Making Strong Connections for a Resilient Future

How Greenways Can Help Mitigate the Devastation of Climate Change

A White Paper

September 2025

Greenways, accepted additions to our landscapes over the decades, should be planned to provide an effective focus in mitigating water damage from sudden flooding as climate change continues apace.

Benefits of Greenways

We of Connect Buncombe believe that greenways, when thoughtfully planned within corridors of conserved open space of pervious soils and adequate vegetated riparian buffers along waterways, can help play a significant role in helping to achieve resilience in a time of disastrous climate change. They should be planned in concert with green infrastructure designed for stormwater management, community connector trails, and flood resilient development that is minimal and regulated. These together can assist us help our communities be more resilient. Greenways can be an advanced form of green infrastructure.

In this paper, we define greenways as more than just pathways for people, but full linear corridors that include natural, green and open spaces that have the appropriate amount of erosion-resistant vegetation to serve as riparian buffers when they are along waterways. To our human community, they provide multi-modal transportation corridors, scenic beauty, and protection from flood waters. They are loved by the people who use them and are both physical and spiritual in character and meaning. They are for all ages and all people. Pedestrians, cyclists, skaters, and even equestrians are attracted to them for the recreation, health, commuting, and social benefits they offer. They are vital parts to community and to the emerging need for green infrastructure as flood management. They will play an even more significant role as more connections are built and interconnected networks emerge. Asheville and Buncombe County, like our neighbors in many parts of the world, have begun a dynamic and growing greenway system.

Here and elsewhere, greenways have created invaluable public rights-of-way through multiple land uses which are otherwise often privately developed. These rights-of-way are extremely important because they create a shared, communal direction even when the surrounding uses may not otherwise align. In the wake of disasters, these rights-of-way can even, when well-planned and connected, provide a lifeline for community resilience. They also provide a basis for further corridor extensions.

Our greenways in our mountain communities are often deliberately, for many reasons, co-joined with the waterways, rivers, streams and creeks, which run through our cities and county. The greenways of Buncombe County are the public projects of our local governments with assistance from grassroots and leadership organizations including neighborhood and community groups such as Friends and Neighbors of Swannanoa, greenway advocacy organizations like us and our closest partners, environmentally oriented leadership groups including RiverLink, the Sierra Club, MountainTrue and Thrive Asheville, as well as major state and federal agencies. They recognize that greenways bring a host of economic revitalization, natural conservation, ecological benefits and vital transportation benefits.

As of now, however, a force majeure which is both revolutionary and radical is beginning to hammer violently at our community and the world at large in the form of climate change. So far, it appears that flooding is the greatest danger in our mountain region, but wildfires and landslides are now more common. It is a huge force that no one is quite prepared for. As a result of these drastic and often deadly confrontations, the purpose of this Connect Buncombe paper is to attempt to relate our greenway accomplishments, plans and aspirations to climate change in its terrible forms of tropical warming, pounding rain and wind, flash flooding, windstorms, extreme droughts, mountainous landslides, earthquakes, tornados and wildfires.

An Era of Disastrous Climate Change

There is general agreement that climate change will worsen. However, there is also an outpouring of experience and wisdom seeking a community, holistic, scientific and governmental response to tempering or mitigating this human and natural crisis. Thus far, the consensus is to emphasize building climate resilience. Resilience means developing the power and ability to adjust or recover as readily as possible from disastrous events. It implies objectivity, readiness for quick response, flexibility, deep study, love of community, faith in the future and widespread political will. Climate resilience is a desire for future and long-term safeguards against disaster.

In the case of western North Carolina, our challenge is to learn from Tropical Storm Helene and other examples through detailed study and then develop plans for future events as best we can anticipate them. Plans for future events must embrace the topics of community readiness at all levels, projecting long term flood levels, establishing resilience hubs as described later in this paper, dealing with trauma, planning for emergency health care, making transportation corridors strong and ready for emergency action, adjusting governmental plans, focused land use planning for hazard areas, revisions to comprehensive plans, zoning ordinances, building codes and practices at local, state and federal levels.

Regarding greenways and trails, we believe that we must integrate their planning with current and desired land uses, ensuring context-sensitive strategic development as well as increasing soil permeability, adjusting elevational design standards, choosing native planting materials, strengthening wildlife habitats and creating continuous riparian buffers. Greenways can and will make major contributions in these areas and, because they represent community and local government collaborations, they can be readily improved for resilience purposes. Relating to the advocacy of Connect Buncombe, experience showed

our organization that we must be adaptable in how we define and plan for the multi-modal connections that are so important to the success of our communities.

As the disaster caused by Helene taught (or reminded) us, there are cases where the safety of the riverbank takes precedence over the human experience when planning a multi-modal transportation corridor. We witnessed situations where paved greenway paths that were located too close to our rivers caused increased damage to the riverbanks. This does not have to be the case to achieve connectivity where the options are confined between a waterway and steep slopes or existing development. Our pursuit of transportation or recreational opportunities does not need to be at the river's expense if there are alternative solutions. However, this does not need to falter our pursuit of multi-modal connectivity.

In the aspirations to connect north to south and east to west, intention must be put into the planning of the specific "vehicle" of connection. Although the ideal greenway provides benefit to humans and the environment in the form of flood mitigation, this form of greenway is not always an option in already-developed riparian corridors, such as many in the City of Asheville. In some cases, the most appropriate vehicle of multi-modal connection may simply be a separated and safe travel lane along a roadway at certain pinch points between a river and the road. This is because the disaster has shown us that we must pick the option that has the least negative impact to the river.

One important goal is to, whenever possible, enlarge the conserved and pervious space surrounding greenway/waterway corridors in order to improve porosity and help slow the water in a flooding. In the wake of Helene, a new potential tool has emerged. It is the federal, state and local government Hazard Mitigation Grant Program, commonly referred to as the Buy-Out Program. For severely damaged properties that have lost 50% or more of their market value, this program allows owners to request a buy-out which transfers ownership to local governments. The program has potential to expand riparian buffers and slow the force of flooding in our floodplains which may, but not always, be appropriate to host greenway paths. In the more urbanized areas of our communities, full greenway corridors as defined in this paper are not always feasible in some areas, therefore this program may open new avenues of flood storage and connectivity within our floodplains. It is still unclear how the Buy-Out program can be utilized. The City and County should seek additional clarity on the program as it relates to greenways, in order to understand how how it can incorporate greenway development.

Inspired By the Dutch & Rising Seas

In an excellent 2017 article in The New York Times, "*The Dutch Have Solutions to Rising Seas. The World is Watching – In the waterlogged Netherlands, climate change is considered neither a hypothetical nor a drag on the economy. Instead it's an opportunity."* The author, Michael Kimmelman, presented an engaging picture of contributions made by the Dutch in addressing climate change over the past 800 years and now into the future. The article plus other recent publications like the magisterial 2012 *Sweet & Salt: Water and the Dutch*, by Tracy Metz and Maartje van den Heuvel, admire and analyze the ways in which The Netherlands (Holland) has steadfastly turned from trying to harness and conquer the sea to falling in love with it and building a relationship which protects its people and communities and lessens future risk.

In 1953 a high tide swept over the northeastern coastline of the Netherlands, which they call the *Watersnoodramp* killing over 1,800 people, forcing thousands to evacuate and rendering large areas of farmland useless for years. As Alice Hill and Leonardo Martinez-Diaz describe it in their 2020 book *Building A Resilient Tomorrow*:

"Once the waters receded, the Netherlands realized that simply trying to keep the water out with dikes, levees and canals could not protect the country. Instead of engaging in an ad hoc struggle against constant flooding in a nation where about a quarter of all land lies below sea level, the Dutch began to think bigger, reimagining how they could live with the water instead of fighting it. Today the Netherlands has some of the most sophisticated flood measures in the world. With outdoor parks designed as back-up reservoirs for flood waters and floating neighborhoods, the Dutch have invested deeply in flood mitigation. As the mayor of Rotterdam astutely observed in 2017, 'We must learn to live with water . . . that's just common sense.' "

In these ways, and after nearly a millennium of experience, the Dutch have achieved open-mindedness in their relationship with the pounding North Sea. This is an invaluable lesson. Although our mountainous communities are experiencing climate change in a different way, as we are elevated much above sea level, the majority of the principles from the Dutch approach are applicable. "Living with water" can apply to our need to live in harmony with our dynamic riverways that are meant to change course with time. Areas designed for flood storage can and should be designed around and within conserved greenway corridors.

It will take many years for us to be able to respond to climate change in the manner of the Dutch. We need an evolving mechanism we can begin to use now. We believe that mechanism is Community Resilience Hubs.

What Are Community Resilience Hubs?

Growing experience with disaster management has generated the concept of Community Resilience Hubs within an environment which, due to its geology and topography, is greatly endangered.

As defined by the Urban Sustainability Network in its *Guide to Developing Resilience Hubs*, Resilience Hubs are designed as ". . . community-serving facilities augmented to support residents, coordinate communication, distribute resources, and reduce carbon pollution while enhancing quality of life. Hubs can meet a myriad of physical and social goals by utilizing a trusted physical space such as a community center, recreation facility, or multifamily housing building as well as the surrounding infrastructure such as a vacant lot, community park, or local business. They provide an opportunity to effectively work at the nexus of community resilience, emergency management, climate change mitigation, and social equity while also providing opportunities to become more self-determining, socially connected and successful before, during or after disruptions."

Community Resilience Hubs are key physical places selected by their communities to be as prepared as possible for future disasters. They are located at or very near the centers of known or anticipated climate hazard areas. Each of them is designed to be a first gathering space and command post for community and governmental members, first responders, and public and volunteer emergency services when disaster

strikes. They may be located in public buildings like schools, libraries or fire departments, or in churches, parks, or commercial buildings. They must be fitted out with key response resources such as emergency instructions, contact information, communication resources designed for disasters when there is no or very little on-grid electricity, medical supplies, potable water, basic non-perishable foodstuffs, mobile electric generators, fuel for vehicles, and nursing stations with sleeping and resting facilities. When feasible, they should be fitted with solar panels to ensure reliable energy in times of outages.

They must be prepared to receive disaster relief organizations and their vehicles. Climate Resilience Hubs need to be known to community members and early responders well in advance of the disasters they are designed to help manage. In non-disaster years, they should be places of organized disaster readiness training and planning for recovery and rebuilding. Each Hub should have an organized council for leadership including recognized officers who meet periodically and keep records. When connected with multi-modal transportation "spokes" such as greenways, they create a "hub and spoke" system which creates additional infrastructure for disaster preparedness.

In a larger sense, the Hubs are also valuable tools for small area community planning. They can provide a foundation for planning, by bringing a community together, to engage everyone in climate preparedness. This preparation should include addressing the best solutions for greenway progress as a basis for long-term community climate resilience.

Summary & Implementation

Connect Buncombe recommends a series of short-term, medium-term and long-term implementation steps which appear feasible and are consistent with what we have been learning from the Helene experience in our mountains, waterways and valleys as well as being consistent with our unique mountain culture.

We recommend that affected communities, Buncombe County, the City of Asheville and our towns and neighborhoods take the following steps:

- Plan for more greenways, using meaningful input from the public community and members of environmental organizations who protect our rivers.
- Encourage local governments to implement their greenway master plans at a faster rate and prepare special plans which specifically address climate-resilient changes. This includes amendments to comprehensive plans, zoning ordinances and building codes.
- New and rebuilt greenway paths should be setback from the rivers or streams they are associated with to allow healthy riparian buffers within the corridor.
- In riparian corridors, minimize the greenway path widths and mowed shoulders to allow the vegetated buffers to be as wide as possible between the river and human activity.
- "Rigid" and impervious development should be minimized as much as possible in areas near our rivers. In some greenway corridors, unpaved paths should be used in place of paved paths to limit impervious surfaces and maximize flood storage.

- Encourage policies of replacing trees when they are removed from a riparian corridor, as well as requirements to stabilize and strengthen riverbanks with appropriate native plants such as river cane. Enforce local tree canopy preservation ordinances where applicable.
- Explore riverbank reinforcement during greenway construction at any pinch points between the river and another terrain. Repairing damaged riverbanks is more costly than constructing paved greenway paths.
- Encourage and help with the preparation of small area plans oriented especially for climate resilience.
- Make sure that flood hazard areas are best identified and mapped based on existing local knowledge.
- Ensure that all community voices are heard and, to the fullest extent possible, acted upon.
- Advocate for the identification of climate resilience hubs within communities associated with climate hazard areas.
- Tap into the Hazard Mitigation Grant Program strategically to expand greenway corridors, vegetated riparian buffers, and green infrastructure flood storage.
- Coordinate with adjacent local, state, and federal governments.
- Continue research into the advanced water management practices of the Dutch and other international and United States areas which have achieved success with water management, including upstream flood storage in strategic locations.
- Seek a timeline for future actions within 5-, 10- and 15-year time horizons.
- Identify a dedicated funding source for matching funds to be used when grant opportunities become available for designing and constructing greenways.

There will need to be a serious effort to establish enlarged and protected wetlands, riparian buffers, expanded green infrastructure, refined conservation districts, specific land use planning, reforestation and soil engineering.

There is also the pressing need to pay closer attention, in the words of Lisa Raleigh, executive director of RiverLink and a certified hydrologist, to “what the river wants”, referring to our central and primary life-giving waterways, the heart of our water system, the French Broad and Swannanoa Rivers.

We need to also keep before us the wisdom of one of our greatest conservationists, Wilma Dykeman, who in the “Long Man, The River” chapter of her classic book *The French Broad,* declares that “the French Broad (River) is, above all, a region of life, with all the richness and paradox of life. Water, forests, plants, animals, people thronging here in rare and wonderful variety”. She asks, “Which is the time to know the River?” It seems to us the time has come.

It appears highly relevant to our purpose that humankind is strongly drawn to waterfront development. Many of the most beautiful and well-planned projects around the world are waterfront developments. It seems fitting that now we must also concentrate on making them help mitigate the devastation of climate change.

For Further Information Contact:
David G. Nutter, AICP,
Chairman, Connect Buncombe Advocacy & Partnerships Committee
Asheville, North Carolina
Tel: 828-505-8242
Cell: 828-279-1820
Email: dnutter@aol.com

A Greenways and Climate Resilience Bibliography

We have discovered some major and well-written books and articles about Greenways and Climate Resilience and wanted you to know about them because they are, in the wake of tropical storm Helene, very useful to Connect Buncombe and our city and county communities. They are vivid, frank and comprehensive in their approach to all aspects of *"Making Greenways Happen"* in an era of radical climate change.

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