emergency management and community preparedness
- stormwater management and flood mitigation
- utility and infrastructure enhancements
- residential upgrades to reduce energy usage and flooding
- energy system enhancements

Goal 4. Infrastructure
Policy IN.2 Quality Water Systems

RECOMMENDATION

IN.2.1
Water Efficiency & Conservation

Develop a water efficient community by decreasing the amount of water used per home, business, and industry.

ACTIONS

1. Improve access to residential rainwater harvesting and rain garden education and resources.

2. Develop standards and best practices about greywater reusage.

3. Create an educational campaign promoting water conservation, include how-to guides for monitoring and auditing home efficiency.

4. Implement the 10-Year Utilities Master Plan as funding is available to continue to ensure all pipelines are leak free and lead free.

5. Consider joining the Community Rating System under FEMA to reduce upfront insurance premiums.

6. Explore financial incentives or tax breaks for commercial property owners who implement green infrastructure such as green roofs, bioswales, or permeable surfaces in new development projects to mitigate stormwater runoff and improve water quality.

7. Support federal and state regulations mandating water-efficient fixtures and appliances in new commercial properties, such as low-flow toilets, faucets, and water-saving appliances.

8. Provide assistance programs for residents to implement best management practices, green infrastructure, and native vegetation to support local ecology and increased stormwater management on residential properties.

9. Provide assistance programs for businesses to implement water-saving upgrades.

10. Develop a river management plan that includes restoration efforts to improve the river's health and resilience to flooding. This can involve naturalizing riverbanks, removing invasive species, and implementing erosion control measures.

11. Launch educational campaigns to raise awareness about the importance of water conservation, stormwater management, and the benefits of green infrastructure.

12. Provide resources and workshops for residents and businesses on water-efficient practices and available incentives.

13. Encourage mixed-use developments with green spaces and permeable surfaces to reduce impervious cover and promote natural infiltration of stormwater.

14. Establish monitoring programs to track water usage, stormwater runoff, and compliance with water efficiency regulations.

15. Foster partnerships with local businesses, community organizations, and government agencies to coordinate efforts and leverage resources for water efficiency projects.

16. Encourage collaboration on research, funding opportunities, and implementation strategies.

Learn from Leaders

How To Save Water
WaterSense, EPA

Saving water is an easy practice that residents of all ages can do. The Environmental Protection Agency created the WaterSense program to help educate about the importance of water conservation and provide some guidance to households to be more efficient with water usage:

- household appliance upgrades
- tips for landscaping
- finding and fixing leaks
- turning off the water when brushing teeth

Goal 4. Infrastructure
Policy IN.2 Quality Water Systems

RECOMMENDATION

IN.2.2
Adaptable Stormwater Systems

Educate residents and promote practices to fortify Danville's homes and businesses against flooding.

ACTIONS

1. Establish a rebate program for members of the community or local businesses who are interested in installing weather stations on their property for the purpose of enhancing data collection for rainfall, temperature, and wind speed.

    Source: Community Collaborative Rain, Hail & Snow Network Danville Public Library

2. Appoint a professional grant writer to proactively pursue and apply for federal funding opportunities related to infrastructure development.

3. Promote the adoption of environmentally friendly infrastructure on private properties.

4. Implement a private property drainage easement to facilitate maintenance efforts.

    Source: USDA – Natural Resources Conservation Service

5. Incorporate flood-resistant features into the design of public parks, including rain gardens and permeable pavements, as part of an annual park improvement initiative.

6. Enhance public knowledge on the risks of flooding to personal properties through educational programs focused on flood insurance.

How to Promote Household Flooding Mitigation

Tool 1

Capturing rainwater can help reduce the amount of water accumulating near homes using methods such as rain barrels or landscaping. Residents should be sure to regularly check that gutters are cleaned of leaves and other debris.
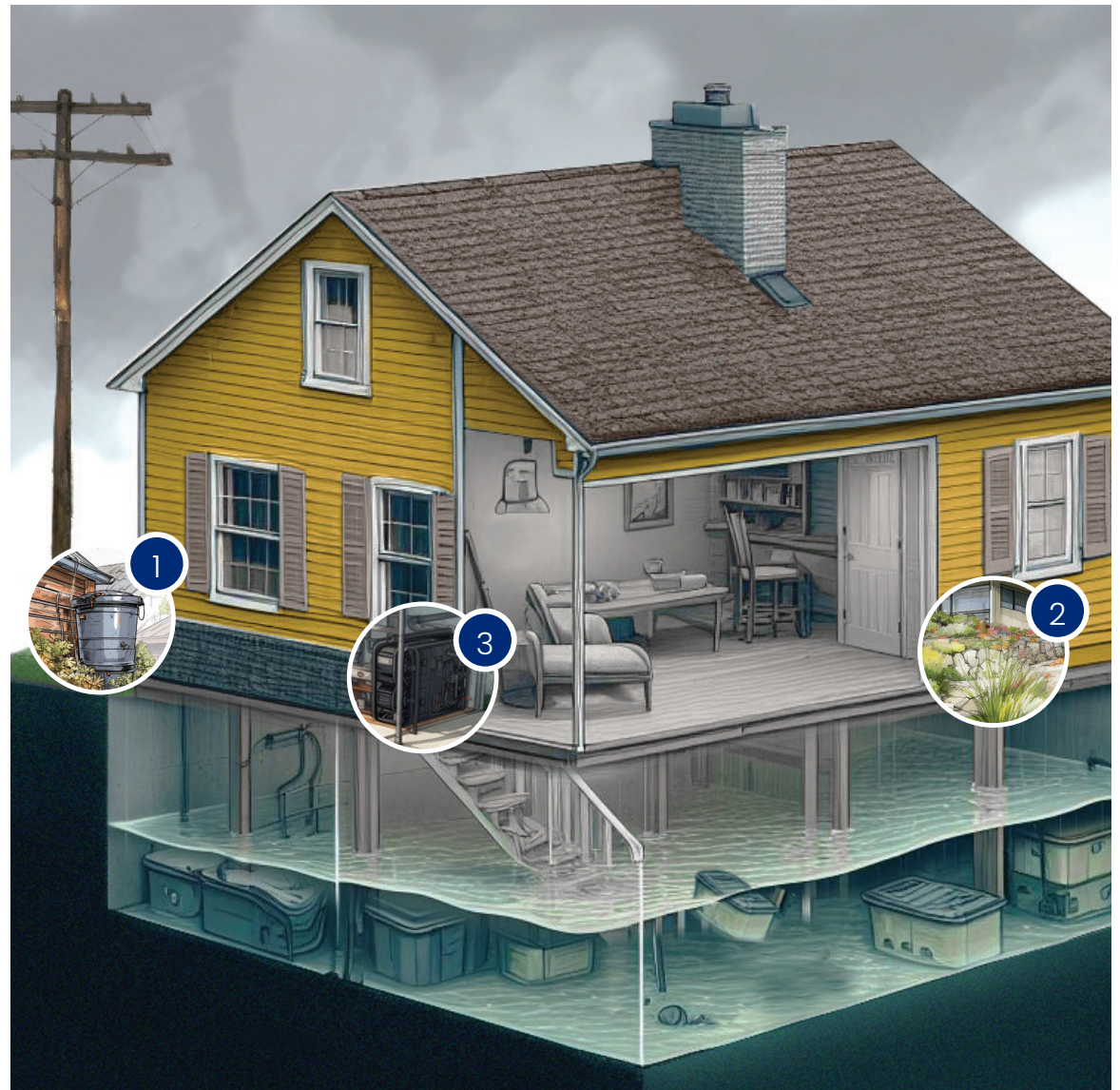
Tool 2

The grading around home foundations should slope away from the home. Avoid using mulch and use rocks or native plants instead to help prevent water from pooling.

Tool 3

If the basement is prone to flooding, having a backup generator can help keep the home dry during a power outage.

Source: Image created by SmithGroup and Artificial Intelligence

Goal 4. Infrastructure
Policy IN.2 Quality Water Systems

RECOMMENDATIONS & ACTIONS

RECOMMENDATION

IN.2.3
Modernized Water Distribution

Enhance existing physical infrastructure for better water management and operations.

ACTIONS

1. Continue to meet or surpass water quality standards and provide educational materials about how to test home tap water quality.

2. Collaborate with the Army Corps of Engineers to examine the environmental effects and safety measures of current dams and make informed decisions regarding their potential renovation or removal.

Low Impact Development
Mississauga, Ontario

A case study was performed to monitor the impact of low impact development (LID) practices on Elm Drive in the City of Mississauga in Ontario, Canada. Improvements included road regrading and permeable pavement installation, along with six bioretention cells connected with an underdrain. Monitoring results found that the LID features reduced peak flow by 60%, reduced runoff volume by 30%, and created a lag time of 20 minutes, reducing stress on the municipal sewer system.

Things To Keep In Mind:

- The LID system was designed to reduce peak flows from a 100-year storm by 13%, but performance was measured to exceed design standards by 47%

- 80% of all rain events produced no outflow

- 86% reduction of pollutant load was achieved for phosphorous, ortho-phosphate, kjeldahl nitrogen, cadmium, copper, lead, nickel, and zinc. 60% reduction of pollutant load was achieved for nitrate and nitrite.

How to Implement Low-Head Dam Modifications

Modifications can be made to low-head dams to improve conditions without undergoing the costly and lengthy process of complete dam removal. Alternatives include

1. Complete dam removal & river restoration.

Restore floodplains with native plantings to stablize riverbanks and improve water quality. This method relieves the cost of dam maintenance. Rock riffle installed downstream can help emulate natural rapids, helping to negate the steep drop of water and diminish unsafe currents.

2. Addition of rock arch rapids.

If the dam is integrated into a river used as a fresh surface water resource, this method can maintain water depth while ensuring recreational safety and avoiding disruption to natural ecosystems.
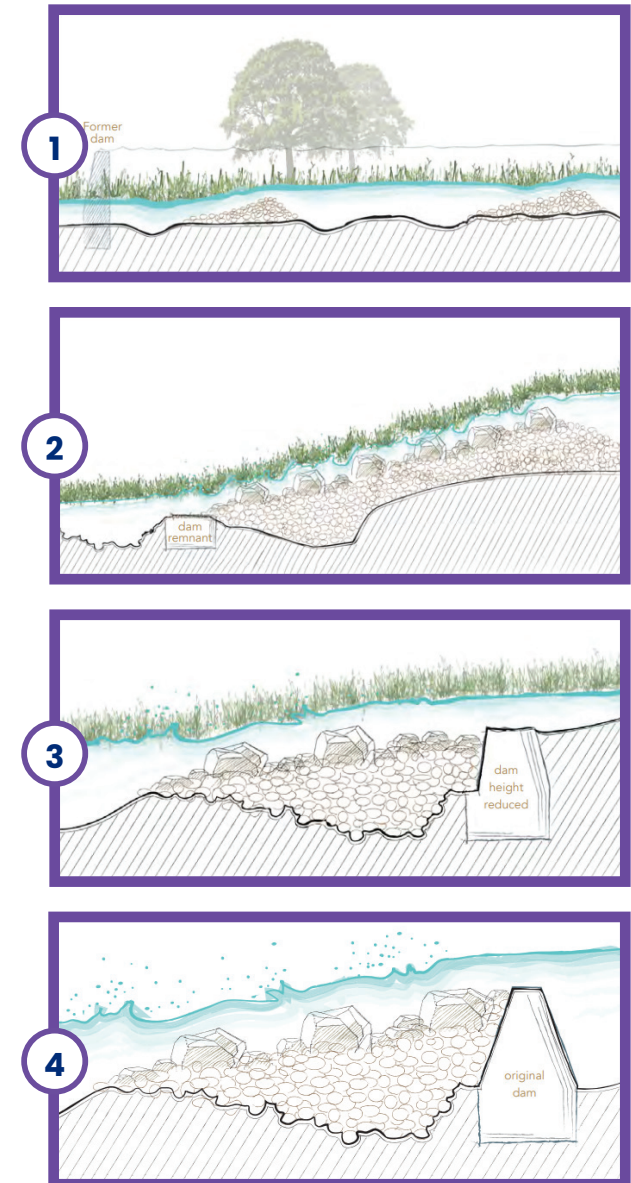
3. Partial dam removal/height reduction.

Prevent the excessive release of sediment while eliminating dangerous recirculating waters and allowing easier passage for fish and other wildlife.

4. Addition of rock ramps.

Strategically placing rocks and boulders below the dam removes the dangerous recirculating currents and allows fish to migrate upstream without having to remove the original dam.

The Iowa Rivers Revival has compiled a booklet of dam information, success stories, and best practices for dam modification.

Source: Adapted from Iowa Rivers Revival

Goal 4. Infrastructure
Policy IN.2 Quality Water Systems

IN.3
Enhanced Telecommunications

Create a plan for better communications both every day and during emergencies, which will help emergency responders react quickly and keep the public safe.

Danville's communication networks connect residents to the internet and the cellular network, whether during an emergency or on a regular day. A modern, best-in-class communications systems for Danville includes:

- Ensuring all residents have access to fast and reliable internet for things like work, job searching, money management, and online education;

- Upgrading telecommunications infrastructures to the latest technologies, like 5G and/or fiberoptics to provide high-speed digital services;

- Reliable emergency communications systems that also provide residents with locations for internet usage during times of power failure;

- Programmatic functions that provide skill improvement opportunities for residents to help navigate a digital world; and,

- Continual feedback opportunities where residents can express comments and concerns to City staff members.

Desired Outcomes

- Timely and succinct emergency information disseminated to all residents when needed

- Residents who are well-informed and have strong connections

- Technologically proficient residents across all age groups

- Seamless and reliable communication between city staff and community members

WHY IT MATTERS

Communication systems provide critical means of safe navigation and evacuations during emergency situations.

Residents can be unsure of where to get information during an emergency, especially when they do not have access to digital devices. The existing methods for emergency communication are transmitted via text or e-mail alert; over 23% of residents do not have a smart phone, and many residents do not have a home computer.

Source: 2020 U.S. Census

What does this mean?

Residents who do not have digital aptitude or those who experience accessibility constraints when using technology may be at a disadvantage for receiving life-saving information. Further, during a power outage, residents can be left without any instruction

DANVILLE IN ACTION

Danville is prioritizing rapid emergency response.
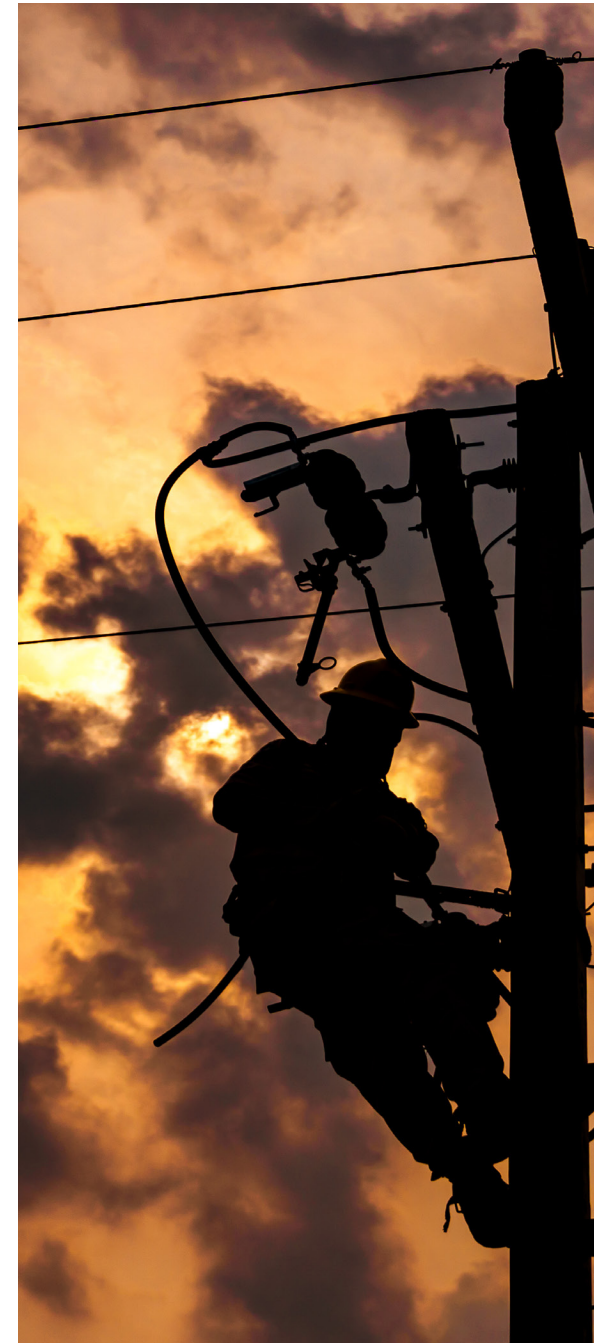
Emergency Notifications

Danville uses EverBridge to notify registered residents about upcoming events, road closures, weather notifications, and instructions during times of emergency. Community members can sign up on the city website.

Call and Text 911

Emergency 911 dispatchers are available through text service as well as traditional calling. This expand the service to residents and visitors, allowing access to help for those who are unable to communicate through phone call either due to speech- or hearing-impairment or unsafe conditions.

Power Outage Notifications

Danville has an Outage Notifications System going live in fall of 2024 to call, email, or text power outage and restoration notifications.

Goal 4. Infrastructure
Policy IN.3 Enhanced Telecommunications

Low-income households are falling behind technologically.

While 27% of Danville residents do not have an internet subscription, the majority of those who are unlikely to prioritize this service in their monthly budget are lower income households making less than $20K per year. Nearly 20% of all households do not own a computing device other than a smartphone; 15.2% of residents have no computer at all. Of those who do not have a computer at home, 46% are residents who have not completed a post-secondary education.

Source: 2020 U.S. Census

Danville is expanding public access to the internet.

Public Wi-Fi

There are currently six public parks and spaces in Danville that are designated as hot parks that allow free public access to Wi-Fi: Carrington Pavilion, Ballou Park, Anglers Park, Main Street, River District, and the Danville Welcome Center.

Public Computers & Internet Access

The Danville Ruby B. Archie Library offers free wireless access for all visitors, and there are public computers available for library card holders for $1 for each hour of use.

Goal 4. Infrastructure
Policy IN.3 Enhanced Telecommunications

Low-income households are falling behind technologically.

What does this mean?

Many websites are not optimized for smart phones, and there are tasks that are nearly impossible to complete without a keyboard and larger screen.

Access to a computer is becoming a necessity, especially for job-related activities like:

- Writing resumes for use in job searches.
- Taking professional video calls while simultaneously having access to screen sharing, note taking, and group chat.
- Successfully completing tasks in an online learning environment.
- Learning and using advanced software for career development.

Further, low-income households without internet service are at a disadvantage when it comes to managing their money, perpetuating frustrating situations that could be relieved with reliable access. Some examples include the following:

- Online banking allows users to check their account balances, know where their money is going, and identify any fraudulent activity.
- Digital budgeting tools make it easier to manage household expenses.
- While checks can get lost in the mail and have a potential to impact credit scores due to missing payment windows, automatic online payments ensure bills are on time.

- Comparing items and reading reviews online can help ensure consumers are buying quality products at the best prices so that they aren't overpaying for products that will need to be replaced frequently.
- Other important tools can help promote a heathy lifestyle:
- Medical test results, symptom checkers, online appointment scheduling, and doctor recommendations can all help residents stay on top of their physical and mental health.
- Activity trackers can help users make sure they are getting enough movement in a day and help motivate them to achieve fitness goals.
- Tele-health appointments can make doctors more accessible to those who struggle with mobility or do not have reliable transportation.

WHY IT MATTERS

Everyday life can be difficult for those who aren't comfortable with the fast pace of new technology.

While there are courses offered on Danville's library website, there are not free public resources available that cover commonly used websites and software such as LinkedIn, Microsoft Teams, online banking, and e-commerce platforms beyond booking plane tickets.

What does this mean?

Residents who lack proficiency in navigating industry standard websites and software may experience a disadvantage compared to those with more technical expertise.

DANVILLE IN ACTION

Danville is providing technology education.

Digital Literacy

Digital literacy programming is available through the Danville Ruby B. Archie Library where residents of all ages can access over 500 online courses, free online tutoring, digital literacy assessments, and more.

Technology Assistance

The library also offers one-on-one technical assistance for residents who need help learning how to use their computers or smart phones, troubleshooting tech issues, and using common software programs.

Goal 4. Infrastructure

Policy IN.3 Enhanced Telecommunications

⊙ WHY IT MATTERS

Resources are available, but residents do not know about them.

Sometimes when things like streetlights go out or trash cans begin to overflow, it can feel like residential neighborhoods are at risk of becoming unsafe. When residents are unable to have trusted communication and prompt response, it can lead to distrust and uncertainty, especially when it comes to unsafe neighborhood conditions.

Fortunately, Danville has made progress in creating a connection with community members through the Fix It Danville app; however, many residents do not know that this resource is available to them.
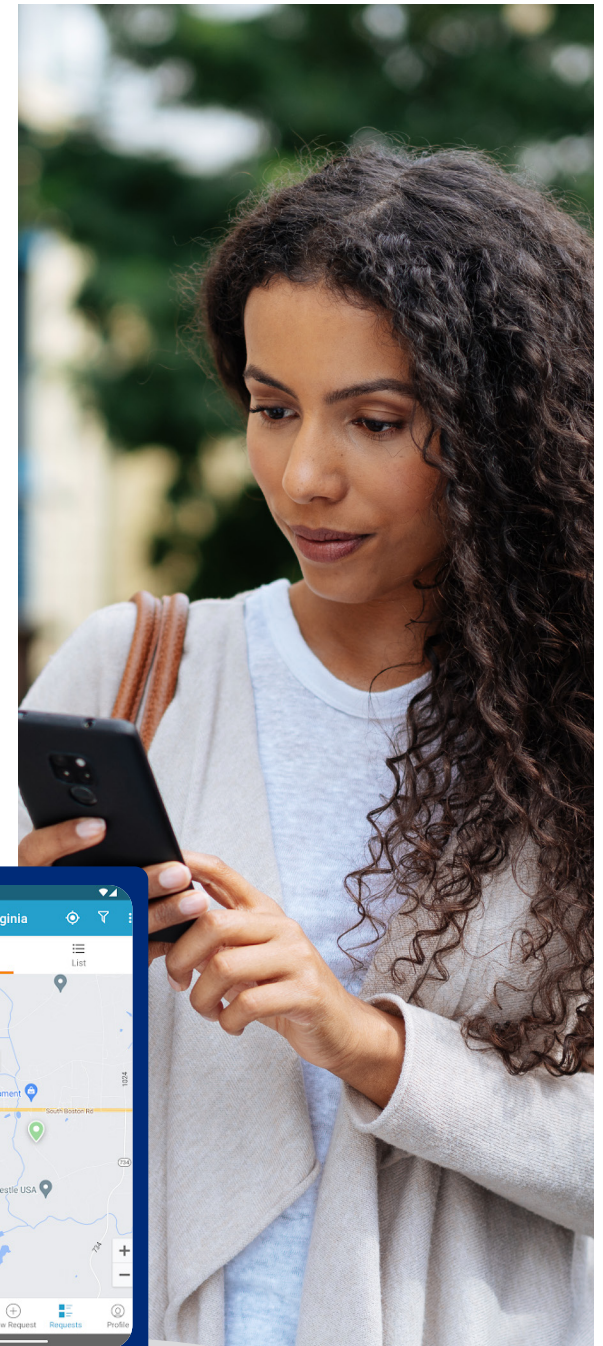
What does this mean?

Even the best resources are ineffective if no one knows about them! Awareness campaigns are crucial to ensuring all residents know what is available to them.

👤 DANVILLE IN ACTION

Danville is connecting with residents through the Fix It Danville app.

The Fix It Danville app, supported by SeeClickFix, offers residents a way to let City staff know about things in their neighborhood like broken streetlights, overflowing trash cans, flooding streets, or other matters that need attention. The app is both Android and IOS compatible.

Goal 4. Infrastructure
Policy IN.3 Enhanced Telecommunications

RECOMMENDATION

IN.3.1
Equitable Emergency Communications

Utilize multiple communication platforms to relay emergency information to residents across the city.

ACTIONS

1. Work with public universities to Implement and promote a robust citywide emergency communications strategy.

2. Ensure coordination is in place among all existing communication outlets.

3. Create redundancies by ensuring all media outlets are receiving the same information at the same time.

4. Involve residents with different disabilities in the emergency communications planning process to understand their needs.

5. Ensure all emergency communication provides clear instructions in multiple formats offered at regular intervals.

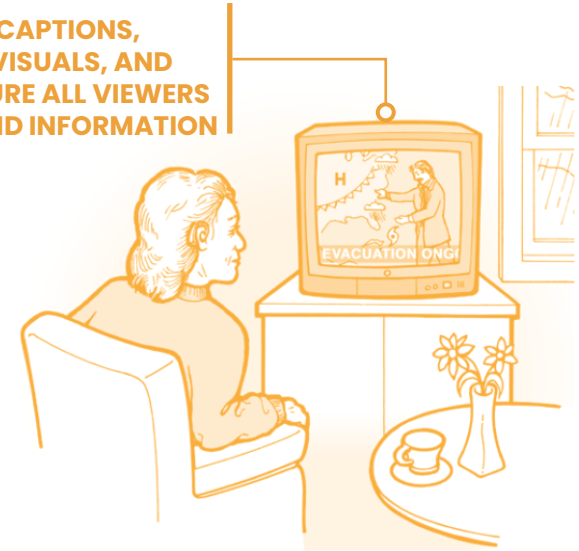6. Provide rebates for battery powered or hand-crank NOAA weather radios.

How to Make Community Emergency Preparedness Accessible to People with Disabilities

Source: Adapted from ADA Guide for Local Governments

INCLUDING CAPTIONS, NON-TEXT VISUALS, AND AUDIO ENSURE ALL VIEWERS UNDERSTAND INFORMATION

TRANSIT BUSES WITH LIFTS HELP EVACUATE WHEELCHAIR USERS

HAND GESTURES AND PRINTED NOTES ASSIST IN COMMUNICATING WITH DEAF RESIDENTS

Goal 4. Infrastructure
Policy IN.3 Enhanced Telecommunications

RECOMMENDATION

IN.3.2
Expanded Internet Coverage

Expand internet coverage to ensure residents have access to fast and reliable Internet services.

ACTIONS

1. Continue to work with providers to expand coverage in the three underserved streets identified by the City energy audit: Eastwood, Blue Jay, and Elizabeth.

2. Continue to promote available federal programs that provide low-cost or free internet services to qualifying households.

3. Continue to provide public wi-fi at all public parks by maintaining the Hot Parks program .

4. Create free and accessible co-working spaces with backup power supply and strong connections for video conferencing.

5. Ensure proper cybersecurity measures are in place for public Wi-Fi zones.

6. Audit cloud security at all public facilities.

7. Allow free access to library computers and charge a reasonable service fee for consumables such as printed materials.

8. Ensure telecommunications distribution lines are upgraded in all neighborhoods

9. Ensure cell towers provide adequate and reliable coverage for all neighborhoods

RECOMMENDATION

IN.3.3
Digital Literacy Improvements

Encourage and support increased digital literacy for all residents.

ACTIONS

1. Expand digital literacy programming that empowers residents to use the internet effectively by creating microlearning modules with digestible lessons that can be completed in short increments.

2. Create partnerships with employers to provide lunch & learn sessions to improve job skills and career prospects.

RECOMMENDATION

IN.3.4
Enhance Communications Management

Improve communication outlets between community members and city staff.

ACTIONS

1. Expand awareness of the Fix It Danville app through social media campaign and a prominent position on DanvilleVA.gov.

2. Implement a chat bot on the City's website to assist with navigation.

Learn from Leaders

Xfinity Internet Essentials Program

Xfinity offers need-based subscriptions at an affordable rate for qualifying households. Customers are also eligible to purchase new laptops through the program for a discounted rate, which can help get community members connected. Xfinity's Internet Essentials Partnership Program works through a sponsoring organization to fund Internet Essentials service for low-income families. Communities across the country have used this program to help connect K-12 students through public school districts and other organizations.

Source: Xfinity Internet Essentials

IN.4
Waste Management

Optimize waste diversion, minimize landfill usage, and promote recycling and composting to minimize environmental and health impacts.

Holistic waste management seeks to rework traditional approaches and move toward a system which maximizes efficiency and resource utilization to move toward a circular economy. In this model, Danville will move towards greater re-use systems, where items produced or used in Danville, can be recycled, and used for second purposes.

Desired Outcomes

- Reduced household waste sent to the landfill
- Cleaner, safer streets and waterways
- Residents of Danville, of all ages, are more informed and take proactive steps towards sustainability

DRAFT 240

" **13,000 tons of waste are collected and disposed of in Danville annually. That's the same as over 1,500 elephants!**

- 2024 City of Danville
"

Goal 4. Infrastructure
Policy IN.4 Waste Management

DRAFT 241

Recycling and waste reduction is not widely practiced among Danville residents.

Danville residents have used the See, Click, Fix app to notify the City about litter and over-flowing public trash cans.

In 2016, Danville reduced recycling annual rates from $195 to $90 and adjusted curbside pick-up scheduling to twice weekly. At the time, only 66 subscribers were registered for the service. While the City has made excellent progress in growing subscriptions, there are many households that are not participating.

What does this mean?

The use of the 'See, Click, Fix' app and trends in recycling suggest that while residents are aware and concerned about litter and waste operations in the city, there is a disconnect with how it is currently being handled.

This disconnect may indicate the following challenges:

- *Engagement Issues*: The drastic drop in annual recycling rates and the scheduling adjustments hint at a community that may be disengaged or unaware of the benefits and availability of recycling services.

- *Infrastructure Challenges*: The presence of overflowing public trash bins, despite the lowered cost for recycling, suggests that the existing waste management infrastructure may be inadequate or improperly utilized.

- *Communication Gaps*: Residents utilizing apps to report issues reflects a proactive community but also points to possible communication gaps between the City's services and its citizens.

- *Policy Effects*: The significant reduction in recycling fees and the subsequent low subscription rate may imply that residents need more information or incentives to participate actively in recycling programs.

- *Resource Optimization*: The existing recycling and composting services, partnerships for glass recycling, and the facilities for yard waste are positive steps that may not be reaching their full potential due to underutilization.

These points underscore the need for better promotion of existing programs, potential service enhancements, and increased community education to ensure waste management and recycling efforts are effective and well-supported by the public.
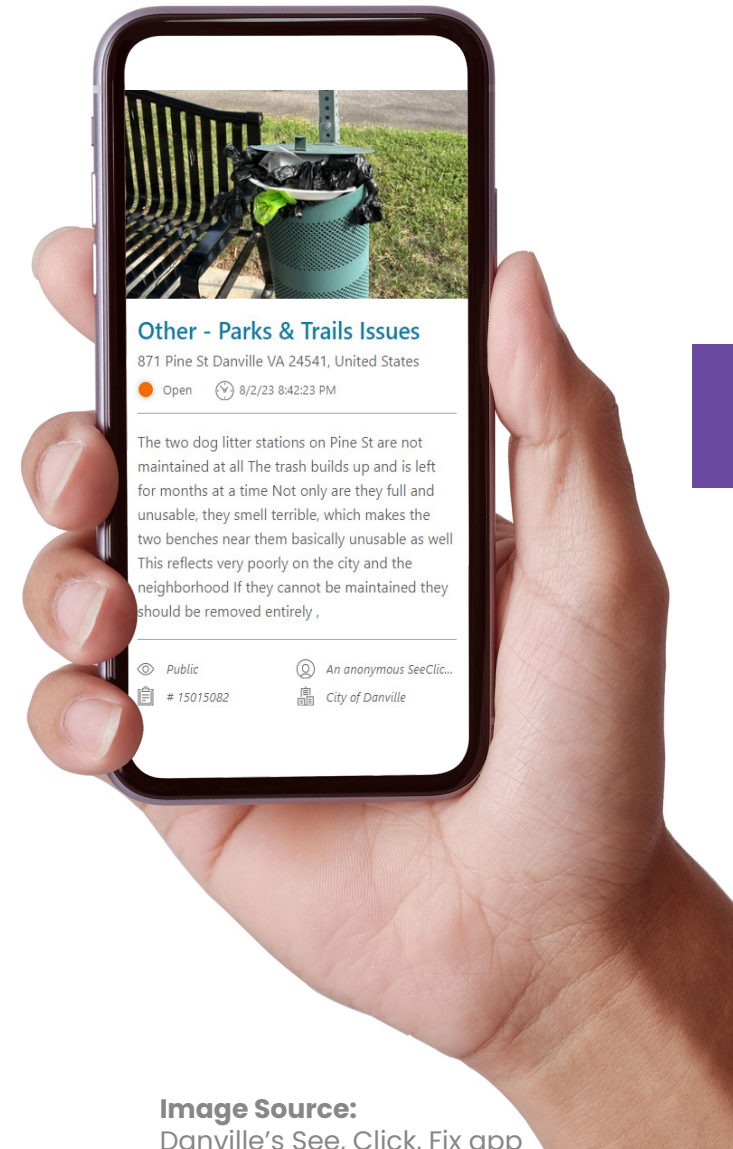
Recycling and waste reduction provide many community benefits.

Immediate Benefits

- *Cleaner streets and waterways:* Expanding curbside recycling services and providing more opportunities to recycle while shopping or walking around Danville helps prevent debris from accumulating and polluting important drinking water sources, like the Dan River.

- *Pest control:* While wildlife and insects are important parts of the ecosystem, they can be dangerous to human health and safety when they aren't in their own habitat. When waste is handled properly, there are fewer opportunities for people to be exposed to dangerous encounters with animals or disease in urban areas.

- *Saving time, money, and the environment:* Streamlining the recycling process benefits air quality and the surrounding environment.

Long-term Benefits

- *Improved sense of community pride:* Reducing litter accumulation is a great way to improve community spirit. Active participation in the process of creating a clean environment helps foster a sense of ownership and pride in shared spaces.

- *Resource conservation:* Creating a culture of reducing consumption and reusing materials helps to minimize the need for landfills, which are notorious contributors to environmental contamination.

- *Increased revenue and job creation:* Improving the waste management process also creates opportunity through the secondhand economy, whether through recycling programming itself or through new businesses taking advantage of the creative reuse of old materials.

Image Source:
Danville's See, Click, Fix app

Goal 4. Infrastructure
Policy IN.4 Waste Management

Education about waste reduction is not prominent.

While there is information on the City's website about what to recycle, where items can be brought, and how much services cost, Danville does not have recycling education programming available to help residents learn how to recycle properly, the importance of waste reduction and, why certain materials are not recyclable.

What does this mean?

When residents do not know what to recycle, where to recycle, or when to recycle, it can lead to low participation, wish-cycling (disposing of items incorrectly, with the hope of them being recycled), and missed opportunities for materials to avoid the landfill. Further, without proper waste education reaching Danville youth, the next generation will continue to be unsure of proper practices and the importance of waste reduction, and the cycle of take-make-waste will continue

Goal 4. Infrastructure
Policy IN.4 Waste Management

Danville is recycling.

Recycling & Composting

Danville offers curbside recycling for all residents on the first and third Thursday of every month; the City also provides some guidance on their website about how and where to recycle different materials. Further, there are two convenience centers and several other recycling drop-off locations located throughout the city. There is also a compost facility available for residents to drop off household yard waste and pick-up compost, mulch, or firewood.

Embracing Partnership

In 2021, the City partnered with O-I to take part in their Glass4Good program which incentivizes glass recycling in communities by providing the much needed recycling infrastructure to ensure glass is properly processed.

Between 2021 and 2024, the Glass4Good partnership resulted in...
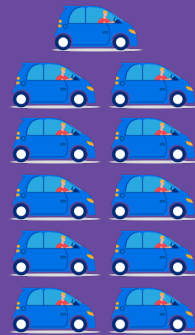
159 tons of glass collected

49,000 kg of CO2 saved

$11,500 donated funds to the local United Way

166 tons of raw materials

The amount of green house gas emissions saved is equal to **11 passenger vehicles on the road.**

The amount of carbon sequestered is equal to **815 tree seedlings grown for 10 years.**

Goal 4. Infrastructure
Policy IN.4 Waste Management

RECOMMENDATION

IN.4.1
Enhance Recycling Participation Rates

Improve recycling collection rates by increasing participation in curbside recycling programs.
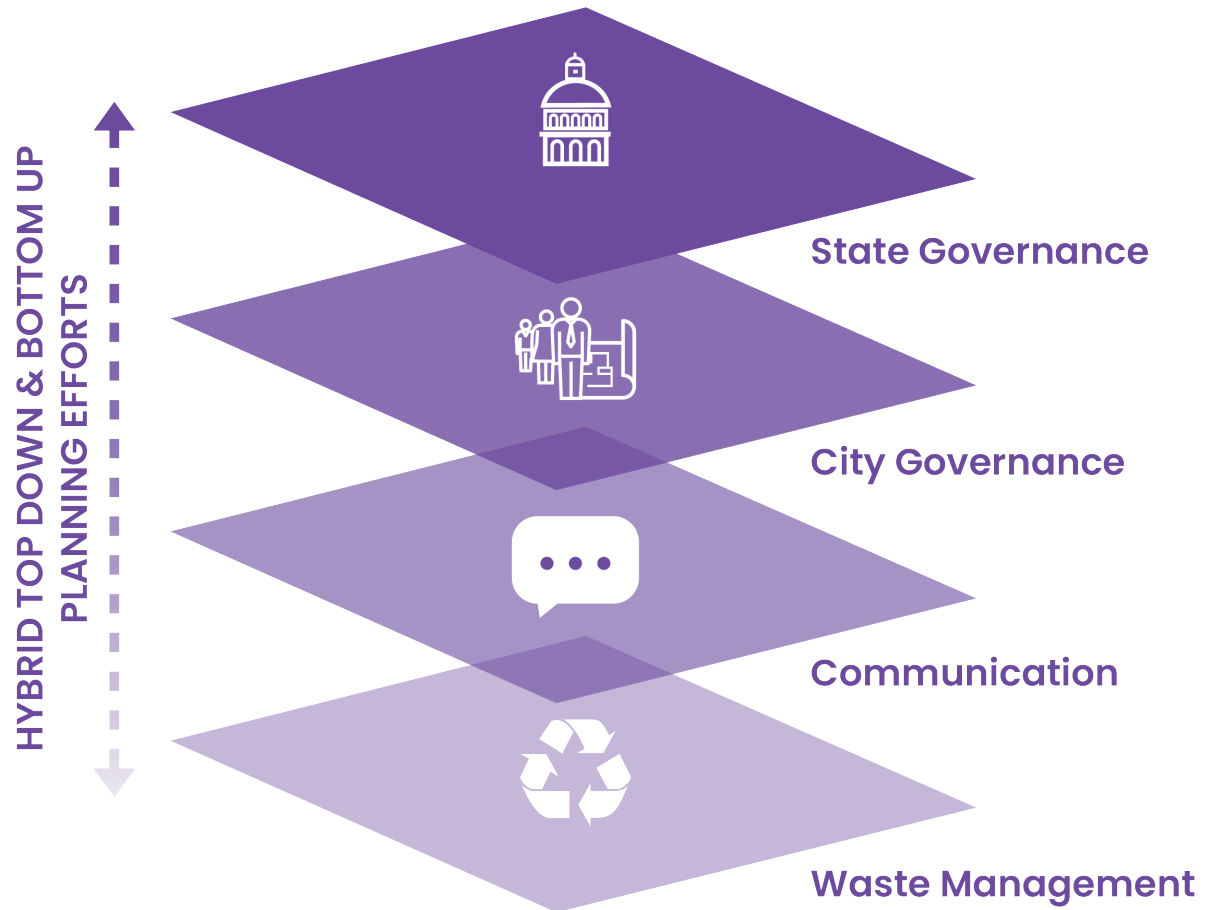
ACTIONS

1. Place recycling, trash, and compost receptacles near every bus stop and downtown.

2. Ensure all public waste and recycling bins are serviced appropriately, understand the frequency at which each station needs to be serviced.

3. Pursue additional funds to support robust residential curbside recycling and compost programming.

4. Update the comprehensive solid waste management program to include a robust curbside residential and city recycling policy.

How to Practice a Hybrid Approach

A hybrid approach can help create synergies between the secondhand economy in Danville and how the City manages resuable or fixable items, organics, recyclable materials, and waste that is destined for the landfill.

In top-down planning, all decisions are made at the government scale; establishing goals for the community using a general lens and assigning actions that may or may not be effective. Conversely, a bottom-up approach begins with grassroots groups seeking to inspire change to the larger system through more targeted efforts on a smaller scale; while these initiatives are often extremely relevent to community members needs, a lack of funding and support in leadership may cause roadblocks. Blending the two into a hybrid approach helps to ensure alignment of a community vision with real challenges that residents are facing.

HYBRID TOP DOWN & BOTTOM UP PLANNING EFFORTS

State Governance

City Governance

Communication

Waste Management

RECOMMENDATION

IN.4.2
Improve Waste Education

Provide programming for recycling, compost, and food waste reduction practices.

ACTIONS

1. Partner with educational institutions to reduce waste.

   Action Steps

   a. Implement food waste prevention programming in all public K-12 schools.

   b. Encourage higher education institutions to implement food waste prevention and recycling programming.

2. Partner with local businesses for collection and reuse of materials.

3. Develop food waste reduction strategies within Danville's River District.

Learn from Leaders

Refuse & Recycling Program
La Crosse, Wisconsin

The Refuse & Recycling Department at the City of La Crosse Wisconsin created an area on the City's website for residents to find information about their service and learn about important practices that can help reduce waste and improve recycling rates. Keep in mind the following:

- A search function that generates an address-specific calendar showing garbage and recycling dates; the website also allows residents to download a PDF of the calendar, set reminder e-mails, and export the file to apps like Outlook and Google Calendar.

- A search function to look up an item to understand if that material can be recycled with a short explanation of how to prepare it or why it cannot be recycled. This function also offers short explanations that inform residents of where their waste ends up after it leaves their home.

- A Discovery Zone with trivia questions related to waste and recycling. The feature will let the user know if they got the question right and provides information about the correct answer to help residents learn more about the importance of reducing waste.
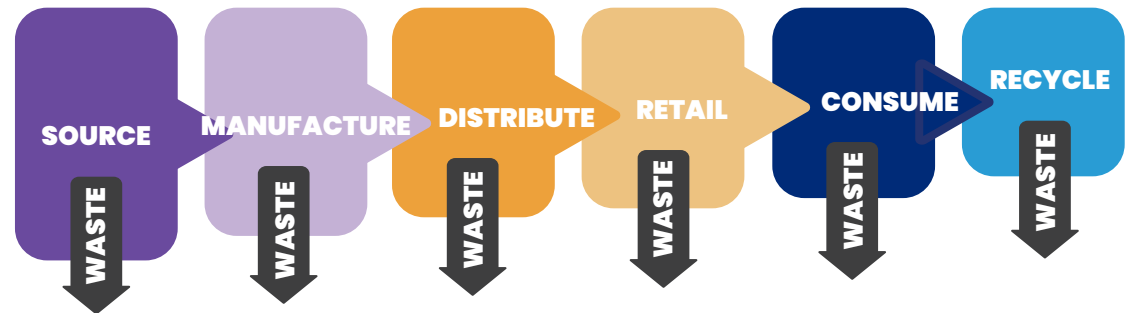
How to Recycle the Right Way

A typical 'open-loop' waste stream begins by sourcing raw materials. These materials are transported to manufacturing facilities where they are used to create everyday items like toasters, clothing, and dishes. These items are then transported to distribution centers where they are shipped to businesses and sold to customers. After a customer is done with an item, it is typically sent to a landfill or recycling center.
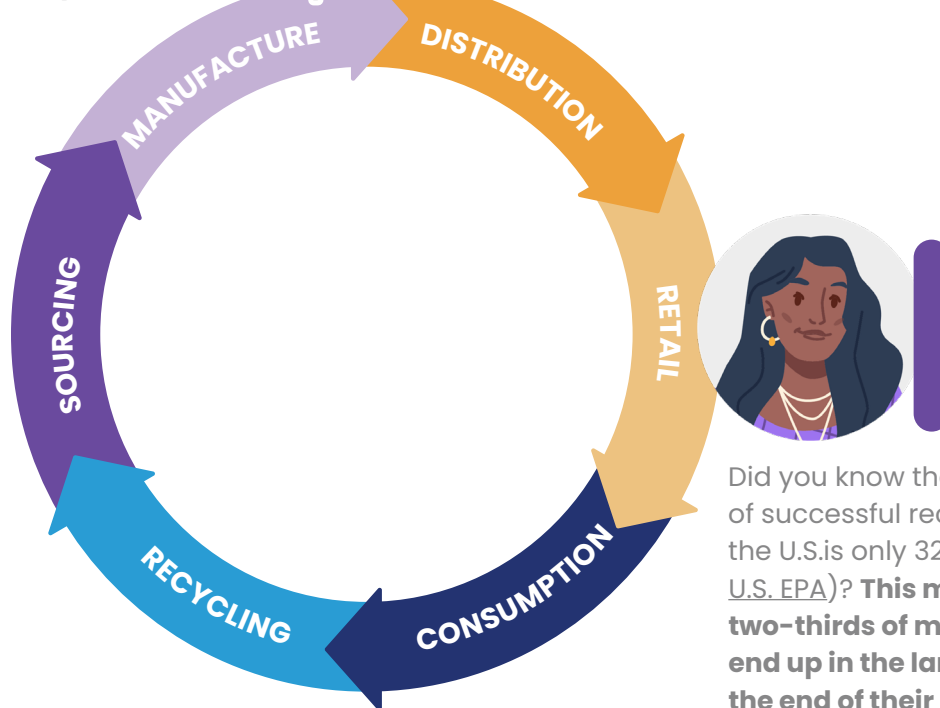
To reduce the amount of waste going to the landfill, it is important to change this process by 'closing the loop' and embracing the circular economy. To do this...

- encourage a culture of reuse;
- purchase secondhand;
- repair or mend things that can be fixed;
- reduce the usage of single-use items;
- and recycle everything else

Typical "Open Loop"

SOURCE — MANUFACTURE — DISTRIBUTE — RETAIL — CONSUME — RECYCLE

WASTE · WASTE · WASTE · WASTE · WASTE · WASTE

Proposed "Closed Loop"

SOURCING → MANUFACTURE → DISTRIBUTION → RETAIL → CONSUMPTION → RECYCLING

Did you know that the rate of successful recycling in the U.S. is only 32% (2023 U.S. EPA)? **This means over two-thirds of materials end up in the landfill at the end of their life cycle.**

Goal 4. Infrastructure
Policy IN.4 Waste Management

IN.5

Community Health & Emergency Preparedness

Invest in healthcare infrastructure to promote community health and expand access to healthcare services.

While healthcare reform may be outside the scope of this plan, the resilience of Danville's soft infrastructure, including healthcare and emergency response systems, is of utmost importance. Residents are facing challenges in accessing quality healthcare, especially for Medicaid and Medicare patients, due to limited options and rising out-of-pocket costs. At the same time, emergency responders are under increasing pressure as weight-related health issues and the opioid epidemic are on the rise. In addition, there are shortages of healthcare providers for maternal care and difficulties in retaining medical staff post pandemic.

These difficulties not only impact public health but also put a strain on emergency response systems. Alongside addressing healthcare concerns, strong emergency preparedness networks are essential for effectively managing both natural and man-made disasters. By strengthening infrastructure and vital city services, Danville can ensure fair access to healthcare and improve resilience in the face of unexpected emergencies, ultimately creating a healthier, safer community for all residents.

> ## "We're seeing more [health and social services] resources be out here now, and people are less reluctant to utilize those services.
>
> *- 2021 Health Equity Report*

Lower life expectancy rates

Danville's average life expectancy range falls in the lower fiftieth percent of the United States overall. This has contributed to the prevalence of Cancer, Coronary Heart Disease and is compounded by obesity. In addition, the potential for Opioid-related overdoses ranks as the third greatest contributor to poor health in this area. Other chronic diseases associated with respiratory and neurological systems have a great impact on the health of the community.
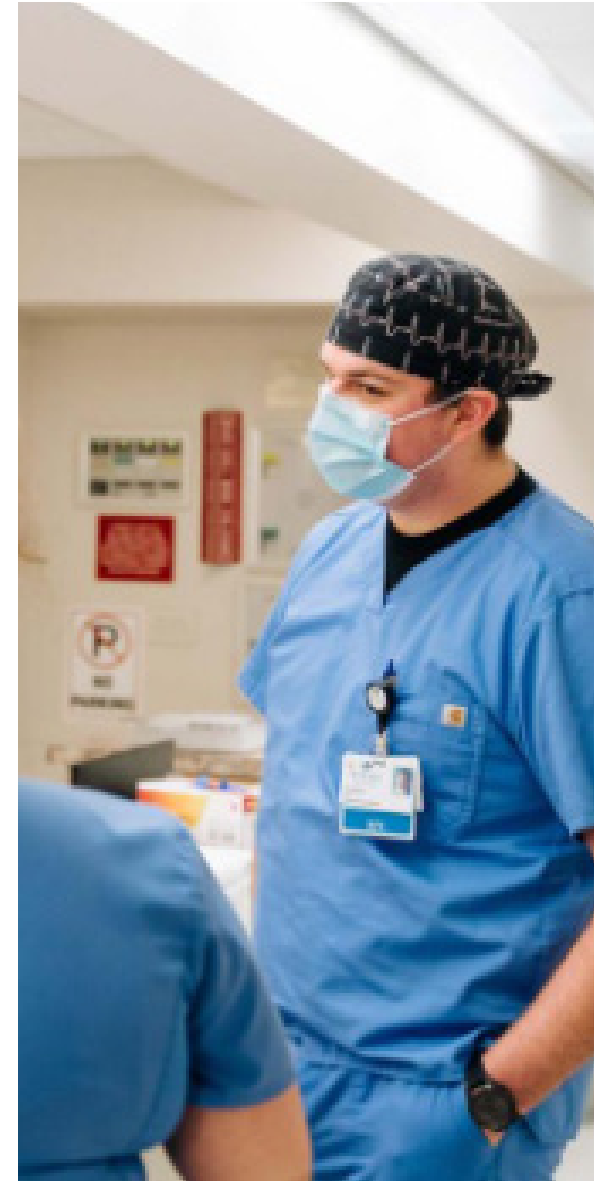
Economic and access barriers to healthcare.

Economic pressures within the community contribute to both a reluctance and even the inability to access healthcare. Access to insurance and Medicaid is limited to less than thirty percent of the population in Danville proper. Many residents are forced to prioritize healthcare lowest on their monthly expenditures following housing and food.

Culture does play an increasing role in healthcare access.

This is not just a challenge for Danville, it is a pattern nationally. Some segments of the population access care only when symptoms force action, while others seek alternative forms of treatment outside of an acute care setting. The diversity of cultures in the Danville community creates a diversity in healthcare perception and behavior which is resulting in a less healthy community than seen in other areas of the country.

Image Source: Danville Register and Bee

Goal 4. Infrastructure
Policy IN.5 Community Health and Emergency Preparedness

Danville is committed to creating and maintaining a safe community for all to live, work, play, and visit.

Safety is a term that is continuously redefined and incredibly personal to each community member. Safety includes safe spaces in times of natural disasters, safe spaces in everyday life, and ways to communicate with City staff about community needs, and safe ways to receive services such as mental health resources. While safety is at the forefront of design, programming, and services for every City department, several key departments are dedicated to safety over-all: Fire, Police, and Social Services.

Emergency Preparedness

Danville's Fire Department is also tasked with emergency management and preparedness. They provide several resources to help individuals and families prepare for potential disasters ahead of time with the following resources:

- Emergency Go Pak
- Developing a Family Disaster Plan
- Developing a Pet Disaster Plan
- Staying informed

Engagement And Communication

Danville's Fire, Police, and Social Services departments prioritize community relationship-building through several key initiatives.

- Barbershop Conversations
- Boys to Men
- Coffee with a Cop
- Convenient Conversations
- Grief Resources and Community Empowerment
- Homelessness Doesn't Define Us
- Incarceration Doesn't Define Us
- Pass the Perspective
- Youth Police Academy
- Community Walks

Goal 4. Infrastructure
Policy IN.5 Community Health and Emergency Preparedness

RECOMMENDATIONS & ACTIONS

RECOMMENDATION

IN.5.1
Public Safety

Continue to work with public safety providers to maintain community trust and provide high quality and prompt delivery of services.

ACTIONS

1. Involve Fire, Police, and Emergency Preparedness staff in the development review process.

2. Continue to proactively build trust between first responders and the community through programming, with a focus on youth programming.

3. Expand emergency personnel support through the actions in the Flood Preparedness and Resilience Plan.

4. Improve publicly owned buildings to provide better services in efficient, shared-use, accessible facilities to better serve residents, per the Future Land Use Plan.

5. Conduct and implement a Fire Department Long Range Master Plan to meet their current and future building and staffing needs.

Learn from Leaders

Youth Engagement & Safety Town
National

Safety Town is a national program aimed at equipping children ages 4-6 with the confidence and knowledge needed to stay safe. They learn skills such as bicycle safety, bus safety, fire safety, pet safety and more. It teaches them useful skills the value of knowing the local police, fire, social services, and other city offices that keep them safe.

Things To Keep in Mind:

- Starting programming young is key to creating a culture of safety and an engaged civic body.

- Danville has strong programs for a variety of age ranges, although most start with young teens.

- Finding opportunities to partner on annual initiatives that pull together multiple departments can expand staff capacity and build morale.

Goal 4. Infrastructure
Policy IN.5 Community Health and Emergency Preparedness

DRAFT

> ## " Safety Town is a play tool for young children to learn safety. If we start early enough, it makes the whole process easier.
>
> *– Safety Town in Warrenton, VA from the Fauquier Times*