City of Charlottesville Climate Change Vulnerability Assessment: Staff and Community Feedback Summary

As of November 2021, feedback was received through the community and local government forums, as well as an online follow-up form distributed following these forums to get additional feedback from people who were not able to attend.

Government staff and community members were asked to select 5 community systems they expect to be the most impacted by each hazard. The following table presents a ranking of the community systems based on the number of times they were selected for each hazard. The 5 highest ranked systems are bolded, and will be the basis of an online survey to be distributed in March 2022, aimed at assessing the magnitude of potential impacts that each hazard will have on these systems.

Extreme Heat	Extreme Precipitation/Flooding	Changing Seasonal Conditions/ Drought
1. Public Health & Wellness (39)	**1. Agriculture (26)**	**1. Agriculture (31)**
2. Energy Supply & Delivery (29)	**2. Food Supply & Access (23)**	**2. Food Supply & Access (29)**
3. Agriculture (28)	**3. Public Safety (23)**	**3. Forestry & Ecological Function (28)**
4. Food Supply & Access (25)	**4. Transportation (23)**	**4. Public Health & Wellness (21)**
5. Forestry & Ecological Function (24)	**5. Housing (21)**	**5. Energy Supply & Access (13)**
6. Public Safety (16)	6. Energy Supply & Access (19)	6. Community & Culture (10)
7. Housing (13)	7. Public Health & Wellness (18)	7. Housing (8)
8. Community & Culture (10)	8. Forestry & Ecological Function (14)	8. Economic Development & Security (7)
9. Transportation (4)	9. Economic Development & Security (7)	9. Public Safety (5)
10. Economic Development & Security (4)	10. Internet & Communications (6)	10. Transportation (3)
11. Public Buildings & Services (4)	11. Community & Culture (5)	11. Public Buildings & Services (2)
12. Internet & Communications (1)	12. Public Buildings & Services (5)	12. Internet & Communications (1)

It is also valuable to note the cumulative vulnerability of community systems from all of the climate hazards. In reality, the immediate and long-term impacts of these hazards will be happening at the same time and interacting with each other. Understanding the overall vulnerability of these community systems to climate change will demonstrate where Charlottesville needs to increase resilience the most to prevent catastrophic impacts. In summary, this is the ranking of community systems in terms of overall vulnerability (the number in parentheses is the total times the system was selected across the three hazards).

1. Agriculture (85)
2. Public Health & Wellness (78)
3. Food Supply & Access (77)
4. Forestry & Ecological Function (66)
5. Energy Supply & Delivery (61)
6. Public Safety (44)
7. Housing (42)
8. Transportation (30)
9. Community & Culture (25)
10. Economic Development & Security (18)
11. Public Buildings & Services (non-emergency) (11)
12. Internet & Community (8)

Synthesized Qualitative Feedback from Virtual Forum and Google Form

Note that some points are repeated because they were mentioned in discussions about more than one system and/or hazard.

Climate Hazard: Extreme Heat

System	Comments on Potential Sensitivities/Impacts
Agriculture	Regional agricultural workers will be unsafe during extreme heat events Regional agricultural productivity will be impacted by heat stress on crops (immediate and long-term, especially from reduced soil moisture), livestock, and workers. Need more awareness of crop varieties that are more heat- and drought-resistant. Regional crops such as apples, peaches, and grapes tend to be particularly susceptible to extremes. Potentially severe regional economic impacts due to aforementioned productivity Tourists and locals will avoid outdoor activities on extreme heat days, including visiting regional orchards/vineyards/farms Efforts to increase urban agriculture and food sovereignty will be stifled by heat stress; inexperienced gardeners might not know how to mitigate extreme heat impacts to their gardens Potential water supply issues arise when irrigation needs compete with residential and other commercial water demand during heat waves
Community & Culture	Outdoor events - such as farmer's markets, concerns, Fridays after Five, sports events- would be suspended, canceled, or otherwise not as well-attended. Social isolation from gather in or spend time in neighborhood parks and other public outdoor spaces
Economic Development and Security	Loss of revenue and employment in agricultural sector (from lower crop productivity and crop damage, reduced tourism, etc) Safety concerns for outdoor workers (see Public Health)
Energy Supply & Delivery	Power outages due to increased energy demand for cooling Potential disruption to above-ground electricity infrastructure; as we electrify (decarbonize), we have to consider resilience/reliability of electricity supply Increased energy burden for low income people; inequitable access to reliable, affordable air conditioning Solar panels might be beneficial for reducing pressure on the grid, but they might also result in property owners cutting down trees that provide passive cooling through shade (in addition to being a part of the natural ecosystem), Solar panels are also disproportionately installed by higher income households who do not already experience high energy burden (energy bills do

	not require a substantial percentage of their income) Cville has municipal gas utility, which can present an obstacle for moving away from this form of fuel - natural gas is an affordable, often more resilient part of the energy supply but is not sustainable Something like a "McMansion tax" that generates revenue from homes requiring massive, inefficient amounts of cooling and pays subsidies for low-income household energy bills Continued cooling is critical for certain medications, oxygen generation, and other medical-related processes; need to make sure all medical facilities have reliable generators in case of power outages Power outages could impact perishable food supply in grocery stores and restaurants Solar panels might be beneficial for reducing pressure on the grid, but they might also result in property owners cutting down trees that provide passive cooling through shade (in addition to being a part of the natural ecosystem)
Food Supply & Access	Efforts to increase urban agriculture and food sovereignty will be stifled by heat stress; inexperienced gardeners might not know how to mitigate extreme heat impacts to their gardens Disruptions to food supply chain from extreme heat being experienced regionally and in other parts of the country/world from which we import food Power outages could impact perishable food supply in grocery stores and restaurants
Forestry & Ecological Function	Wildfire threat may be greater during heat waves Trees and other plant life may be very sensitive to extreme heat (more so to shifting seasonal conditions; see notes under Seasonal Changes) Other habitat and ecological impacts of extreme heat need to be further researched; such as impacts on aquatic life
Housing	A lot of older and/or lower income housing has poor insulation and unreliable/nonexistent air conditioning; including a lot of public housing (see more under Public Health & Wellness) Something like a "McMansion tax" that generates revenue from homes requiring massive, inefficient amounts of cooling and pays subsidies for low-income household energy bills Necessary energy upgrades in rental properties might result in increased rent, further exacerbating the affordable housing shortage. Energy upgrades are often more beneficial for homeowners and landlords, not renters. Phasing out natural gas is important but we need to ensure that existing residential buildings, especially older ones, have proper insulation and electric HVAC systems to ensure safe indoor temperatures. Older buildings often house lower income, disadvantaged populations..
Internet &	None

Communications	
Public Buildings & Services	Many school buildings currently have inadequate insulation and air conditioning Increased pressure on water supply during heat waves Disruptions to services that require working outside, such as public works
Public Health & Wellness	Health risks for people living in older and/or lower income housing with poor insulation and unreliable/nonexistent air conditioning Even people with A/C might not be able to afford the increased energy bill Power outages would affect everyone regardless of income and access to A/C system Health risks for people experiencing homelelessness Exacerbated health risk in areas with little to no tree canopy causing an urban heat island effect; disproportionately affecting people of color; tied to racist covenants and lack of investment in non-white neighborhoods In addition to heat-related illness, people will experience sleep deprivation during hot nights if they do not have A/C and that will have other delayed physical/mental health impacts Sleep deprivation will make it harder for children to focus in school, disproportionately low-income children Certain groups will be more at-risk for heat-related illness than others, such as the elderly and children People who rely on public transportation to get to work and children who take school buses will have to walk to bus stops and wait outside in the heat, often with no shade Outdoor workers are highly susceptible to heat-related illness, especially if there are not adequate work policies in place to protect them (requiring water breaks, moving to after-sun hours, canceling work altogether, etc); similar concern for people who work in restaurants or industrial facilities with poor ventilation and/or AC Dept of Public Health inspections can make sure businesses address occupational health issues, but if they are backlogged they might not identify critical issues soon enough Discourages outdoor recreation which will reduce physical activity and overall well-being Not all school buildings have adequate A/C which will be particularly problematic during summer school We need more cooling centers powered by generators or microgrids; we need to encourage “AC pooling” (people gathering in cooling centers); do we have existing public buildings that could be cooling centers? Continued cooling is critical for certain medications, oxygen generation, and other medical-related processes; need to make sure all medical facilities have reliable generators in case of

	power outages Air quality is worse during heat events, presenting risks for anyone who needs to be outside but particularly those with asthma or other respiratory issues Need for more education around safety during heat events, especially for those who do outdoor work or recreation People who are regularly without access to healthy food and outdoor recreation may have health issues that put them at greater risk for heat-related illness Heat impacts mental health Understaffed hospitals (following pandemic, and in general) might not be able to manage the medical response needs Concerns about land use planning practices (higher density) reducing tree canopy and subsequently increasing urban heat island effect
Public Safety	Heat may increase violence because of how it affects mental health Understaffed hospitals (following pandemic, and in general) might not be able to manage the medical response needs See all comments under Public Health
Transportation	People who rely on active transportation (walking and biking) will be particularly affected during these events; interferes with sustainability goals too People who rely on public transportation to get to work will have to walk to bus stops and wait outside in the heat, often with no shade; transit ridership will decrease during these times Need for more tree canopy to encourage alternative transportation even on hot days Parking lots increase urban heat island effect especially if they are displacing green cover

Climate Hazard: Extreme Precipitation/ Flooding

System	Comments on Potential Sensitivities/Impacts
Agriculture	Floods can destroy crops, or result in wet fields that are harder/impossible to work in, affecting ability to harvest and deliver produce Urban agriculture sites are often on marginal land (including on floodplains and vacant lots in densely developed areas) which experience a lot of surface runoff. These properties have inadequate flood protection and are susceptible to flood erosion, flood damage, and pollution (food safety concerns). We need to prioritize the protection or better siting of community-based agriculture to promote food security. New site at CATEC has locational access/proximity issues, 6th street garden and Avon Farm Shop being lost soon, and IRC sites are mostly not in the city. Economic impacts will be more regional than local because of where the orchards/vineyards and other farms are located
Community & Culture	None
Economic Development and Security	Impacts to the greater economic ecosystem; regional impacts
Energy Supply & Delivery	Potential disruption to above-ground electricity infrastructure (from flooding, wind, and downed trees); as we electrify (decarbonize), we have to consider resilience/reliability of electricity supply Need for more microgrids/on-site generation (e.g. solar) to reduce dependency on one large, centralized grid Power outages could impact perishable food supply in grocery stores and restaurants A power outage would disrupt critical medical equipment/operations that require electricity
Food Supply & Access	Power outages could impact perishable food supply in grocery stores and restaurants Impacts to regional food supply chain Crop damage from floods could increase costs and/or disrupt the delivery of fresh, local produce such as through CSA Boxes, Farm to Table, Green Markets, Farmers Markets, etc.
Forestry & Ecological Function	Land cover changes that result in a drop in vegetation lead to more surface runoff and more peak runoff, leading to spring degradation, pollution, nitrogen, phosphorus runoff Increased sedimentation in rivers

	Water quality issues from contaminated runoff Streambed erosion Downed trees (especially those that are old or otherwise unhealthy) Algae blooms Increased stress on native plants
Housing	10-20% of housing stock is located in 100 year flood plain (which will continue to expand with climate change); disproportionately low-income Flooding can result in immediate damage/injury as well as delayed issues such as mold growth Crescent hall needs to relocate away from flood-prone area Public/mass housing often has poor drainage systems We already have limited affordable housing so a flood event that damages existing public/affordable housing would be devastating; limited buildable land available to develop more housing Zoning/development ordinance is based on inaccurate flood maps (outdated and static, not informed by climate projections), which results in the development of housing in current/future flood prone areas Basements prone to flooding; very costly to waterproof or repair Home infiltration issues from standing water and moisture Sump pumps will be overwhelmed
Internet & Communications	Above-ground infrastructure at-risk. If internet, cellular, and electricity infrastructure go down, people will not be able to receive emergency updates
Public Buildings & Services	Increased pressure on stormwater system that is, in certain areas/parts, under-maintained Particularly concerning for areas with insufficient or maintenance-impaired stormwater infrastructure
Public Health & Wellness	Sitting water after a storm would increase mosquitos and other pests that carry diseases, when storms/floods occur during warmer months Long-term physical and mental health impacts from flooding (viruses, mold, food scarcity, etc) Home infiltration issues from standing water and moisture Sanitation issues from sewer overflow

	Water quality issues from sedimentation, polluted/contaminated runoff, etc. Drainage issues and stagnant water means increased vector and waterborne diseases A power outage would disrupt critical medical equipment/operations that require electricity
Public Safety	If internet, cellular, and electricity infrastructure go down, people will not be able to receive emergency updates Heavy rain and flooding will increase traffic accidents and congestion Greater need for emergency response capacity and preparedness to help with: ○ Medical response for traffic accidents and other injuries caused by the storm/floods (i.e. swift water and downed trees) ○ Evacuating people (and their pets) who are surrounded by flooded roadways or have no access to vehicle ○ Managing circulation via detours and emergency access roads 2018 events showed the need for greater emergency response capacity Roadways in the valleys and other low lying areas are of particular concern Injuries from downed trees New and proposed development increases impervious surface (unless mitigated with green infrastructure) and might be at risk for flooding and/or increase risk for neighboring/downstream buildings (from increased runoff) Alert systems are now so overblown that some people do not know how serious the situation is and might not respond appropriately People are responsive to Code Red alerts but we need to make sure these are pushed out at the right times Managing pets during emergencies More awareness of individual/household flood safety and preparedness measures needed; people will walk through water or do other dangerous activities because they do not realize the risk involved Understaffed hospitals (following pandemic, and in general) might not be able to manage the medical response needs
Transportation	Heavy rain and flooding creates hazardous driving conditions and will increase traffic accidents as well as circulation issues Those who rely on public transportation will be particularly affected if their route is disrupted Downed trees will block roadways and create more safety/circulation issues

	Disruptions to shipping and supply chain Damage to transportation infrastructure from flooding, downed trees/utility lines, traffic accidents, and erosion (delayed impact from prolonged/recurring heavy rain and flooding); increased need for maintenance and repair Discourages active transportation City stream channel is narrow and has the potential for backwater flooding; takes longer to drain on the eastern side and impacts travel access in/out of the City People will not be able to charge their EVs during a power outage Disruptions to school bus routes

Climate Hazard: Seasonal Changes

System	Comments on Potential Sensitivities/Impacts
Agriculture	The growing season is becoming more unpredictable, which makes it hard for farmers (regional and urban) to adapt Different recharge characteristics in water reservoirs Hotter, dryer, longer summers and warmer winters will result in lower water supply. Can we meet regional irrigation needs on top of projected population growth? Animal grazing dramatically affects water quality, so if farmer's can't access water, the cattle will be in streams and reservoirs (impacts on public health) Proliferation of invasive plants and pests Damage to fruit production on the region's vineyards and orchards; apples and grapes need a certain number of chill days/nights to thrive Reduction in soil moisture will strain plants and in extreme cases can cause crop failure Prolonged drought and unpredictable growing seasons would threaten harvest fields and threaten food security for people who rely on their backyard or community garden (which are often on marginal lands without water hook-ups). We need more education for urban agriculture as well as more suitable, equitable siting of community gardens. Lower crop productivity will affect availability of local produce through farmer's markets and CSA programs Wineries and orchards are a huge tourist attraction and employer in the region, which increases the potential economic loss from crop damage and lower crop productivity
Community & Culture	The fall and spring landscape is culturally significant. We haven't had a robust fall color season in years. In the springtime, certain plants will not leaf out like they used to. Although fake ski resorts use artificial snow, warmer winter temperatures will still affect this regional activity Other seasonal outdoor/recreational activities will be affected Harder to plan outdoor events if the weather is more unpredictable If school starts when it is still really hot outside, this will affect the football season
Economic Development and Security	Loss of revenue and employment in agricultural sector (from lower crop productivity and crop damage, reduced tourism, etc) Loss of revenue and employment in recreational businesses tied to specific seasonal conditions River-based businesses would be disrupted by prolonged drought conditions

Energy Supply & Delivery	Increased demand on the grid from longer periods of time requiring A/C Overall weather unpredictability will make it harder for households to budget for utility bills Weather unpredictability will test the resilience of the grid; power outages will not just happen in the winter during storms, they will also happen in the summertime. Lots of opportunities for the grid to be more efficient such as incentives to use energy during off-peak hours Need for more microgrids/on-site generation (e.g. solar) to reduce dependency on one large, centralized grid
Food Supply & Access	Prolonged drought and unpredictable growing seasons would threaten harvest fields and threaten food security for people who rely on their backyard or community garden (which are often on marginal lands without water hook-ups). We need more education for urban agriculture as well as more suitable, equitable siting of community gardens. 1 in 6 residents already experience food insecurity. If the growing season shrinks and/or becomes more unpredictable, this will affect regional food supply. Local produce may become more expensive and less accessible to low-income people and food-based businesses. Impacts to costs/availability of CSA Boxes, Farm to Table, Green Markets, Farmers Markets, etc.
Forestry & Ecological Function	Older, unhealthy trees and certain tree species are particularly threatened by these seasonal changes. The tree canopy is already being threatened by current and proposed development (higher density with little to no preservation of green cover on the existing land). Very little green space left. Reservoir releases will be lower during prolonged drought, impacting streams with low base flow functions (??) Need to understand the effects of warming temperatures on our stream and river ecosystems- will it discourage desirable aquatic life and/or encourage undesirable aquatic life? Proliferation of invasive plants and pests that will disrupt natural habitats and ecosystems Changes to bloom cycles will also affect pollinators Forestry and wildlife corridors may be affected
Housing	Necessary energy upgrades in rental properties might result in increased rent, further exacerbating the affordable housing shortage. Energy upgrades are often more beneficial for homeowners and landlords, not renters. Phasing out natural gas is important but we need to ensure that existing residential buildings, especially older ones, have proper insulation and electric HVAC systems to ensure safe indoor temperatures. Older buildings often house lower income, disadvantaged populations.
Internet & Communications	None

Public Buildings & Services	None
Public Health & Wellness	If there is inadequate potable water supply for livestock, cattle will be in streams and reservoirs causing downstream water quality issues Lower base river flow in the region may result in downstream water pollution into Charlottesville and from Charlottesville into adjacent communities, from wastewater and agricultural discharge Water supply is at risk with reduced soil moisture leading to potential drought conditions If reservoirs become dangerously low, they will be at risk for algae blooms Longer periods of time with conditions conducive to the spreading of vector-borne diseases (mosquitos and ticks)
Public Safety	None
Transportation	None

Other comments

- Climate migration: Even with our own set of climate risks, Charlottesville might be a safe haven as compared to the coastal cities and other places with greater climate risks. Can we maintain a decent cost-of-living and housing supply with an influx of climate migrants?
- Seasonal shifts and climate catastrophes in other regions that produce a lot of our food (California, Global South, etc) will affect our food supply chain. Increased food prices will disproportionately affect low-income households and small, minority-owned food-based businesses.
- Vulnerability to cyber attack

Appendix

Raw Qualitative Feedback from Virtual Forum and Google Form
Aggregated Poll Results from Virtual Forum and Google Form
Poll Results from Virtual Forum
Poll Results from Google Form

Raw Qualitative Feedback from Virtual Forum and Google Form

Extreme Heat

System	Comments on Potential Sensitivities/Impacts
Agriculture	Ag and Food Systems can have separate meaning - with local vs. large-scale ag considerations; highlights lack of access, practices for food sovereignty; Difficult for apartment dwellers to grow their own food - access for growing food is important, and is threatened and changed by climate Impacts on farmers and forest ability to grow Movement of food growers in community gardens and backyards - extreme heat makes this challenging; especially important for folks without cars or access to large supermarkets - do not have money to access produce outside their own yards; Racial and ethnic minorities supportive of gardening - prominent 501c3 promotes gardening in schools and public housing to encourage healthy outcomes Outdoor, manual labor outside - new rules in the era of extreme heat are needed City can Increase tree canopy and generally reduce heat islands. City is currently mapping where the heat islands exist - data coming in soon Influencing food supply sector - considerations for access and timing; conditions of land, access to land for growing; amateur food producers may not know how to adjust to extreme heat - lose access to fresh produce because they lacked knowledge upfront and resources to mitigate Front of supply chain, migrant farmer workers and seasonal farmers, such as vineyard workers, must be kept in mind; Considerations around full cycle of supply chain County limits would experience more impact than city limits Difficulty for people to grow in their home gardens; people become more reliant on drinking water for landscaping - adds artificial stress to drinking water supply County encourages growing food and this goal is compromised More nonfrost / non-freeze days will lead to more pest stress, and in turn, reliance on pesticides which can impact other systems Vineyards - impacts economy directly Further into valley, food from area farms will be prevented from either growing or shipping Heat will affect the ability of farmers to grow crops to maintain their livelihood. This will cause prices to rise, affecting lower income families' ability to purchase healthy foods. Extreme heat (acute and long-term) stands to pose a threat to the Charlottesville-area's agriculture and local food sectors. Extreme heat events and heat waves threaten the stability of agricultural systems, putting strain on local fruit and vegetable production as well as livestock systems. Extended heat waves cause loss of soil moisture, stress to crops, and strain on agricultural workers, who are already under immense physical and economic pressure.
Community & Culture	Less ability to meet outdoors; Farmers markets, Fridays after Five, outdoor concerts, sports events (high school), and other events would need to be suspended or shift to a different time of year

	Parks - people visiting less unless there are water features; several parks include water features now - open between Memorial and Labor day and so would be impacted by seasonal shifts Churches and other gathering spots tied to neighborhoods - buildings that cannot demand on cooling; If gathering is lower, then increases isolation.
Economic Development and Security	Drivers for our delivery companies-Already their health is greatly at risk in the heat and severe storms. All the commuters who rely on the buses and stand waiting without shelter. All the workers who have no place to sit during lunch hour and have to sit in their cars in heat.
Energy Supply & Delivery	Possibility for power outages are higher during hotter months Not all have AC or can afford to run it long hours; if you are not cool at night, your sleep with suffer Solar has become more affordable throughout Southeast, especially on offices; sentiment to want City to support solar more Public health and energy are interrelated; greater heat days, more demand for cooling, creates stress for brownouts Considerations around water supply and wastewater treatment (Rivanna Water and Sewer Authority) Grid-supplied energy stress Pressure on the grid due to increased cooling demand Cville area historically does not experience as many brownouts Not all households have AC With the rising of heat energy companies will benefit by consumer demand forcing lower income earners to use more of their paychecks or do without. Higher income earners who can afford to go solar will opt to cut down larger older trees (happening in my neighborhood now) in the pretense of energy saving and environmentally friendliness, yet do not plant trees to replace the ones removed which creates more heat. Trees that are planted will take years to grow to a size that would benefit the environment and affect heat reduction thus much of the canopy/habitat is lost. The solar panels may provide affordable energy yet when trees are cut down and replaced with something that does not provide habitat or may even kill creatures that are part of the ecosystem then how do we know if they truly are more of a benefit in the long run than if people simply reduced their consumption or included more green space in urban planning. What fraction of our community's low-income population has access to reliable, affordable air conditioning?
Food Supply & Access	Community is currently focused on equity and justice in all systems; Considerations around food costing more and traveling farther; Issues of food access and affordability; limitations and costs to be placed on food Supply chain disruptions; Food sourced from Global South and California, which are anticipated to experience greater climate impacts (both extreme heat days affecting worker safety and productivity, as

	well as seasonal changes). Cultivate Cville - resonating themes for climate impact is around food supply; Impact considerations for organizations that give food away - Also for restaurant owners and food-based businesses. Extreme heat reduces supply, which increases the price of food. Other parts of world, including South America suffers from extreme heat and have produced food for years - but critical to have enough water; Drought will be ruinous to agriculture, perhaps more than heat alone Brazilian crops are accustomed to and evolved with heat; So perhaps types of crop varieties in Cville area would be needed to adapt Similar to seasonal change - as long as water supply is strong, then adaptability is stronger; early season is not as cool; Apples, peaches, grapes are susceptible to extreme what even with enough water
Forestry & Ecological Function	Concerns around urban forest and impacts of new land use practices on ecological function of forests, biodiversity, urban wildlife; Cville is a city of trees, with many now aging trees and evidence of active reforestation is not as strong as potentially can be; More robust urban forestry plan seen as important. 10th and Paige hottest in city - dense without trees Before conversation of "density" opens, Cville is already losing tree canopy - will density reduce tree cover further? Cville is a segment of Albemarle County - creates commuter pathways from Albemarle that can threaten tree Urban tree canopy has declined 16% of over past several years and this fact is being ignored - especially with recent development planned without room for necessary tree cover Waterways - land cover changes and drop in vegetation lead to more surface runoff and more peak runoff, leading to spring degradation, pollution, nitrogen, phosphorus runoff Reservoir releases can be low, impacting streams with low base flow functions (generally not a heavy reliance on fishing) Businesses run recreational activities on the river - could not operate for 6-8 weeks due to drought Parks - enjoyment tied to shade; where too much heat can kill trees, cause limbs to break Shift in where various tree species will grow - impacts forest makeup, shade capability, heat respite. Wildfire threat can increase due to accidental incidental fires Drought's effect on tree canopy - may not be able to plant new trees Dust, particularly in high construction areas Well water - important in County; general water-stress in the region will impact those who live in City indirectly

	Groundcover and tree cover die off will mean more sedimentation in the rivers when rain events occur Tree canopy and heat islands Habitat and ecological impacts Higher income earners who can afford to go solar will opt to cut down larger older trees (happening in my neighborhood now) in the pretense of energy saving and environmentally friendliness, yet do not plant trees to replace the ones removed which creates more heat. Trees that are planted will take years to grow to a size that would benefit the environment and affect heat reduction thus much of the canopy/habitat is lost. The solar panels may provide affordable energy yet when trees are cut down and replaced with something that does not provide habitat or may even kill creatures that are part of the ecosystem then how do we know if they truly are more of a benefit in the long run than if people simply reduced their consumption or included more green space in urban planning. How will warming temperatures affect stream and river temperatures, impacting desirable and undesirable aquatic life survival?
Housing	LEAP program works on making housing more efficient, direct-install - is a valuable program AC becomes increasingly critical part of decent, livable housing units Cville has municipal gas utility, which can present an obstacle for moving away from this form of fuel - natural gas is an important, affordable part of the energy supply but is not sustainable Impact on homeless population - greatly impacted during heat events; City will offer some cooling stations and shelter; hotels, especially during COVID, have been more willing to offer temporary housing Extreme cold events perceived as less difficult to provide shelter for; Perception that heat alleviation becoming more a priority Housing is one of Departments potentially best positioned to respond, as well as Public Safety, Parks and Rec How to address climate migration; considerations around Homeland Security Older, inefficient housing stock Should consider transportation - those who are not able to walk and bike will need to take more transportation Road work in the summer; less ability to make improvements due to union contracts during high heat events; more and more weeks per year, compressing timeframe during which road work can be completed Public housing might be inadequately insulated/conditioned
Internet & Communications	

Public Buildings & Services	School building upgrades required for functional schools and public spaces to be renovated to withstand extreme heat. This will be a budgeting challenge.
Public Health & Wellness	Even up to several years ago, more people were suffering from heat-related illness coming into hospital Proposed land use plans could result in more impervious surface and exacerbate urban heat island effect Concerns about low-income community members unable to afford air conditioning; as well as people experiencing homelessness with little to no access to indoor conditioned space at all Sleep deprivation from hot nights Less tree canopy in low-income neighborhoods - passive shade is lacking Urban heat island considerations; Stormwater green infrastructure has potential to reduce urban heat island - to what degree is this type of infrastructure already located in low-income neighborhoods? During heat waves, admission to ER for all causes rise, even those that seem unrelated to high heat Special considerations for those unable to escape heat, due to outdoor jobs, work in homes that are not air conditioned, etc. Elderly, young people, and people without AC particularly vulnerable During COVID year 1, Cvill closed outdoor activities in parks, water features in parks closed, and this caused more heat-related hardship Heat stroke concerns are heightened Discourages outdoor recreation with implications for health and exercise and well being Heat islands comparison with those living without AC - hotspots emerge for vulnerability Protection via regulation for outdoor workers - rules around requiring water breaks needed; Seems to be tendency to move work to after-sun hours but may not be due to regulation Outdoor farmworks highly susceptible People who need public transportation for mobility Displaced and unhoused populations are highly susceptible. Those who rely on cooling systems and do not have access to AC, including elders Low-wealth and housing that serves low-wealth community members will have less access to cooling; considerations around private vs. public vs. subsidized housing Schools do not always have AC, summer school in particular, and end of years - impact children Electricity consumption patterns structured by peak and lower consumption; Peak moments are when heat waves are worse, which leads to high ACs, and increases high likelihood of outages - exacerbating health impacts for those already susceptible; PReventing outages is high priority

	"AC Pooling" - concept like carpooling, so that people spend time together in cooling centers; would be more sustainable than individual homes cooling - more social, group collective solutions District heating and cooling systems, providing from decentralized locations; Such as UVA Health cooling from centralized chiller locations - Opportunity for microgrids to provide power Urban Heat Island tied to racist covenants, embedded into deeds, and impacts Communities of Color to this day; tied to lack of investment in neighborhoods of Color, such as tree coverage and shade "Mcmansion tax" could generate revenue from homes that require massive amounts of cooling - could pay for AC subsidies for low-income housing Related to energy for AC requirements + 1 During derecho from several years ago, residents suffered health impacts - need for emergency shelter Cooling for medication, oxygen generation, medical-related storage - many buildings have generation systems Air quality issues due to increased dust Recent immigrants growing culturally appropriate foods Those with lower incomes less capable to build food resilience Children with heat exhaustion; heat stroke more prevalent Long-term care facilities and rehab centers require a lot of energy, and when grid is stressed from AC, can put patients at risk Youth - sustained heat (such as all summer), will lead lapses in exercise and overall decreased health Elderly and low-income can be more impacted by high heat Considerations around migration, from warm southern states to cooler northern states Dept of Public Health have work priorities inspecting restaurants, etc. and difficult to reallocate Costs related to energy - may use AC sparingly, which can lead to numerous health issues Cooling stations are set up when a certain heat temperature and duration met - these are positive Homeless population served by cooling stations All summer outdoor events are of concern, to keep people hydrated Education needed around hydration and heat - particularly for those hiking Heat exhaustion and exposure impacts City workforce; OSHA regulations around exposure Training outdoors impacted by humidity and temp Vulnerable communities - Public housing residents where more concrete; elderly members; homeless; large refugee population low-wealth populations without access to cooling during extreme heat events, many of whom suffer

	from chronic health conditions because of lower access to healthy food, will experience greater impact from these events. Housing and public health/wellness also seek to be threatened, especially the young and elderly and those without stable housing, who are demonstrably more susceptible to heat exhaustion, dehydration, and circulatory/respiratory issues. We need a mandate to provide shelter in all the obvious ways for those subject to the severe heat and deluges during workdays. This is an across-the-board mandate
Public Safety	heat increases violence; impacts on mental health and overlap with other life circumstances
Transportation	Walkability and human-powered mobility will suffer during high heat events. Public transport has some buses, and is well used by those without cars; Used by lower-income population; Two routes in Cville that account for most travel - one is free, one is longer with less frequent buses. Not overly reliable, some stops not easy to walk or bike to; Some routes underutilized and that leads to the impression that they are not used, Increases importance of tree canopy Heat can cause greater costs associated with sidewalk maintenance City can be careful about adding parking lots and where they are added (urban heat island effect) Community members who rely on walking/biking/public transportation are also more likely to experience heat related stresses.

Extreme Precipitation/ Flooding

System	Comments on Potential Sensitivities/Impacts
Agriculture	Urban agriculture sites are often located on marginal land (including within flood plains and in vacant lots in densely developed areas) which experience lots of surface runoff. These properties have inadequate flood protection and are susceptible to erosion, flood damage, and pollution by surface runoff which can threaten food safety (therefore sacrificing food access and economic security due to lack of income from lost crops). Ruining crops, soggy fields & access for workers to the product & deliver produce Prioritizing community-based urban agriculture sites is important to continue to have space for community food security - need to restore sites [interrelated with Food Supply & Access] Redevelopment (South 1st and Friendship Court) - loss of sites New site at CATEC… but locational access/proximity issues

	6th St garden being lost soon and Avon Farm Shop (above are UAC managed sites) IRC sites are not mostly in the city Provided access to fresh produce, investing in urban arg increases food access
Community & Culture	
Economic Development and Security	Bigger economic ecosystem; there will be regional impacts
Energy Supply & Delivery	Will increased severe weather put our above-ground electricity supply at greater risk of disruption? As we electrify (to decarbonize) how will our increase reliance on electricity intersect with the increased likelihood of electrical service disruption? Severe storms can cause power outages, the region needs more micro-grids and residential scale power generation. Power lines flooding/precip affecting trees which take down power lines Power outages in summer & heat impacts Economic & communications - effects can be prolonged Location of power stations in Cville - at least some major ones are in low-laying areas, more potential for flooding there Storms, like tonight, consensus that power might go out Above ground power lines - winds Struggle to get solar in Cville and VA - would give grid distribution and home resiliency Current dependency on a single utility for our electric system, so electric system isn't adapting as quickly as other in states
Food Supply & Access	Access, related to transportation Related to agriculture - Farm to Table, Green Markets, if can't get out & can't get access, along with transport of the food (grocery stores)

Forestry & Ecological Function	Downed trees (especially those that are old/unhealthy) Streambed erosion Proposed land uses may increase impervious surface and exacerbate stormwater runoff With heavy rain events, what about additional runoff into streams that flood those zones with nutrients and cause additional erosion and turbidity? Flooding - would cause removal/damage of trees and habitat Water quality & sedimentation could be exacerbated - already a problem; will be a big one. Increased erosion Native plant species will be stressed and need plans to address Erosion Contamination of streams from runoff Algae blooms (aligns with heat too) Increase of mosquitos And then diseases like dengue fever
Housing	Will such flooding threaten drivers unexpectedly or flood homes, leading to mold and other issues? low income housing is often located in flood-prone areas, and homes without proper maintenance can experience flooding and mold issues linked to severe weather events. Crescent Hall (example we've seen); needing to relocate from flooded areas into safe housing, and then if the safe housing is impacted. Public/Mass housing - common to have poor drainage systems & limited other options. Already have limited affordable housing Financial impacts of flooded basements; equity & cost of that Homeless population; affect needing shelter Housing impacts, virus, molds, food scarcity/lack, shortcuts people make that impact mental/physical health. - may not be the 1st effect felt, but has long term health and wellness impacts. Sump pumps being overwhelmed 10%-20% of city housing stock is in flood plains (100 yr flood plain) # of impacted properties - harder to develop and higher risk Harder to build and reducing existing stock

	Increased costs for leaks and flooding and other issues
Internet & Communications	Internet/comm and energy supply - These are very interconnected and dependent on each other. Easy for one to fail you. & if uninformed/unconnected, it's tough during emergencies.
Public Buildings & Services	In addition to established flood zones, what about flooding due to insufficient or maintenance-impaired stormwater management?
Public Health & Wellness	Housing impacts, virus, molds, food scarcity/lack, shortcuts people make that impact mental/physical health. - may not be the 1st effect felt, but has long term health and wellness impacts. Mosquito habitat & vectors Home infiltration issues - standing water & moisture Increased accidents (& Public Safety) Sanitation issues, sewer overflow event possibilities with more pressure on the system (repairs/upgrades are minimizing this risk) Water supply - Automated medical systems (2nd effect from power outages) Drainage issues and stagnant water - increased vectors and water borne issues Water supply & flooding - Cville hasn't had to face issues yet, but other locations have. These systems should be considered for overwhelm Housing, for example, are selling over price and in floodplains Low income communities in flood plains - displacement & housing shortage Mold in buildings
Public Safety	Related to transportation & emergency access to event locations Higher number of accidents increased need for public safety to respond to calls; swept away vehicles Text notification system is useful, ex. Tornado coming. (unclear how readily subscribed to in Cville) Increased accidents Response times & actions (detours and access - Fire/Police response) More accidents/power outages, etc, pulls on public safety responses

	Needing greater levels of response (2018 events) Hills & valleys - when driving, easy to drive into flood in the low areas Damage to houses - if no cellar, first floor Overlap between the systems, (safety, health, transport) Popular recreation areas, ex. Riverview Park areas (for flash floods, no warnings & trapped on trail or in park) Trees being downed - on houses or other directions on people Hurricanes in Cville & other national impacts - along the Cville stream channels Not sure when storm channels were improved; new development has/will increase flooding Changes in the flood plain & new areas will be impacted - Need to be updated Increased load on rescue and fire in response to flooding (swift water, trees, etc) Alert systems - messages now are too overblown that people acclimate and can't differentiate between serious conditions and when nothing happens Code Red alerts… usually pretty good, but this sudden storm tonight, no alerts (or at least not before the storm). Seems like one could've been useful Managing pets during emergencies When flooding, people will try to walk through them. Major flooding is not something people are accustomed to, so won't understand how to avoid/be safe Driving through water, walking through water, type of dangerous activities Unpredictable nature of the weather - not used to it Ex. driving in the snow and how people respond with driving vs in areas with more snow & familiarity How to prepare and know what to do (ex. Snow tires) Global pandemic & unstaffed hospitals - nursing shortages, (½ positions available), public health system doesn't have the capacity to handle the response
Transportation	Enabling getting to places… so for examples, schools & unable to get to places Shipping/Supply Chain impacts for overland deliveries Getting around town limitations & not being able to receive anything Inconvenience of flooding - getting around, detours, needing to access public transit, stops flooded & where to wait

	Flooded roadways, hazardous driving conditions Downed trees/uprooted trees & power lines, (see comments on seasonal changes) Transit - what modes are/aren't available, impacting the roadways and the transportation vehicles, safety & access to bus stops Utilities - Water Resources/Stormwater program affected but not the other utilities, drainage impact calls Specific locations - inland flooding map being updated Super hilly spots/ice/snow (if cold enough) Only have experience-based, no analysis yet … drainage issues (emmet in places, 5th street… it depends) Increased accidents Flooded roads, dangerous of driving for all (personal veh & transit), biking too, for passengers and drivers with transit Erosion of infrastructure (maintain & replace) Water supply structures have major arteries downstream; dam safety in VA is based on probable max. Precipitation (currently lower than projected models) & flood events more often. City stream channel is narrow & backwater-flooding potential… takes longer to drain on the eastern side of the city … impacts travel access to get in/out of the City (emergency safety personnel, & other employers … 2018 experiences) Roads & increased runoff from roadways Increased maintenance costs for culverts Resiliency costs to ensure can handle the increased water levels Transit, walking, biking - getting caught in storms & impeding access to mobility (leads to public safety) EV drivers - if multi-day power outage, how will charge? Riverview Park Trail, erosion is impacting and damaging the trail Could be an example for other trails too Connected with public safety - how to be safe Public transportation - reliance and then canceled Walking, biking, transit access - unpredictability of weather threat to users Drivers for transit mostly live outside of the city - if they can't get in, then transit can't run Underlayers of roads and bridges from erosion; physical destruction on infrastructure from the velocity of the flooding event Cville is challenged to deal with infrastructure in the best of circumstances…

	Current School bus shortage - forced awareness that many of the ways to walk to school aren't safe. Hard to find alternatives (for all modes of transport - not just school buses); options aren't available (sidewalks, bike lanes, time-effective transit routes, etc)

Seasonal Change/Drought

System	Comments on Potential Sensitivities/Impacts
Agriculture	Water supply issues; Cville is planning to increase density in terms of housing, but will the city's water supply actually support that density, given what we know about climate change. "Warming conditions in the winter (plus later ""first-frost"" in autumn and earlier ""last-frost"" in the springtime) can cause major disruptions to agriculture, promoting proliferation of weeds, insect pests, and causing damage in fruit production (such as the region's vineyards and orchards). During the summer months, prolonged heat/drought conditions cause reduction in soil moisture which puts strain on plants and in extreme cases can cause crop failure. Because URBAN agriculture specifically tends to take place on marginal lands without water hook-ups, prolonged drought can threaten harvest yields and threaten the food security of the gardeners who rely on the food. As seasonal trends are disrupted, the zone for insects/pathogen-vectors can spread northward, and the spread of invasive species can accelerate. We don't have a booming agriculture sector, but the greater region definitely has viticulture and orchards that will definitely be impacted Late frost and early frost, drought Apples and grapes grown in the region need a certain number of chill days/nights to thrive Animal grazing dramatically affects water quality, so if farmers can't access water, the cattle will be in streams and reservoirs. Hotter, dryer, longer summers and warmer winters will result in lower water supply. Downstream of Charlottesville, if there is less base river flow, treated wastewater will flow into the adjacent County- Fluvanna Different recharge characteristics in water reservoirs Growing season will be affected Agricultural production of shallots (?) Concerns about agricultural producers being able to adapt to changing conditions In the City, a lot of the urban agriculture sites in low wealth neighborhoods have been lost to redevelopment. There isn't a lot of land being devoted to community autonomy-- we need to increase the amount of land for this use, especially in these low income neighborhoods and neighborhoods of color Urban community gardens and home gardeners will definitely be impacted. Home gardeners share their produce with food banks. Local farms that provide CSAs will be impacted Wineries are a huge tourism attraction as well as an important employer Our farms, wineries, breweries, orchards, etc attract tourists

	Plant life will be affected Orchards and vineyards in the region - effects on community & culture as well as econ development Home gardens - it will become more difficult to know which varieties you can grow with a shifting growing season Growing season is becoming a lot more unpredictable-- it's not just going to shift to a static
Community & Culture	Fall colors on the mountains are culturally significant Fake ski resorts might still rely on winter conditions, even if a lot of the snow is fake. This is more of a regional activity, not local. There is a cultural landscape that is going to be very affected. When it doesn't get cold enough, there are certain biological functions that will be affected, certain plants that will not leaf out or grow like they used to We haven't had a fall color season in years. We haven't had distinct seasons. It's just been hot or not hot. We rarely get cold. We are an appealing place to live in a lot of ways- we have a big university, we are in the mid atlantic- and will probably continue to be appealing compared to other places that are more vulnerable to climate hazards. Will it become harder (more expensive) to stay in Cville as it becomes more popular to live in? A lot of teachers and nurses can't even live within the city-- there is a huge disconnect when these people don't understand the communities they are serving. House sales went from 5-145% above assessed value in the last year Orchards and wineries are very important to our community A lot of overlap with our extreme heat discussion - e.g. outdoor recreation activities that are tied to specific seasons. Any outdoor event will be affected by weather. If school starts when it's still really hot, this might affect ○ football season. ○ Kids waiting at bus stops ○ Sleep quality affected by warm nights, disproportionately in low income households → not being able to focus in school ○ We might not have good Air conditioning in all of our school buildings ○ Big buildings are sometimes cooled via water which might be pretty inefficient/costly

Economic Development and Security	None
Energy Supply & Delivery	Short term impacts during major weather events Demand on the grid during extreme heat events and longer periods of warm temperatures that warrant A/C. The costs of having more extreme seasons and shorter periods of time where you can turn your HVAC off. With regards to our program to put more solar on schools, we need to step up this program. Some of our schools don't have adequate air conditioning. Solar would allow for more cost effective air conditioning. A lot of energy is wasted in the current grid. Lots of opportunities to be more efficient. Use power in better ways. Some utilities provide incentives to use energy during off-peak hours. Dominion. The month where you're not using HVAC is shifting; coming later than usual Power outages might happen more in the summer, not just in the winter
Food Supply & Access	Cultivate Cville is working to introduce native landscapes and making local gardening more accessible; this will be more difficult and expensive with seasonal changes Supply chain disruptions; Food sourced from Global South and California, which are anticipated to experience greater climate impacts (both extreme heat days affecting worker safety and productivity, as well as seasonal changes). Effect to the whole supply chain-- not just within Charlottesville but areas from which we import food Regional food production will be impacted as well Shorter the growing season, the greater stress on regional food supply and greater supply chain In addition to the above: All of the food that we buy from the grocery store that isn't grown local-- how will those supply chains be affected by climate effects in other regions of the US/World? Food insecurity - 1 in 6 residents experience food insecurity - 56% students eligible for free/discounted meals - making sure to meet critical needs in the amidst of climate catastrophe/stressors A lot of our food comes from a few regions of the nation/world that are very vulnerable to climate hazards (Central California, for example) Food Access/Supply + Economic Development system linkage - prices of food increase if the supply chain is affected, and this will have a disproportionate impact on small, minority-owned businesses and their patrons

	Our transportation is completely screwed up, resulting in increased food costs. Will these costs continue to be exacerbated by these seasonal changes? A lot of our food comes from CA, which is experiencing a lot of climate hazards
Forestry & Ecological Function	Increasing invasive species and pests How will warming temperatures affect stream and river temperatures, impacting desirable and undesirable aquatic life survival? How will milder temperatures allow undesirable pests to survive the winter and threaten important ecosystem elements like tree canopy? As seasonal trends are disrupted, the zone for insects/pathogen-vectors can spread northward, and the spread of invasive species can accelerate. Downed trees during storms or other extreme weather events The City has a lot of old and potentially unhealthy trees and they present a hazard to old infrastructure/buildings, especially in dense areas Indirect risk - fallen trees will pose risk to power grid and transportation Ecology can be impacted, especially in streambeds. Increased stream erosion. Invasive species moving into the area (pests and plants) Invertebrates rely on certain seasonal cycles, such as trout relying on cooler temperatures for a certain span of time and other aquatic species (flora and fauna) With respect to heat, plants bloom cycles in the spring. Flowering cycles affecting pollinators. If plants bloom earlier than usual this might present some issues. Forestry and other wildlife corridors within/around the City With the uncertainty, how can we predict how this will affect our forests? How can we manage our forests with this uncertainty? Direct and indirect effects on water quality
Housing	We have an affordable housing shortage, a lot of people experiencing homelessness and housing stability, rising rent prices. Energy upgrades- landlords can charge more, which has caused displacement. Incentives for energy upgrades are really for homeowners/landlords, not renters. It ends up increasing rent for renters. Inland migration-- can we keep up with housing demand? We are planned for increased density-- if this leads to less tree canopy. We are losing trees because of development. The proposed development is eliminating single family zoning and

	replacing with higher density buildings that will displace some green cover In the last 10 years, we haven't been increasing density, but we've been taking up the little bit of green space that we had left We need to have more energy efficiency requirements and phasing out natural gas connections/incentives. In this process, maintaining and allowing existing buildings to function properly- -- proper insulation for these extreme temperature days. Older buildings often house lower income, disadvantaged populations.
Internet & Communications	None
Public Buildings & Services	None
Public Health & Wellness	Water Supply & Increase of population is an area of concern (Public Bldgs & Services) All of our healthcare systems - physical, mental, other-- are already strained and will have immense difficulty responding to any additional stressors/shocks Outdoor activities will be harder during extreme weather events Mosquito and tick borne illnesses will probably increase with longer warm periods Linked with extreme heat/seasonal change, if we have really hot nights (no cooling down), this can be an exacerbating factor for heat related illnesses. Drinking water supply is going to be significantly affected by seasonal conditions If services was separated from buildings, this would be easier to discuss Shorter winters / longer warm mean longer periods with conditions for vector and air borne illnesses. Longer "seasons" for these illnesses and shorter off-season times. Seasonal allergies, flu season, etc. People's bodies might not be able to adjust to seasonal changes that affect when these illnesses cycle through. People might not have access to the healthcare they need, especially if they are not able to adjust to these rapid shifts. Heat-related illnesses will increase for outside laborers and other people who spend time outside. Need for cooling centers for people without access to A/C. Water supply might be affected by overall warming conditions- water quality and quantity. Reservoirs might become dangerously low and at risk for algae blooms. When coastal cities are experiencing increasingly intense events, they will likely migrate inland. Do we have enough water supply? A comprehensive issue that touches all of these hazards. Changing seasonal conditions will affect quality of life. Increase in temperature will affect so many systems that people take for granted. Increase in heat → increase in vector/air borne illnesses

Public Safety	I had public safety in mine because of the increased load on rescue and fire.
Transportation	None

Aggregated Poll Results from Virtual Forum and Google Form

	# of votes per hazard			
System	**Extreme Heat**	**Flooding**	**Seasonal Changes**	**Total**
Agriculture	28	26	31	**85**
Community & Culture	10	5	10	**25**
Economic Development and Security	4	7	7	**18**
Energy Supply & Delivery	29	19	13	**61**
Food Supply & Access	25	23	29	**77**
Forestry & Ecological Function	24	14	28	**66**
Housing	13	21	8	**42**
Internet & Communications	1	6	1	**8**
Public Buildings & Services	4	5	2	**11**
Public Health & Wellness	38	18	21	**77**
Public Safety	16	23	5	**44**
Transportation	4	23	3	**30**
Other	0	0	0	0
Total	**196**	**190**	**158**	

Poll Results from Virtual Forum

System	# of votes per hazard		
	Extreme Heat	Flooding	Seasonal Changes
Agriculture	16	14	17
Community & Culture	6	2	5
Economic Development and Security	1	5	4
Energy Supply & Delivery	19	12	7
Food Supply & Access	16	12	16
Forestry & Ecological Function	15	10	16
Housing	8	12	4
Internet & Communications		5	
Public Buildings & Services	3	4	1
Public Health & Wellness	25	11	13
Public Safety	11	16	3
Transportation	2	18	1

Poll Results from Google Form

System	# of votes per hazard		
	Extreme Heat	Flooding	Seasonal Changes
Agriculture	12	12	14
Community & Culture	4	3	5
Economic Development and Security	3	2	3
Energy Supply & Delivery	10	7	6
Food Supply & Access	9	11	13
Forestry & Ecological Function	9	4	12
Housing	5	9	4
Internet & Communications	1	1	1
Public Buildings & Services	1	1	1
Public Health & Wellness	14	7	8
Public Safety	5	7	2
Transportation	2	5	2
Other	0	0	0