

Broome County

Resiliency Plan



Prepared for: Broome County

Prepared by: 4ward Planning Inc.

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Executive Summary

STUDY OVERVIEW

Study Purpose

Located in south-central New York State in the eastern Southern Tier region, Broome County contains 24 municipalities including one city, 16 towns, and seven villages. The county also contains 57 census tracts, with some spanning multiple municipalities and some municipalities having multiple census tracts. The county faces several environmental hazards such as flooding, severe winter storms, and extreme temperatures, which are expected to increase in frequency and severity over time due to climate change.

Working in collaboration with Barton & Loguidice, D.P.C. (B&L), 4ward Planning provided socio-economic analysis services to Broome County in support of the development of a countywide resiliency plan. This analysis will help the County identify which populations, neighborhoods, or infrastructure are most vulnerable to climate-related hazards, such as flooding and severe storms. These insights are essential for developing a countywide resiliency plan that prioritizes equitable adaptation strategies, strengthens local capacity, and enhances the ability of communities to withstand and recover from future shocks and stressors.

The plan incorporates recent and ongoing planning efforts (such as the 2024 Broome County Hazard Mitigation Plan Update and the Broome County Sustainable Operations Plan and Energy Action Plan), considerations for disadvantaged communities and socially vulnerable populations, actions and strategies for high-risk areas, resiliency projects at the municipal and county level, and engagement approaches that are inclusive and will have the most significant impact countywide.

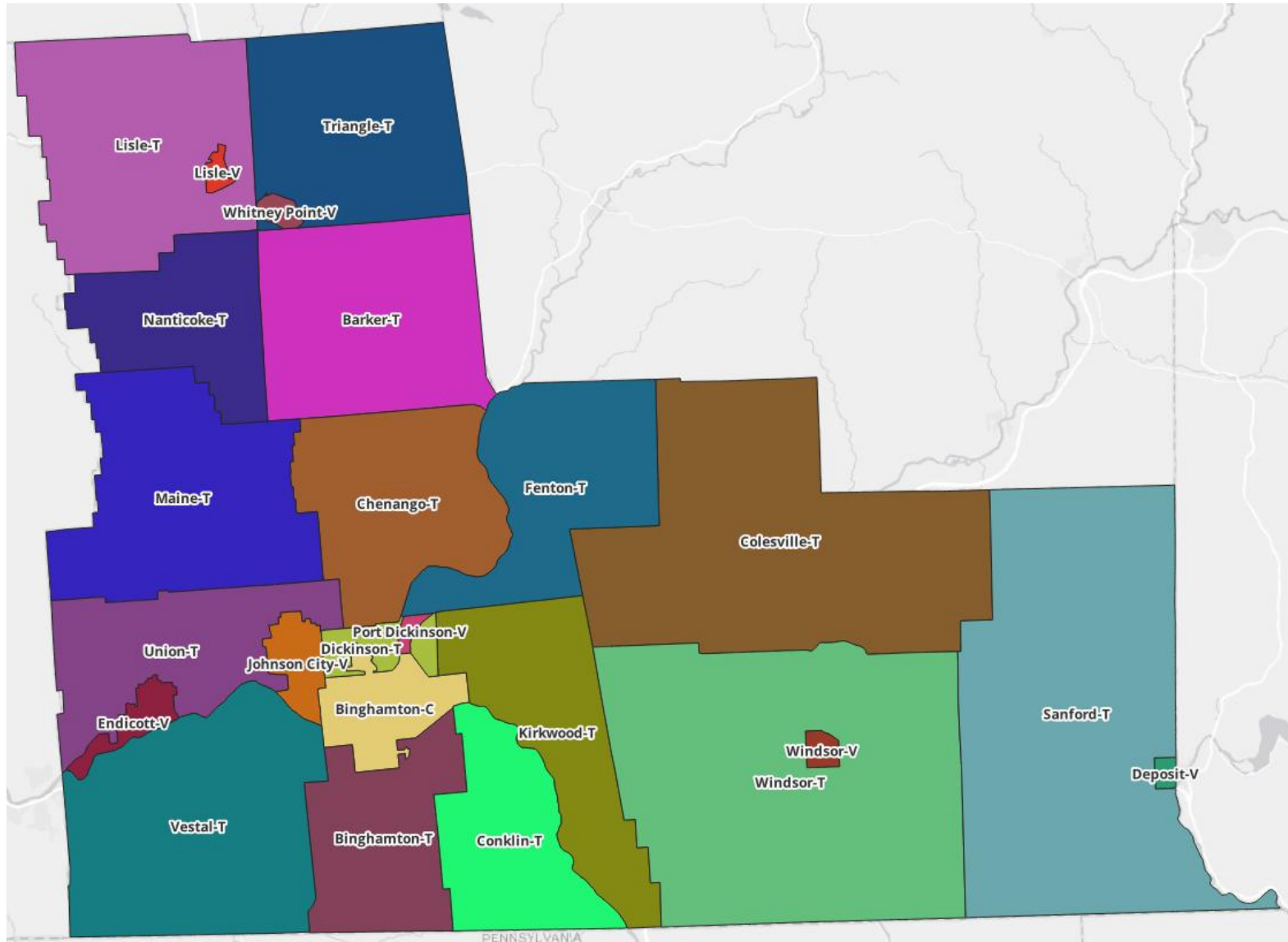
Study Process

This report presents the findings from Tasks 4 and 5 of the study process, which first provides an overview of the region, as well as a comparison of key socio-economic metrics for each municipality, identifying potential vulnerable populations and environmental justice considerations. Next, the report identifies economic drivers and stressors for the county and region. Existing zoning for each municipality was used to pinpoint potential business clusters and tourism offerings that would be most vulnerable to changing environmental hazards. Each portion of the analysis provides insight into implications for future resiliency planning in the county and its municipalities.

The following outlines the study process. This report outlines key socio-economic findings from Tasks 4 and 5.

- Task 1: Initial Project Coordination/ Kickoff
- Task 2: Prepare a Community Outreach and Engagement Plan
- Task 3: Prepare a Shared Vision Statement
- **Task 4: County Profile/Inventory of County Assets**
- **Task 5: Asset Inventory and Risk Assessment**
- Task 6: Strategies, Recommendations, and Opportunities
- Task 7: Identification of Projects and Implementation Actions
- Task 8: Develop Draft Resiliency Plan
- Task 9: Final Public Engagement
- Task 10: Final Countywide Resiliency Plan
- Task 11: Final Project Summary Report and Measurable Results

Figure 1 **Broome County Municipalities**



Source: Broome County GIS & Mapping Services

Figure 2 Broome County Census Tracts by Municipality

Municipality	# Tracts	Census Tracts
Barker-T	1	119.02
Binghamton-C	17	1, 2, 3, 4, 5, 6, 7, 9, 11, 12, 13, 14.01, 14.02, 15, 16, 17, 18
Binghamton-T	1	127.02
Chenango-T	3	121.01, 121.02, 121.03
Colesville-T	1	123
Conklin-T	1	127.01
Deposit-V	1	124
Dickinson-T	1	128
Endicott-V	4	134, 135, 136, 137
Fenton-T	2	122.01, 122.02
Johnson City-V	5	138, 139, 140, 141, 142
Kirkwood-T	1	126
Lisle-T	1	119.03
Lisle-V	1	119.03
Maine-T	1	102
Nanticoke-T	1	120
Port Dickinson-V	1	128
Sanford-T	1	124
Triangle-T	1	119.01
Union-T	8	129, 130, 131, 132.01, 132.02, 133.01, 133.03, 133.04
Vestal-T	5	143.01, 143.02, 144, 145, 146
Whitney Point-V	1	119.01
Windsor-T	2	125.01, 125.02
Windsor-V	2	125.01, 125.02

Note: CDP-level detail for census tracts within Census Designated Places (Endwell, Chenango Bridge, and Binghamton University) is provided in the detailed appendix tables.

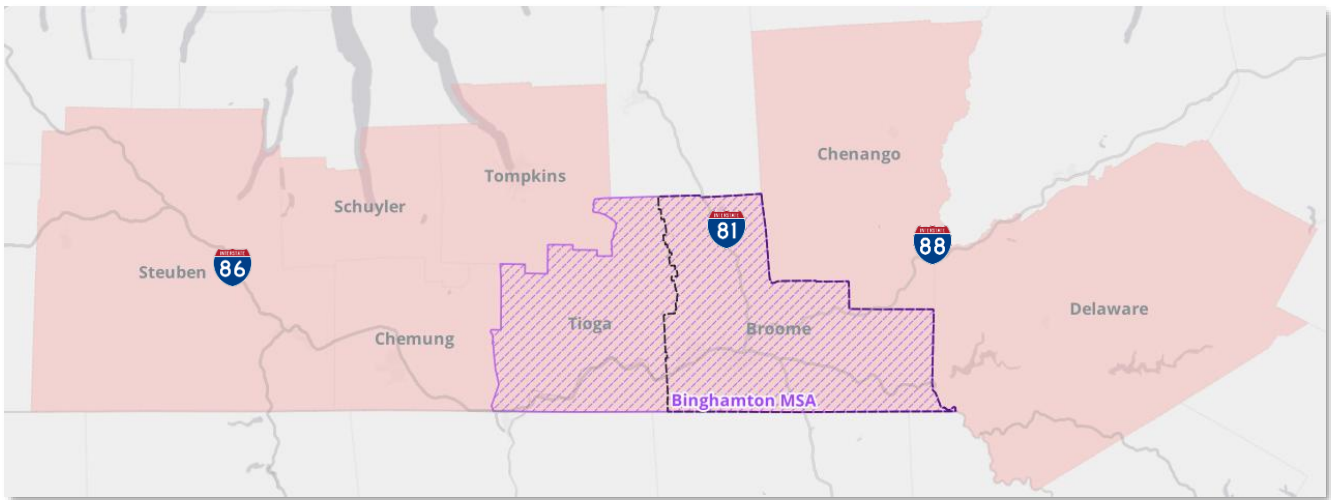
Note: Includes census tracts with $\geq 1\%$ of their land area in the municipality

Source: U.S. Census

Regional Context

Broome County is located in the eastern portion of the Binghamton Metropolitan Statistical Area (MSA), which includes both Broome and Tioga Counties. The county is also located in the eight-county Southern Tier REDC region which (includes Broome, Chemung, Chenango, Delaware, Schuyler, Steuben, Tioga, and Tompkins Counties), which stretches along the state of New York's southern border with Pennsylvania. The county acts as a geographic and logistical anchor, with the city of Binghamton serving as the region's largest urban center, positioned at the crossroads of major interstates like I-81, I-86, and I-88, making it a central hub within the Southern Tier Regional Economic Development Council (REDC) region. Broome County's investments in climate resilience and infrastructure strengthen the Southern Tier region's overall stability, making it more attractive for sustainable economic growth and private investment. These efforts align with the Southern Tier REDC's goals by supporting clean energy, workforce readiness, and equitable community development across the region.

Figure 3 Southern Tier REDC Economic Region



Source: Esri

Recent and Ongoing Planning Efforts

Upper Susquehanna River Basin Comprehensive Flood Damage Reduction Feasibility Study

Broome County is located within the Upper Susquehanna River Basin, a flood-prone area that covers much of south-central New York State and includes parts of 14 counties, with the city of Binghamton being the largest population center in the basin. The 2020 U.S. Army Corps of Engineers (USACE) *Upper Susquehanna River Basin Comprehensive Flood Damage Reduction Feasibility Study* (January 2020) identified significant flood risks in areas such as Binghamton, Chenango, Conklin, Endicott, Johnson City, Kirkwood, and Vestal, highlighting the need for both structural and non-structural flood risk management measures. According to the study, in 2011, flooding from Tropical Storm Lee overwhelmed many of the flood risk management (FRM) areas in the watershed including Binghamton, Endicott, Johnson City, Vestal, Kirkwood, Conklin, and Chenango resulting in over \$500 million in property damage in Broome County alone. The study's emphasis on localized solutions aligns with the 2016 Broome County Resiliency Report which documents local projects and actions taken since the 2006 and 2011 floods to build resilience against future flood events through targeted, community-specific actions.

Broome County Sustainable Operations Plan

According to the *Broome County Sustainable Operations Plan* (December 2024), historically, the County has experienced floods, severe winter storms, and extreme temperatures. As greenhouse gases continue to warm the planet, the following changes are anticipated:

1. **Flooding:** Broome County has extensive flood control systems, but flooding remains the county's top hazard. The risk of flash flooding and riverine flooding is expected to increase due to more frequent and intense precipitation events.
2. **Severe Winter Weather:** The region is likely to experience more severe winter storms, blizzards, and ice storms. However, in the long term, warming trends may lead to reduced snowfall and more rain-on-snow events that increase the risk of floods.
3. **Extreme Temperatures:** Prolonged heatwaves are expected to become more frequent, particularly in urban areas. This could exacerbate public health risks and strain the county's energy infrastructure. Conversely, the number of days in which freeze-thaw cycles occur, and the number of days spent entirely below freezing are expected to drastically decrease by the end of the 21st century, easing the burden on roadway maintenance and repairs due to winter weather.
4. **Drought and Wildfires:** While not currently significant risks, increased summer temperatures could exacerbate drought conditions, which in turn increase the potential for wildfires. Air quality is more likely to be impacted by regional wildfires as well, similar to the air quality impacts experienced from wildfires in Quebec in the summer of 2023.

Hazard Mitigation Plan (2024)

Broome County, in collaboration with local and community partners, completed an update of the 2019 Hazard Mitigation Plan in December of 2024. The goal of the 2024 Broome County Hazard Mitigation Plan (HMP) is to reduce loss of life and property, lessening the impact of disasters. Developed in collaboration with 23 participating municipalities, this plan not only fulfills federal requirements under the Disaster Mitigation Act of 2000 but also ensures eligibility for FEMA funding, thereby supporting proactive disaster preparedness and long-term resilience efforts. The plan identifies hazards of concern and mitigation actions such as projects, plans, or activities identified to help in reducing or eliminating current and future vulnerabilities from hazards. Mitigation actions typically fall into four categories: 1) Local Planning and Regulations, 2) Structure and Infrastructure Projects, 3) Natural Systems Protection, and 4) Education and Awareness Programs. The table below summarizes the plan's identified hazards of concern within Broome County, such as flooding and severe storms.

Figure 4 Example Hazards of Concern and Indicators

Hazards of Concern	Example Concerns or Indicators in Broome County
Dam & Levee Failure	• 37 dams (23 dams deemed high hazards) and 13 levee systems
Drought	• 80 percent of water for public use comes from groundwater sources • 38,075 acres of cropland at risk to drought
Disease Outbreak	• Population exposed to Lyme disease, coronavirus, influenza, West Nile virus
Earthquake	• Population within soil class "D" and "E" hazard areas • Structures in the 500-year and 2,500-year earthquake zones
Flooding	• Population within one- and 0.2-percent flood hazard zones
Invasive Species	• Tier 4 terrestrial species and aquatic species
Severe Storms	• Structures exposed to 100-year and 500-year hurricanes
Extreme Temperature	• Days below three degrees Fahrenheit and days over 90 degrees Fahrenheit
Wildfire	• Population within wildland–urban interface or intermix hazard exposure areas
Severe Winter Storms	• Population experiencing cold weather-related injuries (e.g., traffic accidents on icy roads, hypothermia from prolonged exposure to cold)

Source: Broome County Department of Planning, Broome County Hazard Mitigation Plan Update 2024

Potential Economic Impacts

The table highlights key economic impacts in Broome County resulting from changing environmental hazards.

The counterfactual analysis later in this report accounts for several impacts identified in Figure 5, including direct business disruption and closure, lost earnings and employment, workforce out-migration, tourism and hospitality decline, property-value depreciation, educational-services disruption, and the indirect effects of supply-chain and household-spending reductions. These effects are reflected through sector-specific direct-loss assumptions and BEA RIMS II multipliers. However, the analysis does not constitute a comprehensive accounting of all losses identified in Figure 5. Building, inventory, relocation, transportation-infrastructure, municipal fiscal, government-response, buyout, and insurance costs are either presented as contextual measures of exposure or remain outside the modeled totals.

Figure 5 Example Economic Impacts from Changing Environmental Hazards

People and Jobs	Broome County has experienced modest but persistent long-term decline in population and jobs, driven by out-migration, economic restructuring, and an aging population. Climate change can compound these baseline trends: residents and employees may leave an area due to climate change when repeated hazards like flooding, heat, or rising insurance costs make living conditions unsafe, unhealthy, or economically unsustainable. Flooding is one of several contributing factors including economic decline, job loss, and aging demographics - exacerbated by existing out-migration and housing challenges in the county. From 2010 to 2024, the county's population decreased by 4,430 residents and 9,220 jobs — roughly two percent of current residents and 12 percent of current jobs.
Businesses	More frequent and intense precipitation events put local businesses at risk, with the potential to result in business closures or job losses. According to the 2024 Hazard Mitigation Plan for Broome County, a one-percent annual chance flood event could result in \$341.2 million in inventory loss, \$285 million in relocation loss, \$744.3 million in wage loss, \$241.3 million in rental loss, \$323.7 million in income loss, and \$8.1 billion in building replacement costs.
Supply Chain Disruptions	Disruptions to local supply chains from damaged infrastructure, delayed transportation, and reduced access to resources, which can stall business operations, raise costs, and weaken the economy. According to the 2024 Hazard Mitigation Plan for Broome County, the Transportation lifeline has the most facilities (166) in the one-percent annual chance floodplain. Major roadways that may be impacted by the one-percent annual chance flood event include I-88, I-81, I-86, NY-17, NY-17C, NY-12A, NY-7, NY-7A, NY-363, NY-369, NY-434, and US-11.
Tourism and Hospitality	The number of outside visitors could decline as public health concerns, flooding, severe winter storms, and extreme temperatures become more frequent and reduce tourism spending. For example, visitor spending in the county declined by approximately 40 percent from 2019 to 2020, primarily due to the COVID-19 pandemic, which led to travel restrictions and business closures (Tourism Economics, Economic Impact of Visitors in New York).
Colleges and Universities	Changing environmental hazards can disrupt campus operations, damage infrastructure, and lead to significant financial losses from emergency repairs, enrollment declines, and interrupted research activities. After the September 2011 flooding from Tropical Storm Lee, Binghamton University's Downtown Center was shut down for nearly a year - requiring costly repairs.
Real Estate	Property damage can depress property values, increase insurance and maintenance costs, and deter investment in the local real estate market. According to the 2024 Hazard Mitigation Plan for Broome County, the estimated replacement cost of all buildings located in the one-percent annual chance floodplain would be \$8.1 billion, with \$2.8 billion of this cost occurring in the city of Binghamton.

Broome County Resiliency Plan

Municipal Tax Revenue	As properties become increasingly at risk of and impacted by flooding, their market and assessed values could decline, reducing tax revenues from affected parcels and potentially straining municipal fiscal health. According to the 2024 Hazard Mitigation Plan for Broome County, 5.1 percent of parcels in Broome County are located within the one-percent annual chance floodplain, with this share increasing to 5.6 percent including the 0.2-percent annual chance floodplain.
Government	Changing environmental hazards can strain government budgets through increased spending on disaster response, infrastructure repair, and public health services, while also reducing revenue from disrupted economic activity and property devaluation. Since the mid-2000s, local municipalities have facilitated 504 municipal buyouts, resulting in the permanent removal of 173.7 acres of flood-prone properties from the hazard area. County parcel and assessment data confirm that 490 of the 504 buyout properties (97 percent) now show no structure, with only 14 still showing a building, verifying that the large majority are now vacant or cleared land rather than developed.
Insurance Costs	As flood premiums rise and flood maps are updated, more properties are likely to be included within the one-percent annual chance floodplain, making more homeowners subject to new insurance requirements or higher premiums. The median risk-based cost of insurance in Broome County is \$1,724 per year, compared to the current median premium of \$785 in Broome County, a difference of \$939. Many policyholders in the county may face significant premium increases over time as FEMA's Risk Rating 2.0 phases in full-risk pricing.

KEY TAKEAWAYS

The following section summarizes the key strengths/opportunities and challenges/weaknesses, as well as potential resiliency implications for the Broome County Resiliency Plan. Takeaways are presented for land-use and commuting patterns, and economic drivers.

Flooding and Insurance Costs

Strengths & Opportunities	Challenges & Weaknesses	Resiliency Implications
MUNICIPAL BUYOUTS & ECONOMIC LOSS		
Since the mid-2000s, local municipalities have facilitated 504 municipal buyouts (individual flood-prone properties acquired), resulting in the removal of 173.7 acres of flood-prone properties from the hazard area and reducing long-term flood exposure. These buyouts have been largely concentrated in the Towns of Union and Conklin (70 percent of all the acreage).	- Approximately 5.1 percent of parcels in the County are located within the one-percent annual chance floodplain. - The estimated replacement cost of all buildings located in the one-percent annual chance floodplain is estimated at \$8.1 billion, with the City of Binghamton particularly vulnerable to high flood-related damages. - Buyouts result in decreased tax revenues, higher land maintenance costs, and	The County has reduced long-term flood exposure in high-risk areas concentrated in Union and Conklin, but with 5.1 percent of parcels and \$8.1 billion in building value still at risk, particularly in Binghamton. 

potential disinvestment if not
managed carefully.

Strengths & Opportunities	Challenges & Weaknesses	Resiliency Implications
FLOOD ZONES & INSURANCE COSTS		
FEMA’s updated Risk Rating 2.0 pricing, which more accurately accounts for each property’s true flood risk using modern data and modeling.	The difference between the median risk-based cost of insurance (\$1,724) and the current median premium (\$785) for a single-family home in the County is \$939. Many policyholders face significant premium increases over time as FEMA’s Risk Rating 2.0 phases in full-risk pricing.	FEMA’s Risk Rating 2.0 uses modern, property-specific data to more accurately price flood insurance, resulting in a \$939 gap between current and risk-based premiums in the County, with many policyholders facing significant increases as full-risk pricing is phased in.



Zoning and Job Clusters

Strengths & Opportunities	Challenges & Weaknesses	Resiliency Implications
ZONING		
Twenty of the 24 municipalities in Broome County have some form of zoning to guide where and how development occurs, helping to reduce exposure to changing environmental hazards.	- Four communities (the Town and Village of Lisle, Nanticoke, and Triangle) in the county have not adopted comprehensive zoning ordinances, though all four participate in the National Flood Insurance Program with adopted flood damage prevention ordinances. - Among the municipalities with zoning, there are over 122 uniquely named zoning districts (some names are shared across municipalities; Figure 27 counts each municipality's districts separately).	The lack and overabundance of zoning districts have the potential to create fragmented land-use patterns, inconsistent regulations, and barriers to adaptive, countywide responses to change or crisis.



Strengths & Opportunities	Challenges & Weaknesses	Resiliency Implications
JOB CLUSTERS		
• Currently, job clusters are largely located in the southwest portion of the county along Interstates 81 and 86. • Primary job clusters are concentrated in the county's urban area, encompassing the city of Binghamton and neighboring villages and towns such as Johnson City, Vestal, and Endicott.	• Many clusters are located within significant flooding watersheds. • Broome County is a net importer of labor, meaning that more people commute into the county than leave the county for employment. With many primary job workers commuting long distances, these workers are likely dependent on critical arterial roadways to get to work.	• The concentration of job centers in flood-prone watersheds and reliance on major arterial highways for commuting underscores the need for resilient transportation infrastructure and land-use strategies that ensure access to key employment hubs. 

Economic Drivers and Stressors

Strengths & Opportunities	Challenges & Weaknesses	Resiliency Implications
EDUCATIONAL SERVICES		
- Combined, the <i>Elementary and Secondary Schools</i> and <i>Colleges, Universities, and Professional Schools</i> subsectors provide approximately 11,400 jobs in the county. - Schools and universities like Binghamton University can serve as community resilience hubs, offering shelter, communication centers, and education on climate preparedness.	- Reliance on education employment makes the local economy vulnerable to fluctuations in enrollment, state funding, and institutional restructuring. - Educational facilities may have aging infrastructure vulnerable to flooding, heat, storm damage, and limited funding for large-scale retrofits. 	Heavy reliance on education employment highlights the need to strengthen schools and universities as both economic anchors and resilience hubs capable of supporting community response and adaptation efforts — for example, by hardening campus facilities against flood and heat hazards, equipping campuses with backup power so they can serve as emergency shelters and cooling centers, and aligning workforce-training programs with the county's recovery and adaptation needs.
TOURISM & HOSPITALITY		
- Visitor spending is a significant economic driver of the county's economy. In 2024, Broome County captured \$428 million in direct tourism spending, equivalent to nearly four times that spent in neighboring counties. - Tourism can promote environmental stewardship and fund community resilience through sustainable infrastructure, eco-tourism, and heritage preservation initiatives.	- The largest share of tourism spending in Broome County was associated with food and beverage (\$167 million or 39 percent of total spending). - Reliance on outside visitor spending makes county hospitality businesses and restaurants vulnerable to external shocks like pandemics, economic downturns, or extreme weather that disrupts travel. 	The heavy reliance on visitor spending highlights the need to bolster tourism sector resilience through sustainable practices and infrastructure that can withstand climate and economic disruptions.

Strengths & Opportunities	Challenges & Weaknesses	Resiliency Implications
FOOD SERVICES		
- Combined, approximately 7,360 jobs in the county are in the <i>Restaurants and Other Eating Places</i> or the <i>Grocery and Convenience Retailers</i> subsectors. - Restaurants and food retailers can support community resilience by providing food access during emergencies and adapting quickly through mobile service, delivery, or outdoor dining models.	- With an average annual wage ranging between \$26,000 and \$31,000 per year, a significant portion of the county's workforce employed in these two subsectors may be financially vulnerable and less able to absorb shocks like business closures during climate disasters or pandemics. - Small, independently owned businesses may lack the resources to recover from prolonged closures, supply disruptions, or infrastructure damage.	The concentration of low-wage food service jobs underscores the need for targeted support to sustain essential food access and economic stability during and after climate-related disruptions. 
HEALTH CARE & SOCIAL SERVICES		
- Approximately 7,510 jobs in the county are in the following three subsectors: <i>General Medical and Surgical Hospitals</i>; <i>Nursing Care Facilities</i>; and <i>Residential Intellectual and Developmental Disability, Mental Health, and Substance Abuse Facilities</i>. - Critical health care facilities may have access to emergency preparedness funding, regulatory oversight, and institutional partnerships that support investments in resiliency upgrades.	- Employment in these three subsectors has contracted in recent years, which may be due to pandemic-exacerbated staffing challenges and reduced nursing home admissions. - Workforce shortages and limited capital budgets make it difficult to maintain operations during extreme weather events.	The health care and social services sector is a critical resilience asset, but recent job losses threaten its ability to operate effectively during climate emergencies, underscoring the need for targeted investments in workforce stability and infrastructure resilience. 

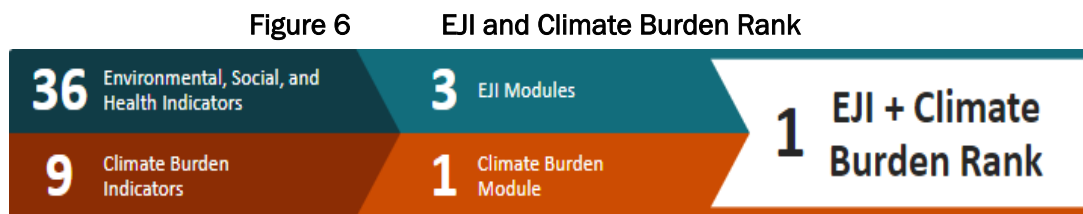
Strengths & Opportunities	Challenges & Weaknesses	Resiliency Implications
GOVERNMENT		
Approximately 3,750 jobs in the county are in the Executive, Legislative, and Other General Government Support subsector. 	Employment in this subsector contracted by 1,169 jobs from the first quarter of 2001 to the first quarter of 2025, which may be partially due to pandemic-induced revenue or staffing shortfalls.	The recent contraction in government employment may have reduced local capacity to plan for, respond to, and recover from environmental and economic disruptions.
ELECTRONIC COMPONENT MANUFACTURING		
- The <i>Semiconductor and Other Electronic Component Manufacturing</i> subsector offers 1,330 relatively high-wage job opportunities in the county, (\$89,724 per year). In the county, this sector is largely comprised of firms dedicated to electronic component manufacturing. - These firms are foundational to electrification and clean energy, offering strategic opportunities to lead in climate-resilient technologies like smart grids, solar panels, and efficient power systems.	These firms rely on precision processes, stable power, clean water, and complex global supply chains - making them highly vulnerable to climate-related disruptions like extreme weather and resource scarcity. 	Local electronic component manufacturing firms may require climate-resilient infrastructure and technology investments that reduce vulnerability to extreme weather events.

Environmental Justice and Climate Burden Considerations

A resiliency plan should consider environmental justice issues because vulnerable and historically marginalized communities often face disproportionate exposure to environmental hazards and have fewer resources to recover from disasters, making it essential to ensure that adaptation strategies are equitable, inclusive, and effectively reduce systemic risks for all county residents. Under the Climate Leadership and Community Protection Act (CLCPA), several areas of the city of Binghamton, the village of Johnson City, and parts of the village of Endicott — along with the entire town of Dickinson, the village of Port Dickinson, and the town of Kirkwood — are designated as Disadvantaged Communities (DACs), directing 40 percent of New York State’s clean-energy and climate investment benefits toward these areas. Many of these DACs lie within flood zones severely affected by the 2006 and 2011 flood events, making them priority geographies for the resiliency strategies identified in this analysis.

To measure environmental justice and climate burden in the county, Broome County census tracts were ranked based on the Centers for Disease Control and Prevention’s (CDC) Environmental Justice Index (EJI) (includes the *Social Vulnerability*, *Environmental Burden*, and *Health Vulnerability* modules) and the *Climate Burden* (CB) module.

As illustrated below, the EJI ranks census tracts based on 36 environmental, social, and health factors and groups them into three overarching modules: *Social Vulnerability*, *Environmental Burden*, and *Health Vulnerability*. The EJI delivers a single rank for each community to identify and map areas most at risk for the health impacts of environmental burden. The Climate Burden (CB) Module includes nine indicators related to heat, wildfire, and extreme events. The CB Module is intended to capture cumulative climate-related environmental burdens that impact the health and well-being of U.S. communities. These two modules can be combined to result in the EJI and Climate Burden rank. These indicators are presented along with data sources in the Appendix.



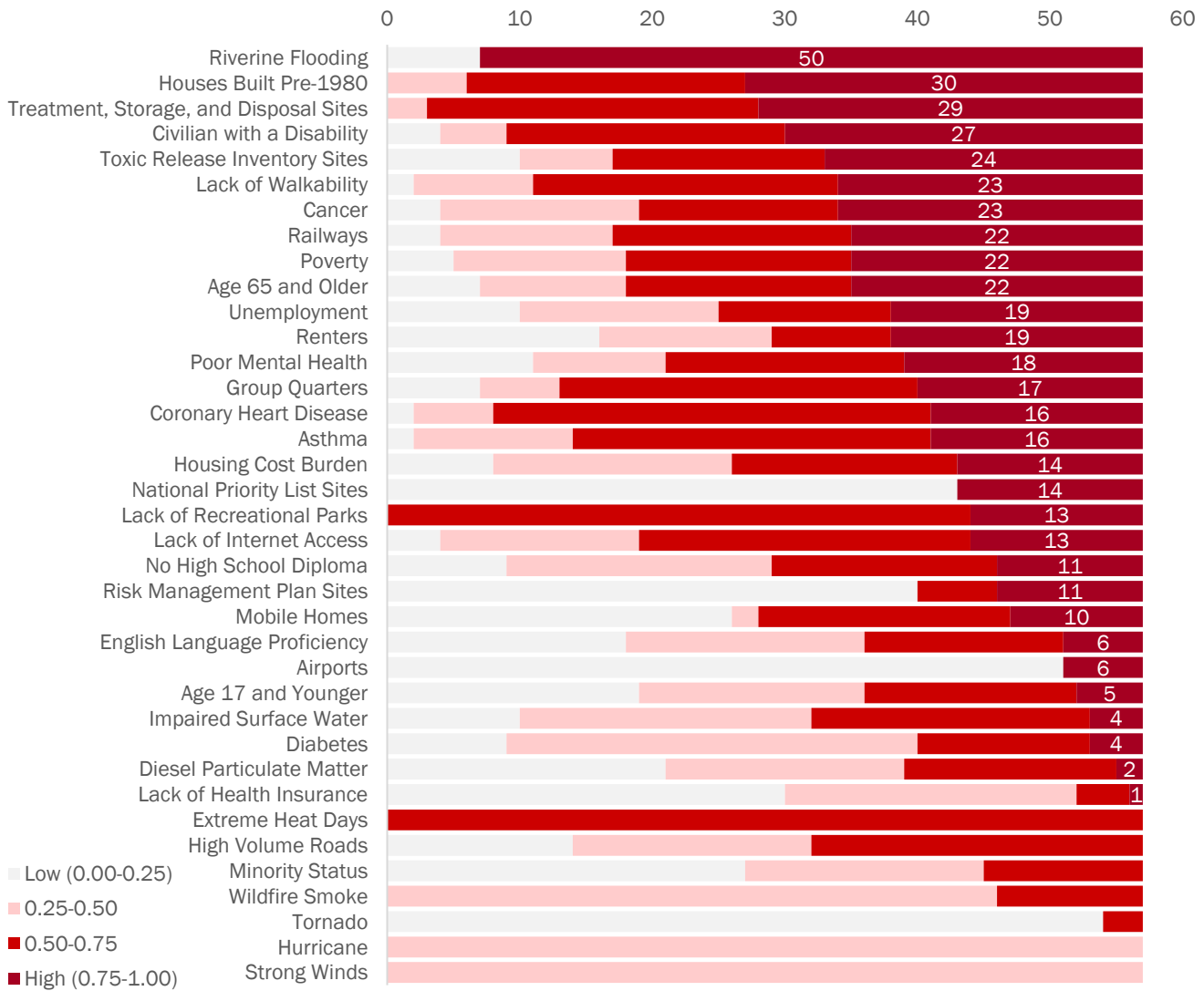
Source: CDC, Agency for Toxic Substances and Disease Registry, 2024 Environmental Justice Index

- **Social Vulnerability Module:** Measures community sensitivity to social stressors such as poverty, education, unemployment, housing burden, and access to health insurance that can affect a population’s ability to prepare for, respond to, and recover from environmental and public health hazards.
- **Environmental Burden Module:** Assesses exposure to environmental stressors including air pollution, toxic releases, high volume roadways, and wastewater pollution, which increase health and environmental risks.
- **Health Vulnerability Module:** Evaluates underlying health conditions and outcomes (such as asthma, cancer, coronary heart disease, diabetes, and poor mental health) that make populations more susceptible to environmental and climate-related hazards.
- **Climate Burden (CB) Module:** Examines exposure to climate-related risks such as extreme heat, wildfire, flooding, hurricanes, tornadoes, and drought, indicating where communities face heightened climate stress and reduced resilience.

EJI and Climate Burden Ranking by Indicator

Across Broome County's 57 census tracts, riverine flooding is by far the most widespread high-risk factor, followed by concentrations of older housing, hazardous facilities, and socioeconomic and health vulnerabilities, illustrating that climate exposure and social stressors frequently overlap.

Figure 7 Number of Census Tracts by Indicator and Risk Ranking



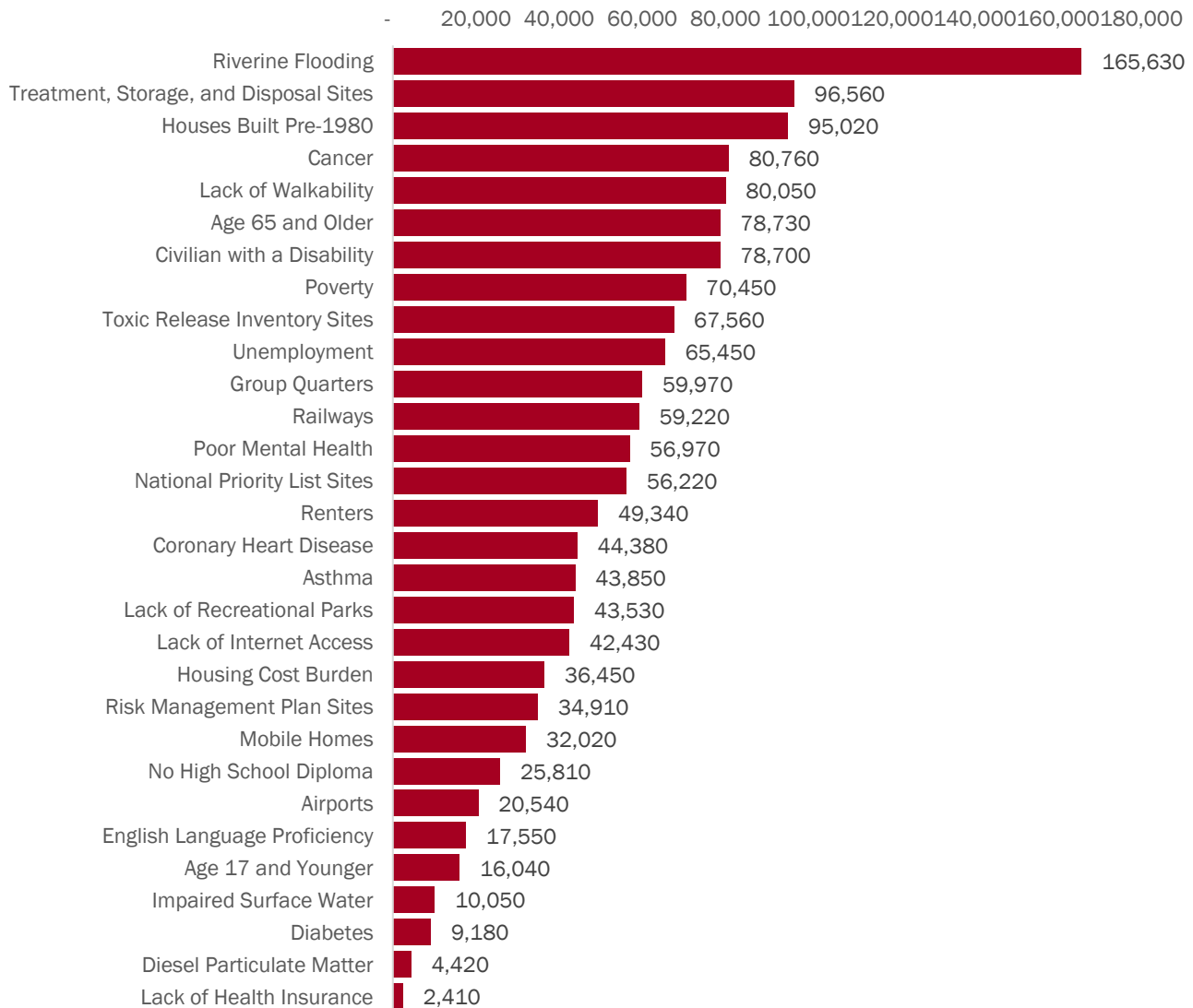
Note: Ozone, Particulate Matter 2.5 (PM2.5), Coal Mines, Lead Mines, Wildfire Proximity, Coastal Flooding, and Drought have a rank of zero; Air Toxics Cancer Risk has a low rank of 0.04. These indicators are omitted from the figure.

Source: CDC, Agency for Toxic Substances and Disease Registry, 2024 Environmental Justice Index

In 2025, the largest populations living in highly burdened census tracts in Broome County are exposed to riverine flooding and legacy environmental conditions—such as hazardous waste sites and older housing—while substantial numbers also face cancer, lack of walkability, aging, disability, and poverty challenges, underscoring the scale and breadth of overlapping resilience needs.

Because a census tract can rank as highly burdened on more than one indicator, the totals above reflect a duplicated count: every census tract in the county ranks highly burdened on at least one indicator, while about 46,300 residents (roughly 24 percent of the county) live in the 16 tracts ranked highly burdened on the combined EJ and Climate Burden index. Definitions for each indicator are provided in Appendix B.

Figure 8 **Number of People in Highly Burdened Census Tracts by Indicator, 2025**



**Health vulnerability measures are marked with asterisks as they are calculated differently than other indicators. While most indicators can have a range of values, the health vulnerability indicators only represent whether or not a given census tract experiences a high estimated prevalence of disease.*

Source: Esri, 2025; CDC, Agency for Toxic Substances and Disease Registry, 2024 Environmental Justice Index

Top Seven Vulnerabilities and Burden Indicators by Population Impacted

The following presents the top seven vulnerabilities and burdens by population impacted according to the *Social Vulnerability*, *Environmental Burden*, *Health Vulnerability* and *Climate Burden* indicators. These indicators are presented below and mapped on the following pages.



165,630 people live in “highly burdened” census tracts (50 of 57, or 88 percent) according to the **Riverine Flooding** climate burden indicator, with people in these census tracts having high risk to flooding when nearby streams and rivers exceed their capacity.



96,560 people live in “highly burdened” census tracts (29 of 57, or 51 percent) according to the **Treatment, Storage, and Disposal (TSD) Sites** environmental burden indicator and may be living near hazardous waste sites associated with increased health risks.



95,020 people live in “highly burdened” census tracts (30 of 57, or 53 percent) according to the **Houses Built Pre-1980** environmental burden indicator, with people in these census tracts potentially having higher exposure to lead paint.



80,760 people live in “highly burdened” census tracts (23 of 57, or 40 percent) according to the **Cancer** health vulnerability indicator, with people in these census tracts having a high estimated prevalence of cancer.



80,050 people live in “highly burdened” census tracts (23 of 57, or 40 percent) according to the **Lack of Walkability** environmental burden indicator, with people in these census tracts not having access to the most accessible methods of physical activity.

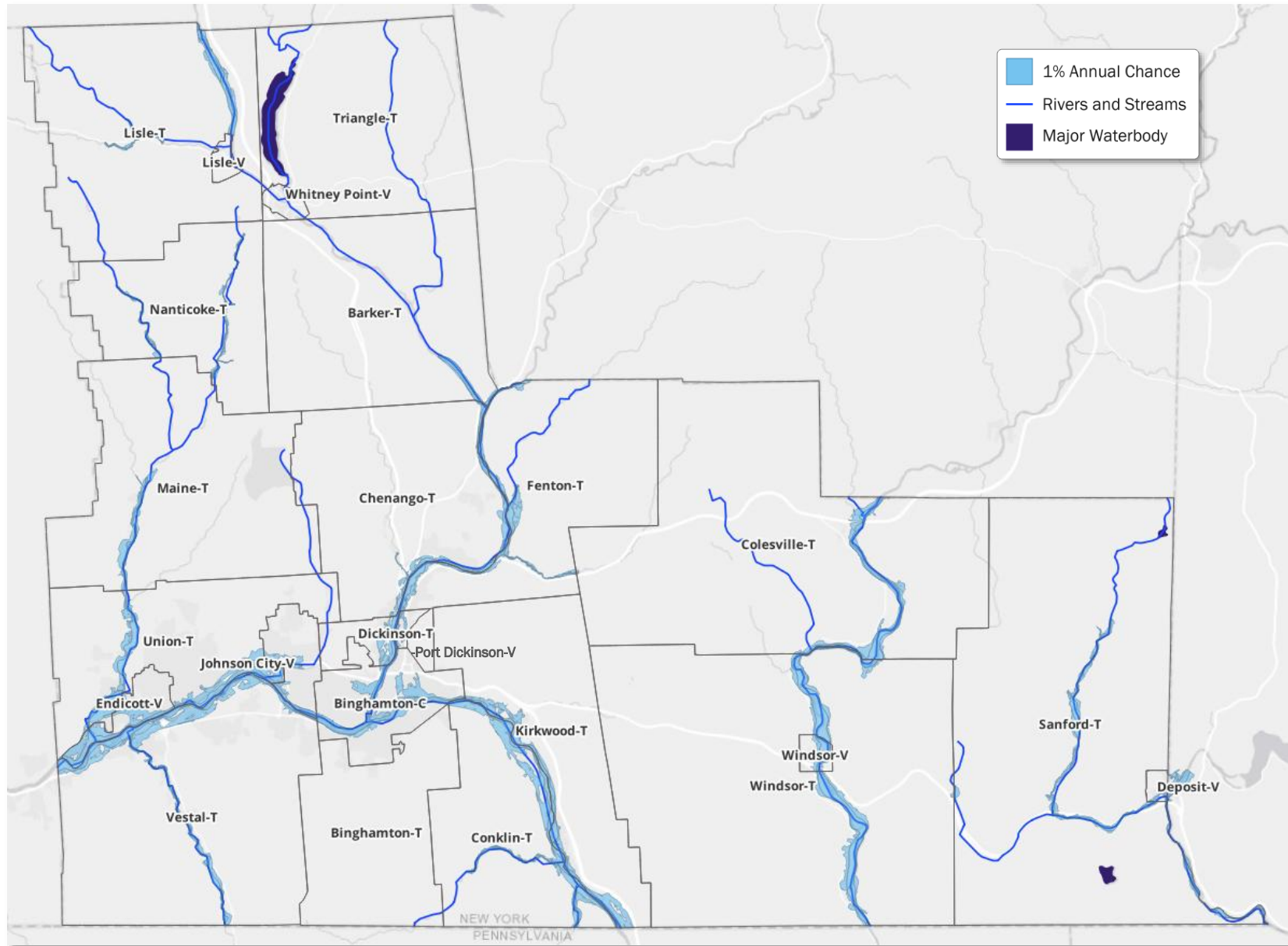


78,730 people live in “highly burdened” census tracts (22 of 57, or 39 percent) according to the **Age 65 and Older** social vulnerability indicator, with older people in these census tracts potentially being more socially isolated than younger populations.



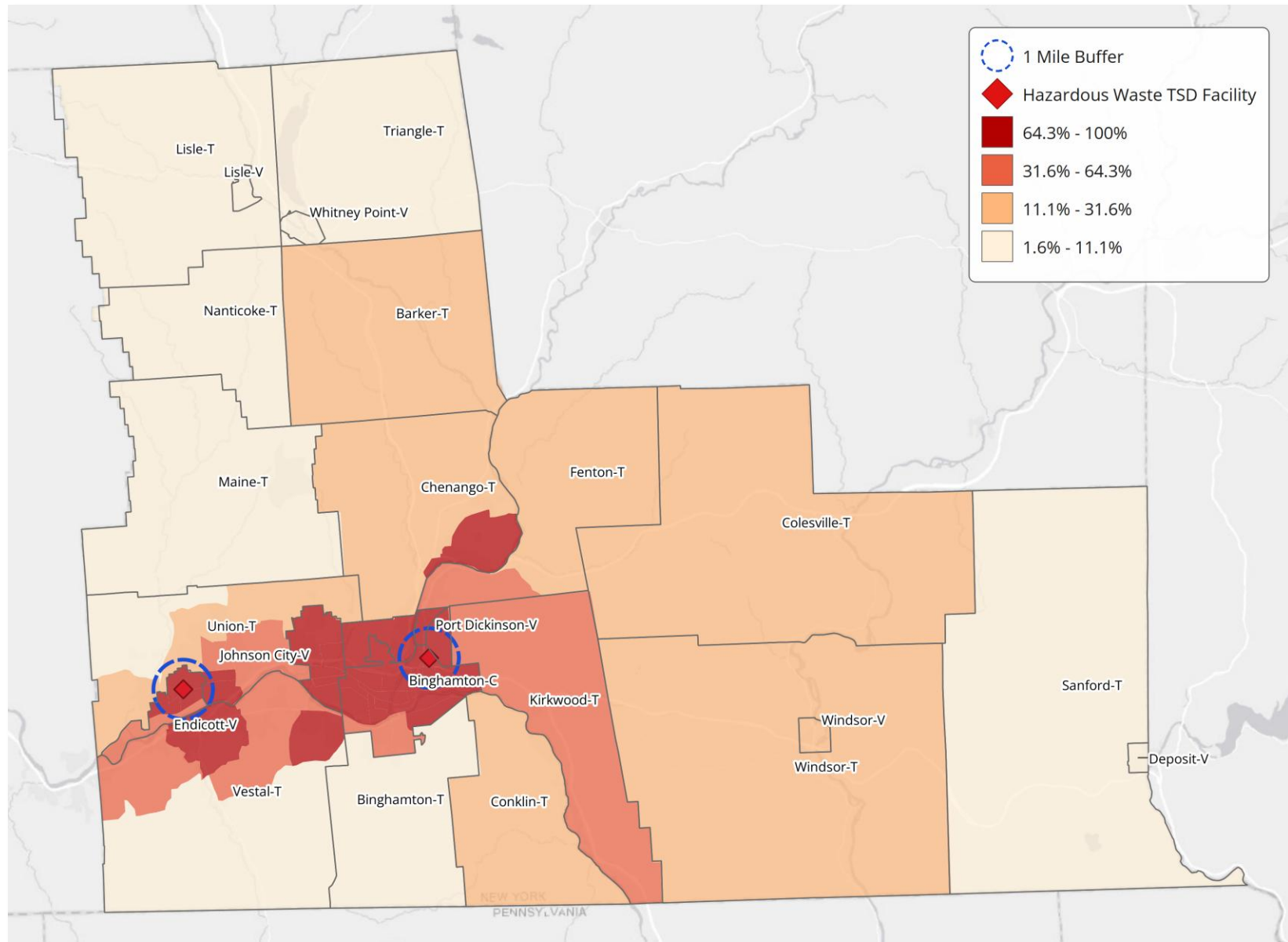
78,700 people live in “highly burdened” census tracts (27 of 57, or 47 percent) according to the **Civilian with a Disability** social vulnerability indicator, with people with disabilities in these census tracts potentially having a harder time preparing for and recovering from environmental hazards.

Figure 9 Riverine Flooding in Broome County



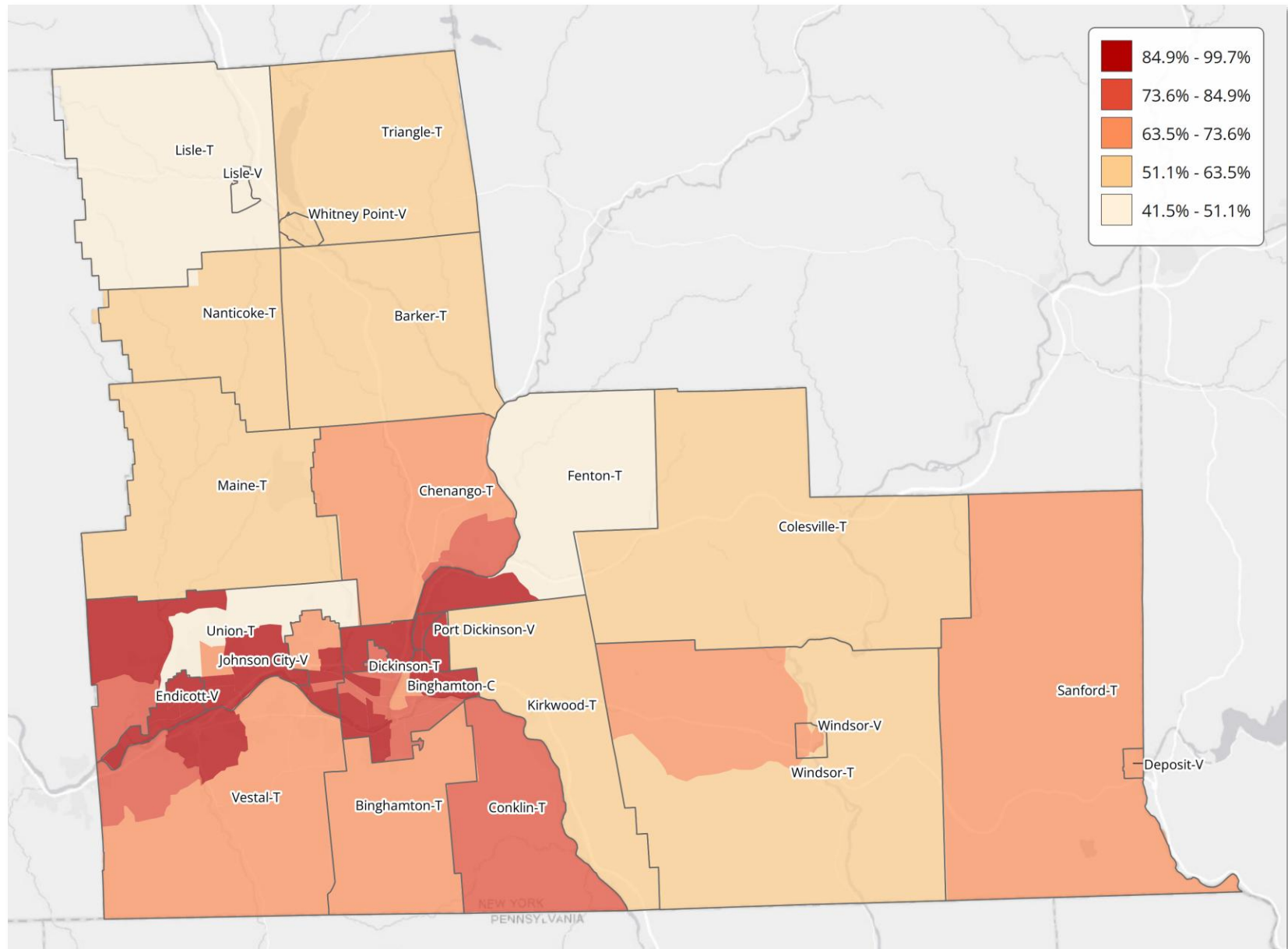
Source: 2024 Environmental Justice Index; Federal Emergency Management Agency (FEMA), 2010; ArcGIS Hub

Figure 10 Proportion of Census Tract within 1-Mile Buffer of Treatment, Storage and Disposal Facility



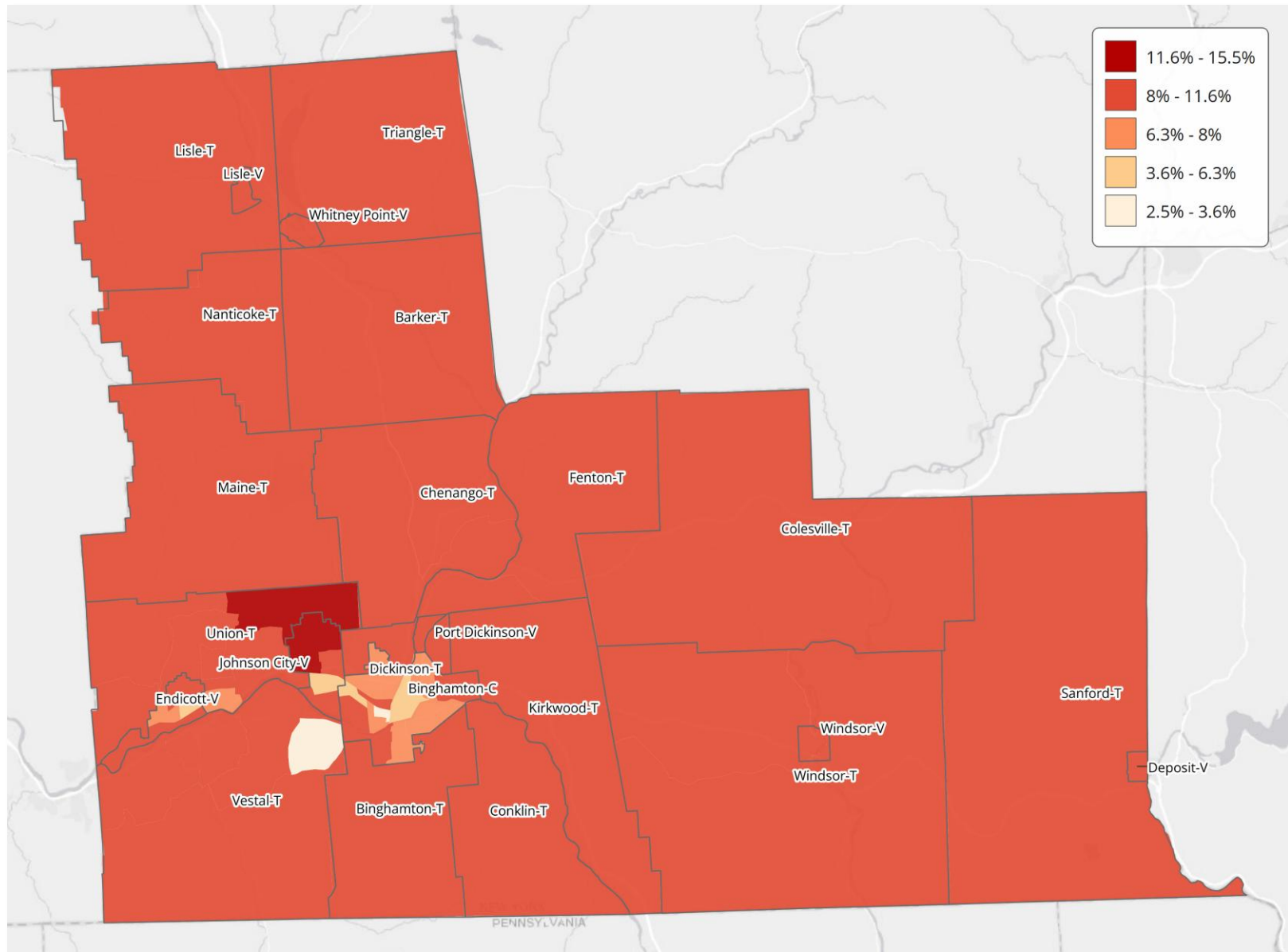
Source: 2024 Environmental Justice Index; U.S. EPA Facility Registry Service

Figure 11 **Share of Housing Built Pre-1980 by Census Tract**



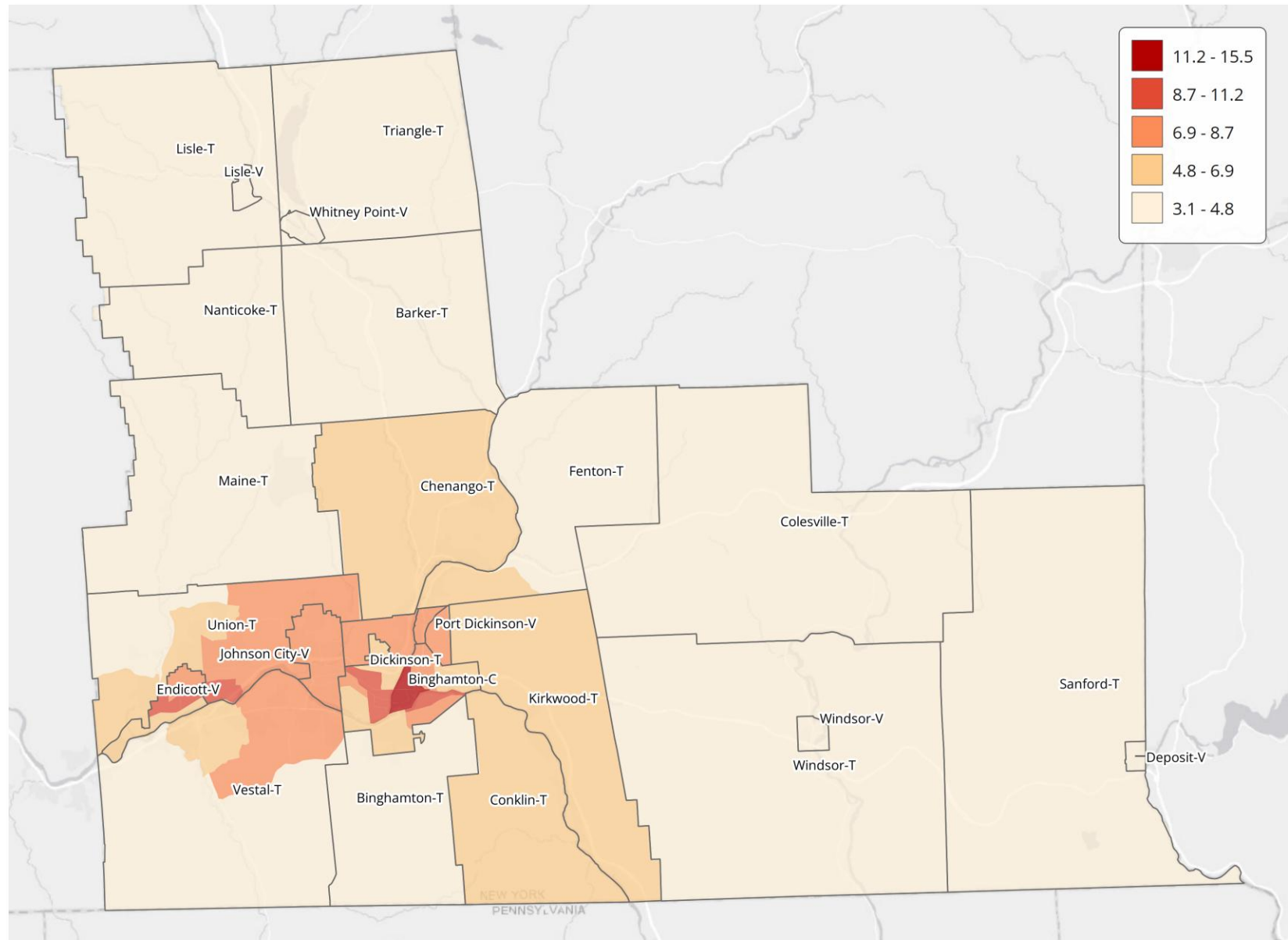
Source: 2024 Environmental Justice Index; U.S. Census Bureau American Community Survey

Figure 12 **High Estimated Prevalence of Cancer by Census Tract**



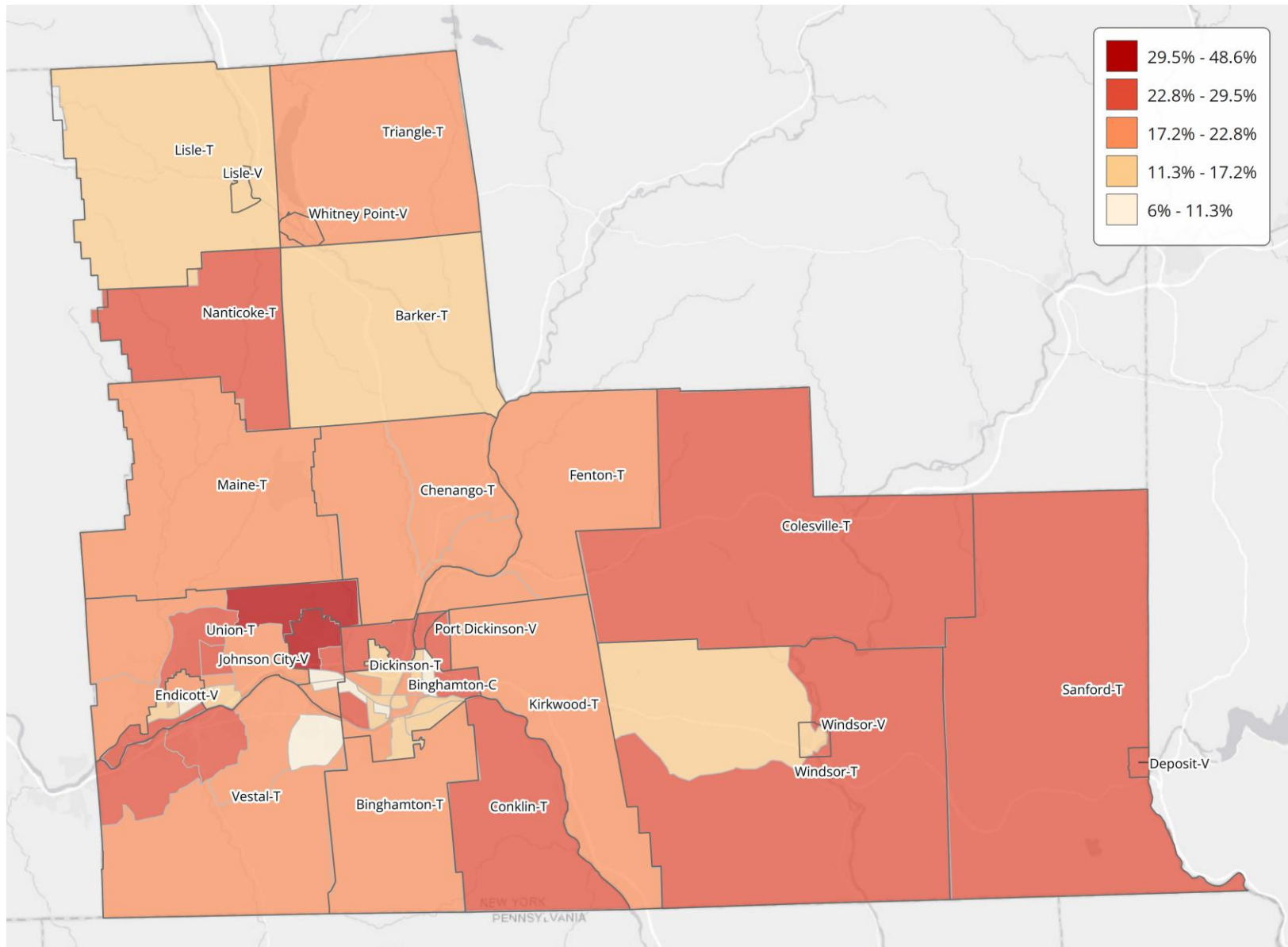
Source: 2024 Environmental Justice Index; CDC PLACES

Figure 13 National Walkability Index Score by Census Tract



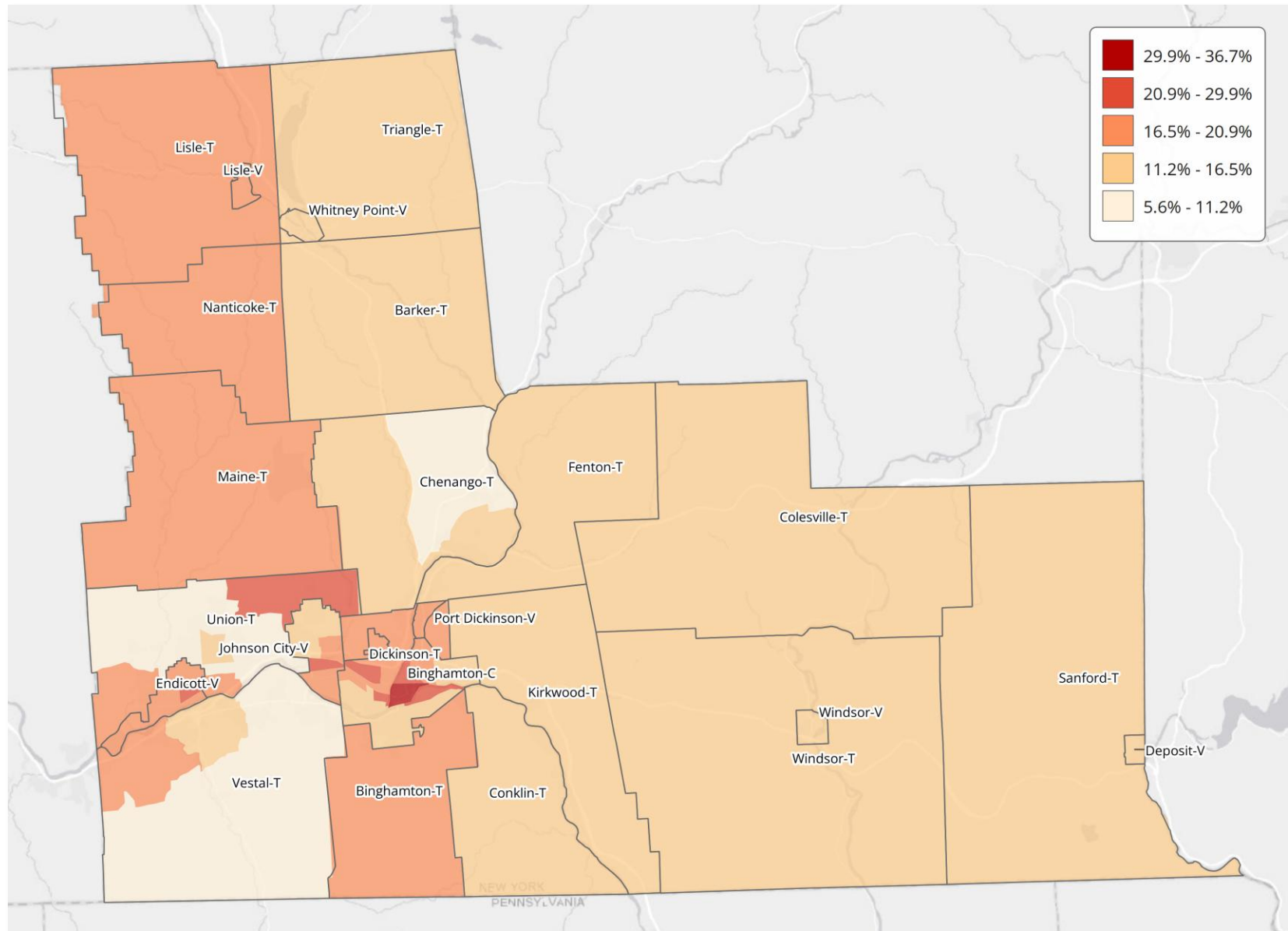
Source: 2024 Environmental Justice Index; U.S. EPA National Walkability Index

Figure 14 Share of Households with Person Age 65 and Older by Census Tract



Source: 2024 Environmental Justice Index; U.S. Census Bureau American Community Survey

Figure 15 **Civilian Noninstitutionalized Persons with a Disability by Census Tract**



Source: 2024 Environmental Justice Index; U.S. Census Bureau American Community Survey

Socio-Economic Overview

The following section examines the county's regional context and compares key socio-economic metrics across municipalities. This analysis will help identify potential disparities in vulnerability, resource capacity, and adaptive needs - enabling more targeted and equitable resiliency planning in the county.

Municipal Profiles

Current Metrics

According to data provided by the U.S. Census Bureau, Center for Economic Studies, and Esri, a private firm that compiles socio-economic census data for various geographies, the Southern Tier region contains approximately 229,648 primary jobs,¹¹ 268,270 households, 317,850 housing units, and 624,790 residents. According to Esri, Broome County contains approximately 195,920 residents, 93,860 housing units, 82,070 households, and 76,693 primary jobs. With Broome County representing approximately 31 percent of all residents and households, 30 percent of all housing units, and 33 percent of all primary jobs in the Southern Tier Region, Broome County's resilience is pivotal to the region's overall capacity to withstand and recover from climate and economic disruptions.

As presented in the table on the following page, the town of Union and the city of Binghamton are the two largest municipalities by population in Broome County, combined representing approximately 52 percent of the county's total population and 57 percent of the county's total households and housing units. Located at the confluence of the Chenango and Susquehanna Rivers, the city of Binghamton is the county's biggest job center, with 31 percent of the county's total primary jobs located in the city. The county has a median household income of \$65,655, with the median household income highest in the town of Binghamton (\$100,733), and lowest in the city of Binghamton (\$46,321). The median age in the county is 41 years, with the youngest median age in the town of Vestal (27 years) and highest in the town of Sanford (49 years). The share of renter-occupied households in the county is 38 percent, with the lowest share in the town of Binghamton (10 percent) and highest in the village of Endicott (62 percent).

¹¹ According to the U.S. Census Bureau, a primary job is the highest paying job for an individual worker (should they have more than one job). Primary-job counts reflect jobs located in a geography rather than the size of its resident workforce.

The following table compares key socio-economic metrics across Broome County municipalities sorted by total population. Top values for each municipal metric are highlighted in green with the lowest values highlighted in red.

Figure 16 Current Socio-Economic Metrics by Municipality, 2025

Geography	Total Population	Total Households	Total Housing Units	Median HH Income	Median Age	Renter Occupied Households
Union-T	54,825	24,869	28,205	\$64,406	44	43%
Binghamton-C	47,304	21,715	25,495	\$46,321	37	61%
Vestal-T	30,119	8,906	9,702	\$81,183	27	26%
Johnson City-V	15,106	6,718	7,874	\$55,511	43	51%
Endicott-V	13,225	6,144	7,261	\$50,339	41	62%
Chenango-T	10,684	4,503	4,853	\$93,644	45	16%
Fenton-T	6,252	2,771	3,094	\$75,758	48	16%
Windsor-T	5,697	2,313	2,950	\$77,447	45	16%
Kirkwood-T	5,279	2,311	2,560	\$57,636	44	29%
Dickinson-T	5,035	1,971	2,199	\$66,802	42	32%
Maine-T	5,019	2,047	2,234	\$76,303	44	14%
Conklin-T	4,853	2,097	2,275	\$73,063	46	17%
Colesville-T	4,767	1,910	2,258	\$72,915	45	18%
Binghamton-T	4,464	1,880	2,018	\$100,733	48	10%
Lisle-T	2,792	1,100	1,230	\$71,539	40	16%
Triangle-T	2,704	1,134	1,314	\$70,693	43	26%
Barker-T	2,444	1,018	1,140	\$76,846	46	13%
Sanford-T	2,163	933	1,651	\$74,216	49	20%
Port Dickinson-V	1,688	803	865	\$62,459	42	38%
Nanticoke-T	1,518	593	677	\$78,498	41	25%
Deposit-V	1,367	648	810	\$62,532	48	31%
Whitney Point-V	930	392	429	\$58,631	41	30%
Windsor-V	879	360	407	\$77,500	41	34%
Lisle-V	342	122	148	\$69,516	41	14%
Broome County	195,919	82,071	93,855	\$65,655	41	38%
Southern Tier Region	624,789	268,274	317,845	\$66,266	41	35%
New York State	19,998,175	7,815,341	8,671,626	\$85,744	40	49%

Note: Table sorted by Total Population. Green indicates the highest value in column, red indicates the lowest value in column.

Source: Esri, U.S. Census Bureau, 2025

Historic Trends and Projections

From 2010 to 2025, Broome County experienced modest but persistent population decline (-0.16 percent annually) and essentially flat household growth (-0.01 percent), while total housing units continued to increase (0.24 percent). These trends mirror patterns across the Southern Tier but contrast sharply with the State of New York overall growth in population, households, and housing. The mismatch between declining population and rising housing supply in the 2010–2025 period suggests structural shifts such as smaller household sizes, aging in place, and incremental residential development occurring without corresponding growth in demand. Looking ahead, projections for 2025–2030 indicate accelerating population loss (-0.51 percent annually), stagnant household growth (0.00 percent), and a decline in housing units (-0.19 percent), signaling a transition from slow growth to potential contraction in the local housing market. Persistent population decline also functions as a resiliency stressor in its own right: the county’s difficulty attracting and retaining residents gradually erodes its tax base, leaving less fiscal capacity to fund resilience investments. This dynamic risks becoming self-reinforcing, as underinvestment in hazard mitigation and quality-of-life infrastructure can, in turn, make the county less attractive to current and prospective residents and employers.

These trends imply that Broome County’s resilience strategy must prioritize stabilization and adaptation rather than growth-based planning assumptions. Emphasis should be placed on reinvestment in existing neighborhoods, housing rehabilitation, and managing vacancy and underutilized properties, while right-sizing infrastructure and public services to match changing demand. Economic resilience efforts should focus on retaining and attracting working-age residents through workforce development, diversification of employment sectors, and quality-of-life improvements. Overall, the resilience plan should acknowledge long-term demographic decline as a structural condition and frame resilience around fiscal sustainability, community health, and adaptive reuse rather than expansion.

Figure 17 Annualized Percent Change for Socio-Economic Trends, 2010-2025

	Total Population	Total Households	Total Housing Units
Broome County	-0.16%	-0.01%	0.24%
Southern Tier Region	-0.34%	0.08%	0.23%
New York State	0.21%	0.45%	0.46%

Source: Esri, U.S. Census Bureau, 2025

Figure 18 Projected Annualized Percent Change for Socio-Economic Trends, 2025-2030

	Total Population	Total Households	Total Housing Units
Broome County	-0.51%	0.00%	-0.19%
Southern Tier Region	-0.42%	0.05%	-0.04%
New York State	-0.09%	0.25%	0.19%

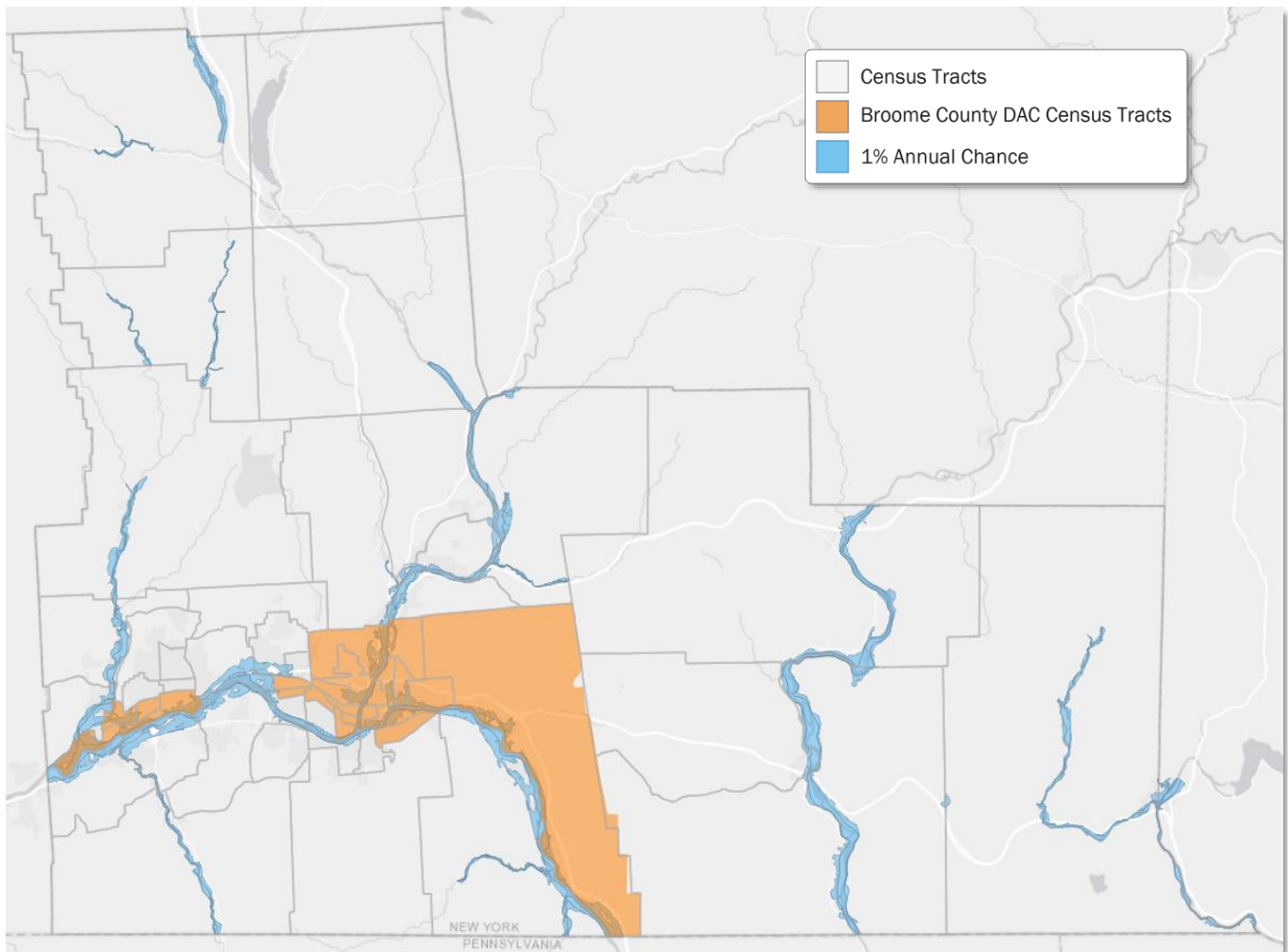
Source: Esri, U.S. Census Bureau, 2025

Disadvantaged Communities

The Climate Leadership and Community Protection Act (CLCPA) of 2019 mandates that New York State prioritizes equity and environmental justice in climate action and requires that 40 percent of clean energy and climate investment benefits be directed to Disadvantaged Communities (DACs). The identification of DACs - based on environmental burdens, climate risks, health vulnerabilities, and socioeconomic factors - forms a cornerstone of equitable resiliency planning.

According to the New York State Climate Justice Working Group, several areas in the city of Binghamton, the village of Johnson City, and parts of the village of Endicott are designated as DACs. The entire town of Dickinson, the village of Port Dickinson and town of Kirkwood are also designated as DACs. Many of these areas are located in flood zones and were severely affected by historic flood events, including those in 2006 and 2011 (Tropical Storm Lee), and continue to face risks from aging infrastructure and inadequate stormwater systems. In Broome County, this requirement has significant implications for how resources are allocated, infrastructure is improved, and communities are engaged in the transition to a more sustainable and climate-resilient future.

Figure 19 Broome County Disadvantaged Communities



Source: New York State Energy Research and Development Authority (NYSDERDA), *Final Disadvantaged Communities (DAC) 2023*; Federal Emergency Management Agency (FEMA), 2010

Land-Use Patterns

Broome County faces increasing economic risks from changing environmental hazards, particularly flooding, which can have significant impacts on building structures, insurance costs, and local government finances. Regional land-use patterns influence how well the county can adapt to and recover from environmental, economic, and social disruptions. Compact, connected, and hazard-aware development supports stronger infrastructure, protects natural systems, and ensures equitable access to essential resources.

FLOOD ZONES AND IMPACT COSTS



Changing flood maps and the increasing impact on land values and insurance premiums threaten the 5.6 percent of parcels in Broome County located within the one percent and 0.2-percent annual chance floodplains.

Flood Zones

Figure 20 presents the acres of land located within the preliminary one-percent and 0.2-percent annual chance floodplains (the 100-year and 500-year floodplains, respectively) in Broome County, as depicted on the FEMA Digital Flood Insurance Rate Map (DFIRM) dated February 5, 2010, according to the 2024 Hazard Mitigation Plan for Broome County. Flood hazard zones occur throughout the county. The largest areas are along the Susquehanna River. Approximately 5.1 percent of parcels in Broome County are located within the one-percent annual chance floodplain, with this share increasing to 5.6 percent when including the 0.2-percent annual chance floodplain. Measured by land area, as shown in the table below, 5.2 percent of the county lies within the one-percent annual chance floodplain and 5.7 percent within the combined one percent and 0.2-percent annual chance floodplains. Several municipalities in Broome County, particularly the villages of Endicott, Windsor, Whitney Point, and Port Dickinson, and the city of Binghamton, have a high percentage of their total land areas within one percent and 0.2-percent annual chance flood zones, indicating elevated community-wide flood exposure and highlighting the need for prioritized flood mitigation and resiliency planning in these municipalities.

Figure 20 Total Land Area in the Preliminary 1% and 0.2% Annual Chance Flood Zones

Municipality	Total Acres (Minus Open Water)	1% Annual Chance Flood Hazard Area		1% and 0.2% Annual Chance Flood Hazard Area (Combined)	
		Acres	Percent of Total	Acres	Percent of Total
Barker-T	26,794	1,146	4.3%	1,152	4.3%
Binghamton-C	7,073	1,340	18.9%	1,729	24.4%
Binghamton-T	16,089	38	0.2%	40	0.2%
Chenango-T	21,905	1,185	5.4%	1,335	6.1%
Colesville-T	50,595	1,444	2.9%	1,516	3.0%
Conklin-T	15,837	1,829	11.5%	2,155	13.6%
Deposit-V	423	72	17.0%	88	20.8%
Dickinson-T	2,761	309	11.2%	365	13.2%
Endicott-V	2,170	881	40.6%	1,017	46.9%

Municipality	Total Acres (Minus Open Water)	1% Annual Chance Flood Hazard Area		1% and 0.2% Annual Chance Flood Hazard Area (Combined)	
		Acres	Percent of Total	Acres	Percent of Total
Fenton-T	21,140	1,283	6.1%	1,397	6.6%
Johnson City-V	2,971	364	12.3%	437	14.7%
Kirkwood-T	19,874	1,251	6.3%	1,384	7.0%
Lisle-T	29,596	1,317	4.4%	1,348	4.6%
Lisle-V	545	93	17.1%	93	17.1%
Maine-T	28,931	1,069	3.7%	1,069	3.7%
Nanticoke-T	15,505	475	3.1%	556	3.6%
Port Dickinson-V	405	116	28.6%	152	37.5%
Sanford-T	57,430	1,233	2.1%	1,295	2.3%
Triangle-T	23,825	1,164	4.9%	1,164	4.9%
Union-T	18,033	1,883	10.4%	2,064	11.4%
Vestal-T	33,555	2,204	6.6%	2,594	7.7%
Whitney Point-V	732	259	35.4%	259	35.4%
Windsor-T	58,336	2,305	4.0%	2,400	4.1%
Windsor-V	727	277	38.1%	286	39.3%
Broome County	455,252	23,537	5.2%	25,895	5.7%

Note: Excludes areas designated as water.

Sources: Broome County 2023; USGS; FEMA 2010, 2024 Hazard Mitigation Plan for Broome County

Building-Related Economic Loss

Flood hazard exposure includes buildings located within FEMA-mapped flood zones or downstream areas subject to flood inundation. Potential damages are based on modeled losses to these exposed structures, measured by the structural and content replacement cost value. According to the 2024 Hazard Mitigation Plan for Broome County, approximately 7,591 buildings are exposed to the one-percent annual chance floodplain, representing 8.5 percent of the County's total building inventory replacement value. The city of Binghamton is particularly vulnerable, with 2,658 buildings located in the one-percent annual chance floodplain. As flood patterns shift, some areas currently in the 0.2-percent annual chance floodplain could be reclassified into higher-risk zones in future FEMA map updates. There are an estimated 11,574 buildings in the combined 1-percent and 0.2-percent annual chance floodplains, with the city of Binghamton also having the greatest number of buildings located in the combined flood zones (4,124 buildings). According to the 2024 Hazard Mitigation Plan for Broome County, a one-percent annual chance flood event could result in building-related economic losses of up to \$341.2 million in inventory loss, \$285 million in relocation loss, \$744.3 million in wage loss, \$241.3 million in rental loss, and \$323.7 million in income loss. According to 2022 RS Means construction cost data, the estimated replacement cost of all buildings located in the one-percent annual chance floodplain would be \$8.1 billion, with \$2.8 billion of this cost occurring in the city of Binghamton. Within the combined 1-percent and 0.2-percent annual chance floodplains, total estimated replacement cost of all buildings would be \$12.8 billion. The estimated replacement cost of buildings located in these floodplains quantifies the potential financial exposure to flood damage, helping prioritize areas for mitigation, investment, and risk reduction.

Figure 21 Business Interruption Loss Estimates from the Preliminary One-Percent Annual Chance Flood Event

Flood Hazard	Total Business Interruption Loss				
	Inventory Loss	Relocation Loss	Wage Loss	Rental Loss	Income Loss
One-Percent Annual Chance Flood Event	\$341,200,000	\$284,950,000	\$744,300,000	\$241,310,000	\$323,690,000

Source: Hazus v6.0, 2024 Hazard Mitigation Plan for Broome County

Figure 22 Estimated Replacement Cost of Buildings Located in Preliminary Floodplains

	Number of Buildings in Flood Zone		Total Replacement Cost of Buildings	
	1% Annual Chance Flood Zone	1% and 0.2% Annual Chance Flood Zones (Combined)	1% Annual Chance Flood Zone	1% and 0.2% Annual Chance Flood Zones (Combined)
Binghamton-C	2,658	4,124	\$2,833,039,765	\$5,383,727,693
Endicott-V	1,133	1,665	\$1,649,080,712	\$1,923,832,873
Union-T	1,009	1,391	\$1,094,205,032	\$1,337,127,424
Vestal-T	836	1,220	\$673,698,194	\$1,438,073,551
Johnson City-V	297	602	\$542,513,669	\$663,186,816
Conklin-T	500	720	\$425,468,682	\$522,767,266
Kirkwood-T	152	246	\$227,269,082	\$355,287,377
Whitney Point-V	119	119	\$192,727,992	\$192,727,992
Chenango-T	150	330	\$121,034,900	\$416,458,571
Deposit-V	96	167	\$96,345,888	\$151,022,050
Colesville-T	108	138	\$41,704,622	\$52,365,969
Fenton-T	66	114	\$36,202,651	\$81,141,272
Windsor-T	103	119	\$32,128,019	\$37,086,255
Port Dickinson-V	82	217	\$26,817,664	\$71,385,176
Lisle-V	37	37	\$18,634,757	\$18,634,757
Maine-T	93	93	\$18,510,772	\$18,510,772
Lisle-T	26	30	\$18,347,683	\$22,231,866
Dickinson-T	9	54	\$15,108,257	\$82,910,954
Barker-T	51	58	\$14,265,439	\$22,381,184
Nanticoke-T	28	63	\$10,243,197	\$24,491,165
Windsor-V	15	24	\$6,893,286	\$10,633,547
Sanford-T	20	40	\$5,210,909	\$9,734,911
Binghamton-T	1	1	\$1,294,635	\$1,294,635
Triangle-T	2	2	\$730,453	\$730,453
Broome County	7,591	11,574	\$8,101,476,260	\$12,837,744,529

Source: Broome County GIS & Mapping Services; RS Means 2022; FEMA 2010, 2024 Hazard Mitigation Plan for Broome County

Insurance Costs

This table compares the risk-based cost of flood insurance versus the current cost of insurance for single-family homes in Broome County, New York State, and the United States as of August 31, 2023. In Broome County, there are 1,477 flood insurance policies in force, all of which have inland-flood exposure. The median risk-based cost of insurance in Broome County is \$1,724 per year, compared to the current median premium of \$785, a difference of \$939 for Broome County policyholders (versus a median difference of \$504 nationally). The difference exists because the current premiums in Broome County are based on older, subsidized rates, while the higher risk-based cost of \$1,724 reflects FEMA's updated Risk Rating 2.0 pricing, which more accurately accounts for each property's true flood risk using modern data and modeling. This suggests many policyholders in the county may face significant premium increases over time as FEMA's Risk Rating 2.0 phases in full-risk pricing.

**Figure 23 Risk-Based Cost of Insurance Versus Current Cost of Insurance:
Single-Family Homes, Levee And Non-Levee, In-Force on Aug 31, 2023**

Geography	Policies in Force (PIF)	Median Risk-based Cost of Insurance ¹	Median Current Cost of Insurance ²	Percentage of Policies with Exposure To:				
				Inland Flood	Storm Surge	Tsunami	Great Lakes	Coastal Erosion
Broome County	1,477	\$1,724	\$785	100.0%	-	-	-	-
New York State	118,453	\$1,834	\$943	100.0%	68.4%	-	0.8%	22.4%
United States	3,149,679	\$1,290	\$786	100.0%	60.7%	1.1%	0.2%	7.9%

¹ Risk-Based Cost of Insurance is what policyholders would pay if they were paying their full actuarial rate as evaluated under the rates implemented Oct. 1, 2021. This rate is based on the expected costs of losses and programmatic expenses, without subsidies. Many policyholders pay less than their full rate. These full-rate estimates will be updated periodically as risks change.

² Current Cost of Insurance: This is what policyholders are paying today. When a policyholder's capped current premium is below their risk-based premium, their premium will increase towards the full rate. This increase is called a "glide path." By law, rates cannot increase by more than 18 percent per year for most policyholders. Under the legacy approach, all National Flood Insurance Program (NFIP) policyholders were subject to premium increases every year. Under NFIP's pricing approach, annual increases will eventually stop once the full-risk rate is realized.

Source: FEMA

Municipal Buyouts

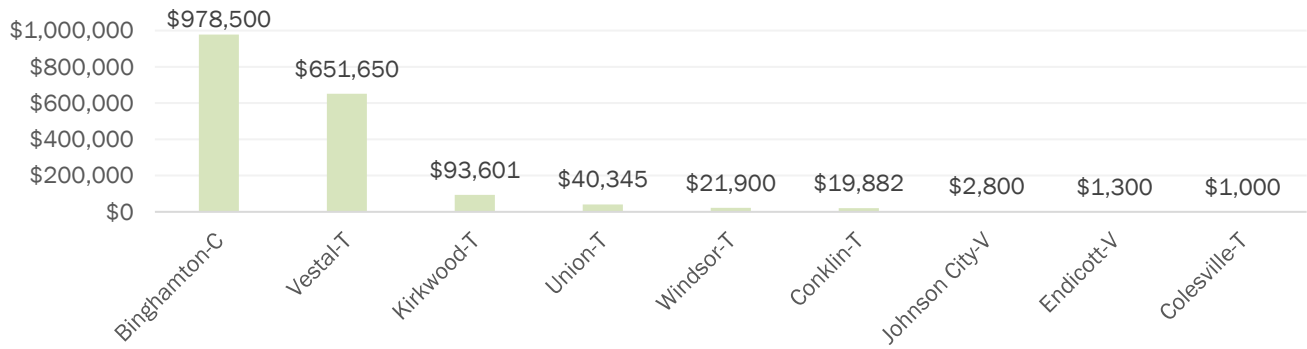
In response to repeated severe flooding in Broome County, notably in 2006 and 2011, local municipalities, in partnership with the County, FEMA, and New York State, implemented a series of municipal buyout programs to reduce future flood risk and protect public safety. The municipal buyouts were primarily funded through a combination of federal, state, and local sources, with the majority of funding provided by FEMA under the Hazard Mitigation Grant Program (HMGP). Since the mid-2000s, local municipalities, with support from Broome County, have facilitated over 504 municipal buyouts, resulting in the permanent removal of 173.7 acres of flood-prone properties from the hazard area. These buyouts have been largely concentrated in the Towns of Union and Conklin (70 percent of all acreage), and now consist largely of vacant land (92 percent of all acreage). Some of this vacant land may have previously been developed before a flood event. Under FEMA's Hazard Mitigation Grant Program, these acquired parcels are deeded to the community and must be maintained in perpetuity as open space, which precludes future structures and limits reuse to compatible uses such as parks, recreation, or floodplain management (44 CFR § 80.19). Municipal buyouts in Broome County reduce long-term flood risk and financial exposure but can lead to decreased tax revenues, higher local land maintenance costs, and potential disinvestment in surrounding areas if not carefully managed through coordinated land reuse and revitalization strategies. Transforming buyout parcels into community assets such as parks, greenways, flood storage areas, or recreational spaces can help enhance neighborhood appeal, support environmental goals, and attract reinvestment while maintaining flood resilience.

Figure 24 Municipal Buyouts by Acreage

Municipality	Vacant	Public Services	Wild/Forest	Residential	Commercial	Multi-Residential	Total	Share
Union-T	57.9	0.3	3.2	1.1	-	-	62.4	35.9%
Conklin-T	58.8	-	-	-	-	-	58.8	33.9%
Kirkwood-T	21.2	-	-	-	-	-	21.2	12.2%
Vestal-T	18.1	2.9	-	-	-	-	21.0	12.1%
Binghamton-C	1.1	4.7	-	1.0	0.2	0.2	7.2	4.1%
Johnson City-V	1.5	-	-	-	-	-	1.5	0.8%
Windsor-T	1.0	-	-	0.2	-	-	1.2	0.7%
Colesville-T	0.3	-	-	-	-	-	0.3	0.1%
Endicott-V	0.1	-	-	0.2	-	-	0.3	0.2%
Total	159.9	7.9	3.2	2.5	0.2	0.2	173.7	100.0%
Share	92.0%	4.5%	1.8%	1.4%	0.1%	0.1%	100.0%	

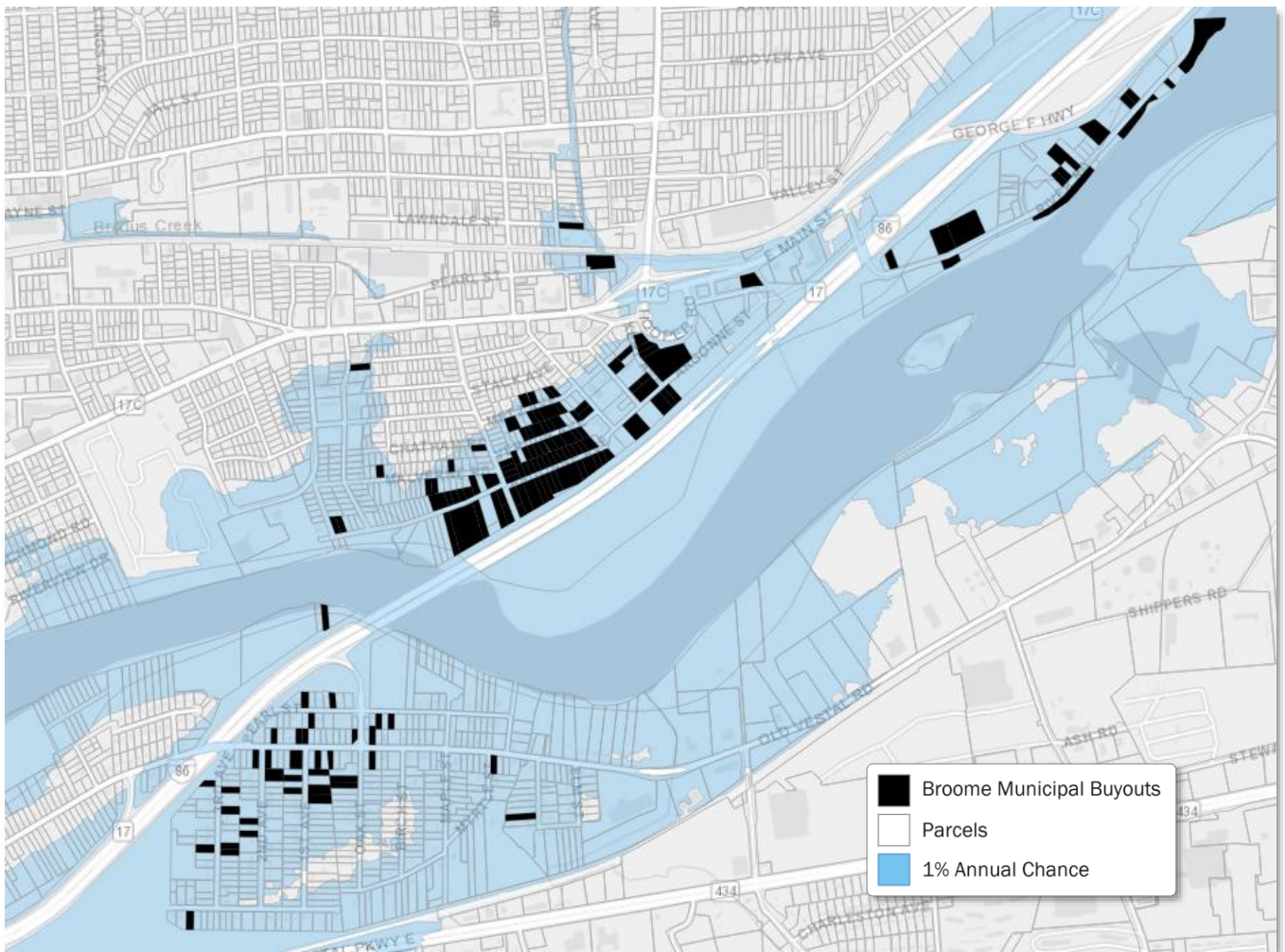
Source: Broome County

Figure 25 Municipal Buyouts by Total Property Value



Source: Broome County

Figure 26 Example of Municipal Buyouts in Preliminary Floodplain, Town of Union



Source: Broome County; FEMA 2010.

ZONING



The lack and overabundance of zoning districts have the potential to create fragmented land-use patterns, inconsistent regulations, and barriers to adaptive, countywide responses to change or crisis.

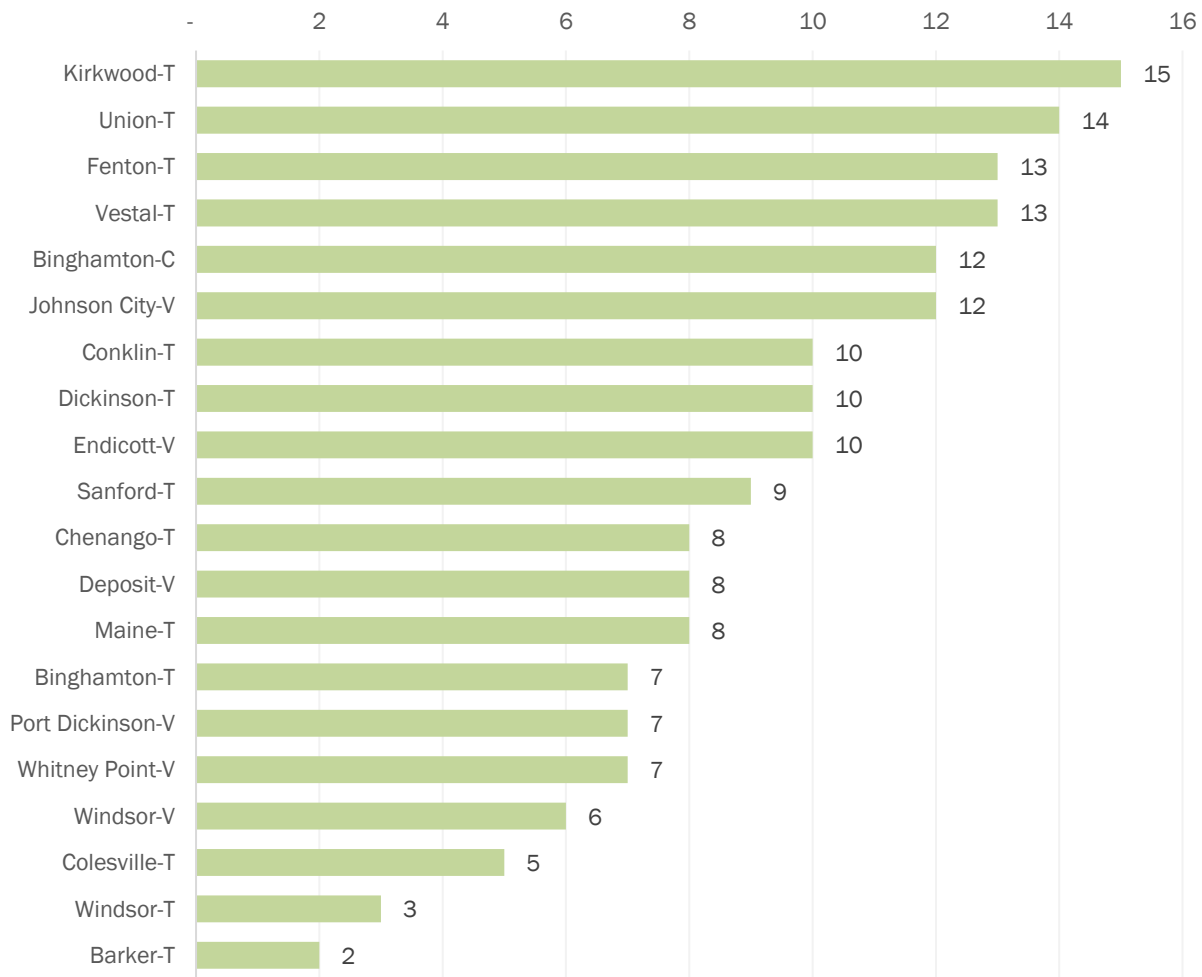
Zoning Districts

Zoning can be a powerful tool in resiliency planning by directing development away from high-risk areas (like floodplains or wildfire-prone zones), encouraging climate-resilient building forms and land uses, preserving natural buffers such as wetlands, and promoting mixed-use, walkable neighborhoods that reduce dependence on vulnerable infrastructure.

In Broome County, 20 of the 24 municipalities have some form of zoning. Four communities (the town and village of Lisle, Nanticoke, and Triangle) in the county have not adopted comprehensive zoning ordinances. Among the municipalities with zoning, there are over 122 uniquely named zoning districts (some names are shared across municipalities; Figure 27 counts each municipality's districts separately). The town of Kirkwood alone has 15 different zoning districts. Kirkwood's variety reflects its location at the I-81/NY-17 (I-86) interchange, where the town spans highway-oriented commercial and industrial corridors, established residential neighborhoods, and rural and agricultural land, requiring more districts to manage that mix of uses. The county's overabundance of zoning districts, which complicates coordinated, countywide adaptation to climate risk, has the potential to create fragmented land-use patterns, inconsistent regulations, and barriers to adaptive, countywide responses to change or crisis.

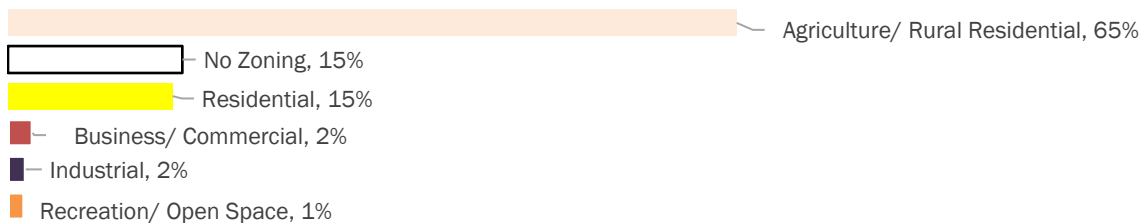
Nearly two-thirds of the county is zoned agricultural or rural residential, which typically encourages low-density development to promote/preserve rural character and provides opportunities for agricultural uses. These agricultural and rural-residential areas lie largely outside the public sewer and water districts, which are concentrated in the Binghamton, Johnson City, Endicott, and Vestal core, and are served predominantly by private septic systems and wells; such dispersed on-site systems are more exposed to flood contamination and harder to adapt through centralized infrastructure, and the Broome County Comprehensive Plan identifies private septic systems as the primary method of sewage disposal in the more rural and suburban parts of the county. Residential zoning, which includes multi-family and mobile home parks, and land with no zoning restrictions are the next largest categories, each accounting for 15 percent of the county's acreage. Business and industrial zoning districts each account for just two percent of total acreage in the county. Recreation and open space comprise one percent (63 percent of this located in the town of Sanford). This land-use base carries an economic-resilience implication: with business and industrial districts each occupying only about two percent of the county's acreage, economic activity and tax-base exposure are concentrated in a narrow commercial and industrial land base, limiting room to diversify or relocate activity after a disruption.

Figure 27 **Number of Zoning Districts by Municipality**



Source: Broome County GIS & Mapping Services

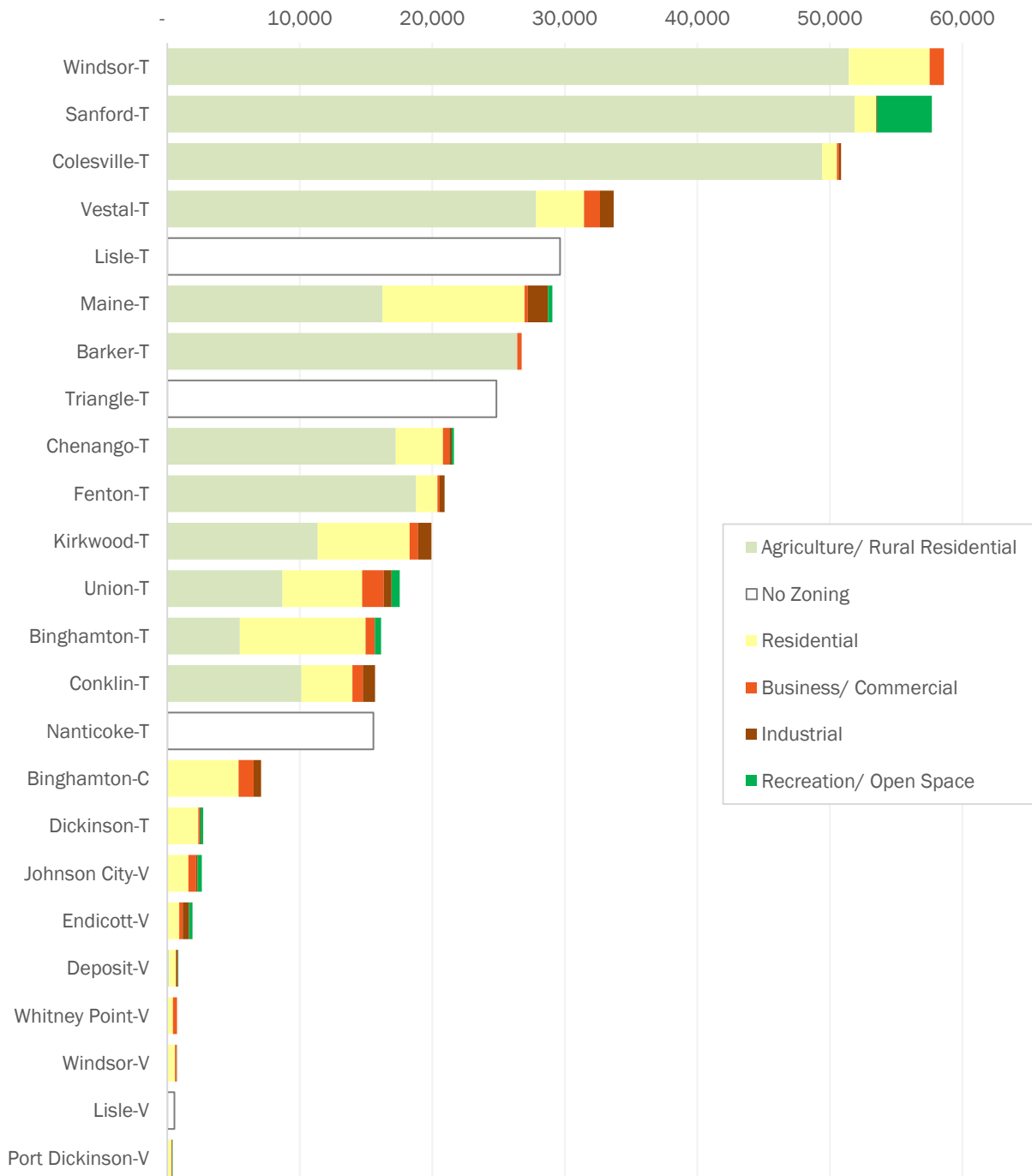
Figure 28 **General Zoning District by Acreage**



Source: Broome County GIS & Mapping Services

The concentration of acreage in a few general district types reflects limited land-use diversification across the county, itself a resilience consideration: A narrow mix of permitted uses offers fewer paths for the local economy to adapt after a disruption.

Figure 29 General Zoning District by Municipality and Acreage

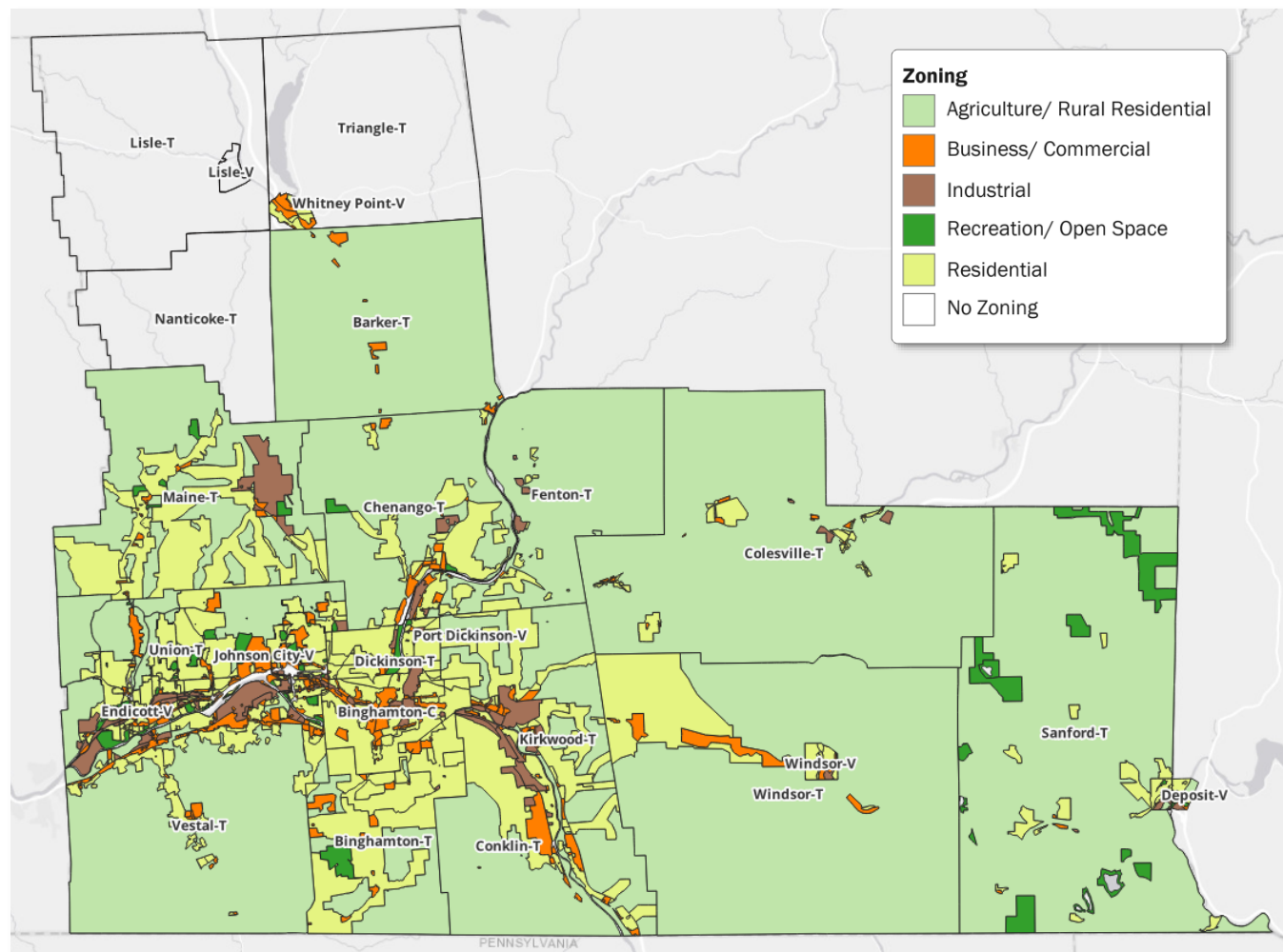


Source: Broome County GIS & Mapping Services

The municipal breakdown shows how unevenly that capacity is distributed: Commercial and industrial acreage is concentrated in the county's urbanized core, while several rural towns remain largely agricultural or unzoned, leaving them little designated capacity to absorb displaced activity.

Because property-tax capacity follows these zoning patterns, municipalities zoned predominantly for residential or agricultural use have narrower revenue bases from which to fund flood mitigation and recovery.

Figure 30 General Zoning District by Municipality



Source: Broome County GIS & Mapping Services

Zoning Tools for Resiliency: A Municipal Benchmark

The figures above describe how much land each municipality assigns to its zoning districts. An equally important question for resiliency is what those ordinances contain. Following the model of the zoning benchmark matrix in the Broome County Agricultural Economic Development Plan (2019), the figure below screens each municipality's adopted land-use regulations for 12 provisions that support hazard mitigation, resource protection, and adaptive capacity. The benchmark is based on a review of zoning codes, published law filings, and county zoning summaries as of July 2026, and reaches all 24 municipalities at least in part; question marks represent provisions that need to be confirmed with municipal clerks.

Figure 31 Municipal Zoning Resiliency Benchmark

Municipality	Flood Damage Prevention (NFIP)	Stormwater / Erosion Control	Wetland / Watercourse Protection	Steep-Slope / Grading Controls	Aquifer / Wellhead Protection	Cluster Dev. W/ Open Space	Agricultural Protections	Renewable Energy Standards	Mixed-Use / Downtown Provisions	Manufactured / Mobile Home	Historic Resource Protection	Telecommunications Siting
Barker-T †	Y	?	?	?	?	?	P	Y	N	P	?	?
Binghamton-C	Y	Y	P	N	N	N	N	N	Y	Y	N	N
Binghamton-T	Y	P	N	N	N	P	N	Y	N	Y	N	Y
Chenango-T	Y	Y	N	N	Y	P	Y	Y	P	Y	N	Y
Colesville-T †	Y	?	?	?	?	?	P	Y*	Y	P	?	?
Conklin-T †	Y	Y	?	P	?	?	P	Y*	P	Y	?	?
Deposit-V	Y	N	N	N	N	N	N	N	N	Y	N	N
Dickinson-T	Y	Y	N	N	N	P	N	Y	N	Y	Y	Y
Endicott-V	Y	Y	N	N	Y	P	N	N	P	Y	Y	N
Fenton-T	Y	Y	Y	N	Y	N	P	N	N	Y	N	Y
Johnson City-V	Y	Y	P	N	Y	P	N	Y	Y	Y	Y	Y
Kirkwood-T	Y	Y	N	N	Y	P	P	Y*	N	Y	N	Y
Lisle-T ^	Y	-	-	-	-	-	-	-	-	-	-	-
Lisle-V † ^	Y	?	?	?	?	?	P	Y	?	?	?	?
Maine-T	Y	N	N	N	N	N	N	Y	N	Y	N	Y
Nanticoke-T ^	Y	-	-	-	-	-	-	-	-	-	-	-
Port Dickinson-V	Y	Y	N	N	N	P	N	N	N	Y	N	N
Sanford-T †	Y	?	P	?	?	?	Y	Y	?	Y	?	?
Triangle-T ^	Y	-	-	-	-	-	-	-	-	-	-	-
Union-T	Y	Y	Y	P	Y	P	N	Y	Y	Y	N	Y
Vestal-T	Y	Y	P	N	Y	Y	P	Y	P	Y	Y	P
Whitney Point-V †	Y	?	?	?	?	?	N	Y	P	Y	P	Y
Windsor-T †	Y	?	?	?	?	?	Y	Y	N	Y	?	?
Windsor-V	Y	N	N	N	N	N	N	N	P	Y	P	N

Y = provision in force P = partial or indirect provision N = none found ? = needs to be confirmed with clerk - = no comprehensive zoning (the town and village of Lisle, Nanticoke, and Triangle; all participate in the NFIP with adopted flood ordinances; the Village of Lisle is shown as its own row because it has adopted standalone land-use laws) † = partially reviewed from law filings and county zoning summaries ^ = municipality without comprehensive zoning * = adopted renewable standards paired with a solar development moratorium: Kirkwood (Local Law 9-2025; all solar energy systems, one year from October 2025) and Conklin (Local Law 2-2025; new commercial-scale applications, in effect as of July 2026) remain active; Colesville's six-month moratorium on commercial systems of 200 kW or more (Local Law 1-2026, filed January 2026) lapsed in July 2026, with a revised solar law proposed but not yet adopted.

Source: Municipal codes as published online, July–August 2026 (ecode360, Municode, and municipal websites); NYS Department of State Local Laws Database; Broome County GIS zoning summaries; Broome County Agricultural Economic Development Plan (2019), Figure 2

most damaging hazard. All 24 municipalities participate in the National Flood Insurance Program, and each has adopted the floodplain management ordinance that participation requires, including the four municipalities without comprehensive zoning. Ten of the 14 fully reviewed codes pair the flood law with stormwater and erosion control programs. Regulation is thinner farther from the urbanized core: The Town of Maine, outside the state-regulated municipal separate storm sewer system (MS4) area, has no stormwater law, and the smallest villages regulate little beyond flooding and mobile homes.

Groundwater protection has become a de facto regional standard. Seven municipalities along the Susquehanna and Chenango valley aquifer (Union, Vestal, Kirkwood, Fenton, Chenango, Endicott, and Johnson City) maintain aquifer or wellhead protection districts. No county or regional body requires this alignment; it reflects the valley aquifer's role as the urbanized area's water supply, and it gives a countywide strategy a foundation to build on.

Three gaps appear countywide rather than in any single municipality:

- **Steep slopes.** No municipality has a dedicated steep-slope ordinance (Union and Conklin apply only partial grading-related controls), a growing exposure as heavy-rain events drive slope failure and gully erosion.
- **Wetlands and watercourses.** Only Union and Fenton have freshwater wetlands laws. Vestal defers entirely to state jurisdiction, which leaves smaller wetlands unprotected after recent federal jurisdictional changes.
- **Agricultural land.** No municipality has adopted a right-to-farm law, unchanged since the 2019 Agricultural Economic Development Plan flagged the same absence, and only Vestal authorizes cluster development with permanently protected open space.

Renewable energy is the most broadly regulated emerging land use in the county. Fourteen of the twenty zoned municipalities have adopted solar or wind provisions, including every zoned town except Fenton:

- **Adoption reaches the smallest communities.** Whitney Point (2023), Barker (2025), and Windsor (2026) adopted solar provisions, Sanford has regulated renewable energy since 1992, and the Village of Lisle, which has no comprehensive zoning, adopted a standalone solar law in 2018.
- **The Town of Binghamton has the most complete framework.** This includes wind, solar, and geothermal standards and the county's only battery energy storage law.
- **The holdouts are urban.** The City of Binghamton, Endicott, Fenton, Port Dickinson, Deposit, and the Village of Windsor have no renewable energy provisions.
- **Three towns are pulling back.** Kirkwood, Conklin, and Colesville pair adopted standards with active or recent solar moratoria, a countervailing trend worth monitoring.

Tools for adapting land use are concentrated in the urban core. Mixed-use and downtown design provisions (Union, Johnson City, and the City of Binghamton) and historic preservation programs (Dickinson, Endicott, Johnson City, and Vestal) mirror the concentration of commercial and industrial acreage described above. Outlying towns have fewer instruments for adapting land use after a disruption, a gap felt most where land without zoning is concentrated: Windsor, Sanford, Colesville, and the four municipalities without zoning.

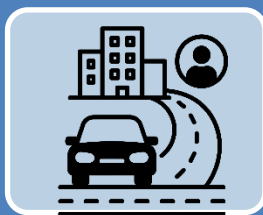
The benchmark points to three near-term opportunities for the resiliency strategies later in this report:

- A model steep-slope and stream-corridor ordinance offered to all municipalities
- Extension of aquifer protection zoning to the remaining valley municipalities
- Adoption of right-to-farm provisions in the agricultural towns identified in the 2019 plan

Economic Drivers and Stressors

Understanding economic drivers and stressors in a county can provide insight into how well a local economy can withstand and adapt to change, disruption, or shocks. For example, if a small business closes or a supply chain fails due to flooding or an extreme weather event, this can trigger economic shockwaves, displace workers, and undermine recovery. Understanding which industry subsectors are present in the region and county is critical for measuring potential risk due to changing environmental hazards: economic impact assessments (e.g., “What happens if this factory floods?”), land-use and transportation modeling (“Where do workers live vs. where they work?”), and climate hazard mapping (e.g., overlaying job centers with floodplain maps).

ECONOMIC HUBS



The concentration of job centers in flood-prone watersheds and reliance on major arterial highways for commuting underscores the need for resilient transportation infrastructure and land-use strategies that ensure access to key employment hubs.

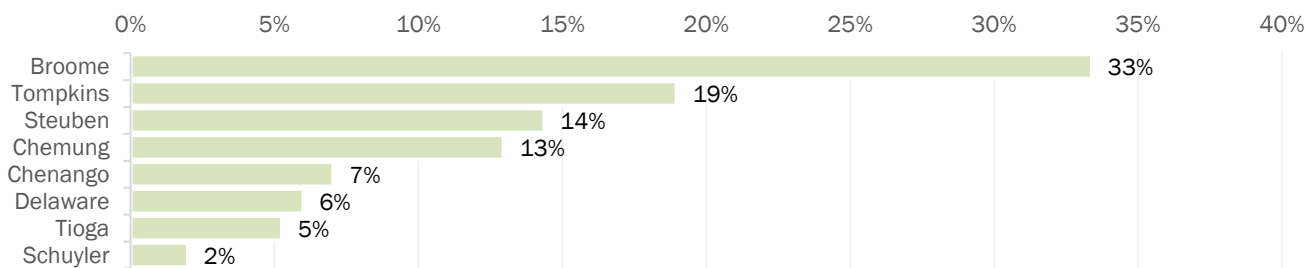
Job Clusters

Identifying clusters of jobs and commercial and industrial land is important because it helps prioritize critical economic hubs for infrastructure investment, hazard mitigation, and recovery planning—ensuring that essential jobs, supply chains, and services remain functional during and after disruptions.

According to primary job data provided by the U.S. Census Bureau, Broome County has the largest cluster of primary jobs in the Southern Tier Economic Region. In 2023 (the latest year available), the county had 76,693 primary jobs (31 percent located in the city of Binghamton), representing 33 percent of primary jobs in the eight-county Southern Tier region.

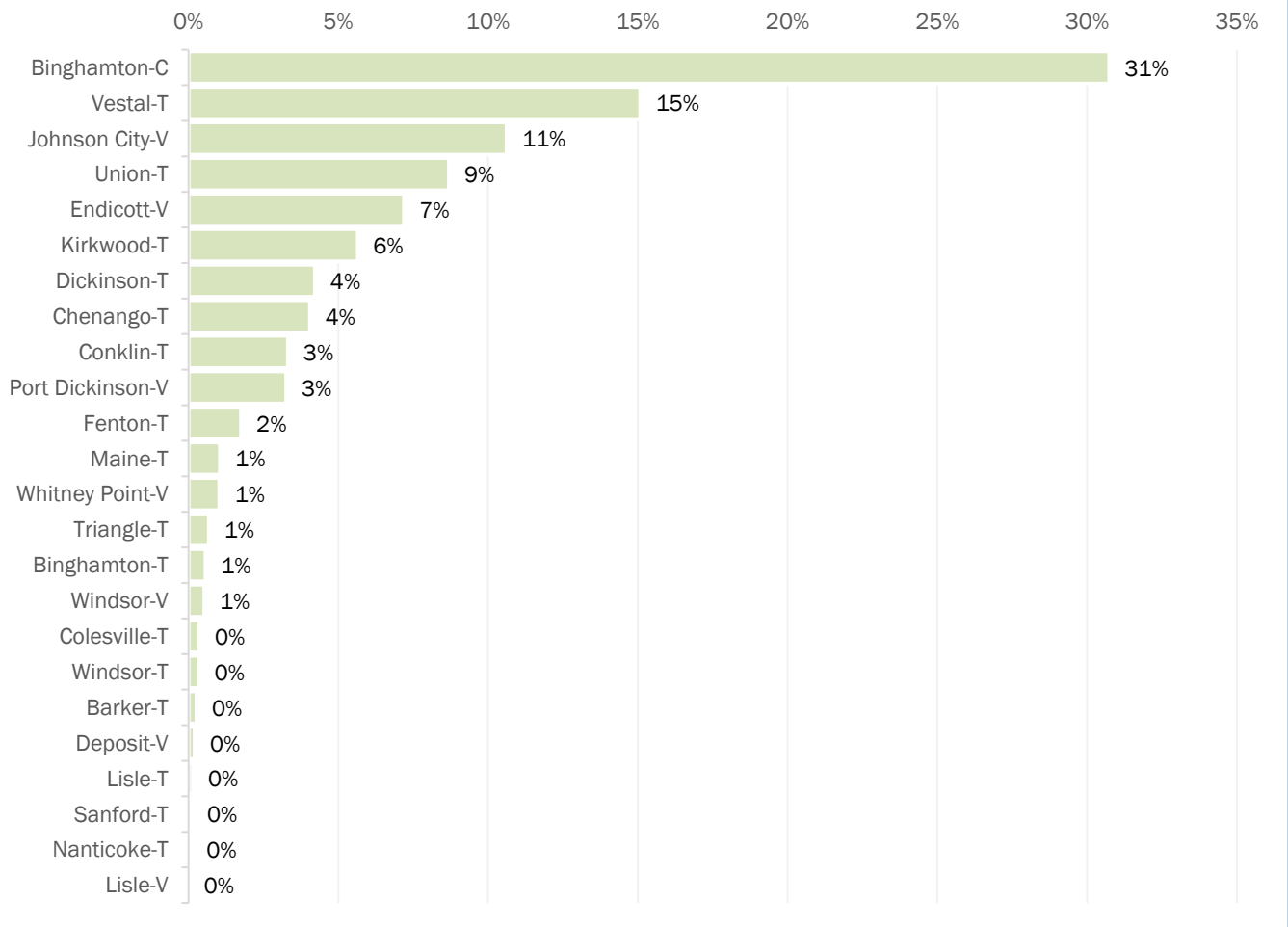
Broome County’s job clusters are largely located in the southwest portion of the county along Interstates 81 and 86, where much of the county’s business/commercial- and industrial-zoned land is located. These primary job clusters are also largely concentrated in the city of Binghamton and neighboring villages and towns such as Johnson City, Vestal, and Endicott.

Figure 32 Southern Tier REDC Region Primary Job Share by County, 2023



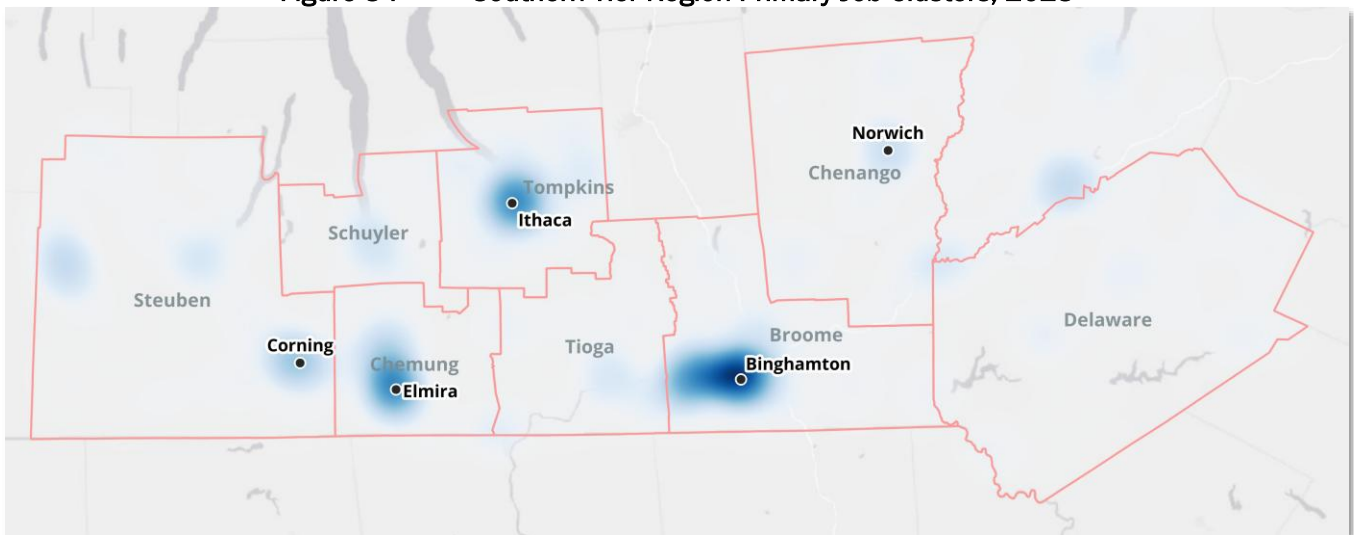
Source: U.S. Census Bureau, Center for Economic Studies, LEHD, 2023

Figure 33 Broome County Primary Job Share by Municipality, 2023



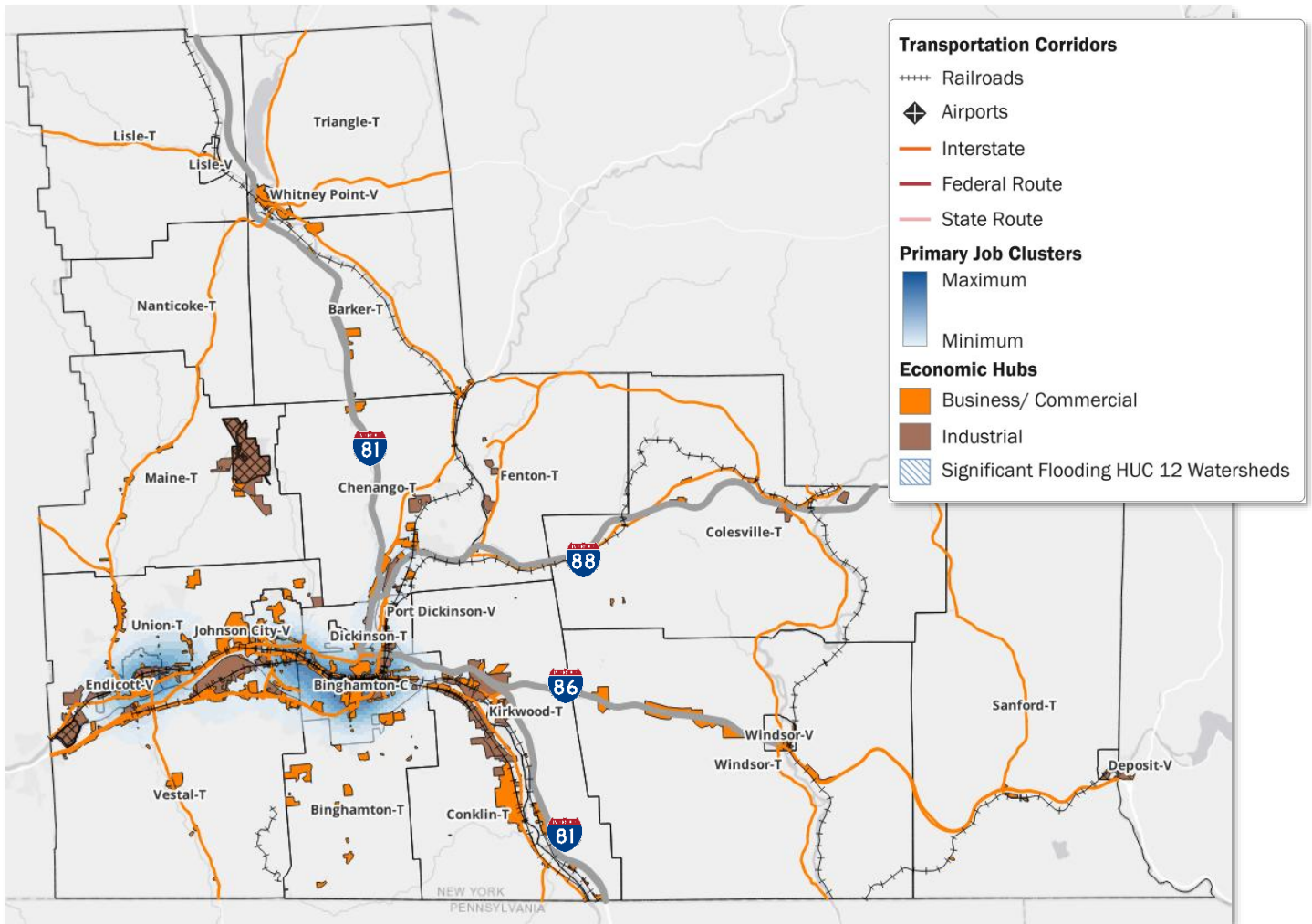
Source: U.S. Census Bureau, Center for Economic Studies, LEHD, 2023

Figure 34 Southern Tier Region Primary Job Clusters, 2023



Source: U.S. Census Bureau, Center for Economic Studies, LEHD

Figure 35 Business/Commercial and Industrial Zoning District



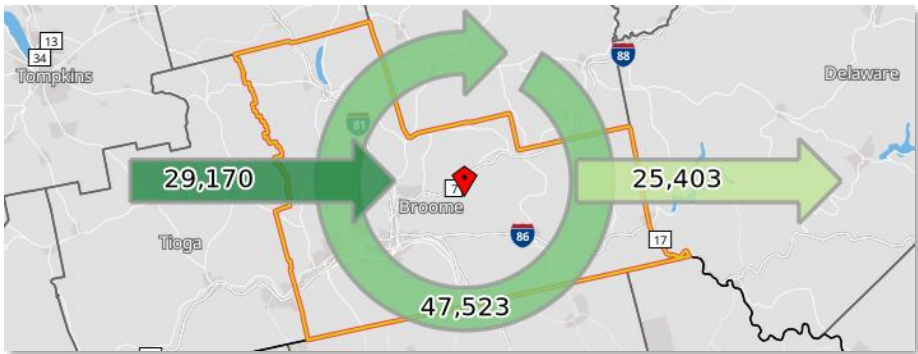
Source: Broome County GIS & Mapping Services; U.S. Census Bureau, Center for Economic Studies, LEHD; New York State Department of Environmental Conservation

Commuting Patterns

Identifying worker commuting patterns helps reveal dependence on critical transportation infrastructure, highlights vulnerabilities to extreme weather and disaster-related disruptions, and informs priorities for resilient transportation, land-use, and emergency response strategies that support economic continuity and worker safety. As shown in Figure 36, Broome County is a net importer of labor, with more workers commuting into the county (29,170) than leaving it for employment (25,403), while approximately 47,523 primary job workers both live and work locally. The remaining 29,170 primary jobs — 38.0 percent of the county total — are filled by workers commuting in from outside Broome County. LEHD residence data show that the largest out-of-county residence concentrations lie along the Tioga County corridor (Apalachin, Owego, and Tioga Terrace), in neighboring Cortland and Chenango counties (Cortland, Greene, and Norwich), and in New York City. Among the top places of residence for all workers employed in the county, the city of Binghamton is home to 13.8 percent, and another 13.3 percent live in the village of Johnson City, the town of Union, or the village of Endicott - indicating a concentration of the workforce in a few core communities.

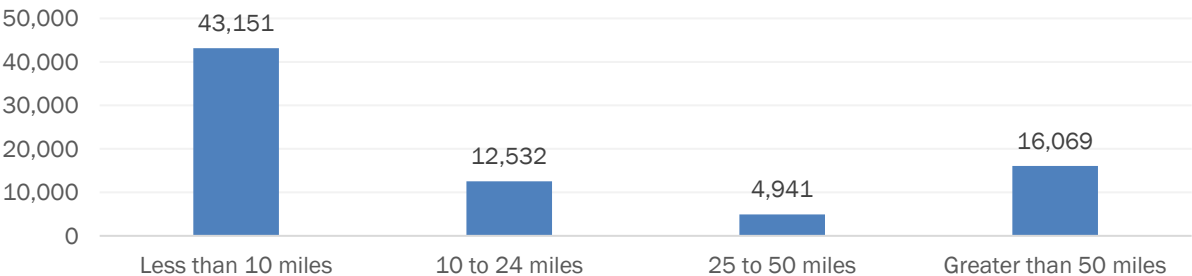
While over half of county primary job workers commute less than 10 miles (56 percent), a substantial share travel long distances, with more than 27 percent commuting over 25 miles, and 21 percent commuting more than 50 miles. Because the county depends on both in-commuting workers and a geographically concentrated residential workforce, disruptions to key transportation routes or population centers could have outsized impacts on employment and economic continuity, making roadway resilience, emergency access, and neighborhood-level resilience critical priorities for the county’s resilience strategy.

Figure 36 Inflow/Outflow: Primary Job Workers, 2023



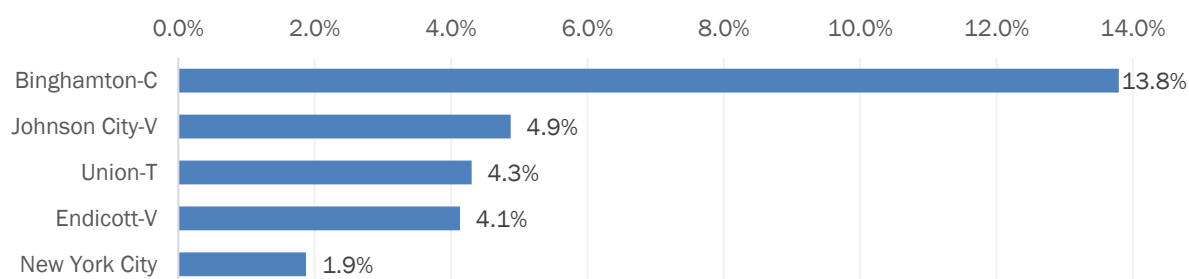
Source: U.S. Census Bureau, Center for Economic Studies, LEHD

Figure 37 Distance to Work: Broome County Primary Job Workers, 2023



Source: U.S. Census Bureau, Center for Economic Studies, LEHD

Figure 38 Top 5 Places of Residence for Broome County Primary Workers, 2023



Source: U.S. Census Bureau, Center for Economic Studies, LEHD

Principal Employers

According to the Broome County Industrial Development Agency (IDA), the county's principal employers with Broome County operations accounted for approximately 20,782 jobs in 2023 – 25.1 percent of the county employment base – led by Binghamton University (5,943 employees) and United Health Services (5,428 employees), reinforcing the central role of education and health care institutions in the county's economic base.

Figure 39 Principal Employers Operating in Broome County by Number of Employees, 2023

Rank	Employer	Employees	Percent of Total County Employment
1	Binghamton University	5,943	7.16%
2	United Health Services	5,428	6.54%
3	Broome County	2,500	3.01%
4	Our Lady of Lourdes Hospital	2,311	2.79%
5	BAE Systems	1,300	1.57%
6	i3 Electronics	1,100	1.33%
7	Maines Paper & Food Services	1,100	1.33%
8	IBM Corporation	1,100	1.33%
	Total	20,782	25.06%

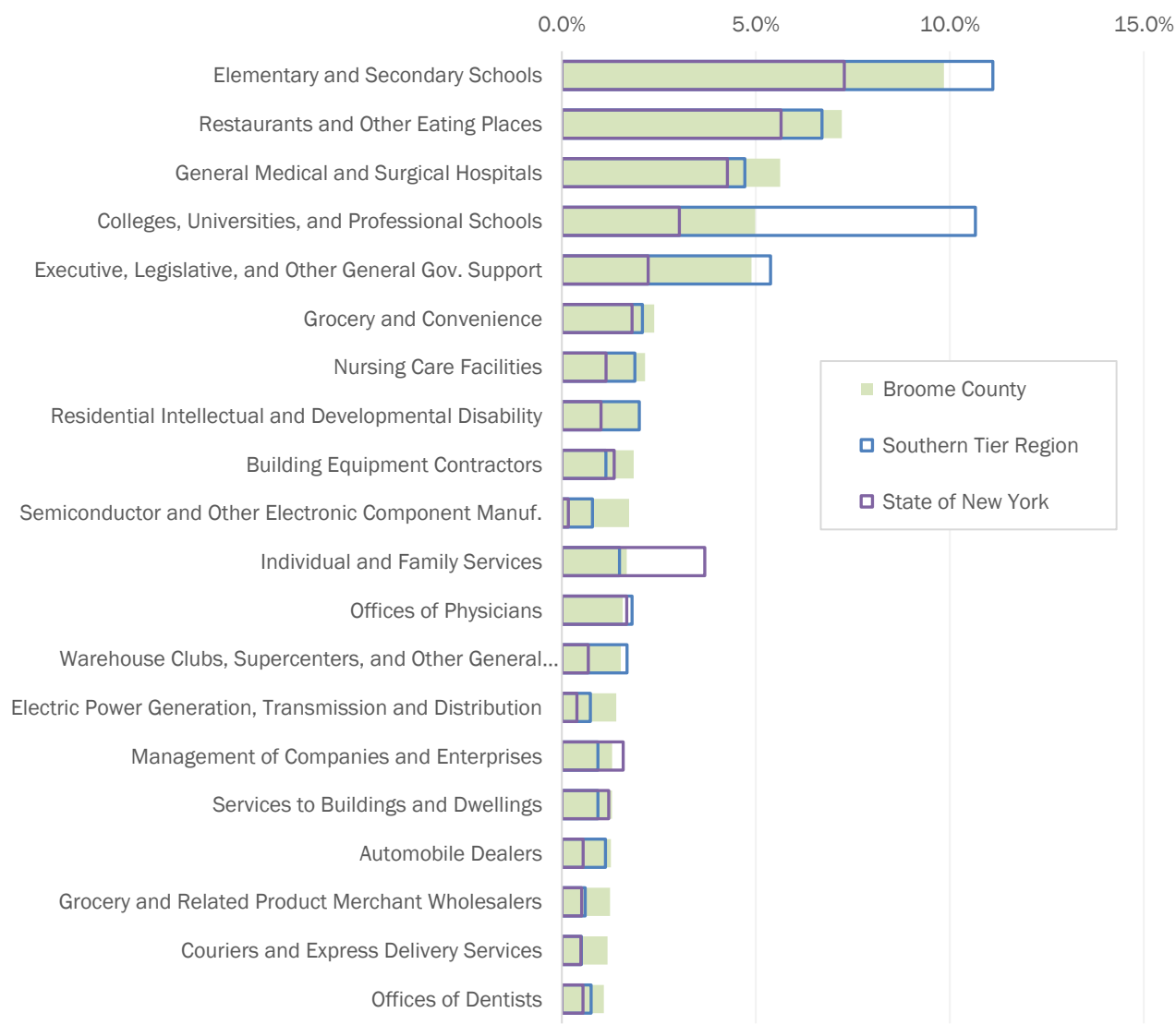
Source: Broome County Annual Comprehensive Financial Report, Year Ended December 31, 2023, Table 16; underlying data from the Broome County IDA (preliminary, subject to revision). Employer counts are self-reported totals.

Note: Two employers listed in the source table are excluded above: Lockheed Martin (2,700 employees, located in Owego, Tioga County) and the Broome Developmental Center (1,400 employees, closed in 2016). The eight remaining principal employers account for approximately 20,782 jobs (25.1 percent of total county employment). Percentages reflect the source's total county employment base of approximately 82,900 jobs; this differs from the LEHD primary-jobs count of 76,693 used elsewhere in this report, which counts only each worker's primary job.

Employment by Subsector

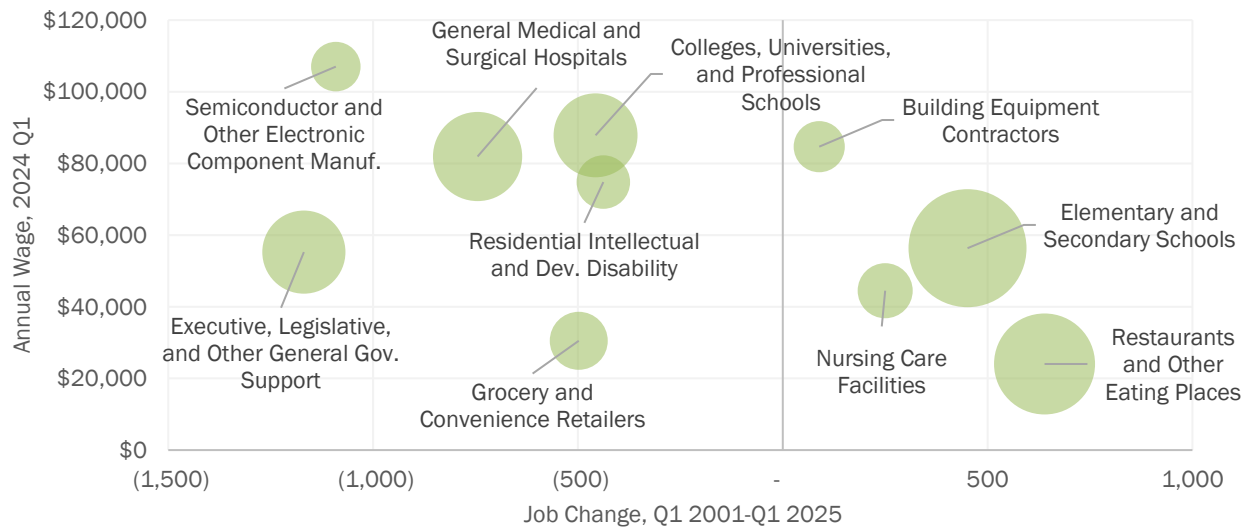
According to first-quarter 2025 employment data for Broome County, the top 20 North American Industry Classification System (NAICS) four-digit industry subsectors in the county reveal a moderately diverse economy, with no one subsector representing more than 10 percent of total employment in the county. While this moderate diversification helps buffer the county against a downturn in any single industry, employment is concentrated in health care, social assistance, and education – sectors tied to institutional and public funding – so sustained funding pressures in these areas would have outsized countywide effects. Continued diversification into advanced manufacturing and other traded sectors would further strengthen the county’s economic resilience.

Figure 40 Top 20 Subsectors by Employment Share, Q1 2025



Source: U.S. Census Bureau, Center for Economic Studies, LEHD, as of first-quarter 2025

Figure 41 **Employment Change among the Top 10 Subsectors by 2025 Employment, Q1 2001-Q1 2025**



Note: Bubble size represents Q1 2025 employment. Each bubble is a subsector, plotted by average annual wage (vertical) against net job change 2001-2025 (horizontal) and sized by current employment — so subsectors to the right gained jobs and higher ones pay more.

Source: U.S. Census Bureau, Center for Economic Studies, LEHD, employment data through first-quarter 2025; annual wages as of first-quarter 2024

Figure 42 Employment Trends of the Top 10 Subsectors by Existing Employment in Broome County

NAICS 4-Digit Subsector	2001	2010	2019	2025	Net Change, 2001–2025
Nursing Care Facilities (Skilled Nursing Facilities)	1,395	2,012	2,150	1,645	+250 (+17.9%)
Restaurants and Other Eating Places	4,897	5,473	6,220	5,536	+639 (+13.0%)
Building Equipment Contractors	1,330	1,163	1,149	1,419	+89 (+6.7%)
Elementary and Secondary Schools	7,105	7,757	7,352	7,556	+451 (+6.3%)
Colleges, Universities, and Professional Schools	4,280	4,528	3,909	3,823	-457 (-10.7%)
General Medical and Surgical Hospitals	5,061	5,966	7,000	4,316	-745 (-14.7%)
Grocery and Convenience Retailers	2,323	2,222	1,988	1,825	-498 (-21.4%)
Residential Intellectual and Developmental Disability	1,991	2,809	1,599	1,553	-438 (-22.0%)
Executive, Legislative, and Other General Gov. Support	4,919	4,542	3,891	3,750	-1,169 (-23.8%)
Semiconductor and Other Electronic Component Manuf.	2,421	1,571	1,723	1,330	-1,091 (-45.1%)

Note: Years shown are the series start (2001), the post-recession benchmark (2010), the last full pre-pandemic year (2019), and the latest available (2025). LEHD reports employment for every subsector in all four of these years, so no value in the table is suppressed or interpolated. Data suppression in the source affects only certain intermediate years not shown here, most notably colleges and universities (reported in 16 of 25 years) and hospitals (21 of 25).

Source: U.S. Census Bureau, Center for Economic Studies, LEHD, first-quarter 2025

Employment Location Quotients

Employment location quotients (LQs) reveal which industries are concentrated locally compared to New York State - helping identify unique strengths, overdependencies, or gaps in the local economy. Industry subsectors having employment LQs greater than one indicate that the county has a relatively high concentration of employment within these subsectors. The following table shows the top 20 subsectors by total employment and average earnings for Broome County, along with employment location quotients (LQs) compared to the state of New York. All but three of the top 20 subsectors in the county have employment LQs greater than one, suggesting that the county has a regional specialization and economic reliance in these subsectors.

Figure 43 Top 20 Subsectors by Employment in Broome County

NAICS 4-Digit Subsectors	Employment (Q1 2025)	Employment LQs (Q1 2025)	Recent Employment Change (Q1 2019 - Q1 2025)	Annual Earnings (Q1 2025)
Elementary and Secondary Schools	7,556	1.34	204	\$52,308
Restaurants and Other Eating Places	5,536	1.27	-684	\$25,716
General Medical and Surgical Hospitals	4,316	1.31	-2,684	\$70,968
Colleges, Universities, and Professional Schools	3,823	1.63	-86	\$97,116
Executive, Legislative, and Other General Gov. Support	3,750	2.18	-141	\$65,796
Grocery and Convenience Retailers	1,825	1.30	-163	\$31,248
Nursing Care Facilities (Skilled Nursing Facilities)	1,645	1.87	-505	\$43,896
Residential Intellectual and Developmental Disability	1,553	1.99	-46	\$82,476
Building Equipment Contractors	1,419	1.36	270	\$90,084
Semiconductor and Other Electronic Component Manuf.	1,330	10.36	-393	\$89,724
Individual and Family Services	1,284	0.45	83	\$41,256
Offices of Physicians	1,205	0.93	-213	\$137,064
Warehouse Clubs, Supercenters, and Other General Merch.	1,166	2.22	-110	\$39,192
Electric Power Generation, Transmission and Distribution	1,076	3.57	201	\$138,732
Management of Companies and Enterprises	994	0.81	-144	\$82,272
Services to Buildings and Dwellings	991	1.06	179	\$62,652
Automobile Dealers	969	2.28	67	\$76,536
Grocery and Related Product Merchant Wholesalers	951	2.42	-582	\$55,368
Couriers and Express Delivery Services	902	2.37	643	\$46,656
Offices of Dentists	830	1.97	7	\$70,836

Subsectors highlighted in bold have LQs greater than one.

Source: U.S. Census Bureau, Center for Economic Studies, LEHD

ECONOMIC DRIVERS

The following section analyzes some of the top industry sectors in the county based on the top subsectors by employment, helping to reveal key economic drivers, dependencies, and vulnerabilities.

Educational Services



Heavy reliance on education employment highlights the need to strengthen schools and universities as both economic anchors and resilience hubs capable of supporting community response and adaptation efforts.

The *Elementary and Secondary Schools* and *Colleges, Universities, and Professional Schools* subsectors are two of the top four subsectors by employment in the county, both with employment LQs higher than one. Public universities and colleges such as Binghamton University and Broome Community College are both part of the State University of New York (SUNY) system. These two institutions provide degrees to meet regional employment needs in engineering and health care. For example, over 21 percent of fall 2023 SUNY Broome Community College students were enrolled in health sciences, while 9.1 percent were in STEM fields, reflecting focused training in areas vital for regional workforce needs.²

Binghamton University is a major economic driver of the county's economy, contributing significantly through employment, research activity, and partnerships that support innovation and regional development. University enrollment has grown steadily from 14,711 students in the fall of 2009 to 18,652 students in the fall of 2025. That growth equates to a compound annual rate of 1.5 percent, although it has slowed to 0.5 percent per year since 2019 and dipped slightly in fall 2025. SUNY does not publish long-range projections, but the historical trend points to a stable or modestly growing student body — roughly 19,100 students by 2030 if the recent pace holds. For resilience planning, Binghamton University can be treated as a durable economic anchor, with the shrinking pool of college-age New Yorkers the main enrollment risk to watch. Not surprisingly, Binghamton University students play a vital role in Broome County's tourism economy, contributing significantly through their spending on housing, dining, and entertainment, as well as by attracting visiting family and friends. According to its FY 2022-23 Economic Impact report, Binghamton University contributes roughly \$1.49 billion to the regional economy and supports over 10,500 jobs, with students and visitors alone spending nearly \$306 million in FY 2022-23.³

During the COVID-19 pandemic, when students left campus, many local businesses experienced substantial revenue declines - highlighting the economic vulnerability tied to student presence. These figures underscore that student presence is a vital economic driver, and dips during breaks or school closures meaningfully affect local commerce.

Currently, three of the county's 55 schools lie within the one percent annual chance floodplain: MacArthur Elementary and East Middle School in Binghamton, and Jennie F. Snapp Middle School in Endicott. No college or SUNY campuses are located within the 1-percent annual chance floodplain.

² SUNY Broome Community College Fast Facts Fall 2023

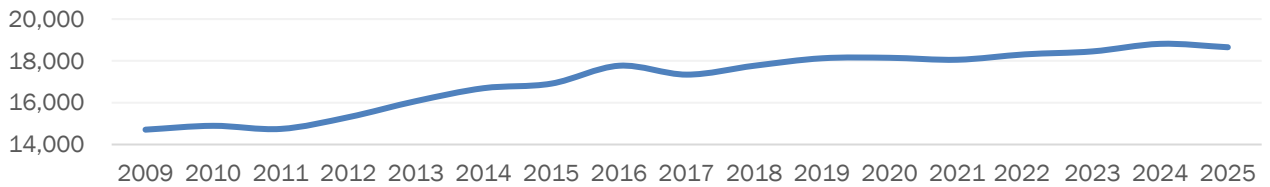
³ The Economic Impact of Binghamton University (FY2022-23), <https://www.binghamton.edu/offices/oir/data-analysis/>

Figure 44 Broome County by Total Private and Public Sector Employment by Subsector

NAICS 4-Digit Industries	Employment (Q1 2025)	Employment LQs (Q1 2025)	Recent Employment Change (Q1 2019 - Q1 2025)	Annual Earnings (Q1 2025)
Elementary and Secondary Schools	7,556	1.34	204	\$52,308
Colleges, Universities, and Prof. Schools	3,823	1.63	-86	\$97,116

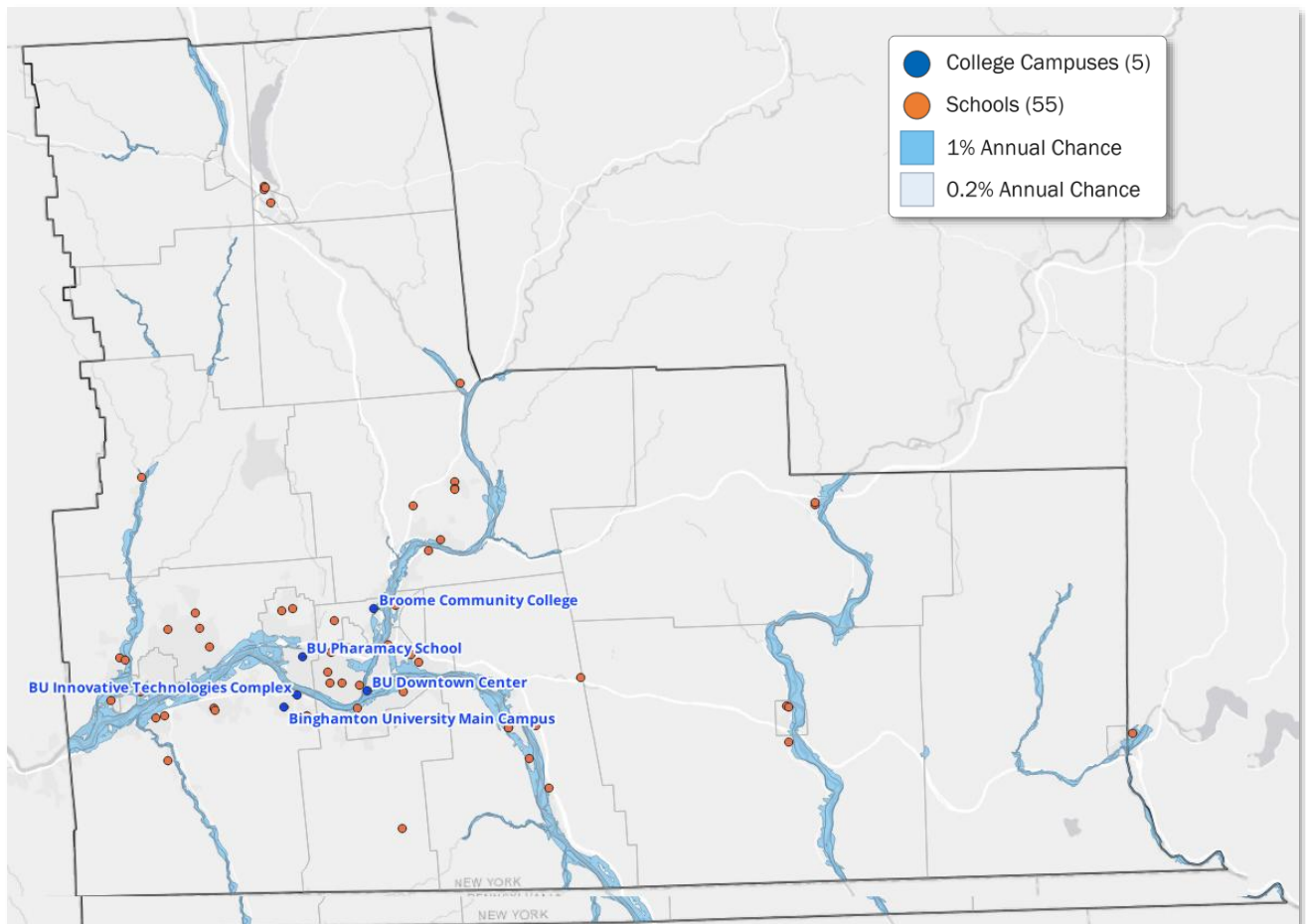
Source: U.S. Census Bureau, Center for Economic Studies, LEHD

Figure 45 Binghamton University Fall Student Enrollment Trends



Source: Binghamton University State University of New York, Office of Institutional Research

Figure 46 Schools, Colleges, and Existing Preliminary Flood Hazards



Note: Flood zones represent the 1-percent and 0.2-percent annual chance flood hazard areas. Includes FEMA preliminary flood hazard GIS data as compiled in the 2024 Broome County Hazard Mitigation Plan; effective regulatory data is not yet available. Schools presented are elementary, middle, and high schools.

Source: Esri, Broome County GIS & Mapping Services, Federal Emergency Management Agency (FEMA), 2010; 2024 Broome County Hazard Mitigation Plan (preliminary flood hazard data)

Tourism



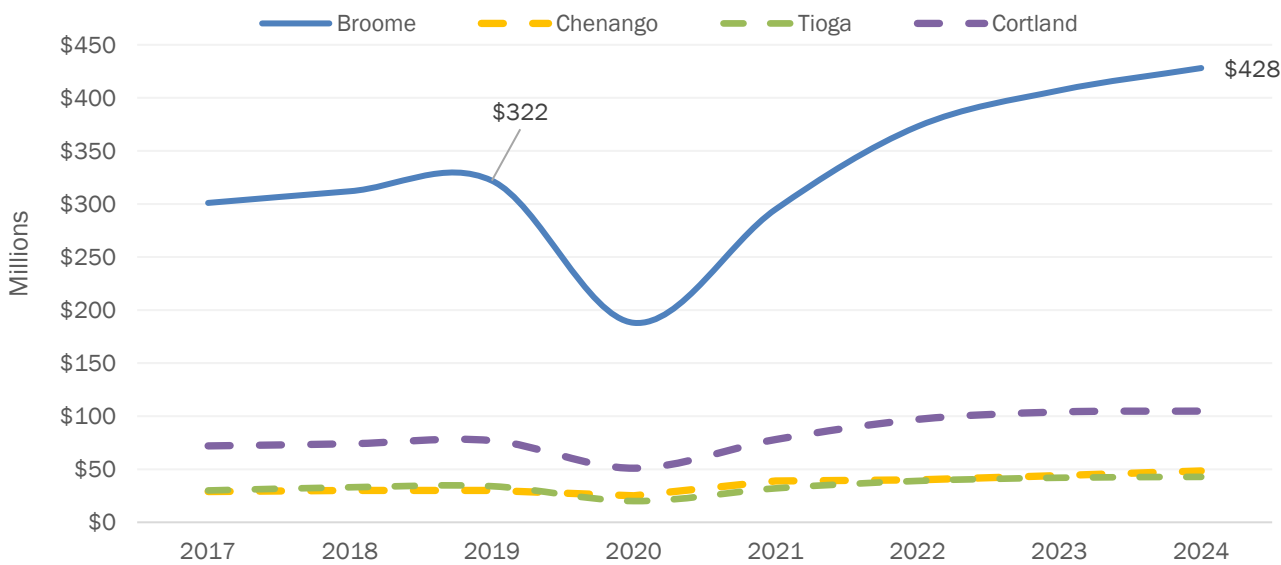
The heavy reliance on visitor spending highlights the need to bolster tourism sector resilience through sustainable practices and infrastructure that can withstand climate and economic disruptions.

Broome County's tourism destinations offer a blend of history, nature, sports, and culinary attractions, appealing to families, outdoor enthusiasts, and cultural travelers. County rivers (Susquehanna, Chenango, Tiohgnioaga, Otselic, and Delaware) support paddling, walking trails, fishing, passive recreation, and destination tourism. Dozens of local buildings are on the National Register of Historic Places, and these sites add value to the community. Notable outdoor and nature attractions include Otsiningo Park, Aqua Terra Wilderness Area, Binghamton University's Nature Preserve, and Chenango Valley State Park. Sports and entertainment offerings include Mirabito Stadium, Visions Veterans Memorial Arena, and the Ross Park Zoo. Arts, history, and culture offerings include the Broome County Forum, Roberson Museum and Science Center, the Bundy Museum of History and Art, the Phelps Mansion Museum, and Endicott's Cider Mill Playhouse. Food and beverage experiences include Binghamton and Endicott Restaurant Week, Binghamton's Wine & Tapas Tour, farmers markets, and craft breweries, as well as local diners and diverse ethnic cuisine. Notable festivals and events include the annual Spiedie Fest and Balloon Rally, Dick's Sporting Goods Open, the LUMA Projection Arts Festival, and the Broome County Fair.

Compared to other adjacent counties, visitor spending is a more significant driver of Broome County's economy, making it more vulnerable to external shocks like pandemics, economic downturns, or extreme weather that disrupt travel. According to data provided by Tourism Economics, in 2024, Broome County captured \$428 million in direct tourism spending, equivalent to nearly four times that spent in neighboring counties. Not surprisingly, given that *Restaurants and Other Eating Places* is the second-largest subsector by employment in the county, the largest share of tourism spending in Broome County was associated with food and beverage (\$167 million or 39 percent of total spending). Spending on *Lodging* (\$141 million or 33 percent of total spending) was the second largest category. While visitor spending declined in 2020 primarily due to the COVID-19 pandemic - which led to widespread travel restrictions, business closures, and public health concerns - visitor spending today remains higher than pre-pandemic levels.

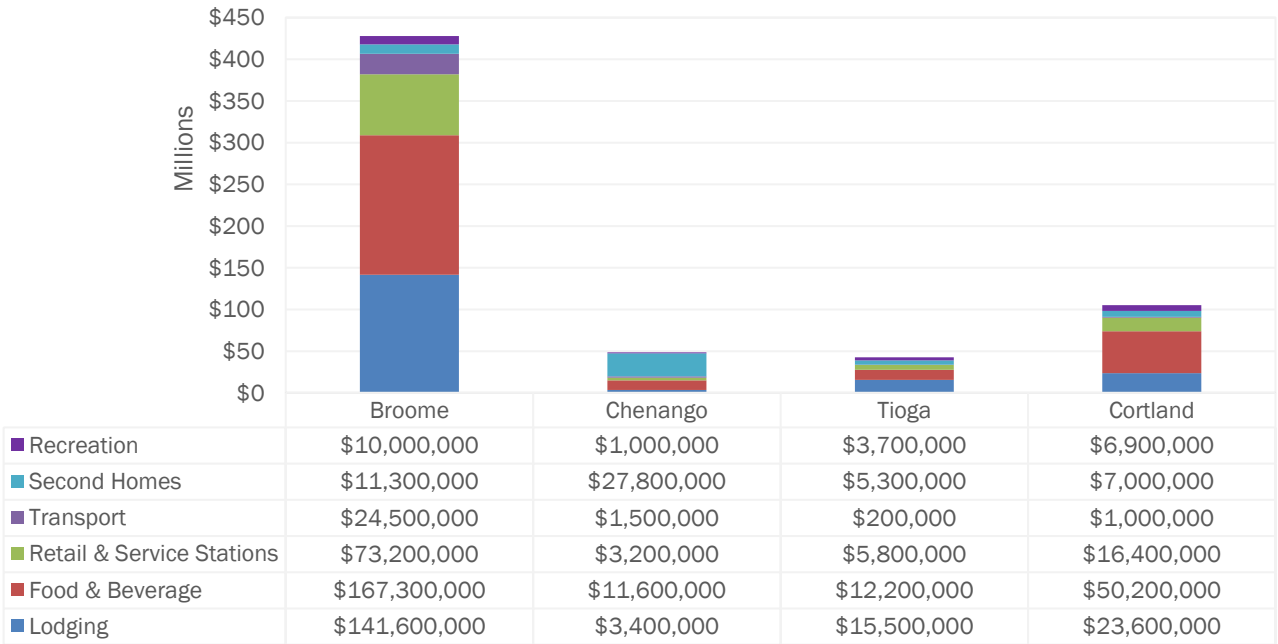
A total of 176 tourism-supportive establishments (restaurants, bars, clubs, recreation and entertainment businesses, historic landmarks and places, and lodging accommodations) are located within the one-percent annual chance floodplain, with the highest concentrations in the city of Binghamton, the town of Vestal, and the village of Endicott, exposing significant flood risk to the county's tourism economy. Since visitor spending substantially drives Broome County's tourism economy, particularly on food and beverage establishments and lodging spending, the resilience plan should prioritize flood mitigation, emergency preparedness, and recovery strategies for these tourism and heritage assets, while encouraging future tourism investment in lower-risk areas and protecting historic resources critical to community character and economic vitality.

Figure 47 Visitor Spending Trends by County



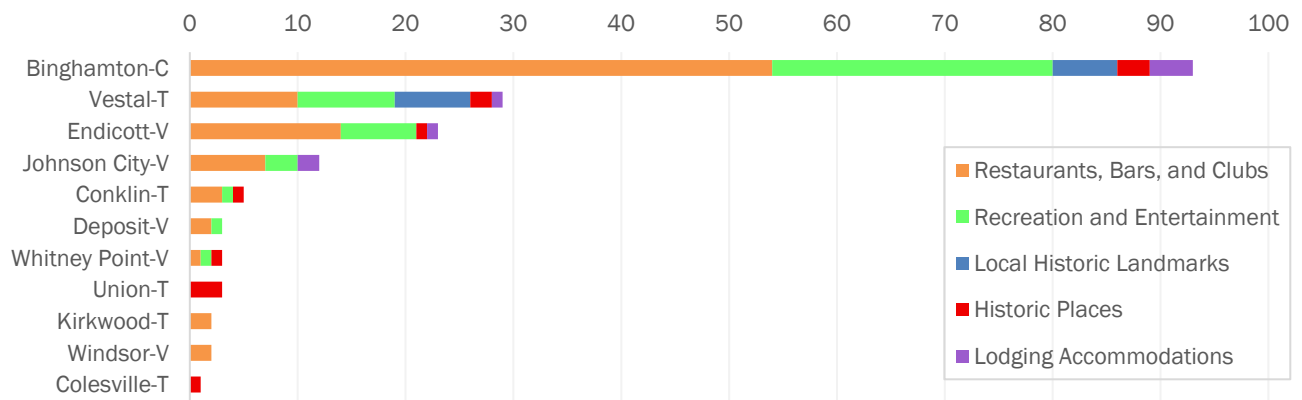
Source: Tourism Economics, Economic Impact of Visitors in New York, Central NY and Finger Lakes Focus, 2020 and 2024

Figure 48 Visitor Spending by County and Category, 2024



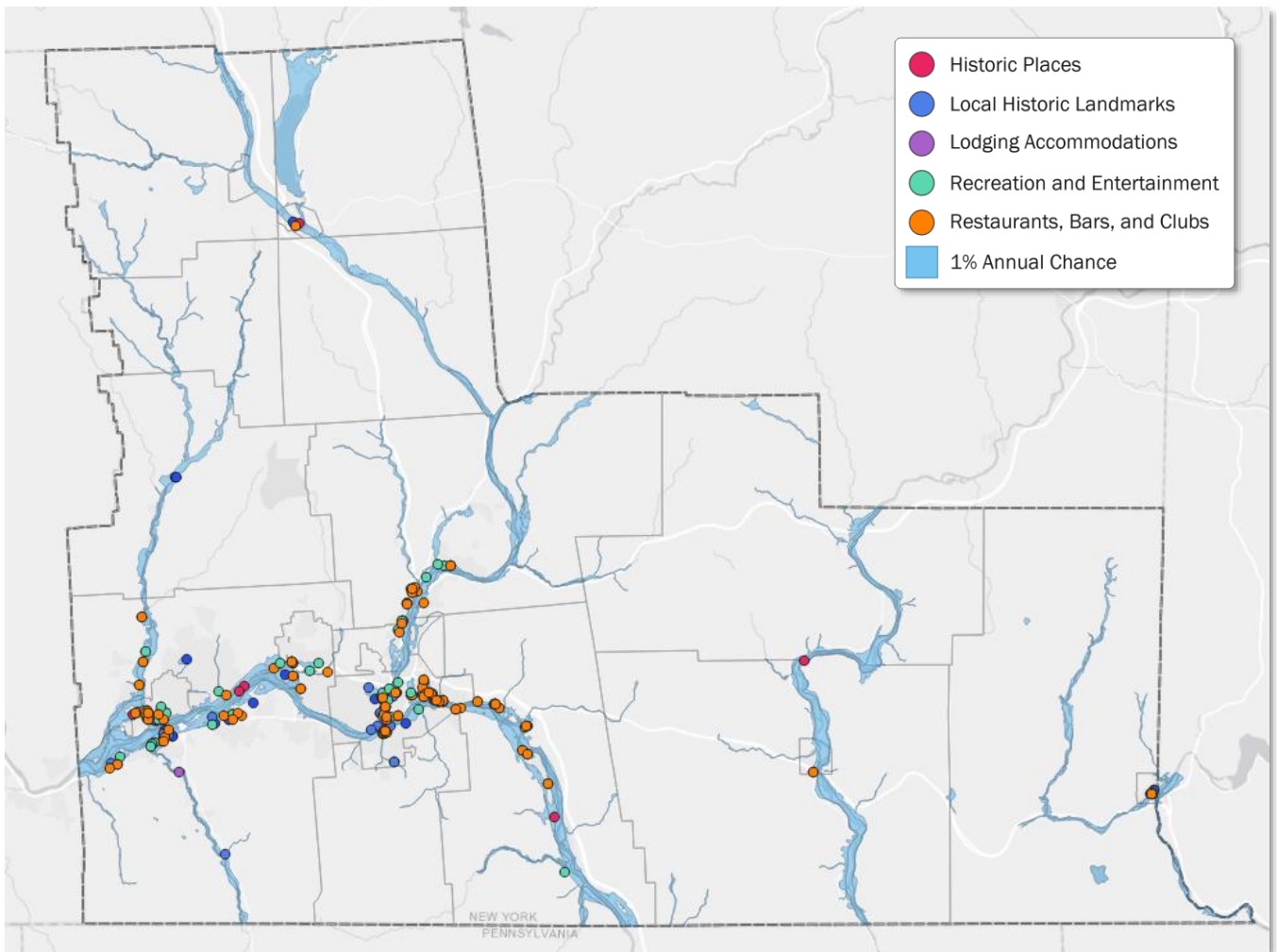
Source: Tourism Economics, Economic Impact of Visitors in New York 2024, Central NY and Finger Lakes Focus, August 2024

Figure 49 Tourism-Supporting Offerings in One-Percent Annual Chance Floodplain by Municipality



Source: Esri, Data Axle; Broome County GIS & Mapping Services

Figure 50 Tourism-Supporting Offerings in One-Percent Annual Chance Floodplain



Source: Esri, Data Axle, Broome County GIS & Mapping Services

Food Services



The concentration of low-wage food service jobs underscores the need for targeted support to sustain essential food access and economic stability during and after climate-related disruptions.

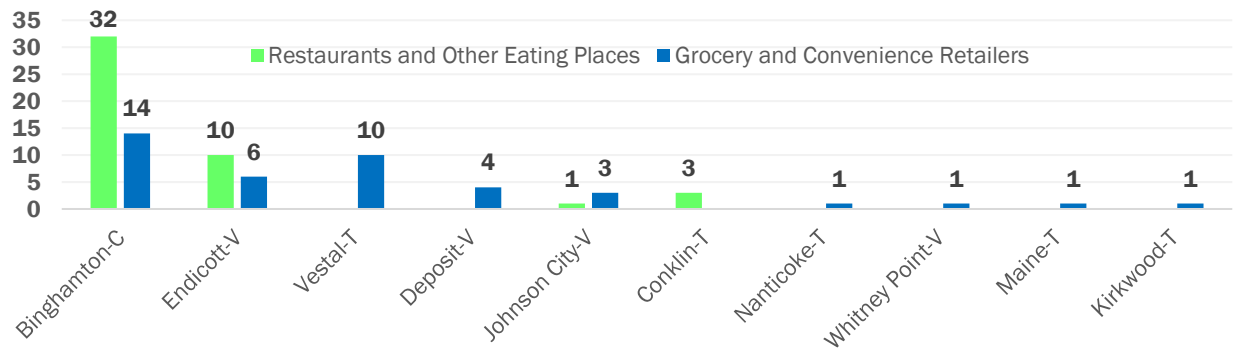
Two of the county's top ten subsectors by employment serve the essential daily need of food, whether prepared on-site (restaurants) or at home (groceries and convenience stores), and reflect a local service economy driven by resident and visitor spending. *Restaurants and Other Eating Places* is the second-largest subsector by employment in the county, providing approximately 5,540 relatively low-wage jobs (average annual wage of \$25,720 per year). The *Grocery and Convenience Retailers* subsector is the sixth-largest subsector by employment in the county, also providing approximately 1,830 relatively low-wage jobs (average annual wage of \$31,250 per year). These subsectors are sensitive to extreme weather events (power outages, supply chain issues, evacuations), public health emergencies, and require stable infrastructure (roads, electricity, refrigeration), supply chain continuity, and consumer mobility and spending.

Given the relatively low-wage job opportunities in these two subsectors, a significant portion of the county's workforce may be financially vulnerable and less able to absorb shocks like business closures during climate disasters or pandemics. For example, as illustrated in Figure 43, employment in the *Restaurants and Other Eating Places* subsector remains lower than before the COVID-19 pandemic.

Given the strong presence of these two subsectors in the county, resilience strategies should target flood-prone areas where restaurants and grocery and convenience retailers are clustered in the county. As presented in the following chart and map, there are 87 food and grocery establishments located within the one-percent annual chance floodplain, largely concentrated in the city of Binghamton and to a lesser degree the village of Endicott and the town of Vestal.

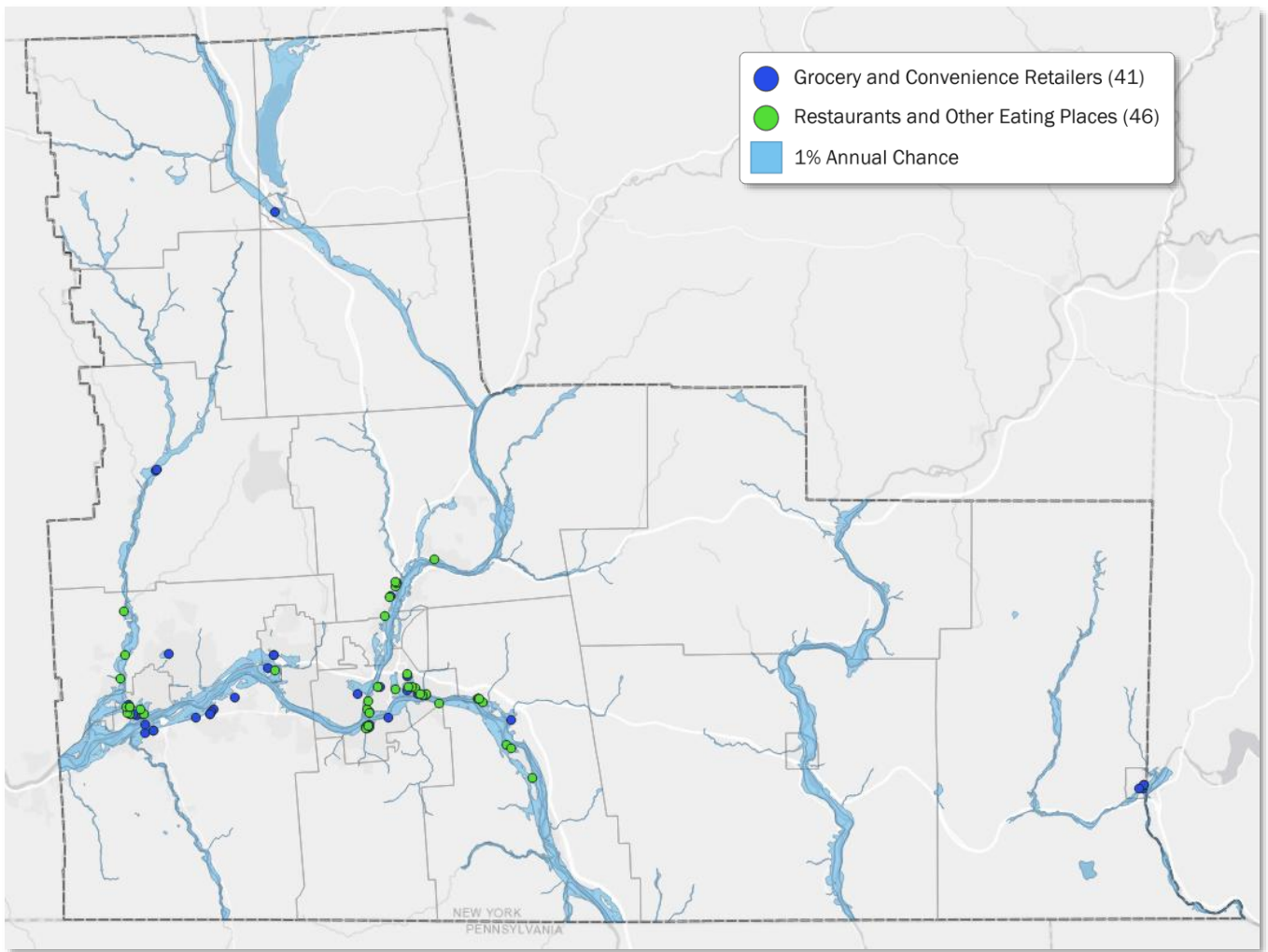
Additional resilience strategies to support the *Grocery and Convenience Retailers* subsector could target backup power and refrigeration for groceries and investments in local food systems to reduce reliance on long-distance supply chains. Additional resilience strategies to support the *Restaurants and Other Eating Places* sector might include supporting backup power and refrigeration investments so establishments can maintain safe food storage during outages, strengthening connections to local and regional food systems to diversify supply chains, and encouraging outdoor dining setups with shade structures and cooling stations to protect food workers and residents during heatwaves or pandemics. Because many food-service establishments operate on thin margins, cost-sharing mechanisms (such as grants or revolving loan funds) may be needed to make these investments feasible. For example, the City of Binghamton adopted ordinances and streamlined permitting to encourage outdoor dining during the COVID-19 pandemic.

Figure 51 Food Establishments in 1% Annual Chance Floodplain by Municipality



Source: Esri, Data Axle; Federal Emergency Management Agency (FEMA), 2010

Figure 52 Food Establishments in 1% Annual Chance Floodplain



Source: Esri, Data Axle, Federal Emergency Management Agency (FEMA), 2010

Health Care and Social Services



The health care and social services sector is a critical resilience asset, but recent job losses threaten its ability to operate effectively during climate emergencies, underscoring the need for targeted investments in workforce stability and infrastructure resilience.

Three of the county's top eight subsectors by employment fall within the broader health care and social services sector, underscoring its importance to community resilience by providing essential services to vulnerable populations, particularly for medical care and long-term health needs.

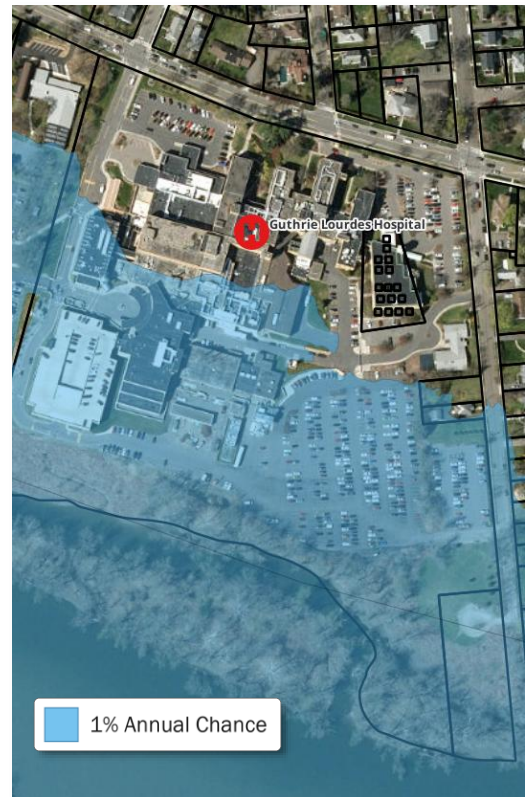
- Likely due to the presence of three major hospitals in the county (Guthrie Lourdes Hospital, UHS Wilson Hospital, and UHS Binghamton General Hospital), the *General Medical and Surgical Hospitals* subsector is the third-largest subsector by employment, providing approximately 4,320 relatively mid-wage jobs (average annual wage of \$70,970 per year). This subsector has also experienced recent employment losses, shrinking by approximately 2,680 jobs from 2019 to 2025. This recent loss may be partially due to the COVID-19 pandemic, which led to early retirements and burnout among healthcare workers. The resulting staffing gaps may have made it difficult for hospitals to operate at full capacity, affecting employment levels. Looking ahead, based on New York State Department of Labor's Long-Term Industry Employment Projections (2020-2030) for the Southern Tier region, the three-digit Hospital subsector is anticipated to grow by 1.5 percent per year through 2030, suggesting that the larger industry sector is expected to experience positive overall growth in the near-term.
- The *Nursing Care Facilities (Skilled Nursing Facilities)* subsector is the seventh-largest subsector by employment, providing approximately 1,650 relatively low-wage jobs (average annual wage of \$43,900). Employment in this subsector contracted by 505 jobs from the first quarter of 2019 to the first quarter of 2025.
- The *Residential Intellectual and Developmental Disability, Mental Health, and Substance Abuse Facilities* subsector is the eighth-largest subsector by employment, with approximately 1,550 relatively mid-wage jobs (average annual wage of \$82,480). Employment in this subsector decreased by 46 jobs from the first quarter of 2019 to the first quarter of 2025.

Resilience strategies should prioritize flood-prone areas where health care facilities are located. For example, Guthrie Lourdes Hospital (formerly Our Lady of Lourdes Hospital), situated within the FEMA one-percent annual chance floodplain, sustained severe flood damage in 2006 that required the evacuation of 150 patients and resulted in approximately \$20 million in damages. This event prompted a collaborative mitigation effort with FEMA and state and federal agencies to design and construct a comprehensive floodwall and protection system. The infrastructure successfully protected the hospital and allowed it to remain operational during

Tropical Storm Lee in 2011, demonstrating the critical role of climate-resilient investments in safeguarding essential community facilities amid increasing extreme precipitation and flood risks.⁴

Although the Guthrie Lourdes Hospital is the only identified hospital, nursing home, or walk-in care facility in the county located within the FEMA one-percent annual chance floodplain, health care facilities countywide remain vulnerable to other climate-related stressors, including power and water supply disruptions, extreme heat, and surges in demand during emergency events. Potential resiliency strategies include upgrading backup power and utility systems, retrofitting buildings for heat resilience, and strengthening emergency response plans through enhanced staff training and coordinated communication protocols.

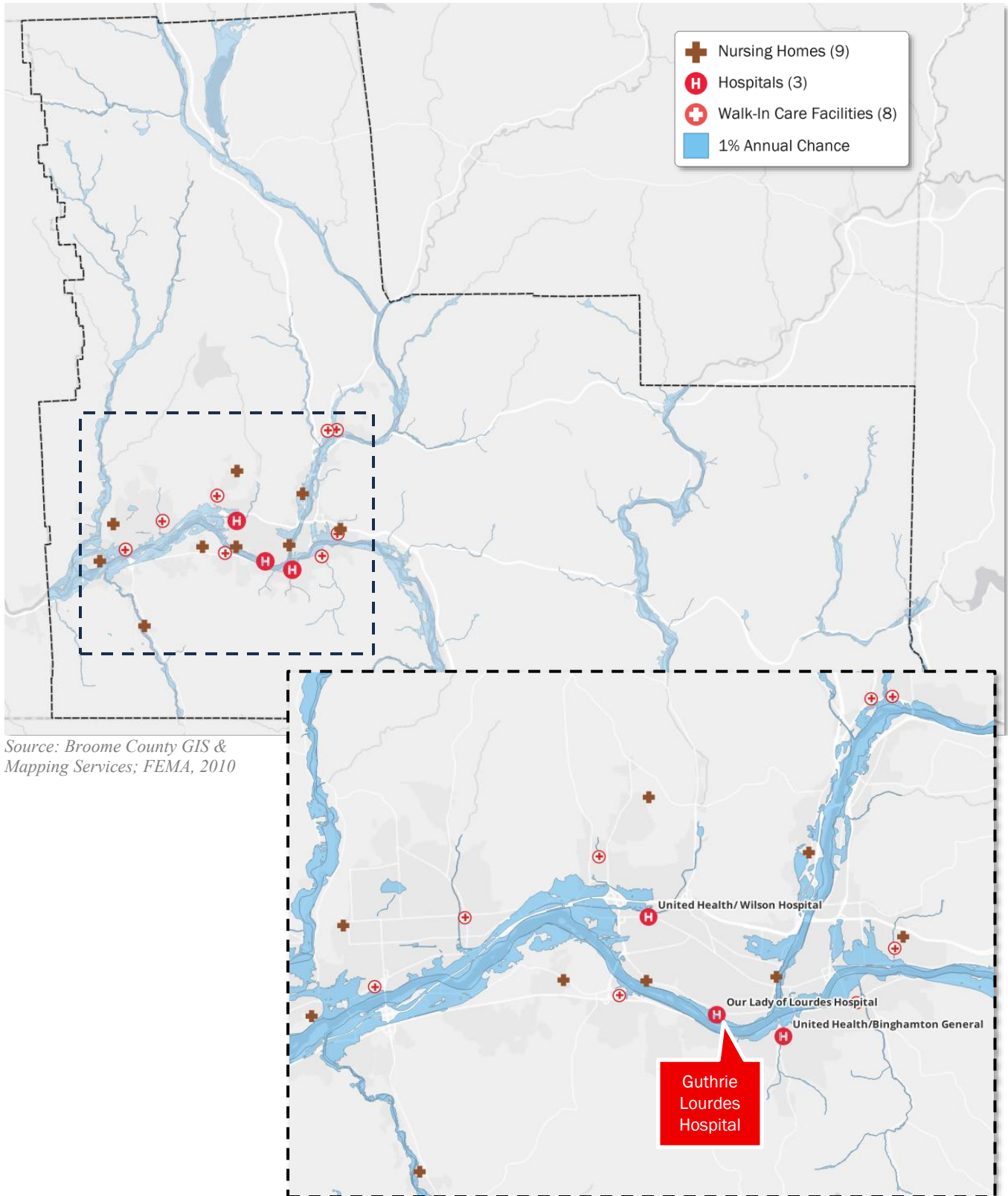
Overall, health care remains a foundational sector with long-term growth potential, especially if workforce recruitment and retention challenges can be addressed through targeted investment and regional partnerships.



A floodwall protected Our Lady of Lourdes Hospital in Binghamton, New York, during Tropical Storm Lee in 2011. Photo by FEMA.

⁴ <https://nysclimateimpacts.org/explore-the-assessment/case-studies/protecting-the-most-vulnerable/>

Figure 53 Hospitals, Nursing Homes, and Walk-In Care Facilities proximal to Preliminary Floodplain



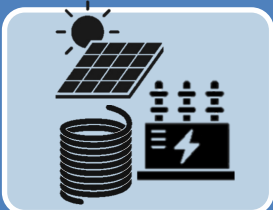
Government



The recent contraction in government employment may have reduced local capacity to plan for, respond to, and recover from environmental and economic disruptions.

Broome County has a strong concentration of employment in the *Executive, Legislative, and Other General Government Support* subsector due to its role as a regional administrative center, with Binghamton hosting numerous county, state, and federal government offices that provide essential public services and support functions across the Southern Tier region. This subsector offers approximately 3,750 mid-wage job opportunities (average annual wage of \$65,796 per year). Employment in this subsector contracted by 1,169 jobs from the first quarter of 2001 to the first quarter of 2025, including a net loss of 141 jobs since early 2019, which may be partially due to pandemic-induced revenue or staffing shortfalls. A strong concentration of government jobs provides economic stability and critical service continuity during climate disruptions, but also requires resilient infrastructure, adaptive workforce planning, and sustained investment to address vulnerabilities in public facilities and emergency response capacity.

Electronic Component Manufacturing



Local electronic component manufacturing firms may require climate-resilient infrastructure and technology investments that reduce vulnerability to extreme weather events.

The tenth-largest subsector by total employment, the *Semiconductor and Other Electronic Component Manufacturing* subsector, is largely comprised of firms dedicated to electronic component manufacturing (e.g., coils, transformers, circuits, magnetic and electronic components, solar panels). Notably, this subsector has an employment LQ of 10.36, meaning its share of county employment is more than 10 times the subsector's share of statewide employment. This subsector offers approximately 1,330 relatively high-wage job opportunities (average annual wage of \$89,724 per year).

Broome County's high concentration of electronic component manufacturing jobs stems from its historical legacy as the birthplace of IBM and a longtime hub for electronics innovation, which established a skilled workforce and infrastructure that continue to support advanced manufacturing today. Further, Binghamton offers robust incubator spaces tailored for electronic component manufacturing startups through the Koffman Southern Tier Incubator and Binghamton University's Center for Advanced Microelectronics Manufacturing (CAMM).

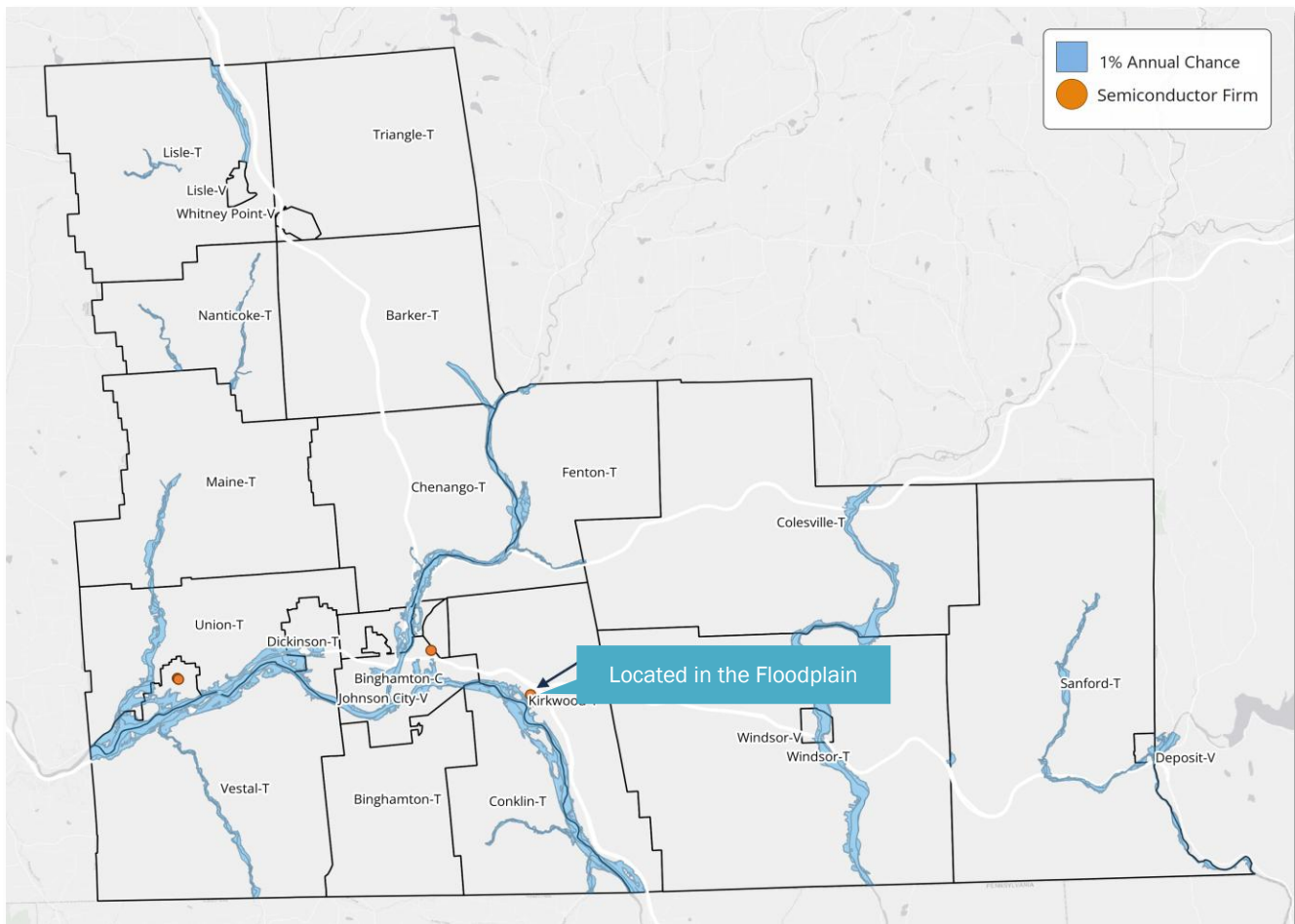
BAE is planning a \$65 million expansion on the Huron Campus in Endicott to accommodate a new battery production line, lab space, and new office space. According to Empire State Development, the aerospace

technology firm has committed to adding 134 new jobs while occupying an additional 150,000 square feet of existing space on the Huron Campus. The batteries will be developed for electric and hybrid electric airplanes.

Even though only one of these four semiconductor and other electronic component manufacturing firms (an electronic coil and transformers manufacturing firm) is located within the one-percent annual chance floodplain, these firms are sensitive to potential climate events because production relies on precision machinery, controlled temperature and humidity, and continuous power supply. Flooding, severe storms, or extreme heat can damage equipment, interrupt operations, and degrade product quality, while power outages and supply chain disruptions can halt manufacturing.

To ensure production continuity and long-term viability, existing and new electronic component manufacturing firms will need to invest in climate-resilient infrastructure, diversify supply chains, and integrate sustainable manufacturing practices, while local governments play a coordinating role in enabling these investments. Broome County and its municipalities can partner with state agencies (such as New York State Energy Research and Development Authority (NYSERDA) and Empire State Development) to offer targeted incentives, technical assistance, and infrastructure upgrades - supporting private firms in flood mitigation, energy efficiency, and facility hardening efforts that reduce risk and strengthen regional economic resilience.

Figure 54 Semiconductor and Other Electronic Component Manufacturing Firms



Source: Esri, Data Axle; Federal Emergency Management Agency (FEMA), 2010

COUNTERFACTUAL ECONOMIC IMPACT ANALYSIS

To quantify the potential economic consequences of environmental hazards, 4ward Planning conducted a counterfactual economic impact analysis using the Bureau of Economic Analysis (BEA) Regional Input-Output Modeling System (RIMS II). The analysis applies Type II final demand multipliers specific to Broome County (2017 benchmark I-O table/2023 regional data), which capture how disruptions to individual industries cascade through local supply chains and household spending to affect total output, earnings, and employment. Type II multipliers account for both inter-industry (indirect) and household spending (induced) effects, consistent with standard practice in disaster and resiliency economic impact analysis.

RIMS II is widely used for disaster and resiliency impact estimation.

Research on Hurricane Katrina and other major events has demonstrated that indirect economic losses can equal 30 percent or more of direct losses, and that these losses increase nonlinearly for more severe events.⁵ A recent study of coastal Virginia used RIMS II indirect and induced multipliers to estimate that sea-level rise-related flooding could generate approximately \$82.9 billion in total economic impact.⁶ A 2025 report by the U.S. Chamber of Commerce and Allstate found that every dollar invested in disaster resilience can save communities up to \$33 in future economic losses.⁷

Three scenarios are modeled below, reflecting different scales of disruption to the economic drivers and flood-exposed sectors identified earlier in this report. The industries selected (food services, accommodation, health care, education, electronic component manufacturing, retail, and real estate) represent the sectors most exposed to the county's primary environmental hazards. A detailed description of the modeling approach, scenario assumptions, direct loss derivations, and methodological limitations is provided in the Appendix.

Please note: The analysis estimates selected business-interruption losses and their local supply-chain and household-spending effects, and does not include damage to buildings, household property, equipment, inventories, and public infrastructure, or effects on industries outside the selected sectors and supply chains beyond Broome County. Consequently, the reported output, earnings, and jobs figures should be treated as partial economic-disruption estimates—not comprehensive measures of property damage, fiscal loss, or societal welfare.

Scenario Analysis: Acute Flood Events

Two acute scenarios were modeled. A moderate flood event (two- to four-week disruption to floodplain businesses) produces an estimated \$46.2 million in total output losses, \$12.0 million in lost earnings, and 258 jobs disrupted from \$32 million in direct losses. A severe, Tropical Storm Lee-scale event (one- to three-month disruption across major employers) produces far larger cascading effects. According to the 2024 Hazard Mitigation Plan, a one-percent annual chance flood could result in \$744 million in wage losses and

⁵ Hallegatte, S. (2008), as reviewed in Botzen, W.J.W., O. Deschenes, and M. Sanders, "The Economic Impacts of Natural Disasters: A Review of Models and Empirical Studies," *Review of Environmental Economics and Policy*, Vol. 13, No. 2, 2019

⁶ "Estimating the economic vulnerability of 2020–2099 storm flooding with sea level rise on Coastal Virginia," ScienceDirect, 2024

⁷ Allstate, U.S. Chamber of Commerce, and U.S. Chamber of Commerce Foundation, *Beyond the Payoff: How Investments in Resilience and Disaster Preparedness Protect Communities*, 2025

\$8.1 billion in building replacement costs. The severe scenario models \$180 million in direct output losses, a fraction of total exposure, and includes a \$50 million construction recovery stimulus as a partial offset.

Under the severe scenario, the county would experience a net loss of approximately \$185 million in total output, \$49 million in earnings, and approximately 1,170 jobs, even after accounting for construction recovery. The food services sector's high employment multiplier (10.7 jobs per million dollars of output) means it generates the largest employment impact, while the health care sector drives significant earnings losses through its high labor-intensity multiplier. The inclusion of induced household-spending effects in Type II multipliers captures the additional economic drag as displaced workers reduce their local consumption, an effect that compounds in a county already experiencing population decline.

Figure 55 Estimated Economic Impact of a Severe Flood Event (2023 Dollars)

Industry	Direct Output Loss (\$M)	Total Output (\$M)	Total Earnings (\$M)	Total Jobs at Risk
Food Services & Drinking Places	\$45.0	\$66.9	\$17.3	480
Accommodation	\$15.0	\$21.1	\$4.9	98
Other Retail	\$30.0	\$42.7	\$9.3	229
Real Estate	\$20.0	\$26.5	\$4.2	154
Hospitals	\$18.0	\$26.9	\$7.8	112
Educational Services	\$15.0	\$22.3	\$7.7	166
Computer & Electronic Mfg.	\$25.0	\$35.6	\$10.2	112
Ambulatory Health Care	\$12.0	\$17.9	\$6.1	102
Total Economic Disruption	\$180.0	\$259.9	\$67.5	1,453
Construction (Recovery Stimulus)	+\$50.0	+\$74.5	+\$18.7	+285
Net Economic Impact	-\$130.0	-\$185.4	-\$48.8	-1,168

Source: Award Planning Inc., 2025; BEA RIMS II Type II Multipliers (2017/2023), Broome County, NY

No-Action Counterfactual: Chronic Cumulative Impact

The most consequential scenario for long-range planning models is the annual effect of repeated flood events and chronic stressors in the absence of resilience investment. This counterfactual captures four reinforcing impact categories: permanent closure of floodplain businesses, sustained tourism declines, property value depreciation, and accelerated workforce out-migration. These trends reinforce Broome County's existing trajectory of population loss (4,430 residents) and job decline (9,220 jobs) between 2010 and 2024.

Figure 56 Estimated Annual Cumulative Economic Impact Under No-Action Scenario

Impact Category	Direct Loss (\$M)	Total Output (\$M)	Total Earnings (\$M)	Total Jobs at Risk
Permanent Business Closures	\$22.0	\$32.7	\$8.5	234

Tourism & Hospitality Decline	\$34.2	\$50.9	\$13.2	365
Property Value Depreciation	\$15.0	\$19.9	\$3.1	116
Workforce Out-Migration	\$18.0	\$26.2	\$6.8	155
Annual Cumulative Impact	\$89.2	\$129.7	\$31.6	870

Source: 4ward Planning Inc., 2025; BEA RIMS II Type II Multipliers (2017/2023), Broome County, NY

Without targeted resilience investments, the county could experience approximately \$130 million in annual output losses, \$32 million in lost earnings, and 870 jobs at risk each year. Over a 10-year horizon, this totals approximately \$1.3 billion in cumulative output losses. This figure does not account for the reinforcing feedback loops between population decline, reduced tax revenue, deteriorating infrastructure, and diminished investment.

Figure 57 Summary of Counterfactual Economic Impact Scenarios

Scenario	Total Output Loss (\$M)	Total Earnings Loss (\$M)	Total Jobs at Risk
Moderate Flood (two- to four-week disruption)	\$46.2	\$12.0	258
Severe Flood (one- to three-month disruption)	\$185.4 (net)	\$48.8 (net)	1,168 (net)
Chronic No-Action (annual)	\$129.7/yr	\$31.6/yr	870/yr

Source: Award Planning Inc., 2025; BEA RIMS II Type II Multipliers (2017/2023), Broome County, NY

Implications

The analysis yields several findings with direct implications for the resiliency plan:

- **Multiplier effects amplify losses by approximately 44 to 45 percent** beyond direct output losses when indirect supplier and induced household-spending effects are included, so the true cost of inaction is substantially greater than physical losses alone.
- **Food services and tourism are disproportionately vulnerable.** With \$428 million in annual visitor spending and employment multipliers of 10.7 jobs per million dollars of output, even modest hospitality disruptions carry large economic consequences.
- **Health care losses generate among the largest earnings impacts per dollar of disruption.** With an earnings multiplier of 0.507 and an employment multiplier of 8.5 jobs per million dollars, hospital and ambulatory care closures ripple through both the labor market and household spending.
- **Over a 10-year horizon, cumulative chronic losses exceed the modeled single severe-event impact.** Annual no-action losses of approximately \$130 million accumulate to roughly \$1.3 billion over a decade, a structural economic challenge that strengthens the case for investment in infrastructure hardening, floodplain management, and business continuity planning.

Environmental Justice Considerations

Environmental justice (EJ) means the just treatment and meaningful involvement of all people, regardless of income, race, color, national origin, Tribal affiliation, or disability, in agency decision-making and other Federal activities that affect human health and the environment so that people:

1. Are fully protected from disproportionate and adverse human health and environmental effects (including risks) and hazards, including those related to climate change, the cumulative impacts of environmental and other burdens, and the legacy of racism or other structural or systemic barriers; and
2. Have equitable access to a healthy, sustainable, and resilient environment in which to live, play, work, learn, grow, worship, and engage in cultural and subsistence practices.

Environmental Justice and Climate Burden

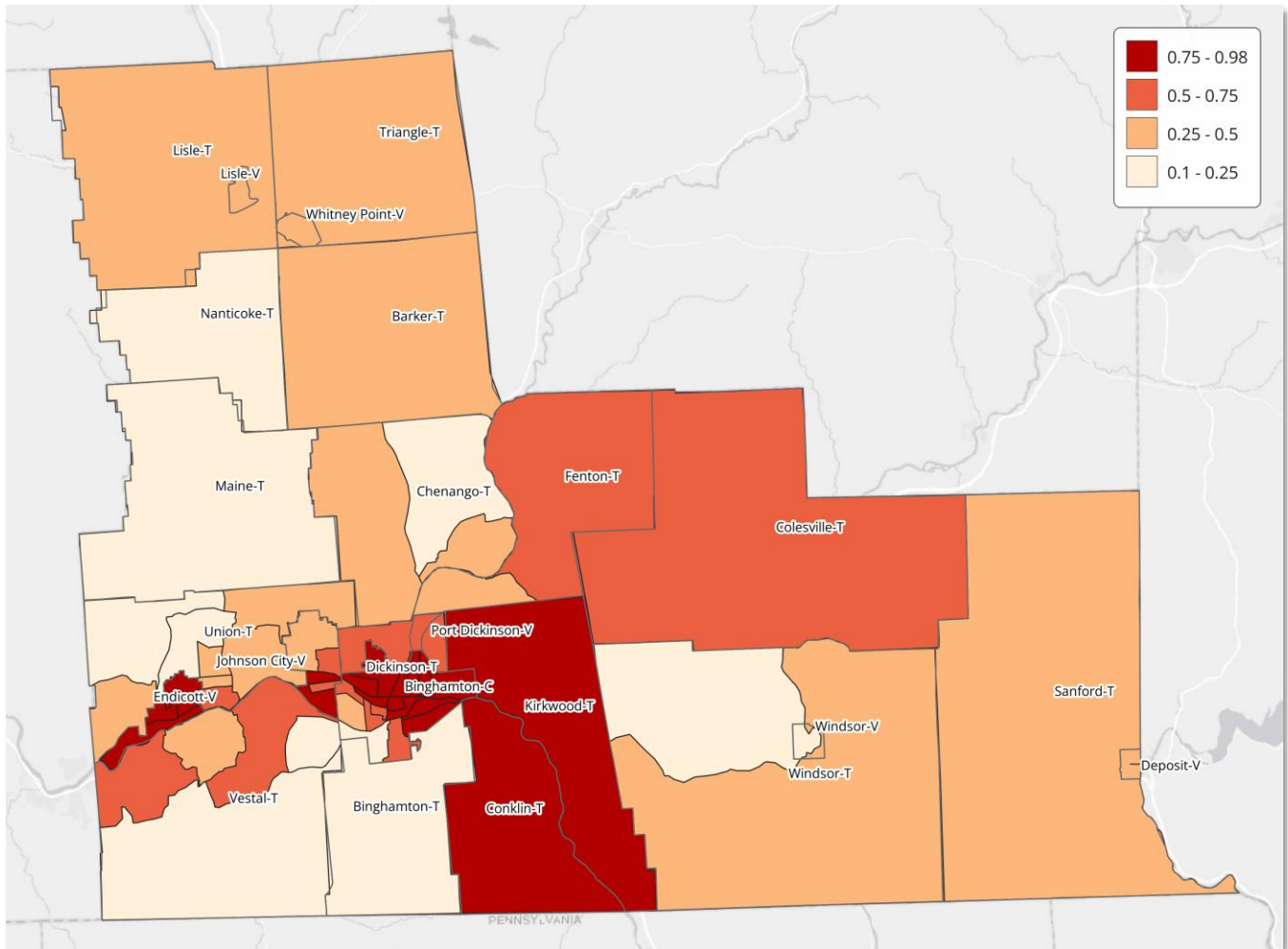
To measure environmental justice in the nation, the Centers for Disease Control and Prevention's (CDC) Agency for Toxic Substances and Disease Registry (ATSDR) developed the Environmental Justice Index (EJI), which was used to measure the cumulative impacts of environmental burden for Broome County - because the tool combines social vulnerability, environmental burdens, and health impacts into a single score for each community, helping to identify areas most at risk from environmental hazards. This comprehensive view allows Broome County to prioritize investments, target emergency response, and design equitable resilience strategies that address the needs of populations facing the greatest cumulative burdens.

EJI and Climate Burden

EJI and Climate Burden rankings compare each census tract to all tracts nationwide. For example, a score of 0.75 indicates that the tract experiences greater cumulative environmental and climate impacts than 75 percent of U.S. census tracts. In Broome County, 16 of the county's 57 census tracts meet or exceed the EJI and Climate Burden ranking threshold and are considered highly burdened, warranting focused attention in resilience and environmental justice planning.

Comparison across tracts shows that the highest overall EJI and Climate Burden occurs where social vulnerability, environmental burdens, health challenges, and climate exposure overlap, rather than where a single risk factor is elevated. In several cases, strong social and health vulnerabilities amplify moderate climate exposure, driving higher overall risk, while lower-ranked tracts tend to experience climate exposure with fewer compounding stressors. With a countywide average score of 0.53, these findings underscore the need to prioritize integrated, place-based resilience strategies in neighborhoods where multiple risks converge, addressing equity, environmental conditions, public health, and climate adaptation together.

Figure 58 Combined EJI and Climate Burden Rank by Census Tract



Source: CDC, Agency for Toxic Substances and Disease Registry, 2024 Environmental Justice Index

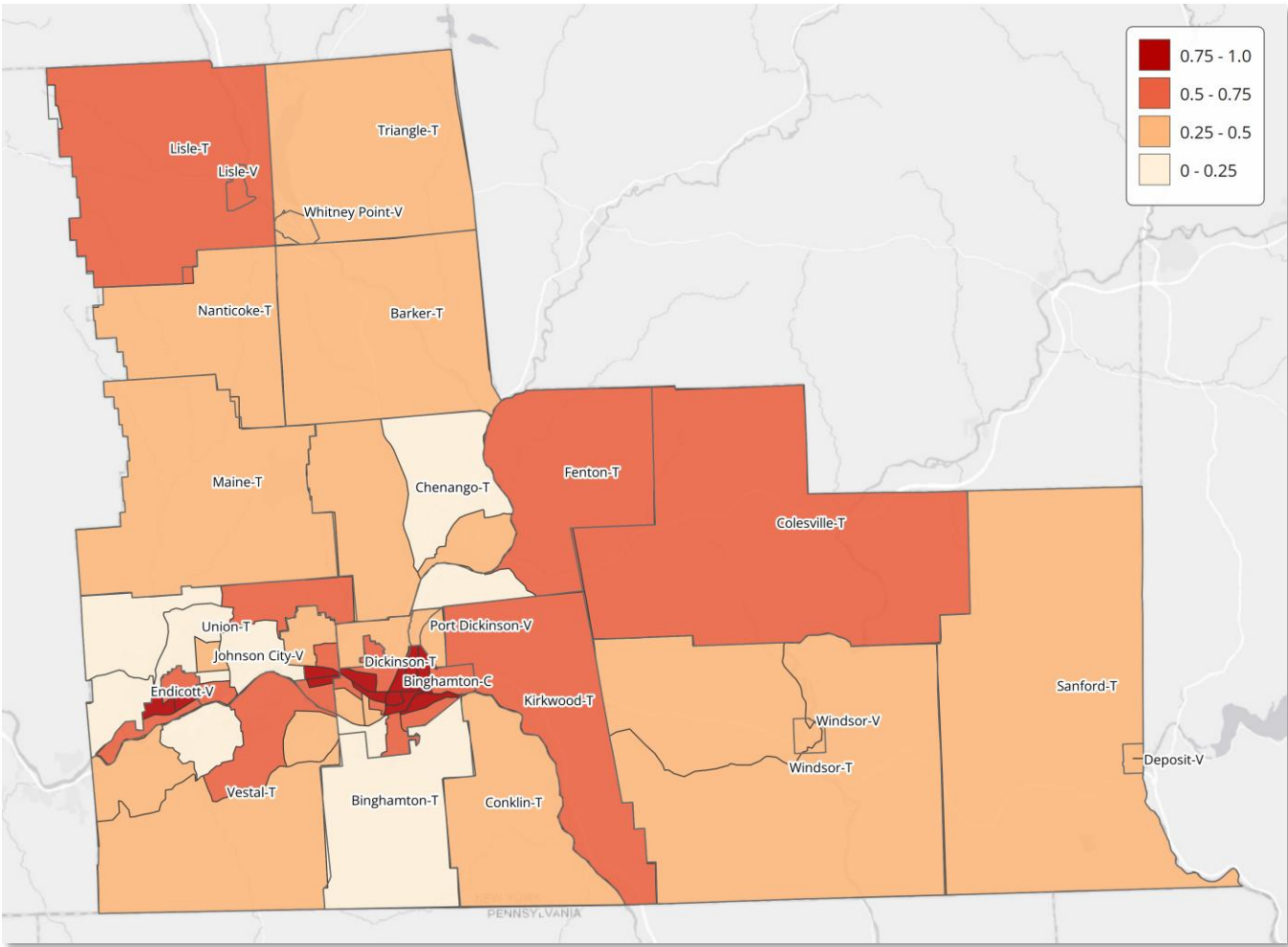
Module Rankings by Indicator

The following section presents average rankings among each EJI and Climate Burden module. Detailed tables by indicator and census tract are provided in more detail in the Appendix.

Social Vulnerability

Social vulnerability in Broome County is most concentrated in a limited number of census tracts within the urban core—particularly in and around the city of Binghamton and the village of Johnson City—where multiple indicators such as poverty, renter concentration, disability, unemployment, housing cost burden, and limited access to services overlap. These highly vulnerable tracts, often located in older, river-adjacent neighborhoods, face reduced capacity to prepare for and recover from climate-related hazards. In contrast, suburban and rural tracts generally exhibit lower to moderate vulnerability, though some face isolated risks tied to aging populations and service access. This pattern highlights the need for targeted, tract-level resilience and equity strategies in the most vulnerable neighborhoods, complemented by broader countywide approaches.

Figure 59 Social Vulnerability Module Rank by Census Tract

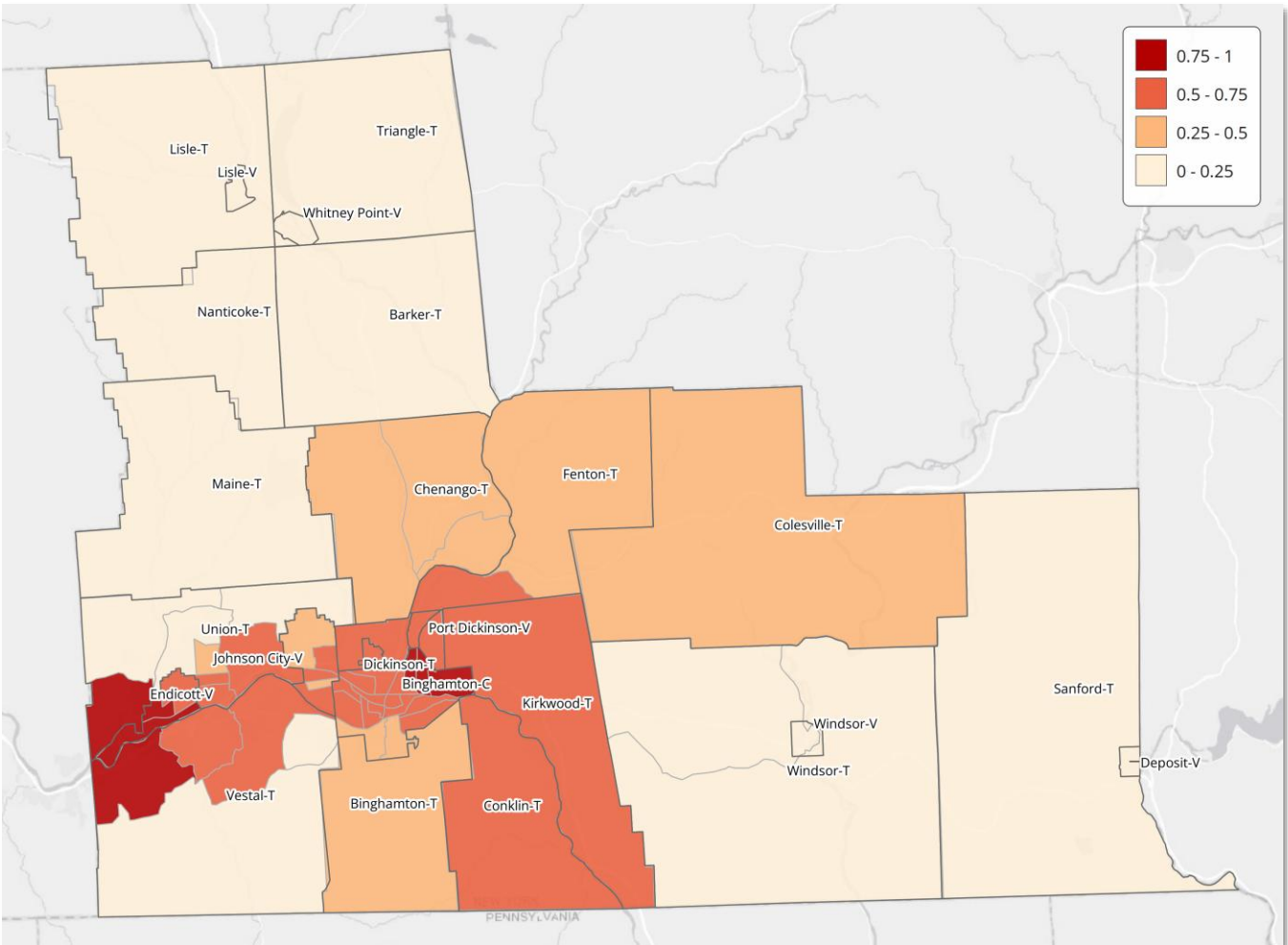


Source: CDC, Agency for Toxic Substances and Disease Registry, 2024 Environmental Justice Index

Environmental Burden

The map of average environmental burden by census tract shows that the highest environmental burdens in Broome County are concentrated in the urban core, particularly in and around the city of Binghamton, the village of Johnson City, and the village of Endicott, where multiple census tracts fall under the “highly burdened” category. These areas reflect the legacy of older housing, historic industrial activity, dense transportation infrastructure, and limited access to green space, which together contribute to elevated exposure to pollution and environmental hazards. Surrounding suburban and rural areas generally exhibit lower to moderate environmental burden, with fewer overlapping risk factors. This spatial pattern highlights the importance of prioritizing remediation, infrastructure investment, and environmental mitigation strategies in the most burdened urban neighborhoods, while continuing to address baseline environmental conditions across the broader county.

Figure 60 Environmental Burden Module Rank by Census Tract

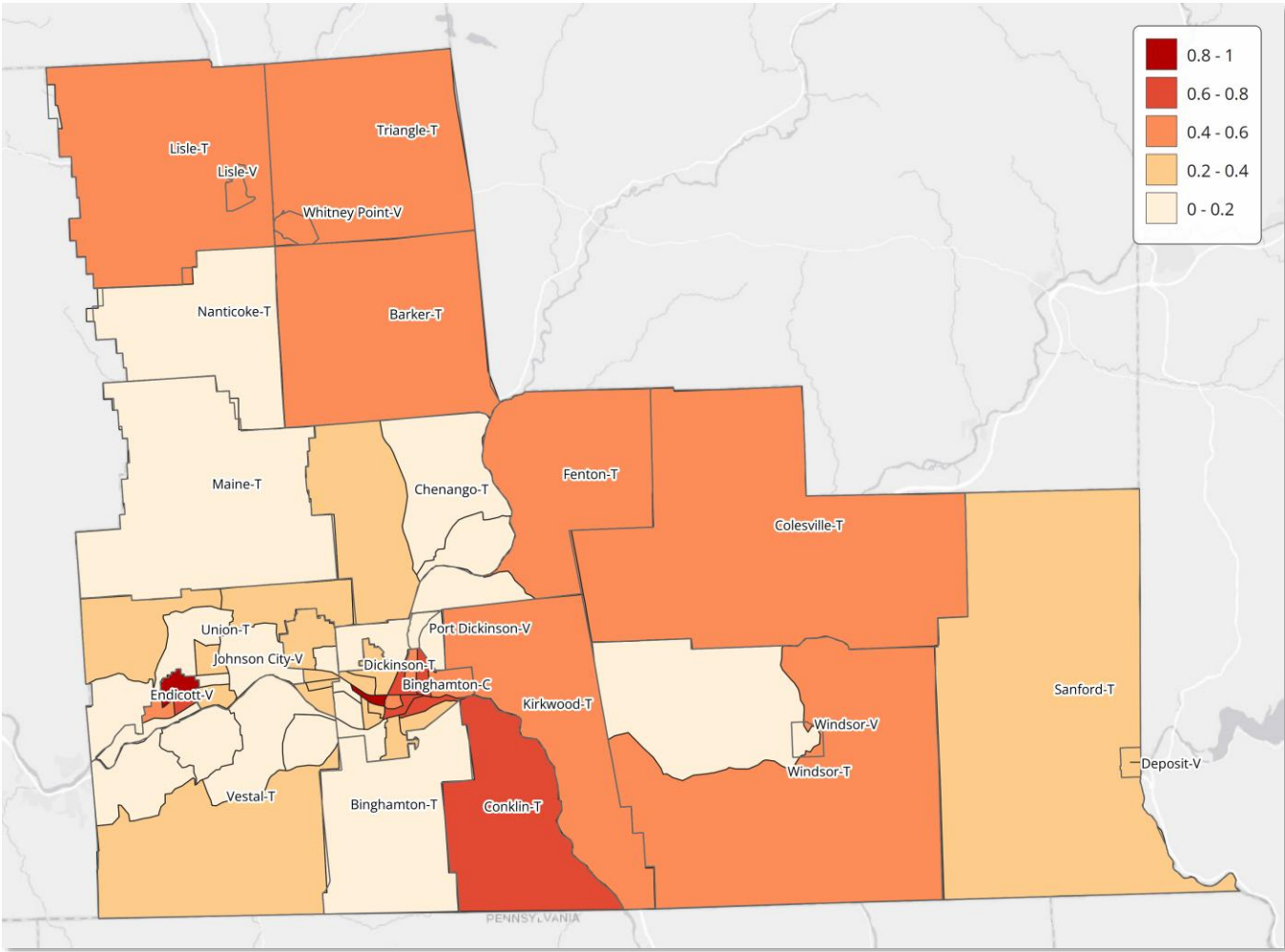


Source: CDC, Agency for Toxic Substances and Disease Registry, 2024 Environmental Justice Index

Health Vulnerability

Health vulnerability in Broome County is highest in the urban core—particularly in Binghamton, Johnson City, Endicott, and parts of Conklin—where census tracts exhibit elevated rates of asthma, heart disease, diabetes, poor mental health, and, in some cases, cancer. These older, urbanized areas face overlapping health stressors that heighten sensitivity to climate-related hazards such as extreme heat, flooding, and poor air quality. Suburban and rural tracts generally show moderate vulnerability, often linked to aging populations and healthcare access limitations, while lower-ranked tracts have fewer overlapping risks but may still face isolated challenges. Overall, the pattern highlights the need to integrate public health into resilience planning through targeted, neighborhood-level interventions in the highest-burden areas, alongside countywide strategies to improve health access, chronic disease prevention, and emergency preparedness.

Figure 61 Health Vulnerability Module Rank by Census Tract

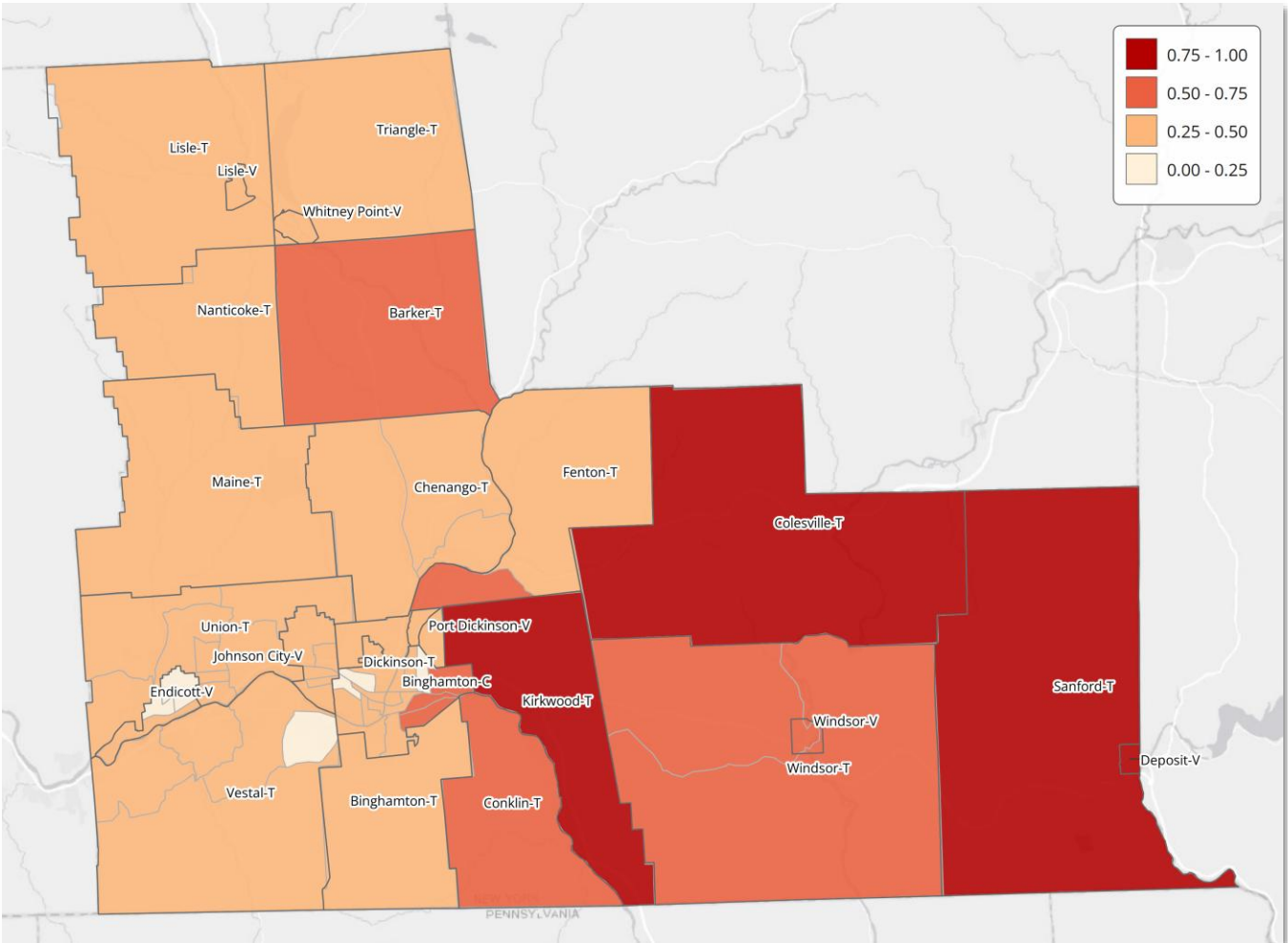


Source: CDC, Agency for Toxic Substances and Disease Registry, 2024 Environmental Justice Index

Climate Burden

The average climate burden map shows that Broome County’s highest climate risks are concentrated in the eastern and southeastern areas—particularly Deposit, Colesville, Sanford, and Kirkwood—where census tracts experience overlapping exposure to riverine flooding, extreme heat, and severe weather. Riverine flooding and extreme heat drive climate risk countywide, resulting in generally moderate burden across the urban core, including the city of Binghamton, the villages of Johnson City and Endicott, with less variation between tracts. Differences at the high end of the rankings reflect where multiple hazards overlap along river corridors and low-lying areas rather than isolated risks. With a countywide average climate burden score of 0.46, these patterns highlight the need for countywide flood and heat preparedness, paired with targeted, place-based interventions in the highest-burden tracts to address compounding climate hazards.

Figure 62 Climate Burden Module Rank by Census Tract



Source: CDC, Agency for Toxic Substances and Disease Registry, 2024 Environmental Justice Index

Appendix A: Counterfactual Economic Impact Methodology

Model and Data Sources

The counterfactual economic impact analysis uses the Bureau of Economic Analysis (BEA) Regional Input-Output Modeling System (RIMS II), a widely used regional economic model that estimates how changes in final demand for one industry's output propagate through the broader economy via inter-industry purchasing relationships. The analysis applies Type II final demand multipliers from Table 2.5 (Total Multipliers by Industry Aggregation) for Broome County, New York, based on the 2017 national benchmark input-output table and 2023 regional data. Type II multipliers capture direct effects (the initial change in the affected industry), indirect effects (changes in output among the industry's local suppliers), and induced effects (changes in household spending as workers' incomes are affected). This is consistent with the approach used in peer-reviewed resiliency studies, including the coastal Virginia sea-level rise impact analysis and IMPLAN-based disaster assessments, which routinely include induced household spending effects.

The multipliers were purchased from BEA and applied in accordance with the RIMS II User's Guide. All dollar estimates are expressed in 2023 dollars, consistent with the regional data vintage underlying the multipliers.

How the Multipliers Were Applied

For each scenario, the analysis follows a three-step process:

- **Estimate direct output losses** for each affected industry, based on the disruption assumptions described below.
- **Apply RIMS II final demand multipliers** to the direct output loss to calculate total output, total earnings, and total employment impacts across all industries in the county. Type II multipliers capture inter-industry supply chain effects (indirect) and household spending effects (induced).
- **Sum across industries** to produce the scenario-level totals reported in the body of the report.

The employment multiplier is expressed as jobs per \$1 million of output delivered to final demand, so direct output losses in dollars are divided by one million and then multiplied by the employment multiplier to yield job impacts.

Scenario Assumptions: Severe Flood Event

The severe flood scenario models a Tropical Storm Lee-scale event causing one to three months of disruption. Direct output losses were estimated for each industry based on the assumed duration of disruption, the share of industry activity exposed to flood hazards, corroborating data from the 2024 Hazard Mitigation Plan, and the economic driver profiles developed for this report. The moderate scenario applies the same industry set at roughly 18 percent of the severe scenario's direct losses, reflecting a shorter (two- to four-week) disruption period.

Figure 63 Direct Output Loss Assumptions by Industry, Severe Flood Event Scenario

Industry (Table 2.5)	Direct Loss (\$M)	Assumed Disruption	Basis for Estimate	Key Exposure Factor
Food Services & Drinking Places	\$45.0	6–12 weeks	Share of establishments in floodplain; average revenue per establishment	167 of the county's 446 food-service establishments (all eating and drinking places) in the 1% floodplain
Accommodation	\$15.0	4–12 weeks	Lodging revenue loss during closure and reduced visitor traffic	Floodplain proximity of hotels/motels
Other Retail	\$30.0	4–8 weeks	Estimated retail sales loss for floodplain-area stores	Retail concentration in flood-exposed downtowns
Real Estate	\$20.0	Ongoing	Rental income loss, transaction delays, vacancy increases	5.1% of parcels in 100-yr floodplain
Hospitals	\$18.0	2–8 weeks	Revenue loss from facility damage, service rerouting, and reduced patient volume	Hospital facilities in or near floodplain
Educational Services	\$15.0	4–12 weeks	Lost institutional output from campus closures and enrollment disruption	BU Downtown Center closed ~1 year post-2011 flood
Computer & Electronic Mfg.	\$25.0	4–12 weeks	Production output loss from facility damage and supply chain interruption	Semiconductor/electronic mfg. cluster in flood-exposed areas
Ambulatory Health Care	\$12.0	2–6 weeks	Revenue loss from office closures, appointment cancellations	Medical offices in flood-exposed commercial areas
Construction (Recovery)	+\$50.0	6–24 months	Emergency repairs, infrastructure restoration, building rehabilitation	Post-disaster reconstruction demand

Note: The 167 food-service establishments reflect the countywide inventory of all eating and drinking places (446 establishments) intersected with the 1-percent annual chance floodplain. Figure 52 presents a separate food-access inventory of 46 restaurants and 41 grocery and convenience retailers (87 establishments).

Source: 4ward Planning Inc., 2025. Direct loss estimates derived from Broome County Hazard Mitigation Plan (2024), QWI employment data, Tourism Economics visitor spending data (2024), and establishment-level analysis from the economic driver profiles in this report

Scenario Assumptions: Chronic No-Action Counterfactual

The no-action counterfactual models annualized losses from four compounding impact categories, assuming no new resilience investments are made. Each category's direct loss was estimated independently and then run through the RIMS II Type II multipliers using the most closely corresponding industry classification in Table 2.5. The estimates reflect conservative assumptions and do not account for compounding feedback effects (e.g., population loss reducing demand, which accelerates further business closures).

Figure 64 Direct Loss Derivation by Impact Category, Chronic No-Action Scenario

Impact Category	Annual Direct Loss (\$M)	Derivation
Permanent Business Closures	\$22.0	Assumes 5% of floodplain establishments permanently close or relocate outside the county, based on average annual output per establishment
Tourism & Hospitality Decline	\$34.2	Assumes 8% sustained reduction in annual visitor spending (\$428M base, 2024) due to reputation effects, repeated event disruption, and reduced outdoor recreation access
Property Value Depreciation	\$15.0	Estimated annual real estate output loss from depressed property values, reduced transaction volume, and increased vacancy in flood-prone areas
Workforce Out-Migration	\$18.0	Estimated output loss from accelerated household relocation, modeled as incremental reduction in consumer spending and labor supply beyond baseline population decline trends, allocated across retail trade (50%), food services (25 percent), and ambulatory health care (25%) consumer-spending multipliers

Source: 4ward Planning Inc., 2025. Estimates derived from ACS population trends, Tourism Economics data, Broome County Hazard Mitigation Plan (2024), and FEMA NFIP data

Limitations and Caveats

- **RIMS II assumes a stable economic structure.** The model's inter-industry relationships are based on observed purchasing patterns in a normally functioning economy. In a severe or prolonged disruption, actual impacts may differ as businesses adapt, substitute suppliers, or permanently restructure.
- **Type II multipliers include estimated induced effects.** The induced component captures the effect of changes in household spending resulting from changes in employment and earnings. These effects assume that household spending patterns remain consistent with pre-disaster conditions, which may overstate impacts if households significantly adjust consumption patterns during a prolonged disruption.
- **Direct loss estimates involve professional judgment.** The direct output losses for each industry are estimates based on available data and reasonable assumptions about disruption duration and exposure. Actual losses from any specific event will depend on flood severity, geographic extent, season, and the specific businesses affected.
- **The analysis does not model fiscal impacts.** Reductions in municipal tax revenue, increased public safety and emergency management costs, and FEMA cost-share obligations are not captured in the RIMS II framework but would represent additional economic burdens.

Appendix B: EJ and Climate Burden Indicators and Sources

	Module	Domains	Indicators	Data Sources
Environmental Justice Rank	Social Vulnerability	Racial/Ethnic Minority Status	- Minority Status - Poverty - No High School Diploma - Unemployment - Renters - Housing Cost Burden - Lack of Health Insurance - Lack of Internet Access	U.S. Census Bureau American Community Survey
		Socioeconomic Status	- Age 65 and Older - Age 17 and Younger - Civilian with Disability - English Language Proficiency	
		Household Characteristics	- Group Quarters - Mobile Homes	
		Housing Type	- Ozone - Particulate Matter 2.5 (PM2.5) - Diesel Particulate Matter - Air Toxics Cancer Risk - National Priority List Sites - Toxic Release Inventory Sites	
	Environmental Burden	Air Pollution	- Treatment, Storage, and Disposal Sites - Risk Management Plan Sites - Coal Mines - Lead Mines - Lack of Recreational Parks - Houses Built Pre-1980	U.S. EPA Air Quality System
		Potentially Hazardous and Toxic Sites	- Lack of Walkability - High Volume Roads	U.S. EPA AirToxScreen
		Built Environment	- Railways - Airports	U.S. EPA Facility Registry Service
		Transportation Infrastructure	Impaired Surface Water	U.S. Mine Safety and Health Admin. Mine Data Retrieval System
		Water Pollution		U.S. Geological Survey PAD-US 4.0
				U.S. Census Bureau American Community Survey
				U.S. EPA National Walkability Index
				U.S. Department of Transportation National Highway System
				U.S. Department of Transportation National Transportation Atlas Database
				Open StreetMap and the U.S. Department of Transportation National Transportation Atlas Database
Climate Burden Rank	Health Vulnerability	Pre-Existing Chronic Disease Burden	- Asthma - Cancer - Coronary Heart Disease - Diabetes - Poor Mental Health	U.S. CDC PLACES Estimates
		Heat	- Extreme Heat Days - Wildfire Smoke - Wildfire Proximity - Coastal Flooding - Drought - Riverine Flooding - Hurricane - Strong Winds - Tornadoes	U.S. CDC National Environmental Public Health Tracking
	Climate Burden	Wildfire		U.S. NOAA Hazard Mapping System
		Extreme Events		Monitoring Trends in Burn Severity
				U.S. FEMA National Risk Index
				U.S. CDC National Environmental Public Health Tracking

Figure 65 Detailed Combined EJI and Climate Burden Rank by Census Tract

Census Tract	Municipality (CDP)	Social Vulnerability	Environmental Burden	Climate Burden	Health Vulnerability	EJI and Climate Burden
36007001300	Binghamton-C	0.93	0.56	0.50	1.00	0.96
36007001100	Binghamton-C	0.98	0.70	0.50	0.80	0.96
36007000500	Binghamton-C	0.96	0.71	0.50	0.80	0.96
36007012600	Kirkwood-T	0.70	0.72	0.87	0.60	0.95
36007000900	Binghamton-C	0.80	0.74	0.53	0.80	0.94
36007000400	Binghamton-C	0.81	0.82	0.50	0.60	0.91
36007000700	Binghamton-C	0.72	0.80	0.54	0.60	0.89
36007000600	Binghamton-C	0.91	0.82	0.06	0.80	0.87
36007001200	Binghamton-C	0.76	0.60	0.50	0.60	0.82
36007013500	Endicott-V	0.96	0.55	0.04	0.80	0.78
36007013900	Johnson City-V	0.94	0.52	0.50	0.40	0.78
36007001800	Binghamton-C	0.73	0.68	0.53	0.40	0.77
36007012701	Conklin-T	0.33	0.67	0.54	0.80	0.77
36007000300	Binghamton-C	0.74	0.67	0.50	0.40	0.76
36007014100	Johnson City-V	0.73	0.68	0.50	0.40	0.76
36007013400	Endicott-V	0.74	0.51	0.04	1.00	0.75
36007013700	Endicott-V	0.68	0.96	0.44	0.20	0.75
36007013600	Endicott-V	0.79	0.80	0.04	0.60	0.73
36007012300	Colesville-T	0.51	0.33	0.76	0.60	0.71
36007013100	Union-T (Endwell CDP)	0.60	0.75	0.45	0.40	0.71
36007001401	Binghamton-C	0.74	0.54	0.50	0.40	0.70
36007014000	Johnson City-V	0.79	0.49	0.50	0.40	0.70
36007012202	Fenton-T	0.63	0.32	0.50	0.60	0.63
36007001700	Binghamton-C	0.70	0.37	0.48	0.40	0.58
36007000200	Binghamton-C	0.86	0.58	0.06	0.40	0.55
36007012800	Dickinson-T / Port Dickinson-V	0.46	0.69	0.50	0.20	0.52
36007012400	Sanford-T	0.36	0.19	0.86	0.40	0.50
36007001402	Binghamton-C	0.38	0.52	0.50	0.40	0.49
36007014301	Vestal-T	0.56	0.54	0.49	0.20	0.49
36007013800	Johnson City-V	0.54	0.54	0.50	0.20	0.48
36007014500	Vestal-T	0.32	0.82	0.43	0.20	0.48
36007012501	Windsor-T	0.44	0.12	0.59	0.60	0.47
36007011902	Barker-T	0.47	0.15	0.51	0.60	0.46
36007012103	Chenango-T	0.45	0.38	0.48	0.40	0.45
36007011903	Lisle-T	0.51	0.11	0.48	0.60	0.44
36007012201	Fenton-T	0.21	0.73	0.54	0.20	0.42
36007014200	Johnson City-V	0.41	0.34	0.49	0.40	0.40

Census Tract	Municipality (CDP)	Social Vulnerability	Environmental Burden	Climate Burden	Health Vulnerability	EJI and Climate Burden
36007012900	Union-T	0.62	0.13	0.49	0.40	0.40
36007011901	Triangle-T	0.41	0.08	0.45	0.60	0.35
36007014400	Vestal-T	0.23	0.62	0.46	0.20	0.34
36007013000	Union-T (Endwell CDP)	0.16	0.66	0.49	0.20	0.33
36007013202	Union-T (Endwell CDP)	0.30	0.32	0.46	0.40	0.32
36007001500	Binghamton-C	0.26	0.52	0.50	0.20	0.32
36007012102	Chenango-T (Chenango Bridge CDP)	0.39	0.40	0.49	0.20	0.31
36007013301	Union-T	0.20	0.82	0.44	0.00	0.31
36007013201	Union-T (Endwell CDP)	0.15	0.58	0.46	0.20	0.27
36007000100	Binghamton-C	0.56	0.53	0.06	0.20	0.25
36007014600	Vestal-T	0.35	0.09	0.46	0.40	0.22
36007013303	Union-T	0.23	0.15	0.47	0.40	0.20
36007001600	Binghamton-C	0.15	0.37	0.49	0.20	0.18
36007012702	Binghamton-T	0.21	0.29	0.50	0.20	0.18
36007012000	Nanticoke-T	0.40	0.15	0.45	0.20	0.18
36007012502	Windsor-T	0.28	0.13	0.56	0.20	0.17
36007010200	Maine-T	0.34	0.14	0.50	0.20	0.17
36007012101	Chenango-T	0.16	0.26	0.50	0.20	0.14
36007013304	Union-T	0.20	0.16	0.46	0.20	0.11
36007014302	Vestal-T (BU CDP)	0.47	0.18	0.06	0.20	0.07
County		0.53	0.48	0.46	0.42	0.53

Note: Classification as highly burdened is based on unrounded index scores; 16 of the county's 57 census tracts meet or exceed the 0.75 threshold. One additional tract's displayed value of 0.75 rounds up from an unrounded score of 0.747, below the threshold. Tracts spanning multiple municipalities are assigned to a primary municipality in the appendix tables; Figure 2 lists all municipalities sharing each tract.

Source: CDC, Agency for Toxic Substances and Disease Registry, 2024 Environmental Justice Index

Figure 66 Social Vulnerability Module Rank by Census Tract

Census Tract	Municipality (CDP)	Civilian with a Disability	Age 65 and Older	Group Quarters	Un-employment	Lack of Internet Access	Housing Cost Burden	Renters	No High School Diploma	Age 17 and Younger	Mobile Homes	Poverty	English Language Proficiency	Minority Status	Lack of Health Insurance	Module Rank
36007001100	Binghamton-C	1.00	0.73	0.93	0.70	0.98	0.94	0.98	0.96	0.49	0.00	0.96	0.67	0.70	0.46	0.98
36007013500	Endicott-V	0.91	0.06	0.94	0.98	0.52	0.99	0.93	0.91	0.72	0.51	0.99	0.44	0.51	0.72	0.96
36007000500	Binghamton-C	0.92	0.71	0.88	0.75	0.67	0.94	0.91	0.84	0.32	0.46	0.99	0.73	0.70	0.30	0.96

Census Tract	Municipality (CDP)	Civilian with a Disability	Age 65 and Older	Group Quarters	Un-employment	Lack of Internet Access	Housing Cost Burden	Renters	No High School Diploma	Age 17 and Younger	Mobile Homes	Poverty	English Language Proficiency	Minority Status	Lack of Health Insurance	Module Rank
36007013900	Johnson City-V	0.91	0.12	0.90	1.00	0.33	0.97	0.92	0.88	0.67	0.49	0.97	0.88	0.65	0.11	0.94
36007001300	Binghamton-C	0.77	0.46	0.97	0.98	0.75	0.98	0.98	0.73	0.19	0.00	1.00	0.75	0.66	0.54	0.93
36007000600	Binghamton-C	0.84	0.23	0.85	0.99	0.60	0.50	0.90	0.96	0.88	0.00	0.95	0.80	0.74	0.28	0.91
36007000200	Binghamton-C	0.97	0.74	0.78	0.96	0.90	0.74	0.71	0.81	0.19	0.00	0.71	0.58	0.55	0.46	0.86
36007000400	Binghamton-C	0.78	0.32	0.64	0.43	0.71	0.69	0.84	0.79	0.38	0.51	0.86	0.77	0.52	0.46	0.81
36007000900	Binghamton-C	0.98	0.32	0.50	0.99	0.59	0.86	0.85	0.80	0.61	0.00	0.91	0.61	0.42	0.16	0.80
36007014000	Johnson City-V	0.86	0.16	0.00	0.87	0.89	0.93	0.92	0.84	0.67	0.00	0.91	0.65	0.55	0.29	0.79
36007013600	Endicott-V	0.86	0.45	0.69	0.78	0.70	0.80	0.81	0.58	0.72	0.00	0.75	0.54	0.45	0.43	0.79
36007001200	Binghamton-C	1.00	0.47	0.55	0.99	0.99	0.94	0.98	0.88	0.00	0.00	0.99	0.00	0.34	0.21	0.76
36007001401	Binghamton-C	0.92	0.20	0.66	0.27	0.69	0.96	0.96	0.54	0.02	0.00	0.98	0.60	0.66	0.78	0.74
36007013400	Endicott-V	0.86	0.65	0.90	0.19	0.65	0.75	0.84	0.71	0.47	0.00	0.84	0.49	0.34	0.49	0.74
36007000300	Binghamton-C	0.77	0.36	0.67	0.88	0.72	0.65	0.89	0.60	0.30	0.00	0.76	0.77	0.49	0.31	0.74
36007001800	Binghamton-C	0.72	0.37	0.50	0.77	0.68	0.38	0.79	0.58	0.34	0.56	0.81	0.74	0.56	0.34	0.73
36007014100	Johnson City-V	0.77	0.71	0.93	0.31	0.47	0.82	0.46	0.60	0.14	0.57	0.78	0.76	0.32	0.48	0.73
36007000700	Binghamton-C	0.55	0.84	0.95	0.93	0.43	0.63	0.53	0.79	0.22	0.52	0.83	0.35	0.22	0.29	0.72
36007012600	Kirkwood-T	0.59	0.70	0.55	0.49	0.61	0.68	0.41	0.48	0.58	0.74	0.54	0.70	0.29	0.61	0.70
36007001700	Binghamton-C	0.62	0.47	0.55	0.85	0.64	0.86	0.70	0.70	0.71	0.00	0.89	0.00	0.43	0.51	0.70
36007013700	Endicott-V	0.85	0.85	0.88	0.73	0.90	0.74	0.79	0.41	0.21	0.00	0.76	0.29	0.15	0.28	0.68
36007012202	Fenton-T	0.57	0.72	0.50	0.71	0.57	0.51	0.40	0.67	0.93	0.96	0.75	0.00	0.10	0.14	0.63
36007012900	Union-T	0.97	0.99	0.89	0.49	0.92	0.62	0.77	0.14	0.07	0.56	0.14	0.63	0.08	0.17	0.62
36007013100	Union-T (Endwell CDP)	0.88	0.47	0.64	0.65	0.85	0.92	0.74	0.63	0.10	0.53	0.67	0.00	0.15	0.13	0.60
36007014301	Vestal-T	0.24	0.73	0.89	0.26	0.20	0.69	0.61	0.55	0.23	0.65	0.59	0.76	0.50	0.22	0.56
36007000100	Binghamton-C	0.79	0.23	0.69	0.73	0.76	0.80	0.85	0.24	0.10	0.00	0.90	0.38	0.56	0.10	0.56
36007013800	Johnson City-V	0.88	0.87	0.62	0.66	0.79	0.37	0.47	0.21	0.44	0.00	0.65	0.29	0.31	0.45	0.54
36007012300	Colesville-T	0.62	0.82	0.50	0.49	0.53	0.37	0.25	0.63	0.82	0.89	0.56	0.00	0.03	0.35	0.51
36007011903	Lisle-T	0.74	0.43	0.00	0.87	0.60	0.46	0.35	0.69	0.85	0.97	0.72	0.00	0.00	0.16	0.51
36007011902	Barker-T	0.59	0.54	0.44	0.68	0.72	0.42	0.11	0.41	0.76	0.89	0.73	0.00	0.16	0.20	0.47
36007014302	Vestal-T (BU CDP)	0.06	0.05	0.99	0.95	0.80	0.56	0.73	0.50	0.02	0.00	0.85	0.59	0.40	0.10	0.47
36007012800	Dickinson-T / Port Dickinson-V	0.81	0.83	0.96	0.18	0.58	0.58	0.51	0.61	0.15	0.00	0.50	0.48	0.20	0.17	0.46
36007012103	Chenango-T	0.70	0.70	0.50	0.05	0.58	0.31	0.46	0.61	0.42	0.81	0.60	0.42	0.06	0.29	0.45
36007012501	Windsor-T	0.60	0.91	0.66	0.85	0.60	0.51	0.13	0.43	0.30	0.70	0.27	0.00	0.01	0.48	0.44

Census Tract	Municipality (CDP)	Civilian with a Disability	Age 65 and Older	Group Quarters	Un-employment	Lack of Internet Access	Housing Cost Burden	Renters	No High School Diploma	Age 17 and Younger	Mobile Homes	Poverty	English Language Proficiency	Minority Status	Lack of Health Insurance	Module Rank
36007011901	Triangle-T	0.55	0.60	0.00	0.96	0.64	0.35	0.48	0.43	0.35	0.88	0.72	0.00	0.04	0.30	0.41
36007014200	Johnson City-V	0.66	0.97	0.87	0.51	0.38	0.57	0.73	0.25	0.12	0.00	0.41	0.35	0.33	0.09	0.41
36007012000	Nanticoke-T	0.75	0.89	0.00	0.41	0.44	0.62	0.34	0.33	0.45	0.94	0.54	0.00	0.06	0.42	0.40
36007012102	Chenango-T (Chenango Bridge CDP)	0.57	0.80	0.50	0.90	0.39	0.55	0.08	0.16	0.63	0.63	0.22	0.40	0.08	0.22	0.39
36007001402	Binghamton-C	0.70	0.28	0.67	0.74	0.48	0.73	0.82	0.15	0.05	0.00	0.94	0.00	0.44	0.06	0.38
36007012400	Sanford-T	0.67	0.92	0.00	0.46	0.83	0.21	0.12	0.29	0.30	0.85	0.57	0.32	0.05	0.38	0.36
36007014600	Vestal-T	0.38	0.69	0.70	0.64	0.56	0.33	0.08	0.32	0.42	0.60	0.26	0.58	0.24	0.08	0.35
36007010200	Maine-T	0.79	0.78	0.50	0.44	0.17	0.43	0.12	0.41	0.51	0.80	0.55	0.23	0.01	0.08	0.34
36007012701	Conklin-T	0.66	0.82	0.00	0.76	0.30	0.44	0.35	0.66	0.16	0.72	0.43	0.00	0.22	0.25	0.33
36007014500	Vestal-T	0.87	0.93	0.62	0.40	0.41	0.31	0.23	0.30	0.19	0.69	0.35	0.25	0.08	0.13	0.32
36007013202	Union-T (Endwell CDP)	0.69	0.85	0.55	0.08	0.61	0.35	0.45	0.32	0.56	0.00	0.48	0.35	0.27	0.02	0.30
36007012502	Windsor-T	0.58	0.55	0.50	0.60	0.55	0.22	0.25	0.43	0.55	0.66	0.41	0.00	0.15	0.03	0.28
36007001500	Binghamton-C	0.69	0.84	0.73	0.44	0.50	0.18	0.33	0.44	0.14	0.00	0.20	0.38	0.29	0.15	0.26
36007014400	Vestal-T	0.58	0.83	0.62	0.50	0.17	0.43	0.21	0.08	0.57	0.00	0.56	0.32	0.26	0.02	0.23
36007013303	Union-T	0.30	0.75	0.37	0.10	0.18	0.07	0.15	0.43	0.58	0.61	0.39	0.75	0.18	0.29	0.23
36007012201	Fenton-T	0.55	0.74	0.77	0.00	0.78	0.03	0.17	0.33	0.58	0.70	0.15	0.00	0.10	0.07	0.21
36007012702	Binghamton-T	0.77	0.72	0.37	0.60	0.30	0.33	0.12	0.25	0.30	0.54	0.40	0.00	0.06	0.20	0.21
36007013301	Union-T	0.79	0.68	0.44	0.03	0.37	0.46	0.56	0.32	0.42	0.00	0.43	0.00	0.10	0.32	0.20
36007013304	Union-T	0.18	0.88	0.67	0.10	0.41	0.41	0.23	0.18	0.36	0.51	0.23	0.40	0.13	0.21	0.20
36007012101	Chenango-T	0.15	0.78	0.37	0.23	0.43	0.17	0.15	0.52	0.38	0.77	0.34	0.00	0.13	0.17	0.16
36007013000	Union-T (Endwell CDP)	0.32	0.75	0.55	0.28	0.26	0.12	0.17	0.10	0.69	0.00	0.28	0.57	0.29	0.19	0.16
36007001600	Binghamton-C	0.49	0.79	0.00	0.30	0.78	0.22	0.28	0.10	0.21	0.00	0.56	0.32	0.26	0.23	0.15
36007013201	Union-T (Endwell CDP)	0.40	0.73	0.37	0.18	0.43	0.44	0.19	0.30	0.53	0.00	0.46	0.35	0.14	0.02	0.15
County		0.68	0.63	0.59	0.58	0.58	0.56	0.53	0.50	0.40	0.37	0.63	0.37	0.29	0.27	0.53

Source: CDC, Agency for Toxic Substances and Disease Registry, 2024 Environmental Justice Index

Figure 67 Detailed Environmental Burden Module Rank by Census Tract

Census Tract	Municipality (CDP)	Houses Built Pre-1980	TSD Sites	Lack of Walkability	Lack of Recreational Destines	Railways	Toxic Release Inventory Sites	Impaired Surface Water	High Volume Roads	Diesel Particulate Matter	Risk Management Plan Sites	National Priority List Sites	Airports	Air Toxics Cancer Risk	Module Rank
36007013700	Endicott-V	0.91	0.71	0.73	0.55	0.81	0.73	0.58	0.61	0.29	0.92	0.99	0.97	0.04	0.96
36007014500	Vestal-T	0.76	0.68	0.91	0.68	0.50	0.42	0.39	0.39	0.09	0.79	0.96	0.94	0.04	0.82
36007000400	Binghamton-C	0.96	0.84	0.60	0.55	0.81	0.86	0.53	0.61	0.78	0.97	0.00	0.00	0.04	0.82
36007000600	Binghamton-C	1.00	0.84	0.54	0.55	0.81	0.86	0.54	0.61	0.78	0.98	0.00	0.00	0.04	0.82
36007013301	Union-T	0.74	0.64	0.76	0.65	0.68	0.73	0.19	0.18	0.13	0.87	0.97	0.95	0.04	0.82
36007013600	Endicott-V	0.89	0.84	0.46	0.55	0.81	0.86	0.58	0.45	0.30	0.69	0.95	0.00	0.04	0.80
36007000700	Binghamton-C	0.96	0.84	0.72	0.55	0.81	0.79	0.55	0.61	0.56	0.97	0.00	0.00	0.04	0.80
36007013100	Union-T (Endwell CDP)	0.92	0.84	0.40	0.55	0.81	0.86	0.76	0.61	0.37	0.00	0.95	0.00	0.04	0.75
36007000900	Binghamton-C	0.79	0.84	0.45	0.55	0.81	0.86	0.55	0.61	0.66	0.93	0.00	0.00	0.04	0.74
36007012201	Fenton-T	0.97	0.72	0.80	0.66	0.81	0.61	0.53	0.56	0.37	0.00	0.95	0.00	0.04	0.73
36007012600	Kirkwood-T	0.57	0.69	0.83	0.78	0.59	0.55	0.46	0.41	0.35	0.76	0.94	0.00	0.04	0.72
36007000500	Binghamton-C	0.67	0.84	0.28	0.55	0.81	0.86	0.53	0.61	0.74	0.96	0.00	0.00	0.04	0.71
36007001100	Binghamton-C	0.84	0.84	0.24	0.55	0.81	0.86	0.54	0.61	0.66	0.88	0.00	0.00	0.04	0.70
36007012800	Dickinson-T / Port Dickinson-V	0.95	0.78	0.58	0.55	0.68	0.73	0.48	0.51	0.71	0.77	0.00	0.00	0.04	0.69
36007001800	Binghamton-C	0.83	0.78	0.56	0.55	0.71	0.86	0.55	0.52	0.63	0.74	0.00	0.00	0.04	0.68
36007014100	Johnson City-V	0.91	0.84	0.52	0.55	0.75	0.86	0.27	0.61	0.44	0.00	0.93	0.00	0.04	0.68
36007000300	Binghamton-C	0.74	0.83	0.67	0.55	0.67	0.75	0.49	0.55	0.67	0.74	0.00	0.00	0.04	0.67
36007012701	Conklin-T	0.79	0.61	0.79	0.79	0.59	0.60	0.40	0.23	0.16	0.73	0.96	0.00	0.04	0.67
36007013000	Union-T (Endwell CDP)	0.90	0.73	0.55	0.60	0.68	0.67	0.74	0.43	0.33	0.00	0.97	0.00	0.04	0.66
36007014400	Vestal-T	0.96	0.81	0.74	0.55	0.48	0.66	0.62	0.47	0.18	0.00	0.94	0.00	0.04	0.62
36007001200	Binghamton-C	0.64	0.84	0.07	0.55	0.81	0.86	0.53	0.61	0.66	0.74	0.00	0.00	0.04	0.60
36007013201	Union-T (Endwell CDP)	0.98	0.84	0.61	0.55	0.81	0.86	0.76	0.47	0.33	0.00	0.00	0.00	0.04	0.58
36007000200	Binghamton-C	0.97	0.84	0.40	0.55	0.81	0.86	0.48	0.61	0.66	0.00	0.00	0.00	0.04	0.58
36007001300	Binghamton-C	0.83	0.84	0.46	0.55	0.81	0.86	0.52	0.61	0.62	0.00	0.00	0.00	0.04	0.56
36007013500	Endicott-V	0.91	0.84	0.36	0.55	0.81	0.86	0.76	0.57	0.42	0.00	0.00	0.00	0.04	0.55
36007013800	Johnson City-V	0.97	0.84	0.53	0.55	0.81	0.86	0.27	0.61	0.58	0.00	0.00	0.00	0.04	0.54
36007014301	Vestal-T	0.67	0.73	0.54	0.61	0.57	0.63	0.56	0.38	0.35	0.00	0.98	0.00	0.04	0.54
36007001401	Binghamton-C	0.74	0.84	0.49	0.55	0.81	0.86	0.53	0.61	0.58	0.00	0.00	0.00	0.04	0.54
36007000100	Binghamton-C	0.83	0.84	0.51	0.55	0.81	0.86	0.35	0.61	0.59	0.00	0.00	0.00	0.04	0.53

Census Tract	Municipality (CDP)	Houses Built Pre-1980	TSD Sites	Lack of Walkability	Lack of Recreational Destines	Railways	Toxic Release Inventory Sites	Impaired Surface Water	High Volume Roads	Diesel Particulate Matter	Risk Management Plan Sites	National Priority List Sites	Airports	Air Toxics Cancer Risk	Module Rank
36007001500	Binghamton-C	0.98	0.84	0.73	0.55	0.70	0.79	0.28	0.61	0.46	0.00	0.00	0.00	0.04	0.52
36007001402	Binghamton-C	0.95	0.84	0.49	0.55	0.75	0.77	0.41	0.61	0.58	0.00	0.00	0.00	0.04	0.52
36007013900	Johnson City-V	0.89	0.84	0.52	0.55	0.81	0.86	0.27	0.61	0.54	0.00	0.00	0.00	0.04	0.52
36007013400	Endicott-V	0.96	0.84	0.63	0.55	0.81	0.86	0.74	0.16	0.32	0.00	0.00	0.00	0.04	0.51
36007014000	Johnson City-V	0.81	0.84	0.51	0.55	0.81	0.86	0.27	0.61	0.52	0.00	0.00	0.00	0.04	0.49
36007012102	Chenango-T (Chenango Bridge CDP)	0.77	0.83	0.79	0.63	0.75	0.33	0.53	0.47	0.28	0.00	0.00	0.00	0.04	0.40
36007012103	Chenango-T	0.69	0.62	0.78	0.75	0.37	0.45	0.23	0.33	0.19	0.00	0.00	0.89	0.04	0.38
36007001700	Binghamton-C	0.73	0.67	0.77	0.55	0.43	0.68	0.55	0.47	0.41	0.00	0.00	0.00	0.04	0.37
36007001600	Binghamton-C	0.88	0.73	0.77	0.55	0.37	0.59	0.32	0.60	0.41	0.00	0.00	0.00	0.04	0.37
36007014200	Johnson City-V	0.65	0.83	0.60	0.55	0.60	0.69	0.38	0.40	0.42	0.00	0.00	0.00	0.04	0.34
36007012300	Colesville-T	0.51	0.59	0.98	0.83	0.52	0.00	0.30	0.28	0.10	0.00	0.94	0.00	0.04	0.33
36007013202	Union-T (Endwell CDP)	0.70	0.70	0.60	0.55	0.61	0.69	0.76	0.17	0.25	0.00	0.00	0.00	0.04	0.32
36007012202	Fenton-T	0.40	0.62	0.98	0.83	0.56	0.00	0.25	0.27	0.13	0.00	0.95	0.00	0.04	0.32
36007012702	Binghamton-T	0.67	0.48	0.95	0.74	0.36	0.40	0.38	0.13	0.13	0.66	0.00	0.00	0.04	0.29
36007012101	Chenango-T	0.64	0.65	0.84	0.75	0.62	0.00	0.48	0.48	0.26	0.00	0.00	0.00	0.04	0.26
36007012400	Sanford-T	0.66	0.56	0.96	0.77	0.49	0.35	0.21	0.24	0.06	0.00	0.00	0.00	0.04	0.19
36007014302	Vestal-T (BU CDP)	0.65	0.77	0.62	0.55	0.00	0.66	0.27	0.41	0.33	0.00	0.00	0.00	0.04	0.18
36007013304	Union-T	0.45	0.59	0.73	0.58	0.44	0.52	0.63	0.00	0.19	0.00	0.00	0.00	0.04	0.16
36007011902	Barker-T	0.47	0.58	0.94	0.96	0.57	0.00	0.18	0.31	0.11	0.00	0.00	0.00	0.04	0.15
36007012000	Nanticoke-T	0.50	0.48	0.95	0.81	0.33	0.00	0.00	0.11	0.07	0.00	0.00	0.82	0.04	0.15
36007013303	Union-T	0.93	0.50	0.89	0.79	0.33	0.32	0.18	0.00	0.12	0.00	0.00	0.00	0.04	0.15
36007010200	Maine-T	0.59	0.54	0.94	0.78	0.00	0.00	0.21	0.00	0.07	0.00	0.00	0.92	0.04	0.14
36007012502	Windsor-T	0.68	0.62	0.89	0.92	0.00	0.00	0.33	0.37	0.19	0.00	0.00	0.00	0.04	0.13
36007012900	Union-T	0.35	0.62	0.65	0.63	0.33	0.55	0.52	0.10	0.21	0.00	0.00	0.00	0.04	0.13
36007012501	Windsor-T	0.53	0.59	0.89	0.81	0.39	0.00	0.28	0.23	0.19	0.00	0.00	0.00	0.04	0.12
36007011903	Lisle-T	0.42	0.55	0.94	0.86	0.50	0.00	0.13	0.34	0.07	0.00	0.00	0.00	0.04	0.11
36007014600	Vestal-T	0.70	0.53	0.95	0.73	0.00	0.29	0.23	0.10	0.07	0.00	0.00	0.00	0.04	0.09
36007011901	Triangle-T	0.49	0.56	0.89	0.76	0.40	0.00	0.22	0.18	0.07	0.00	0.00	0.00	0.04	0.08
County		0.76	0.73	0.67	0.64	0.60	0.58	0.43	0.42	0.36	0.25	0.23	0.10	0.04	0.48

Note: Ozone, Particulate Matter, Coal Mines, and Lead Mines have a rank of zero and are omitted from the table.

Source: CDC, Agency for Toxic Substances and Disease Registry, 2024 Environmental Justice Index

Figure 68 Health Vulnerability Module Rank by Census Tract

Census Tract	Municipality (CDP)	Asthma	Cancer	Coronary Heart Disease	Poor Mental	Diabetes	Module Rank
36007013400	Endicott-V	0.84	0.73	0.91	0.77	0.69	1.00
36007001300	Binghamton-C	0.91	0.78	0.99	0.95	0.90	1.00
36007001100	Binghamton-C	0.94	0.25	0.77	0.97	0.69	0.80
36007012701	Conklin-T	0.84	0.76	0.83	0.72	0.54	0.80
36007013500	Endicott-V	0.98	0.22	0.81	0.99	0.83	0.80
36007000600	Binghamton-C	0.95	0.37	0.82	0.95	0.77	0.80
36007000900	Binghamton-C	0.89	0.49	0.82	0.86	0.68	0.80
36007000500	Binghamton-C	0.96	0.28	0.74	0.96	0.75	0.80
36007001200	Binghamton-C	0.93	0.23	0.80	0.99	0.59	0.60
36007012501	Windsor-T	0.68	0.79	0.73	0.53	0.42	0.60
36007013600	Endicott-V	0.84	0.49	0.69	0.84	0.50	0.60
36007000700	Binghamton-C	0.68	0.93	0.93	0.52	0.64	0.60
36007012600	Kirkwood-T	0.68	0.73	0.73	0.58	0.39	0.60
36007011902	Barker-T	0.70	0.75	0.77	0.62	0.51	0.60
36007000400	Binghamton-C	0.83	0.46	0.74	0.80	0.57	0.60
36007012202	Fenton-T	0.73	0.85	0.92	0.59	0.64	0.60
36007012300	Colesville-T	0.70	0.75	0.73	0.59	0.45	0.60
36007011901	Triangle-T	0.68	0.68	0.73	0.61	0.44	0.60
36007011903	Lisle-T	0.75	0.62	0.76	0.70	0.47	0.60
36007014200	Johnson City-V	0.36	0.98	0.95	0.17	0.58	0.40
36007012103	Chenango-T	0.65	0.73	0.74	0.57	0.42	0.40
36007000300	Binghamton-C	0.68	0.36	0.31	0.68	0.21	0.40
36007001402	Binghamton-C	0.75	0.40	0.64	0.87	0.39	0.40
36007014000	Johnson City-V	0.83	0.27	0.52	0.89	0.50	0.40
36007001700	Binghamton-C	0.75	0.49	0.57	0.72	0.36	0.40
36007013303	Union-T	0.36	0.88	0.67	0.19	0.26	0.40
36007001800	Binghamton-C	0.79	0.40	0.42	0.78	0.33	0.40
36007014600	Vestal-T	0.33	0.88	0.67	0.19	0.31	0.40
36007000200	Binghamton-C	0.75	0.40	0.62	0.78	0.56	0.40
36007013900	Johnson City-V	0.94	0.29	0.61	0.96	0.60	0.40
36007012900	Union-T	0.28	0.99	0.97	0.07	0.51	0.40
36007014100	Johnson City-V	0.60	0.81	0.67	0.43	0.37	0.40
36007013100	Union-T (Endwell CDP)	0.79	0.48	0.61	0.78	0.44	0.40
36007001401	Binghamton-C	0.87	0.03	0.13	0.99	0.08	0.40
36007013202	Union-T (Endwell CDP)	0.41	0.93	0.83	0.20	0.46	0.40
36007012400	Sanford-T	0.54	0.87	0.76	0.42	0.45	0.40

Census Tract	Municipality (CDP)	Asthma	Cancer	Coronary Heart Disease	Poor Mental	Diabetes	Module Rank
36007014301	Vestal-T	0.20	0.78	0.65	0.19	0.45	0.20
36007012101	Chenango-T	0.65	0.78	0.65	0.57	0.37	0.20
36007001500	Binghamton-C	0.36	0.70	0.35	0.20	0.13	0.20
36007012201	Fenton-T	0.44	0.87	0.55	0.25	0.22	0.20
36007012702	Binghamton-T	0.47	0.84	0.65	0.29	0.31	0.20
36007013201	Union-T (Endwell CDP)	0.57	0.78	0.61	0.39	0.27	0.20
36007014400	Vestal-T	0.44	0.78	0.55	0.34	0.27	0.20
36007001600	Binghamton-C	0.44	0.88	0.65	0.24	0.33	0.20
36007013800	Johnson City-V	0.68	0.63	0.59	0.63	0.35	0.20
36007010200	Maine-T	0.60	0.71	0.65	0.50	0.35	0.20
36007012102	Chenango-T (Chenango Bridge CDP)	0.38	0.81	0.55	0.23	0.23	0.20
36007013304	Union-T	0.54	0.82	0.57	0.37	0.27	0.20
36007012800	Dickinson-T / Port Dickinson-V	0.70	0.66	0.64	0.62	0.29	0.20
36007000100	Binghamton-C	0.65	0.27	0.35	0.72	0.29	0.20
36007014302	Vestal-T (BU CDP)	0.60	0.01	0.01	0.96	0.01	0.20
36007012000	Nanticoke-T	0.60	0.70	0.55	0.54	0.26	0.20
36007014500	Vestal-T	0.38	0.88	0.59	0.24	0.23	0.20
36007012502	Windsor-T	0.57	0.73	0.65	0.45	0.36	0.20
36007013000	Union-T (Endwell CDP)	0.23	0.84	0.40	0.07	0.14	0.20
36007013700	Endicott-V	0.62	0.68	0.65	0.56	0.36	0.20
36007013301	Union-T	0.54	0.66	0.44	0.39	0.20	0.00
County		0.65	0.63	0.65	0.58	0.42	0.42

Source: CDC, Agency for Toxic Substances and Disease Registry, 2024 Environmental Justice Index

Figure 69 Climate Burden Module Rank by Census Tract

Census Tract	Municipality (CDP)	Riverine Flooding	Extreme Heat Days	Wildfire Smoke	Hurricane	Strong Winds	Tornado	Module Rank
36007012600	Kirkwood-T	0.78	0.69	0.50	0.48	0.41	0.71	0.87
36007012400	Sanford-T	0.78	0.69	0.54	0.37	0.43	0.71	0.86
36007012300	Colesville-T	0.78	0.68	0.56	0.36	0.41	0.52	0.76
36007012501	Windsor-T	0.78	0.71	0.53	0.48	0.41	0.00	0.59
36007012502	Windsor-T	0.78	0.69	0.50	0.48	0.41	0.00	0.56
36007000700	Binghamton-C	0.78	0.69	0.45	0.48	0.41	0.00	0.54
36007012701	Conklin-T	0.78	0.68	0.47	0.48	0.41	0.00	0.54
36007012201	Fenton-T	0.78	0.68	0.49	0.46	0.41	0.00	0.54
36007001800	Binghamton-C	0.78	0.68	0.45	0.48	0.41	0.00	0.53

Census Tract	Municipality (CDP)	Riverine Flooding	Extreme Heat Days	Wildfire Smoke	Hurricane	Strong Winds	Tornado	Module Rank
36007000900	Binghamton-C	0.78	0.68	0.45	0.48	0.41	0.00	0.53
36007011902	Barker-T	0.78	0.69	0.54	0.33	0.41	0.00	0.51
36007012101	Chenango-T	0.78	0.69	0.53	0.33	0.41	0.00	0.50
36007012202	Fenton-T	0.78	0.69	0.53	0.33	0.41	0.00	0.50
36007000300	Binghamton-C	0.78	0.62	0.45	0.48	0.41	0.00	0.50
36007013900	Johnson City-V	0.78	0.62	0.45	0.48	0.41	0.00	0.50
36007012800	Dickinson-T / Port Dickinson-V	0.78	0.62	0.45	0.48	0.41	0.00	0.50
36007001100	Binghamton-C	0.78	0.62	0.45	0.48	0.41	0.00	0.50
36007001500	Binghamton-C	0.78	0.62	0.45	0.48	0.41	0.00	0.50
36007014100	Johnson City-V	0.78	0.62	0.45	0.48	0.41	0.00	0.50
36007001300	Binghamton-C	0.78	0.62	0.45	0.48	0.41	0.00	0.50
36007001402	Binghamton-C	0.78	0.62	0.45	0.48	0.41	0.00	0.50
36007013800	Johnson City-V	0.78	0.62	0.45	0.48	0.41	0.00	0.50
36007001200	Binghamton-C	0.78	0.62	0.45	0.48	0.41	0.00	0.50
36007014000	Johnson City-V	0.78	0.62	0.45	0.48	0.41	0.00	0.50
36007001401	Binghamton-C	0.78	0.62	0.45	0.48	0.41	0.00	0.50
36007000400	Binghamton-C	0.78	0.62	0.45	0.48	0.41	0.00	0.50
36007000500	Binghamton-C	0.78	0.62	0.45	0.48	0.41	0.00	0.50
36007012702	Binghamton-T	0.78	0.60	0.47	0.48	0.41	0.00	0.50
36007010200	Maine-T	0.78	0.59	0.55	0.41	0.41	0.00	0.50
36007014200	Johnson City-V	0.78	0.62	0.43	0.48	0.41	0.00	0.49
36007012900	Union-T	0.78	0.62	0.43	0.48	0.41	0.00	0.49
36007013000	Union-T (Endwell CDP)	0.78	0.62	0.43	0.48	0.41	0.00	0.49
36007012102	Chenango-T (Chenango Bridge CDP)	0.78	0.68	0.50	0.36	0.41	0.00	0.49
36007014301	Vestal-T	0.78	0.60	0.45	0.48	0.41	0.00	0.49
36007001600	Binghamton-C	0.78	0.60	0.45	0.48	0.41	0.00	0.49
36007012103	Chenango-T	0.78	0.62	0.53	0.37	0.41	0.00	0.48
36007001700	Binghamton-C	0.78	0.59	0.45	0.48	0.41	0.00	0.48
36007011903	Lisle-T	0.78	0.61	0.54	0.36	0.41	0.00	0.48
36007013303	Union-T	0.78	0.57	0.45	0.48	0.41	0.00	0.47
36007013201	Union-T (Endwell CDP)	0.78	0.57	0.43	0.48	0.41	0.00	0.46
36007014600	Vestal-T	0.78	0.57	0.43	0.48	0.41	0.00	0.46
36007014400	Vestal-T	0.78	0.57	0.43	0.48	0.41	0.00	0.46
36007013304	Union-T	0.78	0.57	0.43	0.48	0.41	0.00	0.46
36007013202	Union-T (Endwell CDP)	0.78	0.57	0.43	0.48	0.41	0.00	0.46
36007013100	Union-T (Endwell CDP)	0.78	0.55	0.43	0.48	0.41	0.00	0.45
36007012000	Nanticoke-T	0.78	0.59	0.55	0.33	0.41	0.00	0.45

Census Tract	Municipality (CDP)	Riverine Flooding	Extreme Heat Days	Wildfire Smoke	Hurricane	Strong Winds	Tornado	Module Rank
36007011901	Triangle-T	0.78	0.62	0.51	0.33	0.41	0.00	0.45
36007013700	Endicott-V	0.78	0.53	0.45	0.48	0.41	0.00	0.44
36007013301	Union-T	0.78	0.53	0.45	0.48	0.41	0.00	0.44
36007014500	Vestal-T	0.78	0.53	0.43	0.48	0.41	0.00	0.43
36007000100	Binghamton-C	0.00	0.62	0.45	0.48	0.41	0.00	0.06
36007000200	Binghamton-C	0.00	0.62	0.45	0.48	0.41	0.00	0.06
36007000600	Binghamton-C	0.00	0.62	0.45	0.48	0.41	0.00	0.06
36007014302	Vestal-T (BU CDP)	0.00	0.60	0.45	0.48	0.41	0.00	0.06
36007013400	Endicott-V	0.00	0.54	0.43	0.48	0.41	0.00	0.04
36007013600	Endicott-V	0.00	0.53	0.43	0.48	0.41	0.00	0.04
36007013500	Endicott-V	0.00	0.53	0.43	0.48	0.41	0.00	0.04
County		0.69	0.62	0.47	0.46	0.41	0.03	0.46

Note: Wildfire Proximity, Coastal Flooding, and Drought have a rank of zero and are omitted from the table.

Source: CDC, Agency for Toxic Substances and Disease Registry, 2024 Environmental Justice Index

The table below defines each indicator shown in Figures 6 through 8. Health-prevalence indicators are modeled estimates from the CDC PLACES program; proximity indicators measure the share of a census tract within a one-mile buffer of the listed feature.

Indicator	Definition
Age 17 and Younger	Percentage of persons aged 17 and younger
Age 65 and Older	Percentage of persons aged 65 and older
Airports	Proportion of the census tract within a one-mile buffer of an airport
Air Toxics Cancer Risk	Estimated lifetime cancer risk from inhalation of air toxics
Asthma	Estimated percentage of individuals with asthma
Cancer	Estimated percentage of individuals with cancer
Civilian with a Disability	Percentage of civilian noninstitutionalized persons with a disability
Coal Mines	Proportion of the census tract within a one-mile buffer of a coal mine
Coastal Flooding	Average annualized frequency of coastal flooding events
Coronary Heart Disease	Estimated percentage of individuals with coronary heart disease
Diabetes	Estimated percentage of individuals with diabetes
Diesel Particulate Matter	Ambient concentration of diesel particulate matter
Drought	Average annualized frequency of drought events
English Language Proficiency	Percentage of persons (age 5+) who speak English less than well
Extreme Heat Days	Annual number of extreme heat days
Group Quarters	Percentage of persons living in group quarters
High Volume Roads	Proportion of the census tract within a one-mile buffer of a high-volume road or highway
Housing Cost Burden	Percentage of households earning less than \$75,000 that pay more than 30 percent of income for housing
Houses Built Pre-1980	Percentage of houses built before 1980, a proxy for potential lead exposure
Hurricane	Average annualized frequency of hurricane events
Impaired Surface Water	Percentage of the census tract intersecting an impaired or impacted watershed (HUC-12 level)
Lack of Health Insurance	Percentage of persons without health insurance
Lack of Internet Access	Percentage of persons without internet access
Lack of Recreational Parks	Limited park access: proportion of the tract within one mile of a park or greenspace, ranked inversely
Lack of Walkability	National Walkability Index rank, with lower walkability ranked as higher burden
Lead Mines	Proportion of the census tract within a one-mile buffer of a lead mine
Minority Status	Percentage of persons identifying as a racial or ethnic minority
Mobile Homes	Percentage of housing units designated as mobile homes
National Priority List Sites	Proportion of the census tract within a one-mile buffer of an EPA National Priorities List (Superfund) site
No High School Diploma	Percentage of persons age 25+ without a high school diploma
Ozone	Ambient concentration of ozone

Indicator	Definition
Particulate Matter 2.5 (PM2.5)	Ambient concentration of fine particulate matter (PM2.5)
Poor Mental Health	Estimated percentage of individuals reporting poor mental health
Poverty	Percentage of persons with income below 200 percent of the federal poverty level
Railways	Proportion of the census tract within a one-mile buffer of a railway
Renters	Percentage of housing units that are renter-occupied
Risk Management Plan Sites	Proportion of the census tract within a one-mile buffer of an EPA Risk Management Plan facility
Riverine Flooding	Average annualized frequency of riverine flooding events
Strong Winds	Average annualized frequency of strong wind events
Tornado	Average annualized frequency of tornado events
Toxic Release Inventory Sites	Proportion of the census tract within a one-mile buffer of an EPA Toxics Release Inventory site
Treatment, Storage, and Disposal Sites	Proportion of the census tract within a one-mile buffer of an EPA treatment, storage, and disposal facility
Unemployment	Percentage of persons who are unemployed
Wildfire Proximity	Modeled proximity to recently burned wildfire areas
Wildfire Smoke	Modeled exposure to wildfire smoke

Source: CDC/ATSDR, 2024 Environmental Justice Index Technical Documentation and Data Dictionary.