

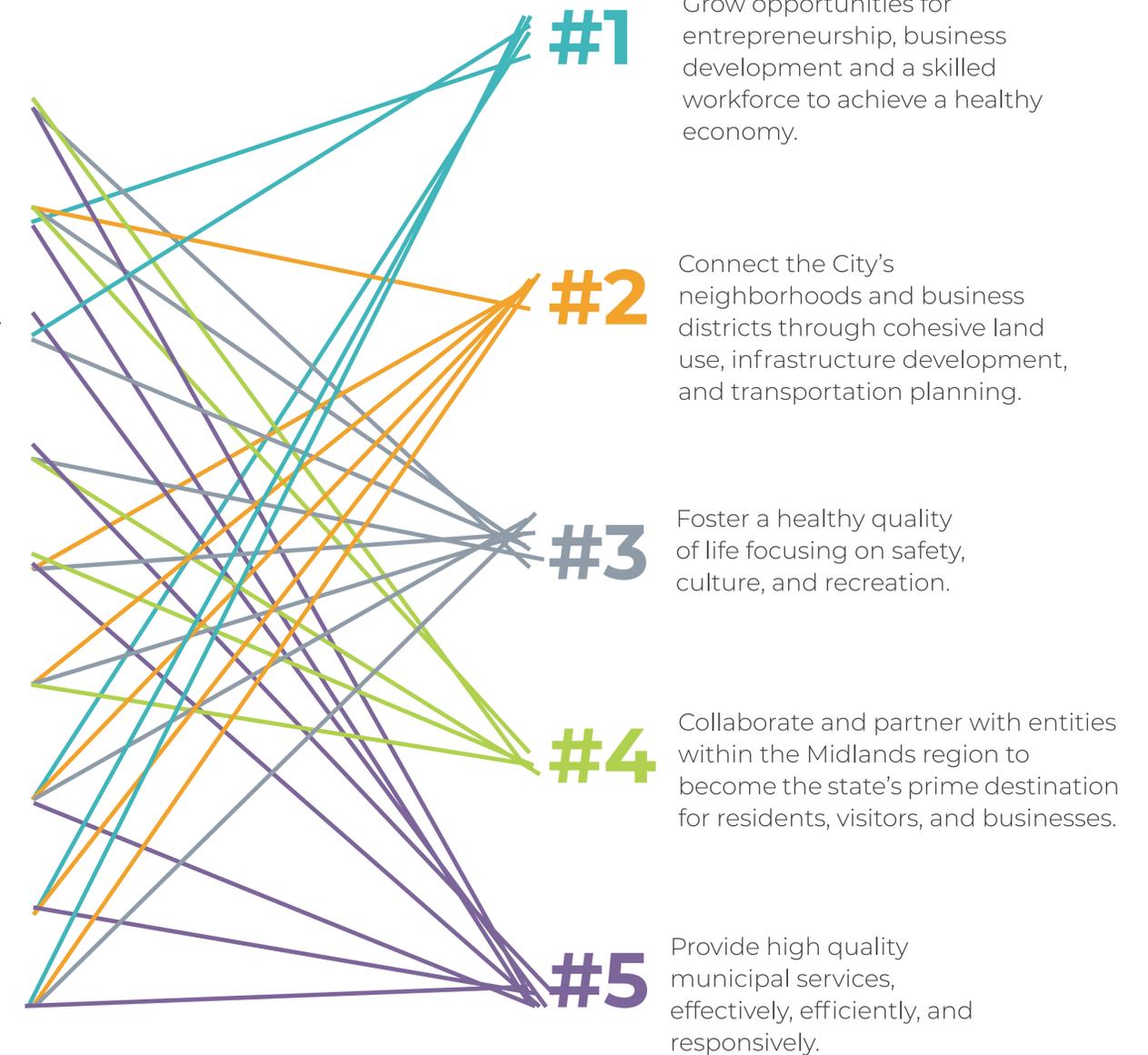


### NATURAL RESOURCES GUIDING PRINCIPLES

We believe in...

-  **Fostering a culture** that appreciates and is committed to protecting our natural resources. (Goals 3, 4, and 5)
-  **Leading by example** - the actions of our employees and our citizens set the standard in our state. (Goals 1, 2, 3, 4, and 5)
-  A Columbia that **reduces, reuses, and recycles** - decreasing our production of waste and pollutants. (Goals 1, 3 and 5)
-  **Clean and accessible waterways.** (Goals 3, 4, and 5)
-  **A robust urban tree canopy** that contributes to the health and beauty of our city. (Goals 2, 3, 4, and 5)
-  A Columbia where our **natural resources benefit our community's health.** (Goals 2, 3, and 4)
-  **A prepared and resilient community** in the face of our changing climate. (Goals 1, 2, 3, and 5)
-  A Columbia powered by **clean and sustainable energy.** (Goals 1, 2, and 5)
-  **A data-driven and innovative approach** towards natural resource conservation and preservation. (Goals 1, 2, 3, and 5)

### ENVISION COLUMBIA GOALS



Are we missing any guiding principles for this element?  
If so, leave yours with us on a sticky note.







“Resilience is the capacity of a system to absorb disturbance and still retain its basic function and structure.” Planning for resiliency involves thinking about how we adapt to and mitigate risks resulting from changes - whether those changes are due to population growth, development pressures, or our changing climate. The system in which we operate is dependent on our natural resources - in planning for resiliency, we seek to mitigate damaging impacts on those resources, while also relying on those same resources to provide our system with resiliency.

-Resilience Thinking: Sustaining Ecosystems and People in a Changing World, Walker & Salt, 2006

## Why plan for resiliency?



Population in the Central Midlands is expected to continue to grow exponentially, from 839,819 people in 2020 to 1,365,128 in 2050. This growth will place pressures on both our built and natural systems.



Ecosystem services that we rely on are not priced when considering the costs of many decisions we make. Pollination, water purification, nutrient cycling, and hazard mitigation through natural systems like wetlands must also be able to adapt.



Our climate is changing. In the southeast, we continue to see historical shifts in the increased number of hot days, warm nights, and days with heavy precipitation (greater than three inches). These are also indicators of the changing strain on our energy and our natural resources.

-Fourth National Climate Assessment, Volume II, US Global Change Research Program, (2018)

## Risks

The Fourth National Climate Assessment identified four key messages for the Southeast:

- Increased urban infrastructure and health risks are posed by heat, flooding, and vector-borne diseases.
- Flood risks in coastal and low-lying regions will continue to increase.
- Natural ecosystems will be transformed, placing the ecological resources we depend on at risk.
- Economic and health risks for rural communities - especially in the agricultural, timber, and manufacturing sectors.

-Fourth National Climate Assessment, Volume II, US Global Change Research Program, (2018)

## Case Studies & Strategies

Communities are planning for resiliency, focusing on protecting their natural resources and mitigating risks. Some of the steps being taken are:

- Committing to reduce greenhouse gas (GHG) emissions (Pittsburgh, PA)
- Taking steps to reduce the urban heat island effect (Phoenix, AZ)
- Developing a City Resilience Strategy (Atlanta, GA)
- Identifying lessons learned from natural disasters and best practices to improve resilience (Charleston, SC)
- Planting heat tolerant, drought tolerant, and native plants (Cities throughout the South)
- Restoring wetlands and riparian areas (Charlotte, NC)
- Getting ready for 100% clean, renewable energy - in 2017, **Columbia** was the first City in the state to commit to a goal of transitioning by 2036.



During our first phase of the planning process, survey respondents and focus group participants strongly agreed that land near rivers and streams should be protected and made accessible to the public.



### Protecting Our Waterways

Protection of riparian (river and stream bank) areas, as well as wetlands, helps ensure our waterways continue to function well during extreme events. Wetlands and bank areas help provide for storage and treatment of water during flooding and heavy precipitation events. These areas are often not only protected through regulation, but also through the placement of conservation easements. Wetland and stream bank restoration is often taken on by local governments or nonprofits with the help of grant funding, or by developers with redevelopment surrounding impaired streams.

### What is sustainable riverfront development?

As Columbians, our rivers are a large part of our identity - and they also pose one of our greatest opportunities. During our first phase of engagement, many citizens noted that the riverfront was underutilized and disconnected from the City, in spite of its proximity. While we can look to other cities like Asheville, Austin, and Portland, our riverfront is uniquely Columbia. Most riverfront development examples are in fact redevelopment - Columbia didn't industrialize along our riverfront, constricting and polluting our rivers in the same way many cities have. We are downstream of watersheds that take in increasingly heavy rains, and our river floods regularly, so providing hardscaped development right up to the river would not be sustainable or wise. Our rivers are increasingly clean, and Columbians love to play in them - escaping our summer heat, appreciating our wildlife, and accessing nature.

### Share your thoughts with us.

How should the City be involved in protecting land near rivers and streams and providing/ensuring public access?

Please place up to TWO dots below.

### Providing Public Access

Quality public access helps citizens connect with natural areas. Access to waterways should consider:

- the needs of recreational users like boaters and fishers
- waterfronts as a space for interaction with natural areas (scaled appropriately) - not just as an exhibit on display
- how best to address, protect, and preserve ecosystem services and wildlife while balancing public accessibility



Prioritize improving existing and creating new public access points to the river.

Work with local non-profits and others on stream restoration and cleanup efforts.

Work with local non-profits to permanently protect riparian areas through purchase of land or conservation easements

Require new developments to plan for the preservation of these areas, and provide public access where possible and/or identified on a plan or official map.

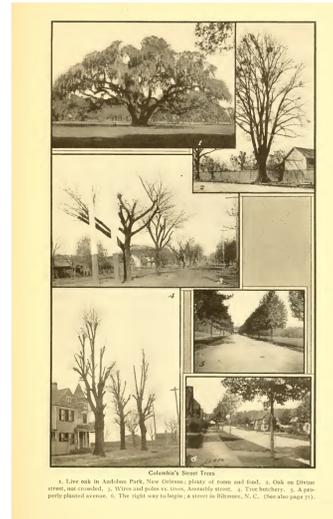


“Once seen as highly problematic for many reasons, street trees are proving to be a great value to people living, working, shopping, sharing, walking and motoring in and through urban places.” - Dan Burden, *Urban Street Trees* (2006).

## Did you know?

*Improvement of Columbia SC, Report to The Civic League Plan* issued in 1905 highlighted the importance of trees, tree types, and the need for more trees in Columbia as well as the following:

- Wires and Poles vs Trees on Assembly St.
- Tree Butchery
- The report also included the city's first tree inventory and planting recommendations



## Benefits of an Urban Canopy

- Reduced and more appropriate urban traffic speeds
- Safer walking environments
- Placemaking
- Increased security
- Improved business
- Less drainage infrastructure
- Rain, heat, and sun protection
- Reduced harm from tail pipe emissions
- Gas transformation efficiencies
- Lower urban air temperatures
- Lower ozone
- Aesthetics
- Screening
- Reduced blood pressure and overall emotional and psychological health
- Time in travel perception
- Improved operations potential
- Added value to property value
- Road design flexibility
- Filtering and screening agent
- Long pavement life
- Connects the human senses to nature



## Linking City Departments Responsibility and Resources

### Charlotte, NC

The City of Charlotte recognizes that green infrastructure is not just the responsibility of one department or agency but is best realized when departments, organizations, and agencies work together.

#### Examples of green infrastructure:

- Bioretention (aka rain gardens)
- Wetlands wet ponds
- Water quality buffers
- Street trees
- Restoration of floodplains

### Seattle, WA

The City of Seattle recognized in 2013 that green infrastructure, urban forestry, and the design of streets are integrally connected. Their goal is to be able to manage 700 million gallons of runoff annually with green infrastructure and urban forestry by the year 2025. This initiative brings together planning and development, utilities, transportation, parks and recreation, and community led projects. The City uses a multi-disciplinary team and an iterative design approach to ensure the best possible streetscape for stormwater, forestry, and user experience.

### Wilmington, NC

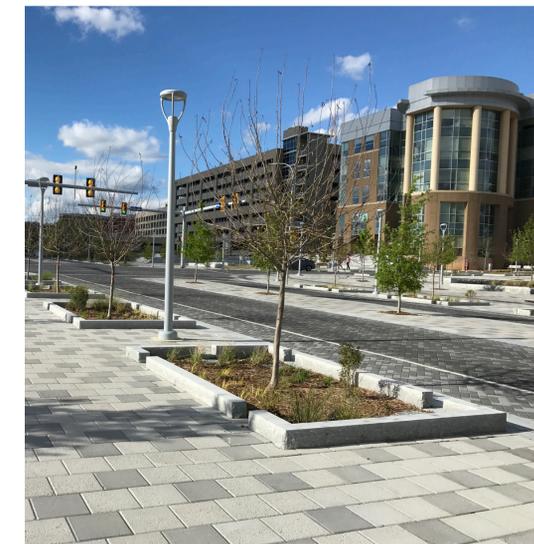
In 2017, the City of Wilmington developed their *Trees 2 offset H2O*, which was funded by the NC Forestry Service. “This ... study of Wilmington’s forest canopy and the role that trees play in up taking, storing and releasing water. This study was undertaken to assist Wilmington in evaluating how to better integrate trees into their stormwater management programs.” Recommendations include the modernization and coordination of city practices and procedures to allow Wilmington to treat stormwater more effectively.

## Data What You Have = Moving Forward

### New York, NY

In 2016, the City of New York took a census of all trees. The project was carried out by 2,300 volunteers surveying more than 685,000 street trees across the five boroughs. Data was collected on species, health, trunk size, and location. This information will now allow the forestry department to focus their maintenance work through prioritization. With the data they can develop a process of being proactive rather than reactive. It also provides tree information about their species through an interactive app helping residents learn about trees.

- Mapped Trees: 694,249
- Number of Species: 234
- Trees Favorited: 4, 773
- Most Common Species: London Planetree (12%)
- Stormwater intercepted each year: 1,085,377,251 gallons with a value of \$10m



Columbia, SC: Foundation Square - 2017 Street Tree Planting with Bioswale

## Collaboration City/County/University

### Foundation Square

Envisioned in 2007, Foundation Square was opened a decade later in 2017. The Square is the centerpiece to the eastern portion of the Innovista District in Downtown Columbia. Located at the intersection of Greene Street and Lincoln Street, the Square is both a catalyst for development and the intersection of two urban greenways.

The Square became a reality through the collaboration of City, County, and University organizations with the support of a diverse set of professionals including engineers, foresters, landscape architects, architects, public works staff, planners, and urban design professionals.

#### Details:

- Trees: 120
- Bioswales: 40
- The entire plaza has a “modular suspended pavement system that uses soil volumes to support tree growth and provide powerful on site storm water management through absorption, evapotranspiration, and interception.” -Deeproot.

## Did you know?

*The first governments in the US to protect shade trees were states such as Massachusetts in 1856, followed by six other states in 1857. Shortly thereafter counties and cities began protection policies.*

Do you have an idea of how the City and can integrate more trees into Columbia?





## Opportunities for Recreation

Within the urban environment, the majority of our access to natural areas is through parks and green spaces. The CDC estimates “that creating and improving places to be active can result in a 25% increase in the percentage of people who exercise at least 3 times a week.”

## Locally Grown Food

Local food has a shorter time between harvest and your dinner table, which means it has a much higher nutrient value. Purchasing locally grown foods can help:

- maintain farmland and green or open space in your community
- support the local economy

## Ecosystem Services

Ecosystem services provide clean air, purify water, mitigate natural and man-made hazard risks, and support agriculture.



In NYC, street tree density was linked to a **lower prevalence of asthma** among 4-5 year olds. (Lovasi et al, 2008)

A study found that two of the best predictors for 5-year survival for older adults were **having a place to take a stroll, and living nearby parks and trees.** (Takano, T., Nakamura, K., Watanabe, M., 2002)

### Case Studies & Strategies

Data clearly shows that how we care for and interact with our natural environment impacts our health directly. Communities across the country prioritize natural resource protection, conservation, and equitable access:

- Columbia, SC, along with other cities, has embraced the 10-minute walk campaign, which calls on mayors to demonstrate their commitment to parks and inspires them to adopt long-term, system-wide strategies to improve equitable access to parks.
- Portland, OR is studying how they can grow a more equitable urban forest, ensuring that all populations have access to a healthy and vibrant urban tree canopy and the benefits it provides.
- The Buncombe County, NC Farmland Preservation program encourages the voluntary preservation and protection of farmlands and local food systems.

ALMOST

# 1/2

OF RICHLAND COUNTY ADULTS CONSUME LESS THAN ONE SERVING OF FRUIT PER DAY

(SCDHEC, 2013)

NEARLY

# 70%

OF RICHLAND COUNTY ADULTS ARE OVERWEIGHT OR OBESE

(SCDHEC, 2013)

INDIVIDUALS WITH ACCESS TO BUILT AND NATURAL FACILITIES ARE

# 43%

MORE LIKELY TO EXERCISE THAN THOSE WITH POOR ACCESS

(SOUTH CAROLINA HEALTH + PLANNING TOOLKIT, SCDHEC, 2015)



# Natural Resources

## IMPLEMENTATION STRATEGIES

Which three of the below are the most important (●) for Columbia to accomplish in the next 10 years? Let us know by placing your dots.

Pick 3!  
most important (●)

### GROW AWARENESS

Partner with state and local agencies, nonprofits, schools/universities, neighborhoods, businesses, and other community groups to grow awareness and affect cultural change.

### LEAD BY EXAMPLE

Examine City policies and practices to identify baseline data, improve efficiencies to conserve resources, harness our buying power, and reduce, reuse, and recycle.

### COLLABORATE & MAINTAIN A SYSTEMS APPROACH

Natural resource issues do not adhere to municipal boundaries - continue watershed-based planning efforts and collaborations, and partner to provide consistent and effective messaging on regional needs and goals.

### PLAN FOR RESILIENCY

Identify and implement robust strategies for managing natural hazards and increased strains on resources, including consideration of climate change-related risks.

### BE READY FOR 100% CLEAN & RENEWABLE ENERGY

- Invest in clean energy generation for City facilities.
- Invest in and incentivize clean energy usage in development.
- Work with local utility providers to improve efficiencies while prioritizing access for citizens facing the largest energy burdens (financial burdens) and pollution hazards.

### TACKLE WATER QUALITY IMPROVEMENTS

Work to improve water quality through:

- Education and outreach
- Stream and wetland restoration
- Sustainable stormwater and wastewater infrastructure improvements

### PROTECT, PROVIDE, & ENHANCE ACCESS

Protect, provide, and enhance access to:

- the City's rivers and waterways
- open spaces and natural areas
- a healthy urban tree canopy

### DEVELOP THE RIVERFRONT SUSTAINABLY

Set the standard for integrating the rivers into City life in a way that provides public access, brings activity to the riverfront, and protects ecosystem services.

### TRACK OUR PROGRESS

Work to identify and gather the data needed to set a baseline and measure both our successes and failures.

