"Home of the World's Largest Cherry Pie"

# City of George

Climate Change and Resiliency Sub-Element

Exploring Climate Impacts

January 15, 2026

"The WA Department of Commerce climate planning grant is supported with funding from Washington's Climate Commitment Act. The CCA supports Washington's climate action efforts by putting cap-and-invest dollars to work reducing climate pollution, creating jobs, and improving public health. Information about the CCA is available at www.climate.wa.gov."

# 1. Introduction

## Background

Unavoidable climate impacts are projected to happen through the end of this Century, and Washington state's goal, through the Growth management Act(GMA), is to reduce the severity of the consequences resulting from these climate hazards.

To achieve this goal, local jurisdictions like the City of George, are required to study and identify the climate changes projected to occur and implement planning policy to reduce the consequences from hazards with the highest risk of impact and that create the most damage to the community.

Looking through the perspective of 11 sectors, identified in the graphic below and in the following sections,, City assets must be identified and paired with each hazard to assess their vulnerability in the coming years then take action to build and implement policy that will maintain community resilience to those hazards into the future.


*Figure 1: 11 Sectors to guide climate resiliency planning.*

Understating the City's demographics helps identify key issues for the City to prioritize and assist the most people in maintaining climate resilience. The graphics below[1] provide a summary, highlighting key demographics that are owed deeper investigation in how climate impacts effect these major populations within the City. We can see out of the 809 residents counted in the 2020 census, agricultural work provides almost 60% of jobs for residents, 80% of the residents are renters instead of homeowners, only 2% have a bachelor's degree or higher, 80% speak Spanish and over 90% are of Hispanic or Latino heritage, and there is a small 4% population of people 65 years and older. See Appendix A for a full demographic study. These data points along with others can be used to identify disparities in the City that create social vulnerability, which is looked at closer in the next section.

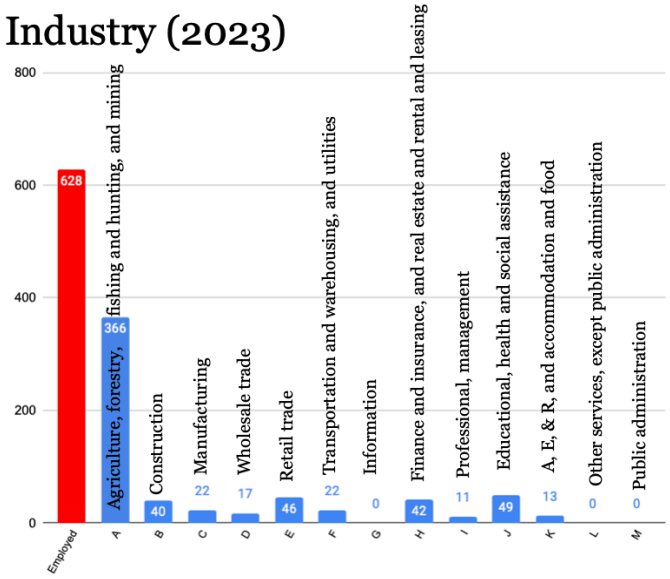



*Figure 2: 2023 George workforce demographics*

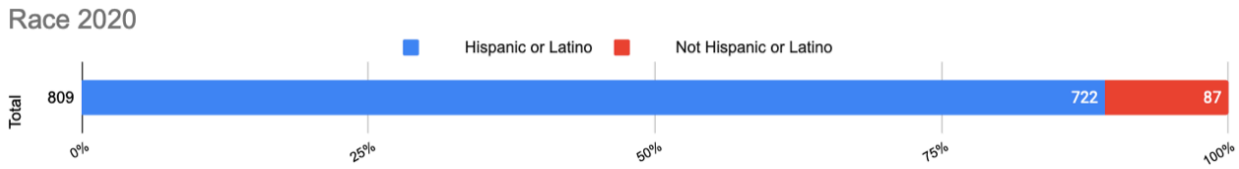
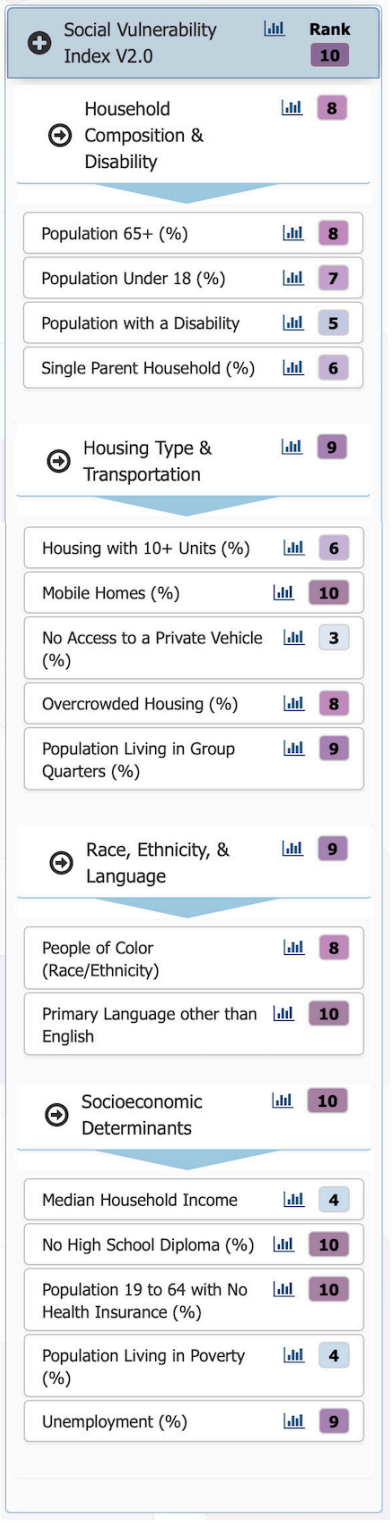



*Figure 3: 2020 George Hispanic/Latino demographic*

[1] https://data.census.gov/profile/George_city,_Washington?g=160XX00US5326455

## Social Vulnerability




When climate hazards occur now and worsen in the future, the most vulnerable populations are dealt the most severe consequences. Identifying who in the community are most vulnerable is key to assure policy doesn't disproportionality address hazards and miss helping underserved community members. The Washington State Department of Health has gathered and analyzed disparities data and is shared through their "Washington Environmental Health Disparities Map"[2]

Based on census tracts, the area–including the City of George–has a high social vulnerability index of 10 out of 10. The highest factors contributing to this rating include no high school diploma, no health insurance, primary language other than English, and living in mobile homes. Unemployment and living in group quarters are the next highest contributors. See other significant factors in the image to the left.

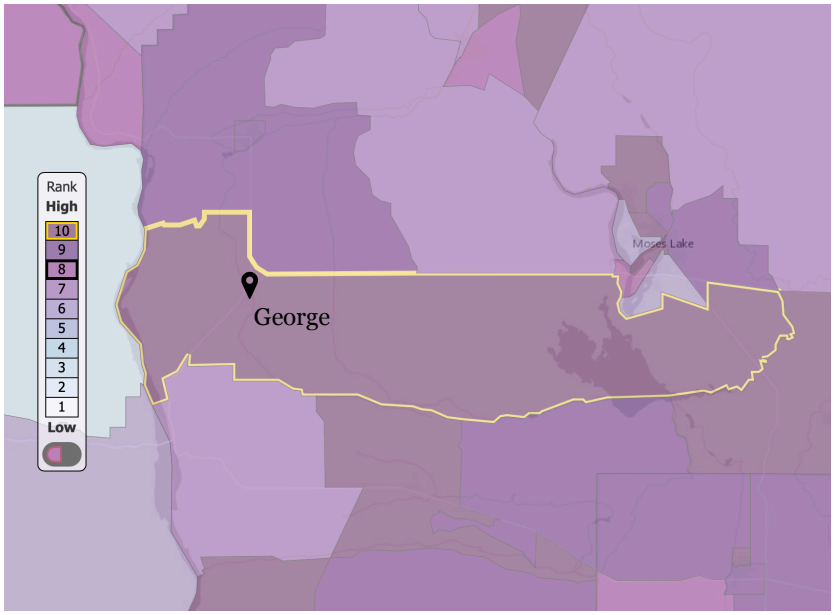



*Figure 4: Census Tract expressing Social Vulnerability*

[2] https://doh.wa.gov/data-and-statistical-reports/washington-tracking-network-wtn/washington-environmental-health-disparities-map

These social vulnerabilities are paired with pollutants to assess health disparities for the Dept. of Health, but this same vulnerability data is useful in understanding consequences from the climatic impacts projected by the end of the century. As the Dept of Health methodology report explains, "In short, where you live, your income, your race, or your language ability may put you at greater risk for exposure to the harmful health effects of environmental pollution."[3] These same factors can put you at greater risk from higher temperatures, wild fire smoke, drought, or other climate hazards too.

This focus on social vulnerability ensures environmental justice for the people of George, which RCW 36.70A.030(17) defines as "the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to development, implementation, and enforcement of environmental laws, regulations, and policies. Environmental justice includes addressing disproportionate environmental and health impacts in all laws, rules, and policies with environmental impacts by prioritizing vulnerable populations and overburdened communities and the equitable distribution of resources and benefits."[4]

[3] Washington Environmental Health Disparities Map
https://deohs.washington.edu/sites/default/files/2022-08/311-011-EHD-Map-Tech-Report.pdf
[4] http://app.leg.wa.gov/RCW/default.aspx?cite=36.70A.030

## 2. City of George Assets

The 11 sectors used to group the City's assets and have been mapped and identified for quick reference in assessing climate impacts to the community. Identifying these assests utilized the City's infrastructure plans and Comprehensive Plan that use agency data, such as the Transportation Improvement Board, Department of Fish and Wildlife Mapping (PHS), Department of Historical and Archeological Preservation (DHAP). Input from community members and additional state and federal agencies supplemented this identification process.

### Agriculture & Food Systems

Grant County contributes to roughly 20% of the States agricultural market value[5]. The City of George is surrounded by agriculture as shown in the map below highlighting the pivot irrigation crop circles and irrigation canals in the immediate vicinity. The City also contains resources that support the agricultural industry including truck weight stations, rest stops and refueling stations; food storage; wine processing and storage; equipment maintenance, and fertilizer production. Irrigation supplies are sold just outside of the City, and the United states Bureau of Reclamation irrigation canals that being water to farms in the region run through the City.

A wide variety of crops are grown, processed, and/or stored in the area, which include potatoes, onions, alfalfa and hay, corn, seeds, serrano chiles, mint, and marijuana. To the north of the City beef, milk and other dairy products are also produced. Animal husbandry in the area includes cows, horses, chickens, goats, sheep, pigs, and fish.

Due to the difficulty of farming, financially and climatically, the number of small, family-owned farms and orchards are decreasing, and large corporate farms are filling in the voids. To fill the labor gaps of these farms and ranches from local workers, H-2A workers are brought into the area as well, but there is still scarcity in the labor workforce and for their housing needs. To illustrate the scale of this workforce, Grant County had between 2,000 and 10,000, H-2A certified workers per year between 2014 and 2024[6], while the Grant County American Community Survey shows the agricultural workforce to vary between 8,000 and 11,000 in the same 10-year period.[7] With such a flux in worker numbers, how capacity is maintained for climate resiliency will need to be carefully considered.

The local agricultural workers and H-2A workers should be considered separately when assessing vulnerabilities, as H-2A workers have federal protections not always afforded to local workers. Understanding the unique needs of local workers, the Quincy Valley Medical Center has developed resources for agricultural works and done extensive studies on how outdoor workers are more vulnerable than indoor workers regarding climate hazards. These will be

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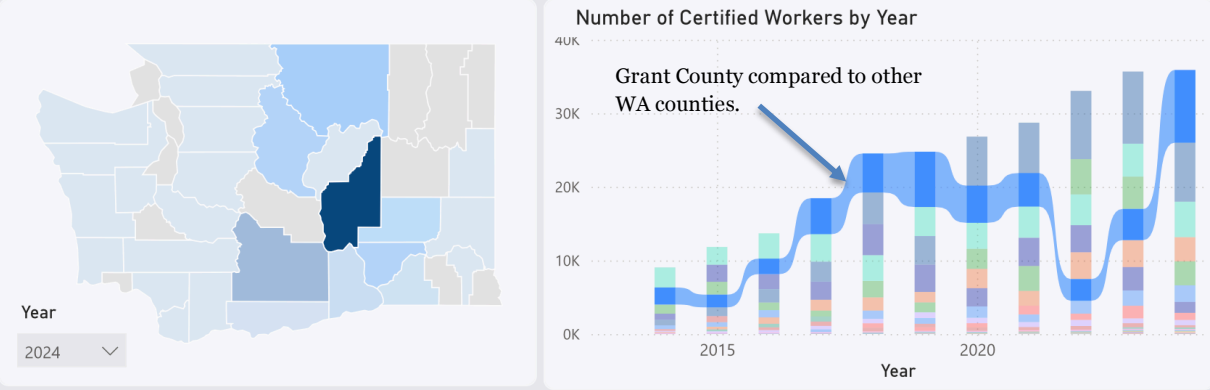
[5]https://www.nass.usda.gov/Publications/AgCensus/2022/Full_Report/Volume_1,_Chapter_2_County_Level/Washington/st53_2_001_001.pdf

[6] https://esd.wa.gov/jobs-and-training/labor-market-information/employment-and-wages/agricultural-employment-and-wages

[7] https://data.census.gov/table/ACSDP1Y2024.DP03?q=dp03&g=050XX00US53025

valuable resources for policy creation as the City of George's climate element is further developed through this process.




| County | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Grant | 2,311 | 1,722 | 2,102 | 4,889 | 5,301 | 7,512 | 5,059 | 4,556 | 2,945 | 4,232 | 9,876 |
| **Total** | **2,311** | **1,722** | **2,102** | **4,889** | **5,301** | **7,512** | **5,059** | **4,556** | **2,945** | **4,232** | **9,876** |

*Figure 5: Graph of Grant County Certified H-2A Numbers from 2014-2024*

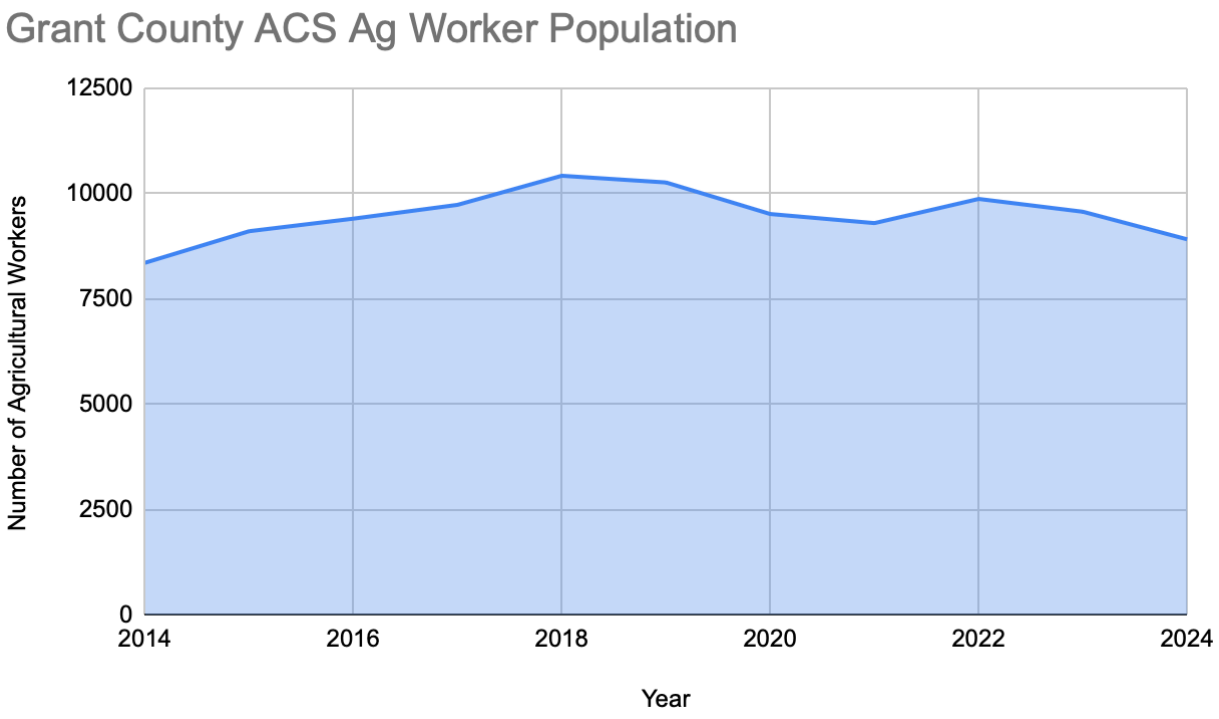



*Figure 6: Graph of Ag Worker Population in Grant County*

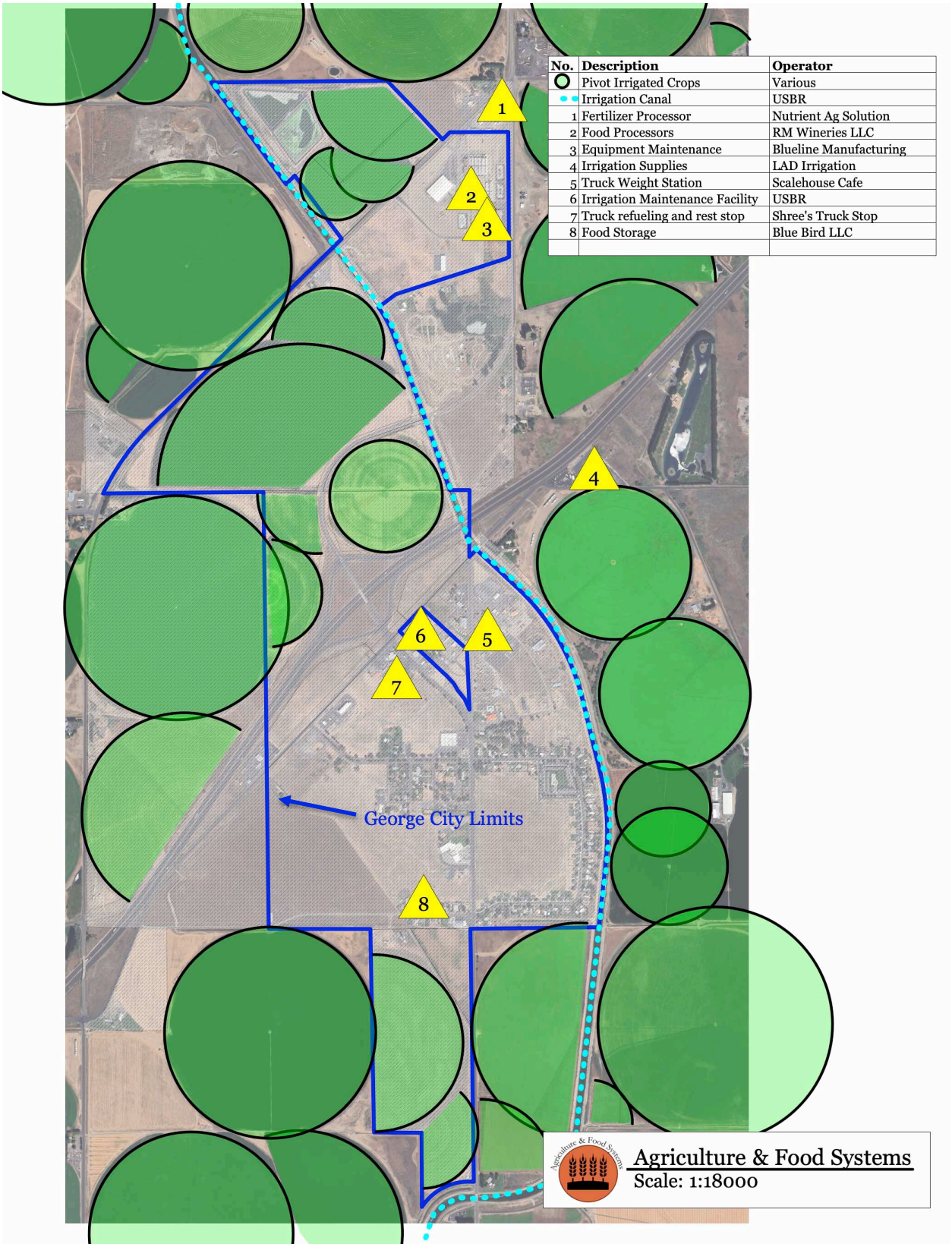



*Figure 7: Mapping of Agricultural Assets*

## Buildings & Energy

The City of George has a total assessed improvement value of approximately $55M as of 2025[8]. This is calculated by subtracting the land market value of the properties from its total market value. The map below shows the structures built in and around the City. Overlaying these with the City's zoning maps, the mix of industrial, commercial, and residential structures is identified. The City has a healthy mix of uses, and ample open land left for growth. This growth, needed to accommodate the housing needs for the State over the next 20 years, will put higher demand on the City's infrastructure and power needs.

The Housing stock is diverse, with a mix of single-family residences, duplexes, multifamily housing, and mobile home/RV parks. About 26% over houses are older than 1986, when the Washington State Energy Code became a building regulation for new construction. About 23% of the housing stock include mobile homes and RVs[9]. These kinds of dwelling units are less insulated and equipped for efficient temperature and air quality control.

Grant PUD provides power and fiber optic transmission lines to the City. The distribution lines and a power substation are located on the map below. George has current policies that require new distribution lines to be installed underground.

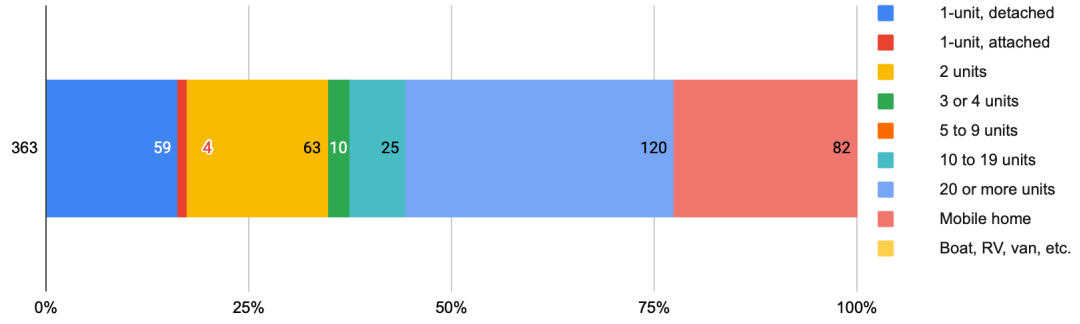



*Figure 8: 2023 Housing Characteristics*

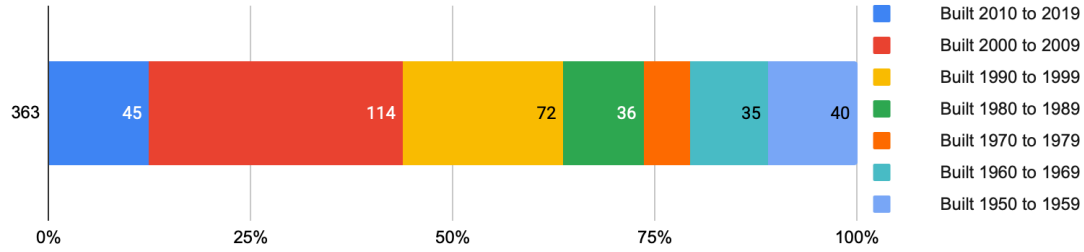



*Figure 9: Year of Structure Built*

[8] Grant County Parcel Data- https://data-grantcountywa.opendata.arcgis.com/maps/c0eeee697cd74f0a825c0a842d0a878d/about

[9] DP04 American Community Survey: https://data.census.gov/table/ACSDP5Y2023.DP04?t=Heating+and+Air+Conditioning+(HVAC):Physical+Characteristics:Water,+Sewage,+and+Plumbing+Facilities:Year+Structure+Built&g=160XX00US5326455

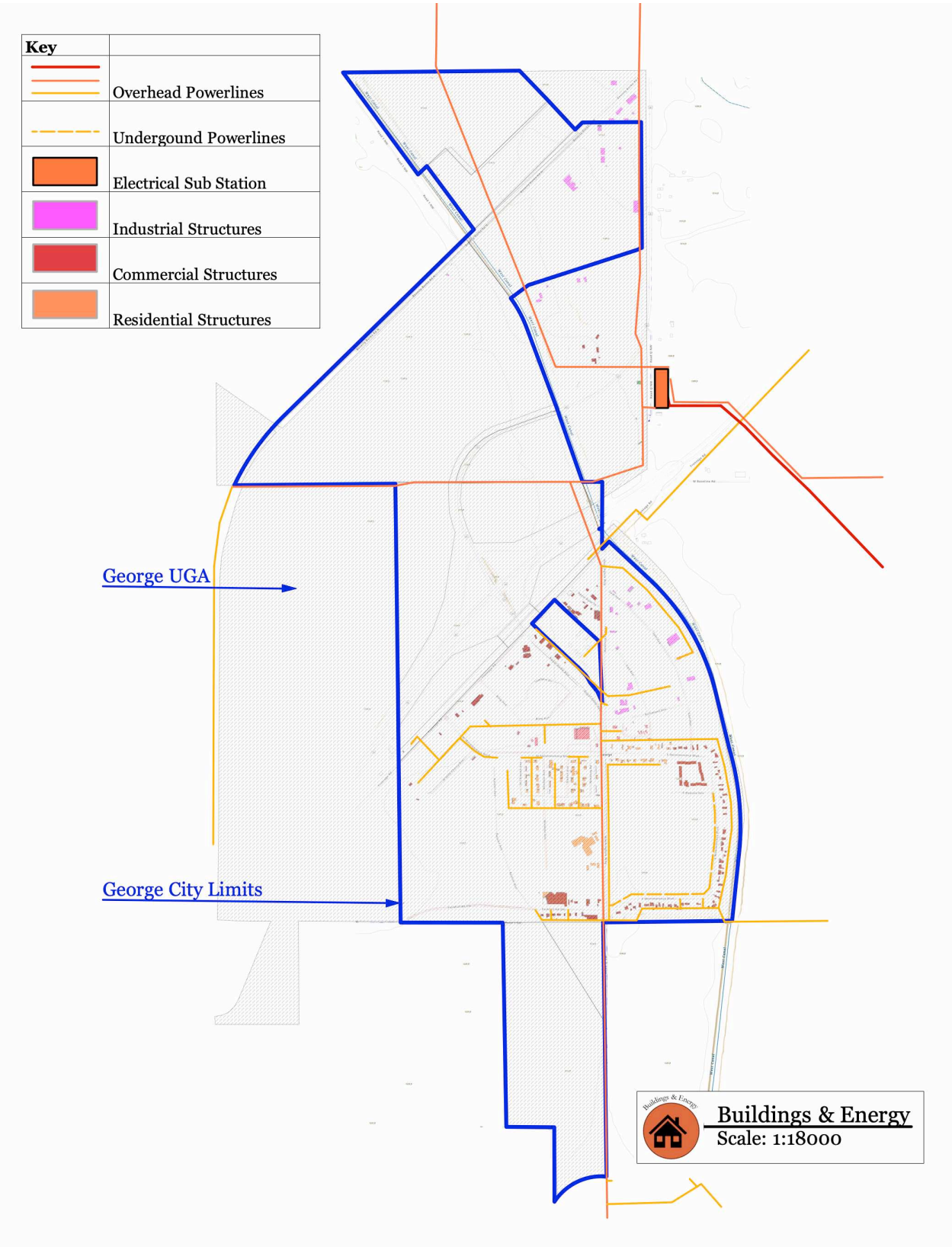



*Figure 10: Building and Energy Mapping*

## Cultural Resources & Practices

The City of George is located between native tribe reservations, such as the Colville, Spokane, Wanapum, and Yakima Tribes, and was a likely ground for native activity in the past. According to the Dept. of Archeology and Historic Preservation, the City is in an area with high archeological risk and very high risk, so major development is required to have a cultural resource survey taken prior to development to assure significant history isn't lost. The Map from DAHP WISAARD shown below highlights the areas of significant risk, as well as inventories for historic significance. While no properties have been made landmarks yet, the watermaster house and USBR irrigation canal are eligible. The community has also spoken about the significance of the large Martha Inn sign on Frontage Rd. and gaining historic landmark status may be pursued. On top of a knowl in the center of town, founder Charlie Brown had built a swimming pool. A partially filled in and overgrown concrete liner is all that remains, but the significance cold be re-imagined as a town center element.


*Figure 11: Watermaster house is eligible for landmark status*

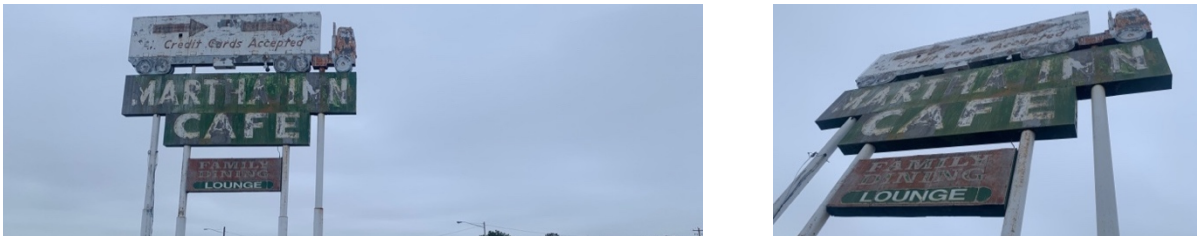



*Figure 12: Martha Inn Café sign on Frontage Rd. remains, though the café has been removed.*

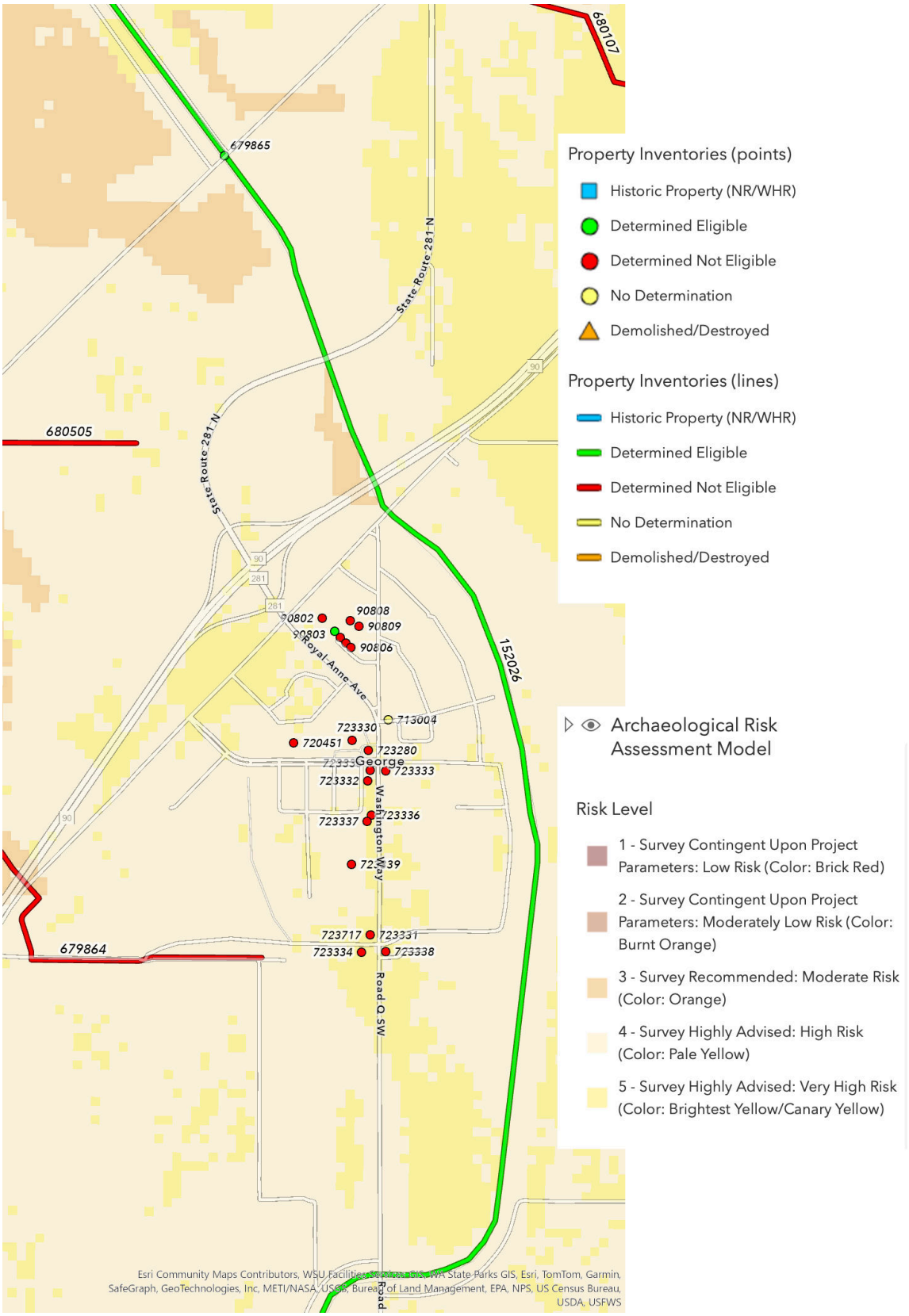



*Figure 13: DHAP WISAARD Map used to help identify locations of potential cultural significance*

The City is relatively young, being incorporated in 1961, but is already developing a rich culture of its own. Having the name George Washington, holding one of the largest 4th of July celebrations and an annual weeklong Bluegrass Festival, and planning to build on a colonial themed aesthetic; the City is a slice of Americana, to go with the world's largest cherry pie.

Marthas Inn Cafe, which has been demolished, used to be a cultural hub and community gathering center for the city. Having a gathering space like that is important to the community and encourages interaction between the locals and tourists stopping on their way through. The Colonial Market shops and restaurants try to fill this gap. The George Community Hall is an available venue for hosting events and is important resource to community as well.

The town has grown to have a majority Hispanic population, with over 90% of the community identified as Hispanic or Latino in the 2020 Census, which has the potential of bringing its own culture to the City as well. A Mexican restaurant in the colonial market building in the center of town, has become an important gathering place as well as the local churches, filling the gap left behind when Marthas Inn Café was removed.

## Economic Development

While the City of George's economy is greatly influenced by the agriculture industry as noted above, its proximity to the Gorge Amphitheater and the data centers in Quincy makes tourism and tech industry support facilities promising economic drivers of the community. With an active Quincy Port District owning vacant land in City limits waiting to be developed, additional economic pools can be tapped into. Having a diversity in its economic portfolio is an asset to nurture and encourage.

A Holiday Inn Express hotel and GQ extended stay motel in the City commercial core support both tourists and contract workers coming into the area. Developers have expressed interest in adding an additional hotel and recreational vehicle park within the City to increase that capacity.

Storage is also a viable business model being tested in the City, supporting local needs, as well as more affordable storage options for people west of the mountains that vacation in eastern Washington frequently.

The City is planning to develop out a civic core identifying the heart of the City. This would combine facilities such as City Hall, Library, Post Office, and Museum into a Colonial Themes structure, and surround that with attractive park amenities. This core would establish the infrastructure need to support the commercial growth in the city core as well.

Economic development has the typical hurdles, such as growing capacity of the City's water and sewer systems, and reserving power from the Grant County PUD. Also, the access to property along Highway 281 is restricted as well, impacting several properties including the land owned by the Port District. These hurdles are likely to be stressed further by the projected climate hazards.

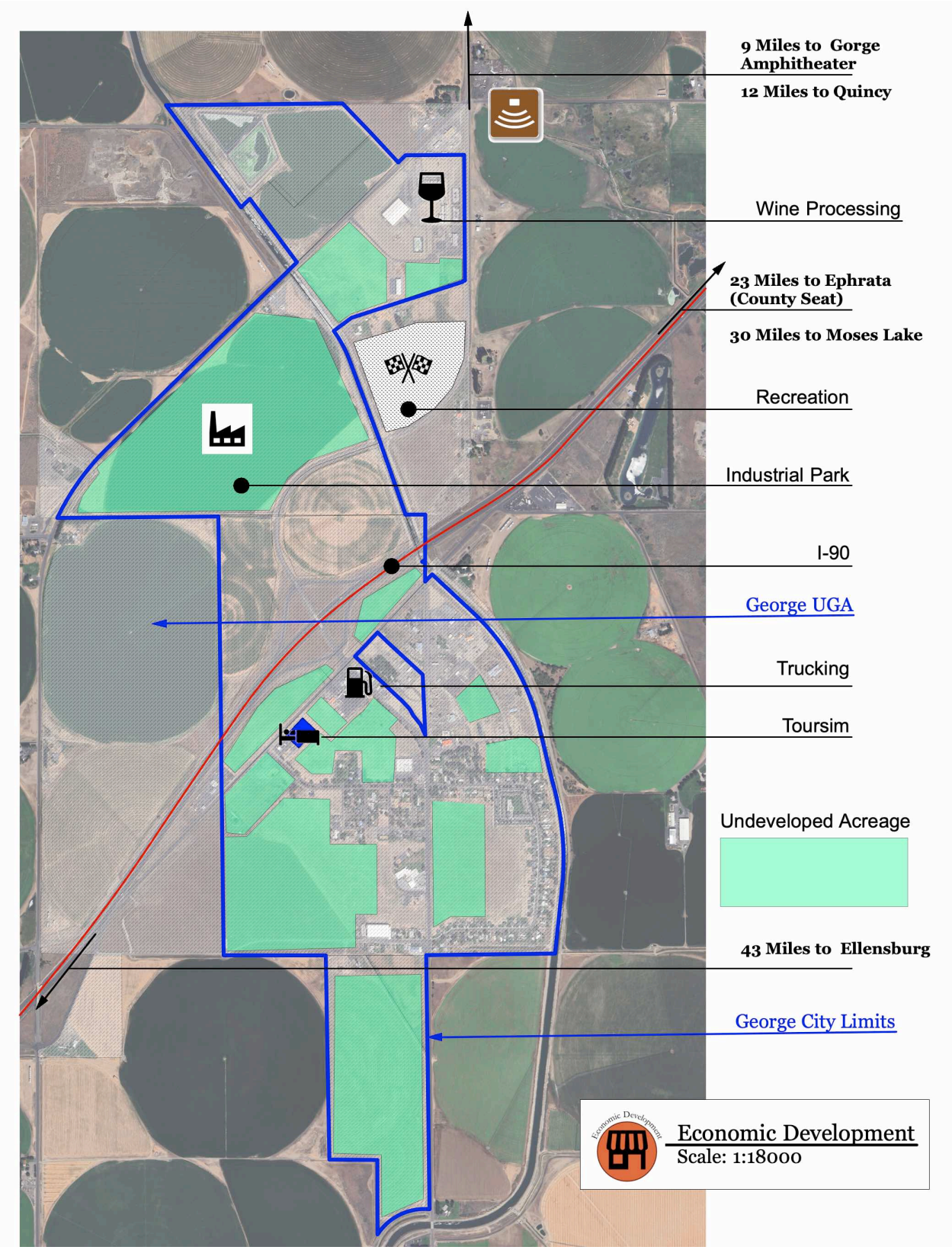



*Figure 14: Mapping economic development resources*

## Ecosystems

Mixed between crop circles, roads and highways, and City development, Shrub-steppe habitat has been presumptively identified by the Dept. of Fish and Wildlife. Major development must have a wildlife study conducted to assure that there is no net loss of this habitat or priority species living in this habitat. Ideally, these priority habitats are connected to larger animal migration channels and support a thriving ecosystem alongside human development. Development often mitigates impacts to low quality Shrubsteppe in City limits by preserving high quality Shrub-steppe at a prescribed ratio that has a more meaningful impact to wildlife. See example image below[10].

The Washington Ground Squirel and the Burrowing Owl are two priority specicies in the area, and and are required to be looked for through a study prior to major development proceeding on vacant lands. However, most vacant lands withing the City limits have been mowed and maintained for weed control throughout the years, making them low habitat candidates for these species.

WDFW Photo- Washington Ground Squirrel

WDFW Photo- Burrowing Owl

[10] Shrubstepp Habitat Example: Shrub-steppe in Beezley Hills, Washington, USFWS/A. LaValle, Public Domain, https://www.fws.gov/media/shrub-steppe-beezley-hills-washington

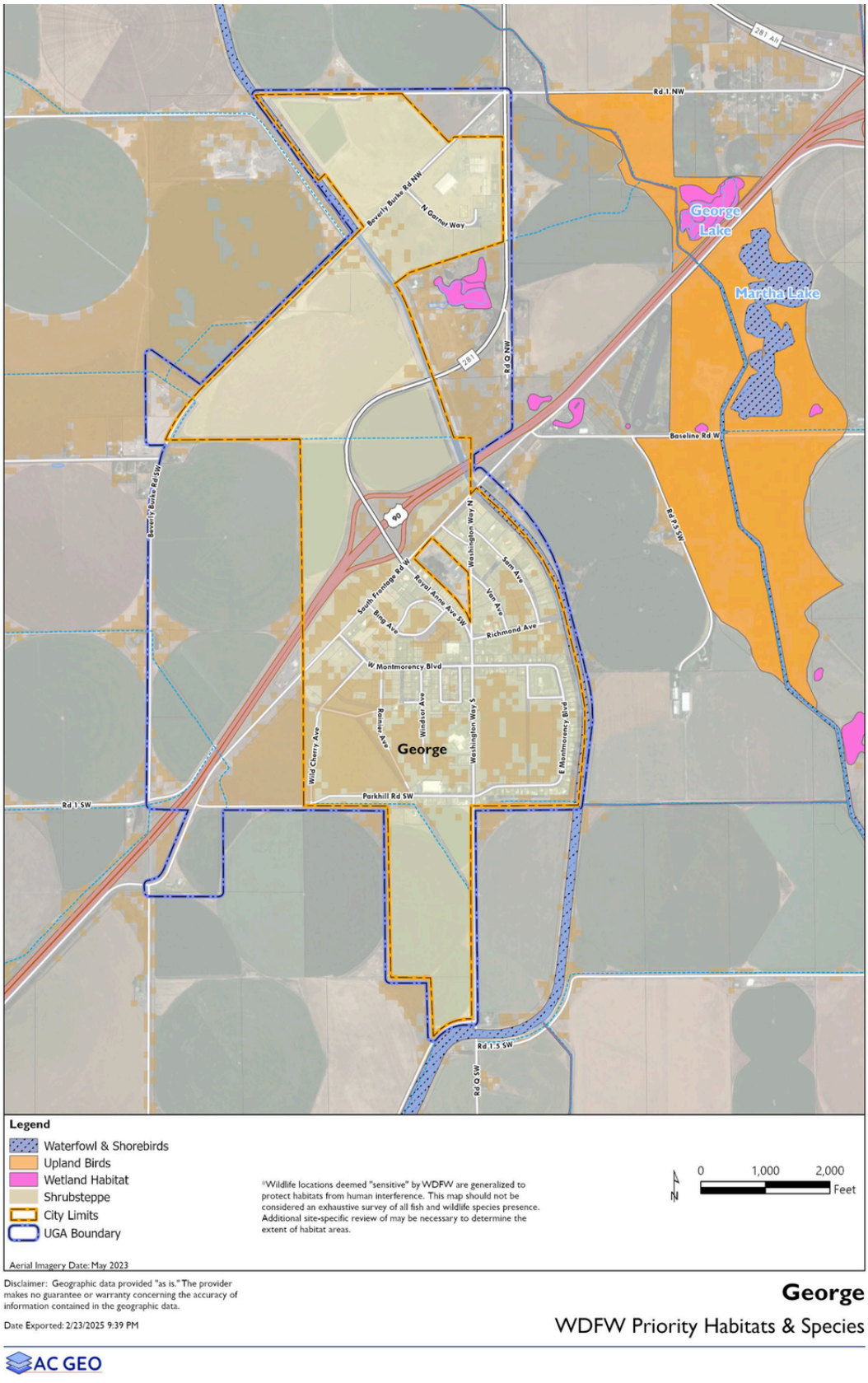



*Figure 15: City of George's Adopted Critical Area Map for Fish and Wildlife*

Being in a high desert climate, trees have been an important part of George's development, by providing tree lined pathways and boulevards. The trees provide cooling through shade and transpiration. The mapping of tree and plant canopies is captured in the map below[11].

Within the City limits and UGA, the tallest and densest tree canopy cover is provided at the Community Park, the USBR irrigation property, and the Mobile home park next to City Hall.

Trees at the Watermaster Headquesrters.

Trees by City Hall & Mobile Home Park.

Trees at the City Community Park.

[11] Global Canopy Height 2020: https://www.arcgis.com/apps/mapviewer/index.html


*Figure 16: Mapping of Tree and Shrub density and height*

## Emergency Management

Grant County Fire District #3 provides fire protection and EMT-B services to the City from Station 35 within City limits across the street from City Hall. Composed mostly of volunteers, Station 35 is home to 1 structure fire engine, 1 water tender, 1 brush truck, 1 grass truck, and 1 quick response/support vehicle, and is capable to respond to all types of fires within the City of George.

Columbia EMS has 3 paramedics and 2 EMTs stationed in Quincy, with one more on call in Sunland.

Police protection is provided by the Grant County Sheriff's Office, and they have a satellite office in the George City Hall building. The City also contracts for security services, to help keep an eye on the community, as the County Sheriff Office has responsibility to cover all of Grant County. The Local security provides a presence in the community, with personnel that can engage with community, ask questions, and reduce chances of crimes, however, they have no authority to provide citations or process people for crimes. They can quickly pull the County in to enforce the laws if they see activity beyond their capacity to intervein. The County Courthouse and County Jail is in Ephrata, about 23 miles to the north.

The City doesn't have its own emergency management plan but is included with the Grant County Comprehensive Emergency Management Plan 2024[12]. Emergency contact and communication is available through phone, Facebook, and Wireless Emergency Alerts (WEA) through Everbridge, and emergency preparedness guides are available in Spanish and English.

See the mapping of these services under health and well-being.

## Health & Well-being

There are no pharmacies, clinics or hospitals within the City of George, but it is included in Grant County Public Hospital District No. 2. The nearest clinics and pharmacies are 12 miles to the north in Quincy, and the Quincy Valley Medical Center there is the nearest hospital, while the Columbia Basin Hospital is in Ephrata 23 miles away. The public voiced that Samaritan Hospital in Moses Lake is still the most used hospital.

There are also behavioral health and wellness services provided by Renew and Community Health Centers with offices in both Quincy and Ephrata to the north.

The North Central Washington Library, with its temporary library facility located at the George Elementary School, has a privacy booth setup for telehealth opportunities.

[12] https://www.grantcountywa.gov/1496/Comprehensive-Emergency-Management-Plan

Well-being also includes opportunities for recreation, socializing, and exercise. Families attend school programs like STEAM night, use the school and City parks, and use the NCW library housed at the school. There are also opportunities for horse riding clubs, but these can be cost restrictive for many families. Children, outside of attending the elementary school, are often cared for by Love and Learn Preschool, or unlicensed caregivers because of the costs associated with caregiving.

See the mapping of these and emergency services below.

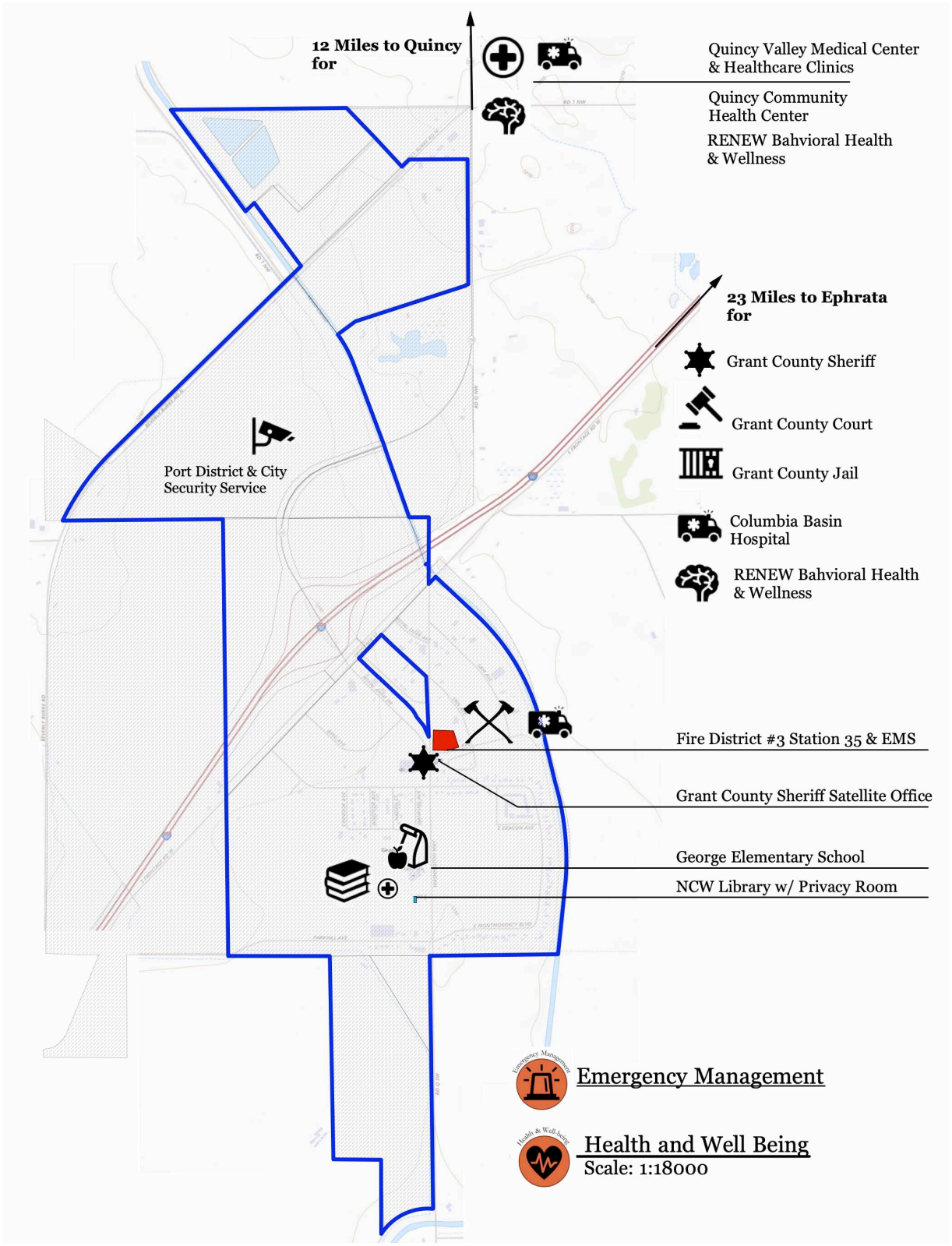


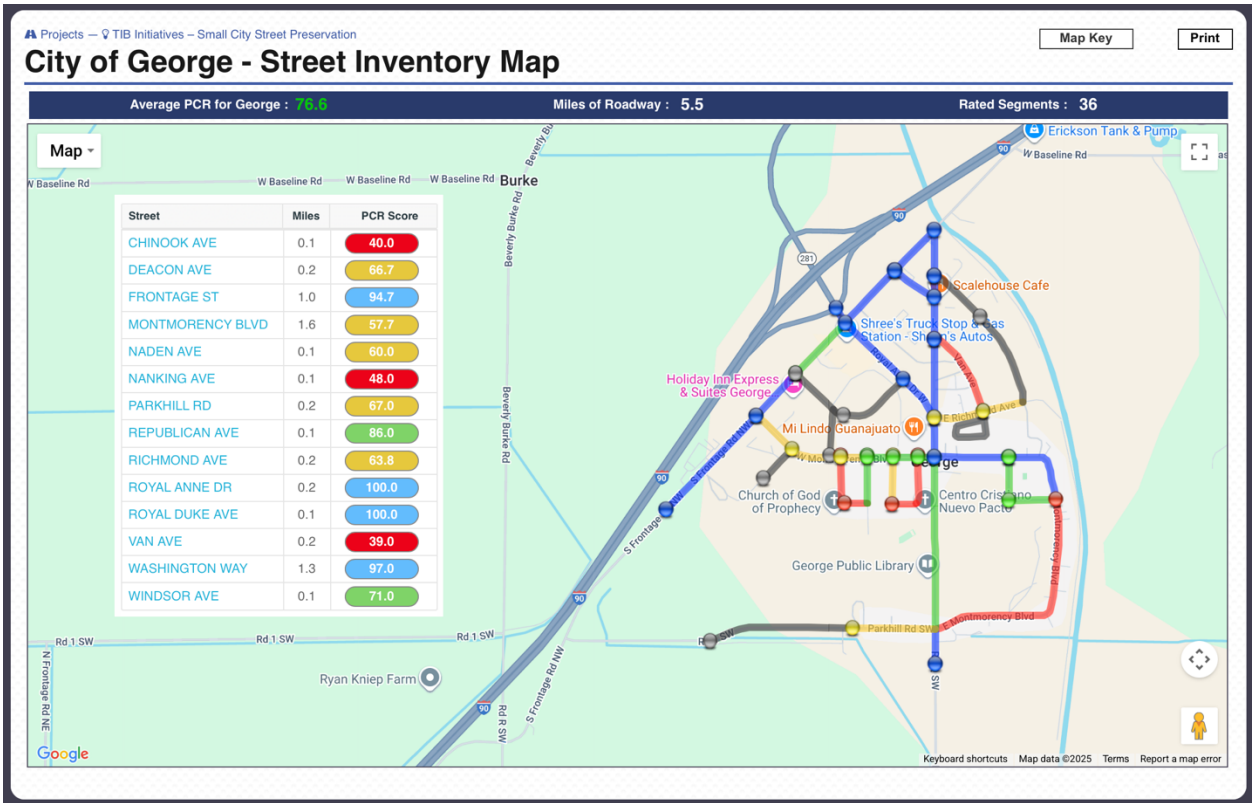

*Figure 17: Mapping identifying emergency management, health and education resources.*

## Transportation

I-90 is a critical infrastructure for the State of Washington and passes through the City of George. Spanning from Seattle to Spokane and beyond, I-90 is a major transportation corridor. It's junction at George supports Shree's Truckstop and the Scale Station Café, and is the intersection with the highway to the Gorge Amphitheater. WSDOT reports that over 16,000 annual average daily trips (AADT) pass through the interchange[13]. The economic impact of this asset is talked about under the economic development section.

Highway 281 connects George to Quincy to the North, which connects to Wenatchee on SR 28. This is a mostly 2-lane route, with some passing lanes mixed in. 281 has about 7,000 north and southbound AADT per WSDOT traffic counts. The Chelan-Douglass Transportation Council estimates a cost of $1.2B to widen this transportation corridor to 4 lanes.

The transportation system of roads is evaluated by the Transportation Improvement Board, which offers grants for street maintenance and repair to eligible City's having financial need. That is shown in the map below[14]. Garnet Way in the industrial park to north is a City street not shown in this mapping. Beverly Burke Rd NW and Highway 281 in City Limits are also not evaluated in this map and are maintained by the County and State respectively.




[13] https://wsdot.public.ms2soft.com/tcds/tsearch.asp?loc=Wsdot&mod=TCDS
[14] https://www.tib.wa.gov/Dashboard/modules/SmallCityMaintenance/scsigisfullcity.cfm?AN=George

For public transportation, the City is served by the Grant Transit Authority (GTA), with one bus route, and by People for People, and Greyhound. GTA route 40 makes 7 trips between 8 AM and 6PM, Monday-Friday, and connect to Quincy and Ephrata. Transfers can be made from those locations to other local communities like Moses Lake, Soap Lake, and Wenatchee. The community also has multi-modal transportation options, with a robust trail and sidewalk system in place for a community of its size.

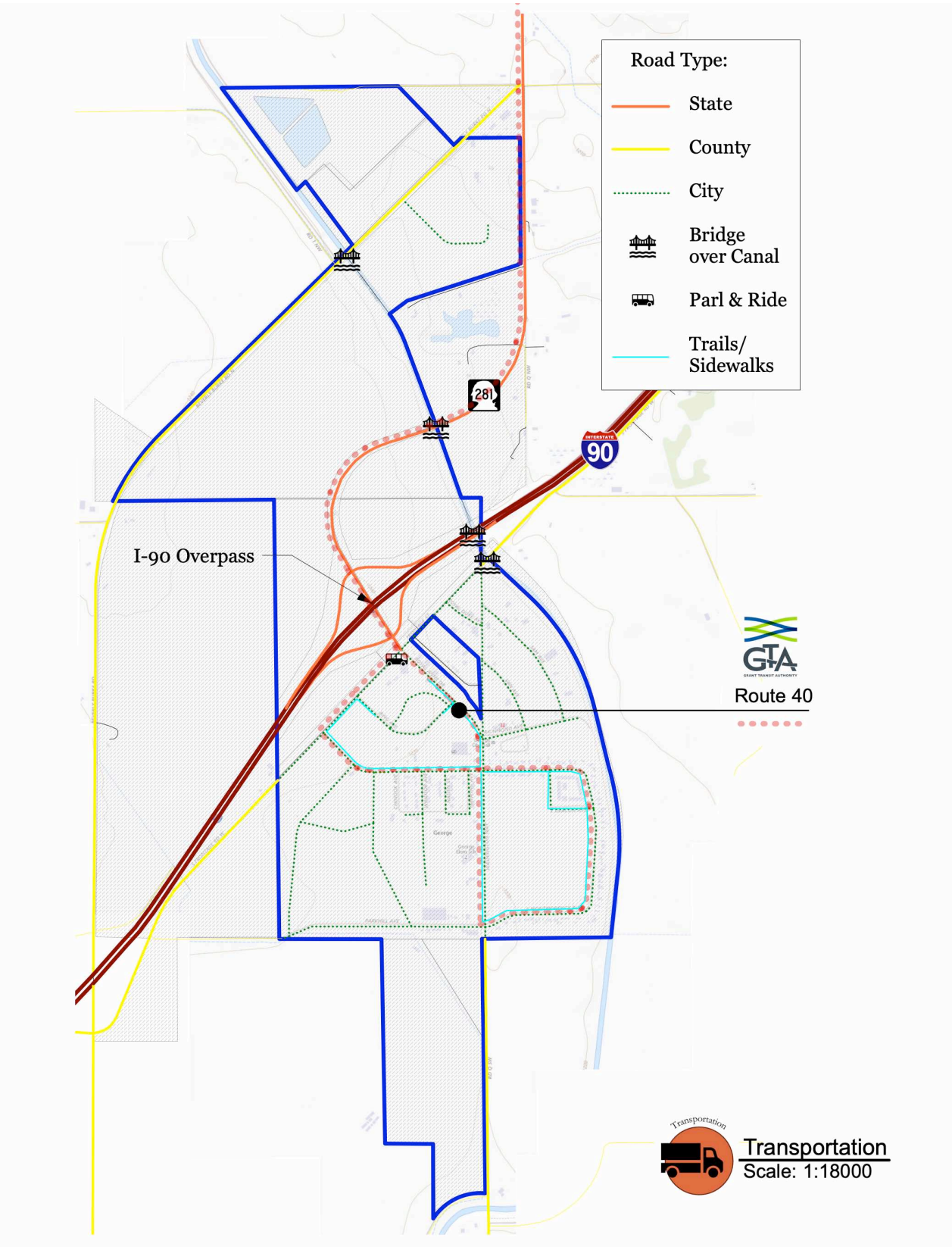
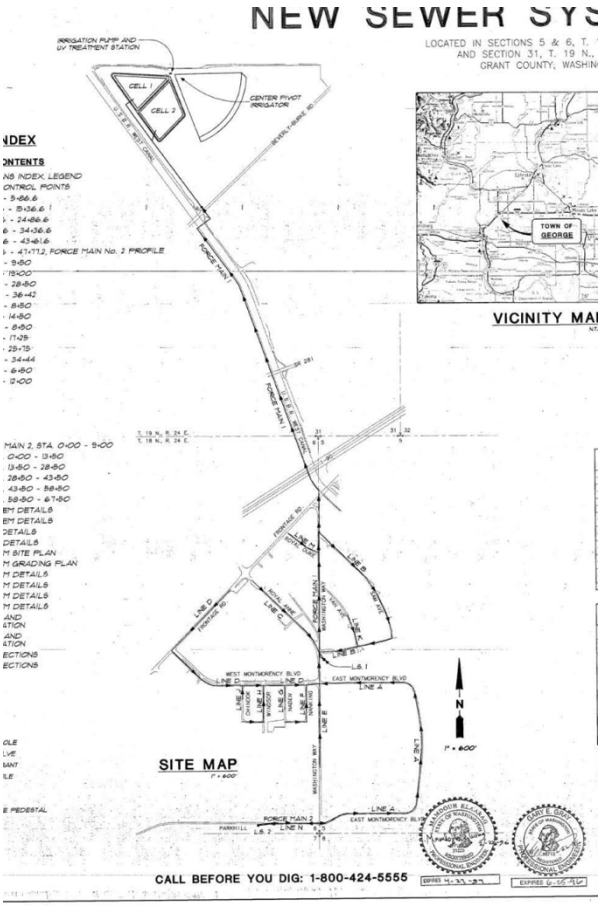



*Figure 18: George's Multi-Model transportation system.*

## Waste Management




The City of George sends about 800 tons of waste to the landfill through garbage collection services. To reduce waste outflow, there is also a 40-ton container that is used for collecting yard waste that is recycled at a Quincy compost facility. Paper, plastic, glass, or can recycling is not locally available.

The City of George currently treats its sewage with a lagoon system. Two lagoon cells can hold about 60 acre feet of sewage, and about a 23 acre field can be sprayed with effluent. When nearing capacity, the lagoon system can face troubles during the winter when the spray fields cannot be used due to freezing temperatures. The size of the lagoon is critical in holding enough sewage until it can be distributed in early spring.

The City is in discussions about expanding the sewage treatment capacity and contemplating building a relationship with the Gorge Amphitheater for a combine facility, as both locations are bumping into capacity limitations as of 2025.

## Water Resources

The City's municipal water system is composed of 2 active wells, 2 reservoirs, and distribution piping. The reservoirs can hold 613,000 gallons of water and provide the needed water pressure. This provides potable water for residences and businesses, landscape irrigation, and fire protection through fire hydrants and sprinkler systems. The City has a water right for 1,000 gallon per minute instantaneous withdrawal, and 572 acre feet per year. In 2025, the City used about 78.2 million gallons of water which equals 240 acre feet.

The City faced water capacity issues through the 2023-2025, when Well #3 was not producing enough water due to reduced aquifer levels. To quickly fix the issue, Well #4 was equipped with a larger pumping capacity to meet current demands and growth, but Well #3 needs to go deeper to accommodate the growing City's water system capacity.

The City is also surrounded by the USBR irrigation canals providing irrigation water for agriculture and is a separate water source than local aquifers.

The map below shows the City's municipal water system. The canals are marked on the Agriculture mapping provided earlier.

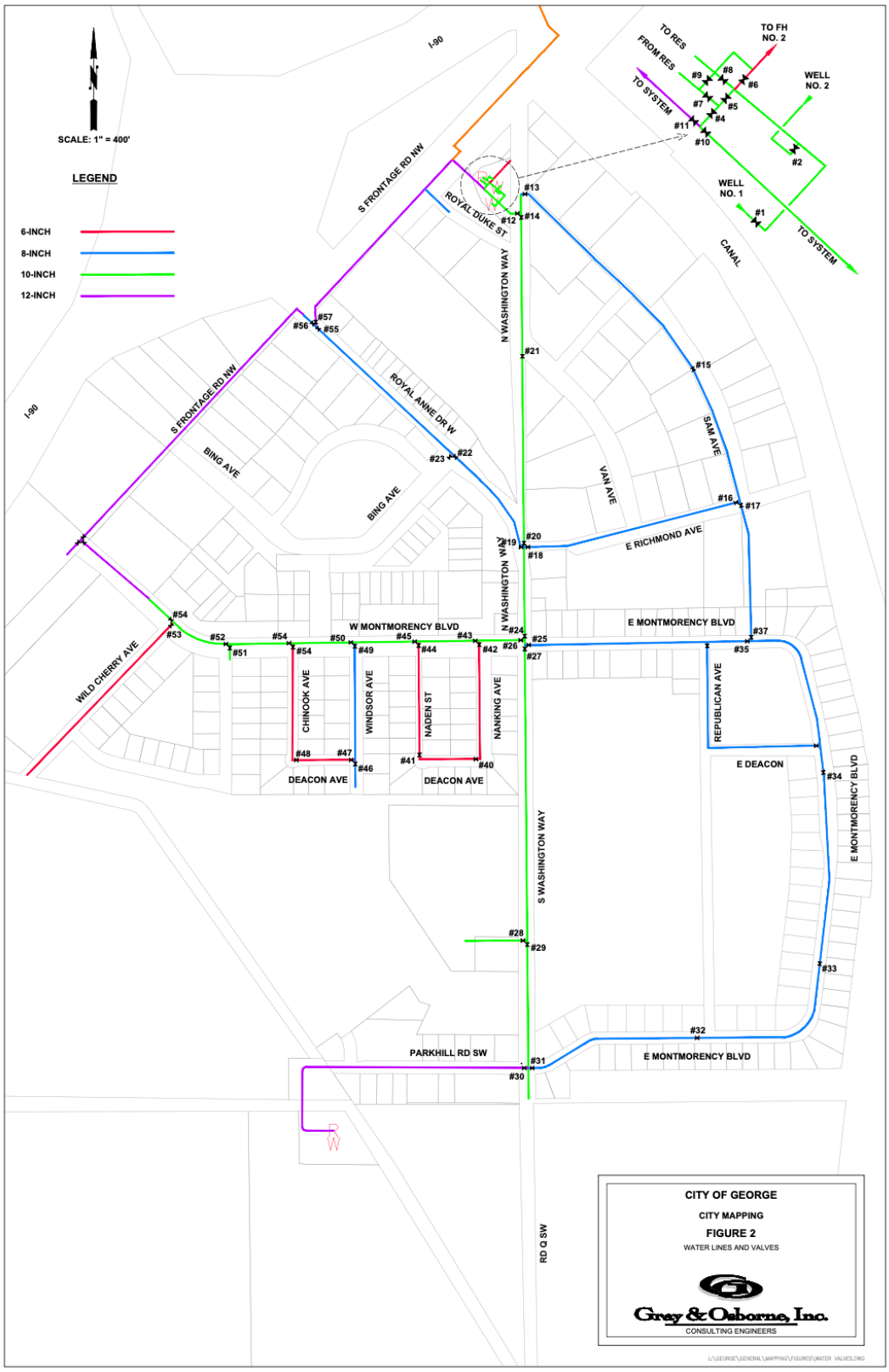



*Figure 19: George's water system and distribution map*

## Zoning & Development

The City amended its Comprehensive Plan in 2025 to address comments left from state agencies like the Dept of Fish and Wildlife and the Health District. It was also an opportunity to prepare the documents for the required 2027 periodic update required by the Growth Management Act. This amendment expanded on the City's zoning map, by separating out and adding maps of the City's annexation history, vacant/underutilized parcels, and for future land use. These documents help set City priorities and goals for the next 20 years, and work in conjunction with development regulations. The Periodic Update will also require the review and update of the City's critical area ordinance and development regulations including zoning and subdivision regulations.

The Comprehensive Plan is the City's path forward to grow responsibly. Starting with the projected growth in the County over the next 20 years, the City's allocation of that growth needs to be accommodated, by looking at the growth impacts on land use, housing, utilities, capital facilities, transportation, economic development, parks and recreation, and now climate as a required element from HB 1181.

# 3. Climate Hazards

## Grant County Overview

For a detailed analysis of the climate hazards projected to impact Grant County, read the climate report that steered their climate resiliency policy making[15]. An online visual story is also available and presented to be less technical and more accessible[16]. In Summary, the following climate hazards from the study are likely to have the most impact on the City of George.

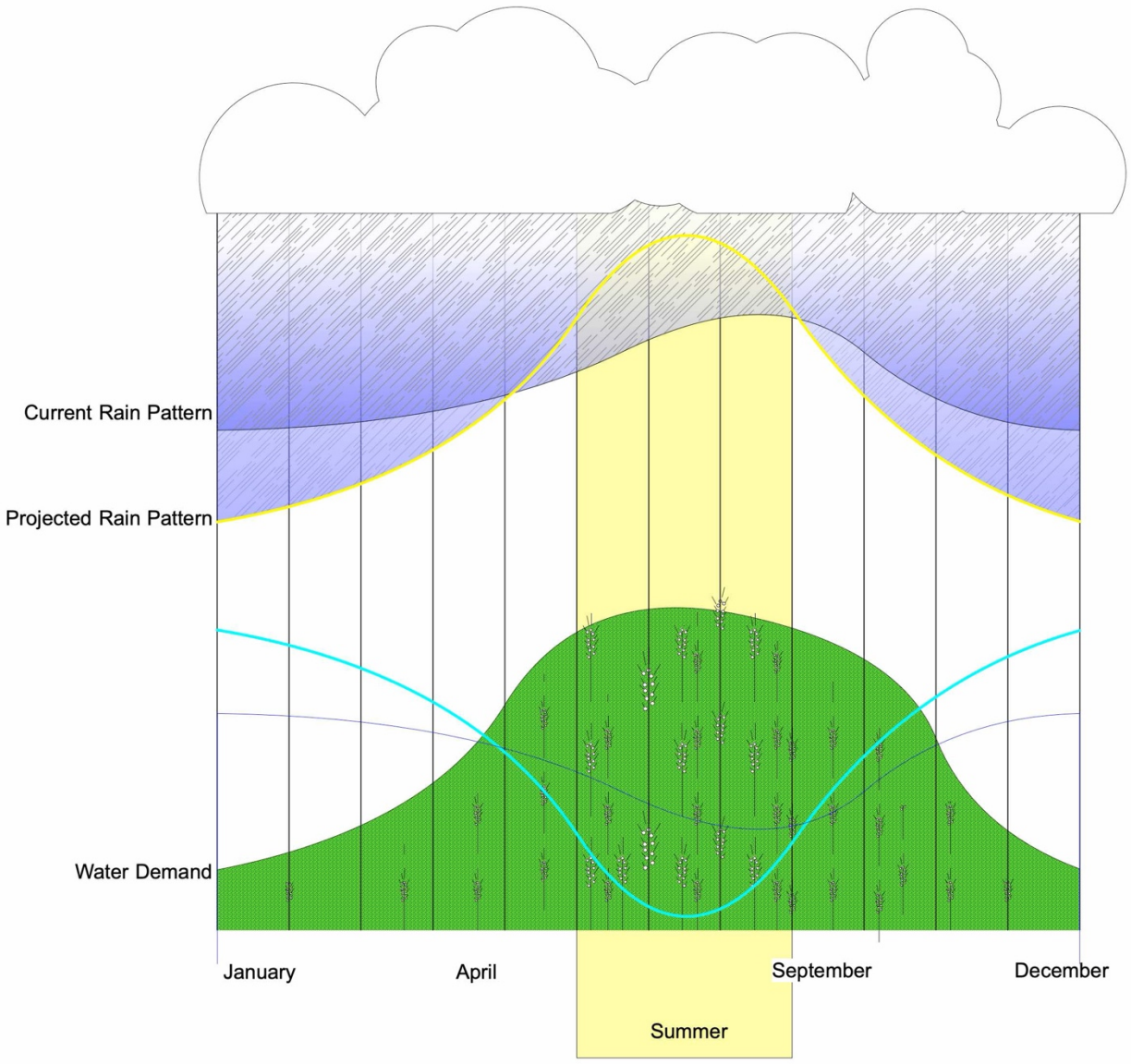
Climate Projections provide for several scenarios, and the two considered by this climate plan are called RCP 4.5 and RCP 8.5. The RCP 4.5 assumes greenhouse gas emissions are reduced by global climate policy and new technologies and is the low emission projection, while RCP 8.5 assumes greenhouse gas emissions will continue "business as usual" and continue to increase through the end of the century and is the high emission projection.[17]

## Drought

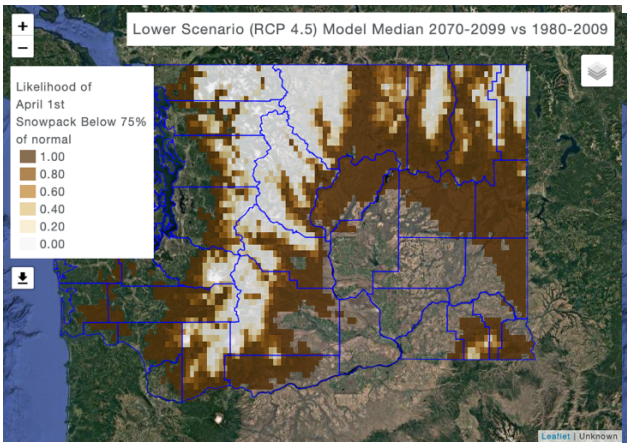
The data shows that George is going to see an increase in precipitation by the end of the century, however, when and how the rain falls is projected to be more concentrated with an increase in

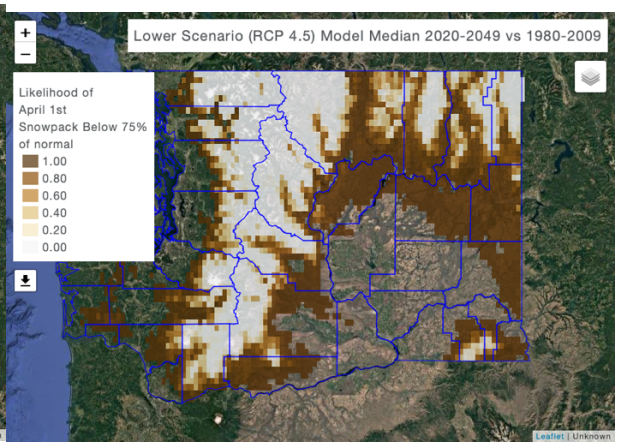
[15] Grant County Climate Impacts: https://www.grantcountywa.gov/DocumentCenter/View/14207/Grant-County-Climate-Impact-Report-June-2025
[16] Climate Impacts in Grant County: https://storymaps.arcgis.com/stories/1f7eca3b9cd04068b4e05ed941bea160
[17] Climate Mapping for Resilience and Adaptation https://livingatlas.arcgis.com/assessment-tool/explore/details

extreme rainstorm events and erratic decreases in summer precipitation. Overall, a 25% chance of summer drought is expected which means there will be less than 75% rainfall than the historical average between 1980 and 2009.

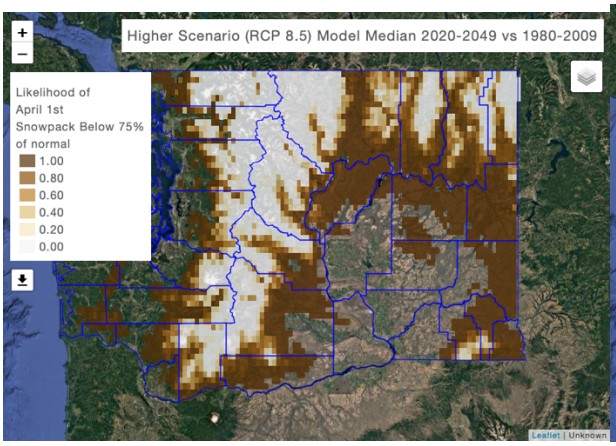


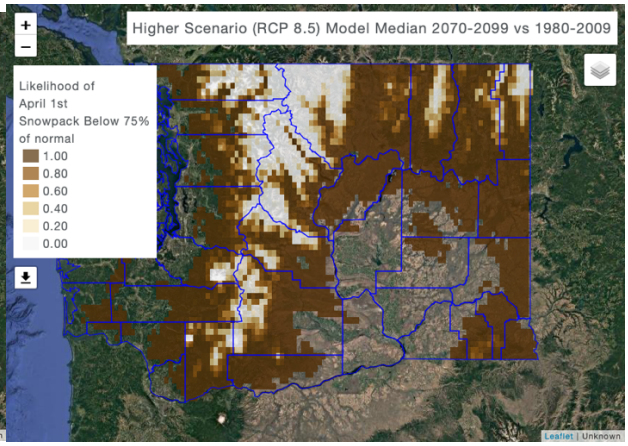

Reduced snowpack in the greater region can contribute to reduced aquifer levels and water supply, while water demand is expected to grow. Water sources are critical for health and quality of life for people, irrigation for farms, and hydroelectric power to enable industry. The following images show the projected chance of 75% or greater reduction in snowpack, a legal indicator of drought. Large dark brown areas with a value of 1, mean there is certainty of snowpack drought compared to the 1980-2009 base level of snowpack.




Low Emission Projections

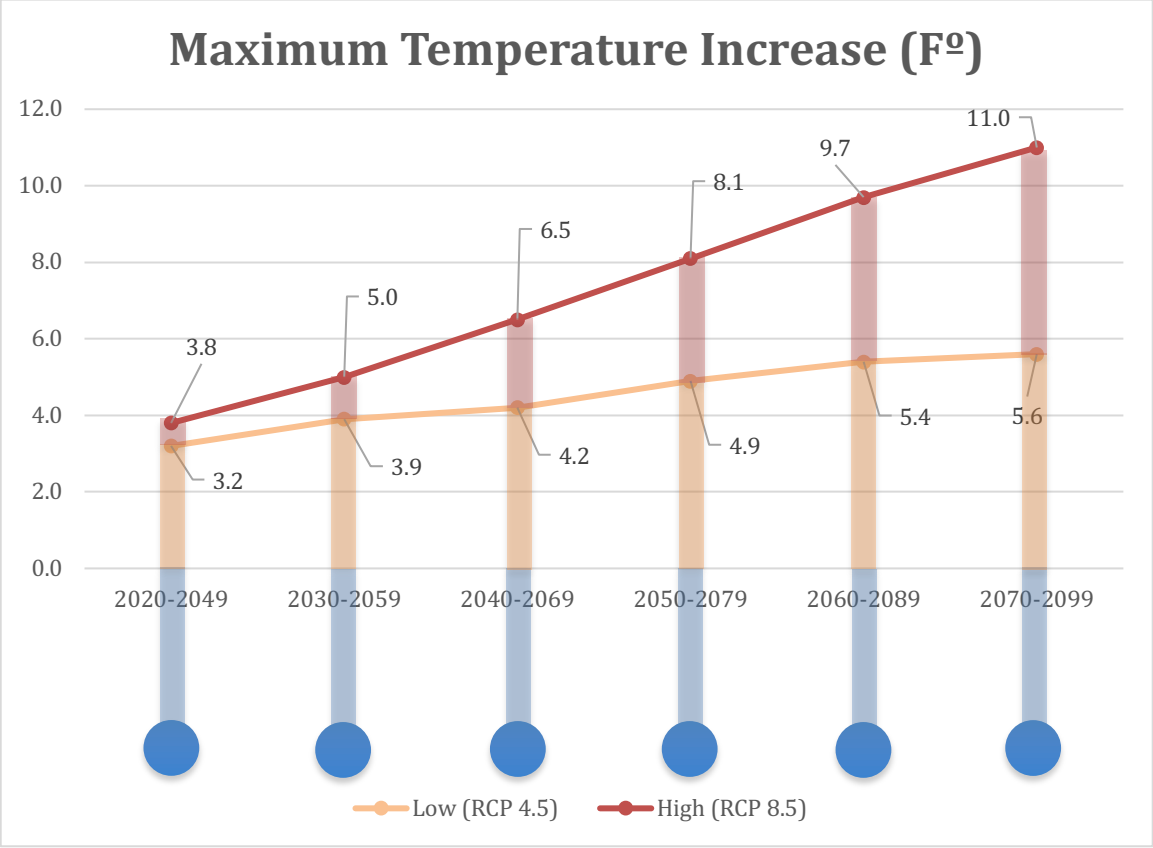



High Emission Projections

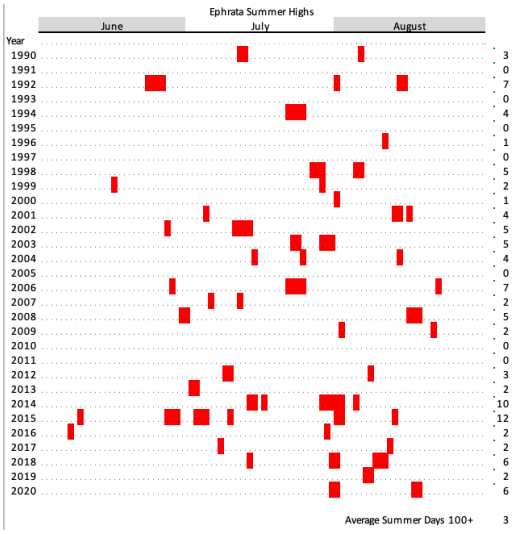
## Extreme Heat

George is going to see an increase in extreme heat days through the rest of the century. More days of the year will require cooling and fewer days of the year will require heating.

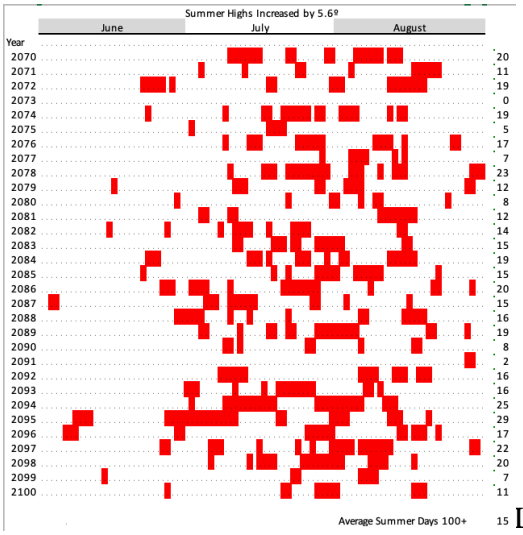



This chart shows the projected maximum summer (June-August) temperature increase from a low to high range.[18] Looking at temperature data from the nearby Ephrata weather station (George currently does not have its own weather station), the increase has significant impacts. Currently on average from 1990-2020, the area experiences only 3.3 days of the summer that reach 100º F or above. With the increase projected, that can become between 14.8 and 33.2 days of the year by the end of the century. For comparison of what that increased heat would feel like in the summer, taking a trip to today's Carlsbad, New Mexico provides a close approximation. Carlsbad averages 24 summer days over 100º as a comparison and shown in the charts below.

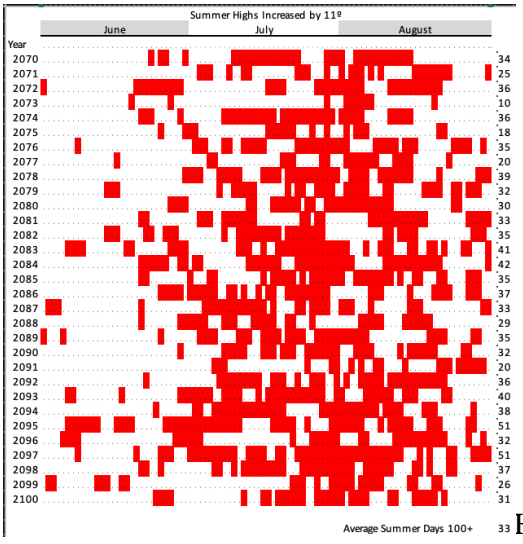
[18] Climate Mapping For A Resilient Washington: https://data.cig.uw.edu/climatemapping/



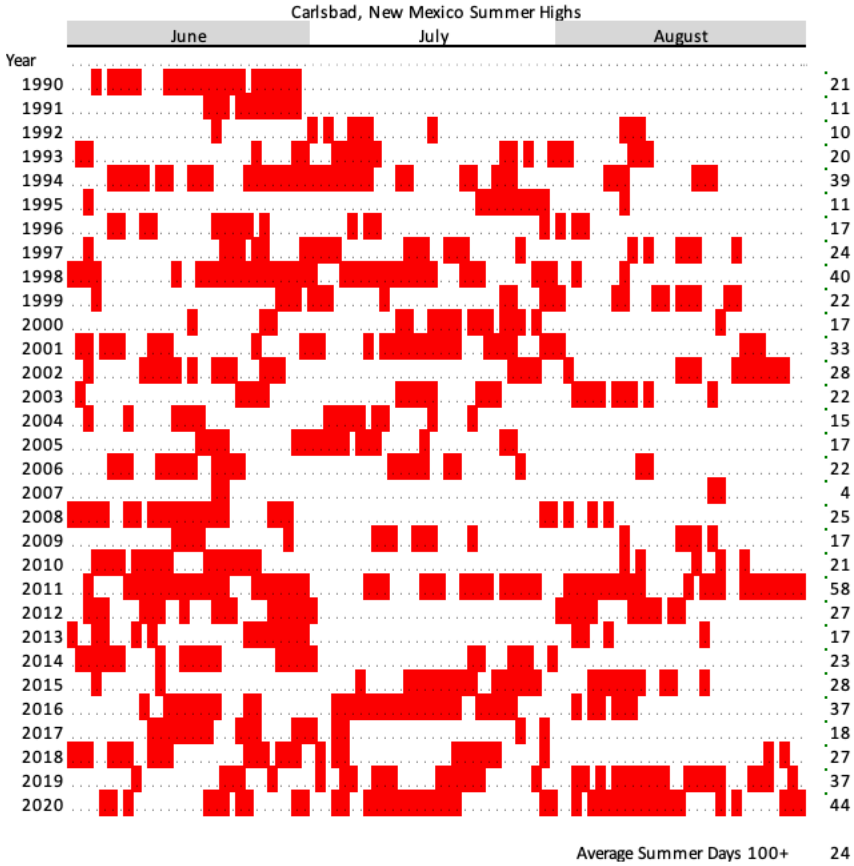

1990-2020 record of days 100º of higher




Low Projection of days 100º or higher



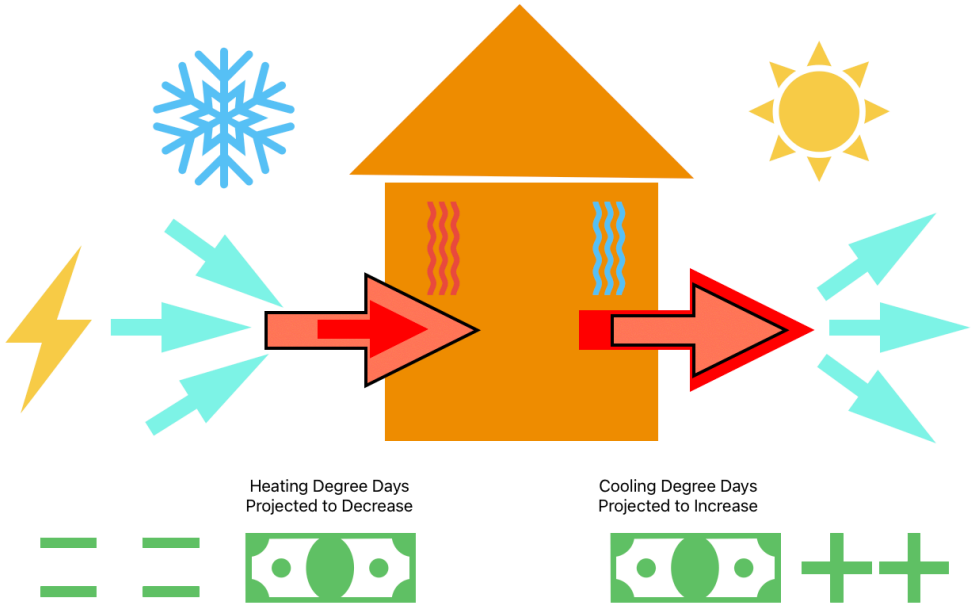

High projection of days 100º or higher




By comparison, the summers in Carlsbad, New Mexico currently experience 24 days 100 and over per summer.

While this increasing temperature lowers the energy consumption for heating demand in the winter months and shoulder seasons, the cooling energy demand is increased. This is significant to the built environment as it relates to energy consumption, as more heating or cooling means running a building heating or air conditioning system more. Utility district wide, the accumulated impact of hundreds of thousands of buildings responding to the climate can be taxing on a power utility.

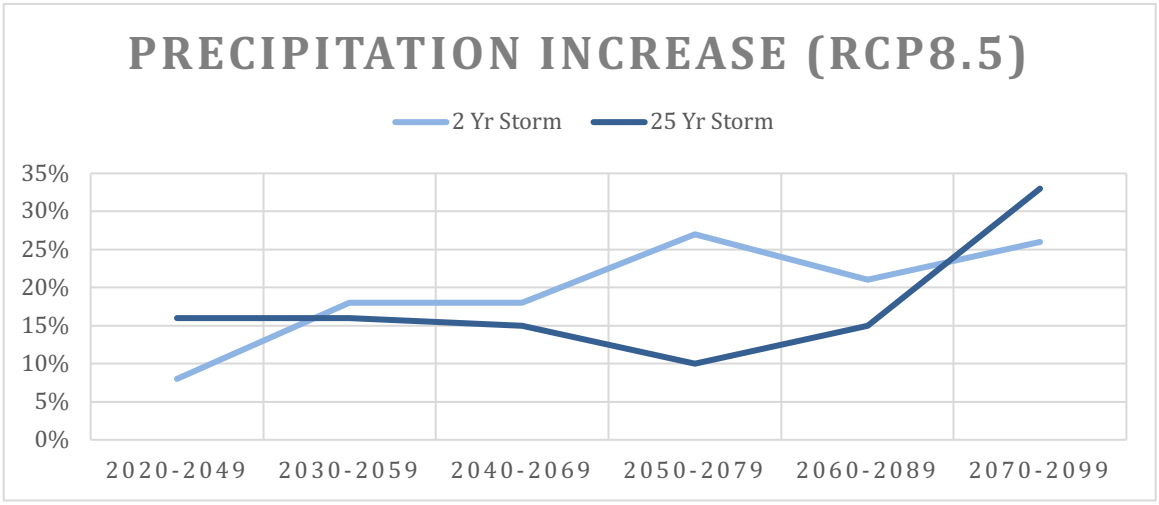
With a warming climate through 2099, George is expected to see between 569°F and 1,097°F degree-days increase for cooling annually. For heating, it's projected to see a reduction between 1,128°F and 2,014°F annually. While these numbers are a way to calculate changes consistently across the globe and the scientific community, what do these numbers mean? The decrease in heating needs is about double the amount of the cooling increase. This could equate to an annual reduction in energy consumption overall, if heating and cooling are equally efficient.




Another component of increased heat in the area is the ability for people and homes to cool at night is reduced when there are higher low temperatures. Natural ventilation is limited for its cooling effect, and evaporative cooling or mechanical means may be required which increases water and/or energy consumption in the evenings as well. If these cannot be provided, a persons heat stress is worsened.

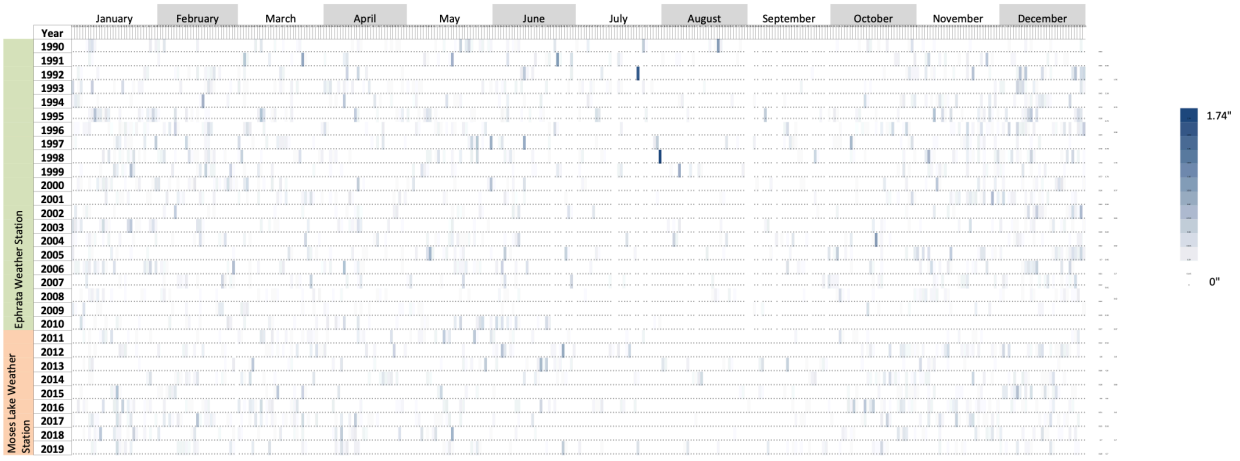
## Extreme Precipitation

George is going to see an increase in extreme precipitation through the rest of the century. While the occurrence of 1" (or greater) of rainfall in a day is not projected to increase much, heavier rainfall events are expected to increase in frequency compared to the period from 1980-2009.




This chart shows the projected percent increase to 2-year storms and 25-year storms over 30-year time periods through the end of the century.

The heatmap below, shows the max. rainfall intensity for each day from 1990-2019 recorded at an Ephrata and Moses Lake stations (no station was available for George)[19]. This 30-year data set, used as a base, can estimate increased daily rainstorm events using the increases from the charted data above.

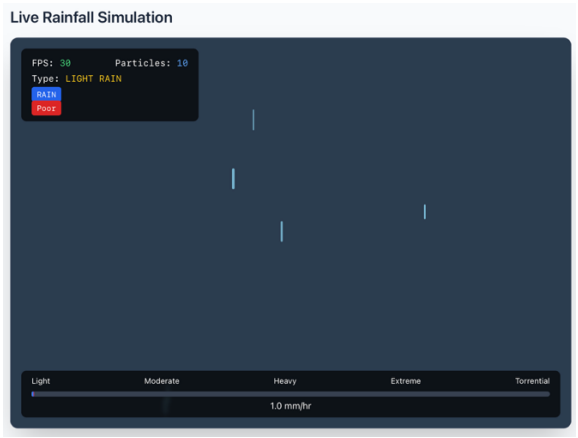


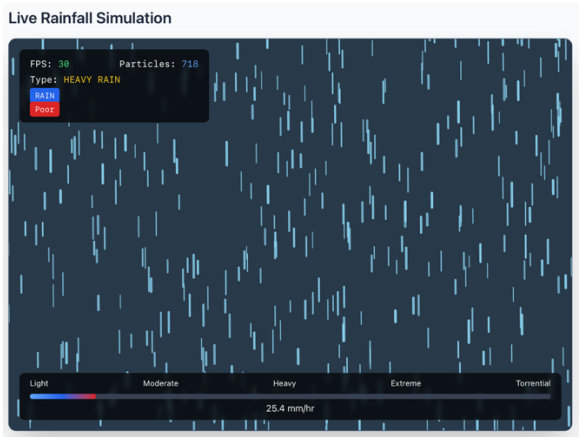

[19] https://www.climate.gov/maps-data/dataset/past-weather-zip-code-data-table
EPA Stormwater Calculator: https://swcweb.epa.gov/stormwatercalculator/precipitation

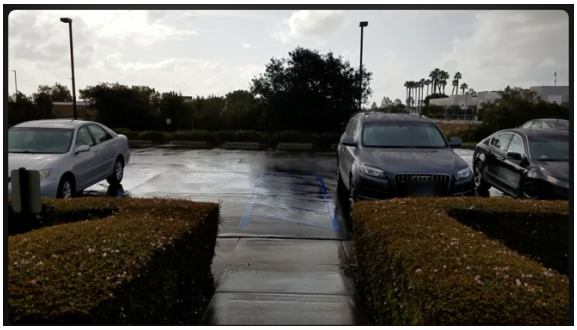
Max daily precipitation in 2 years- an average of each 2 yr period over 30 years is .8”/day with a range from .32”-1.74”. The average increased by 8-26% could see storms with 1” of rain falling in a day. Spread over a 24 hour period, rain intesity would only be .04”/hr, but if in a 2hr storm the intesity would be .5”/hr

Max daily precipitation in 25 years- an average of each 25 yr period over 30 years is 1.74”/day. Increasing this by 10-33% could see storms with 2.31“ of rain falling in a day. Spread over a 24 hour period, rain intesity would only be .1”/hr, but if in a 2hr storm, the intesity would be 1.15”/hr.

This means George could see storms that cause erosion issues or overload stormwater systems for short periods of time. Using an online rain simulator[20] or the NOAA rain rate visualizer[21], this can help visualize the intensity of rain being discussed. Videos at the links provide the best experience, but the photos provided from the noted sources give a general idea.



.04” / Hour Rainfall

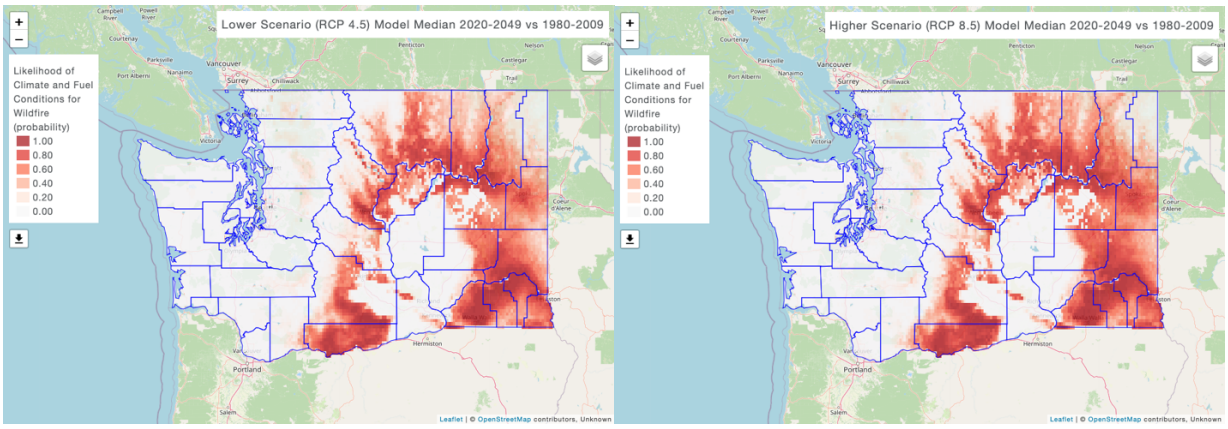
1”/ Hour Rainfall

[20] https://rainsimulator.com
[21] https://www.weather.gov/lox/rainrate

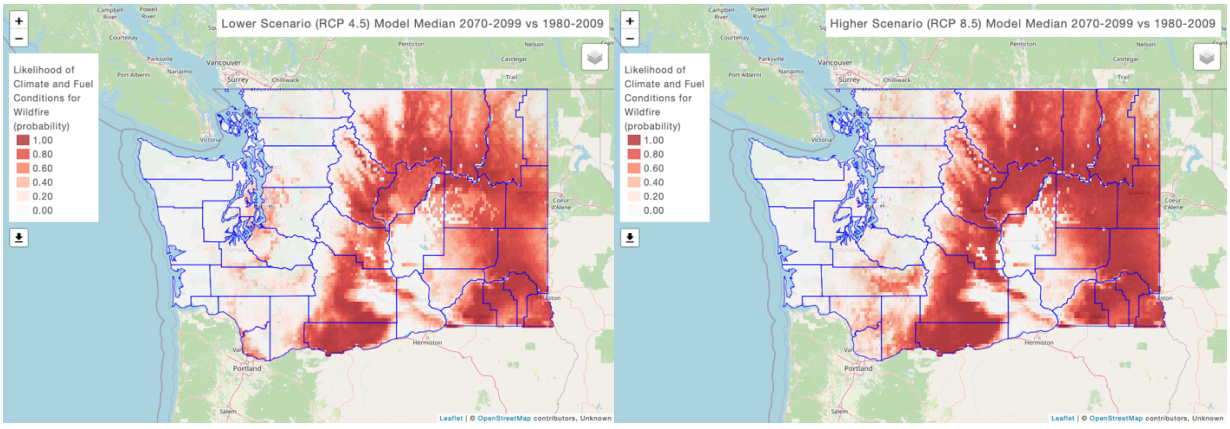
## Wildfire- Smoke and Air Quality

While George and most of Grant County is protected from an increased wildfire risk, it is surrounded by environments that will be at more risk. With the increased risk and wildfire events on all sides, the winds are likely to blow smoke and poor air quality into the City.

Locally, the undeveloped areas of towns have been generally mowed and maintained, reducing the amount of combustible fuels within the City. However, the process has encourages weed growth, and the concern from tumbleweed is high. These dry weeds accumulate through wind storms and need to be collected and disposed of at an increasing labor cost to the community. Higher average temperatures could increase fire risk from this specific source.

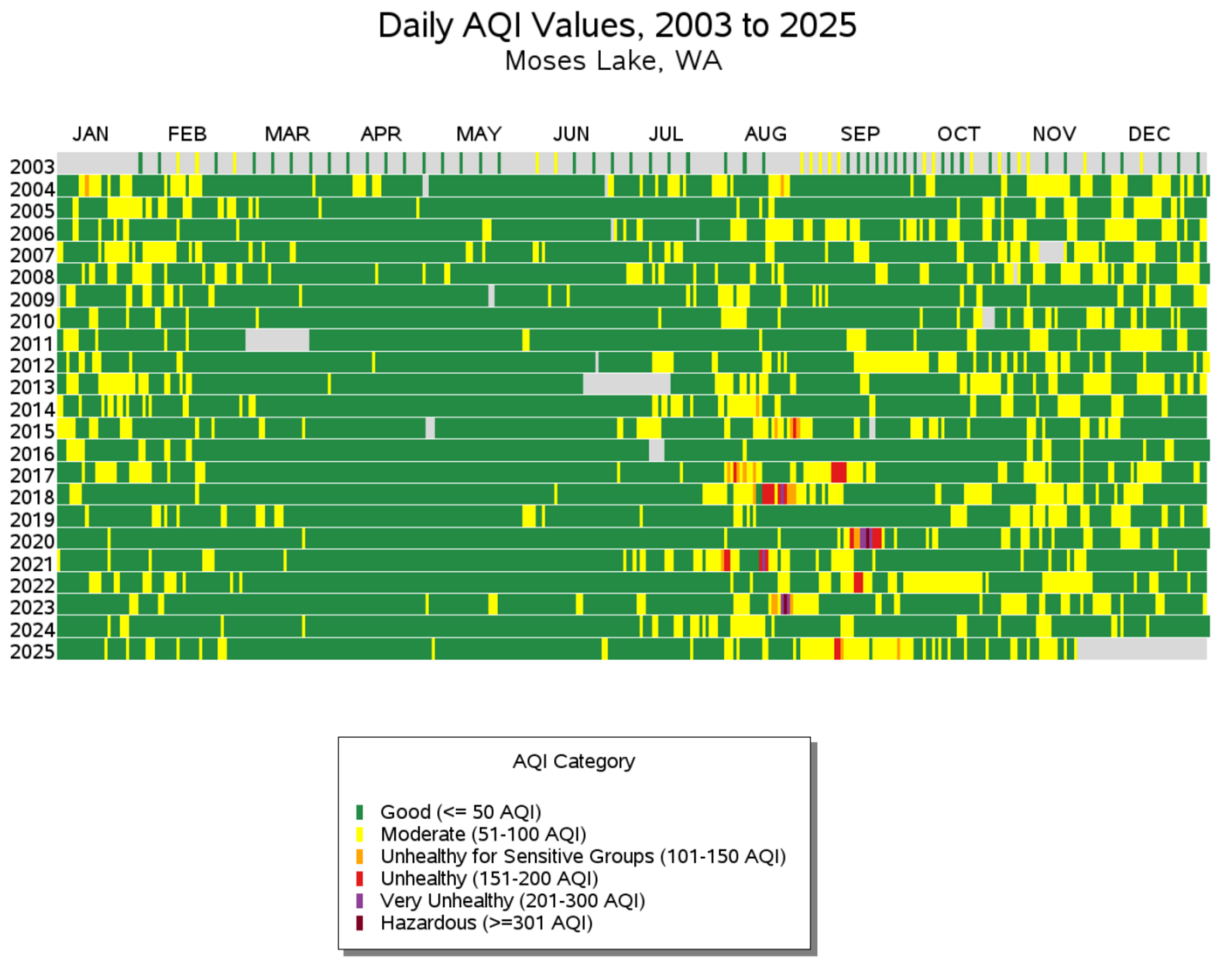



2020-2049 mapping of low to high projections of increased wildfire risk.



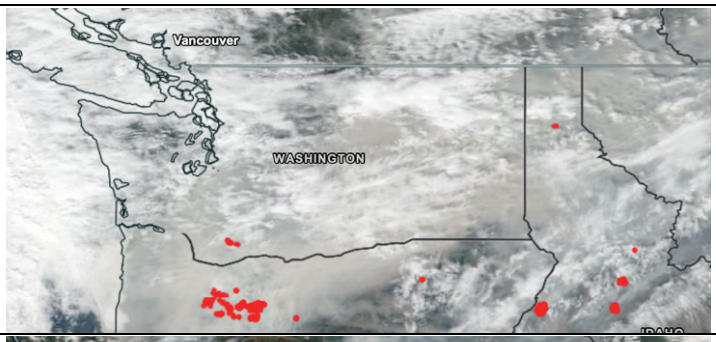
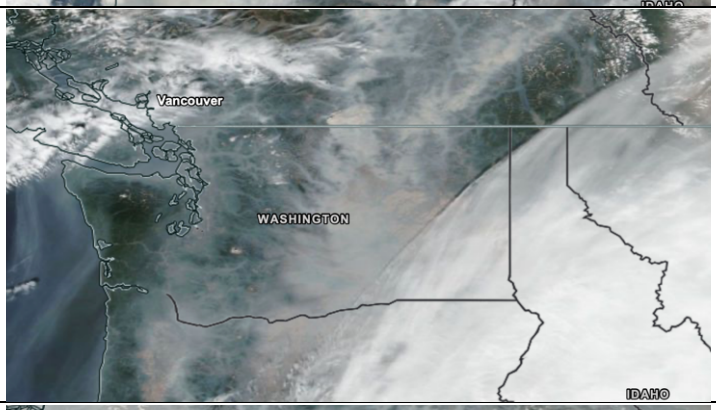
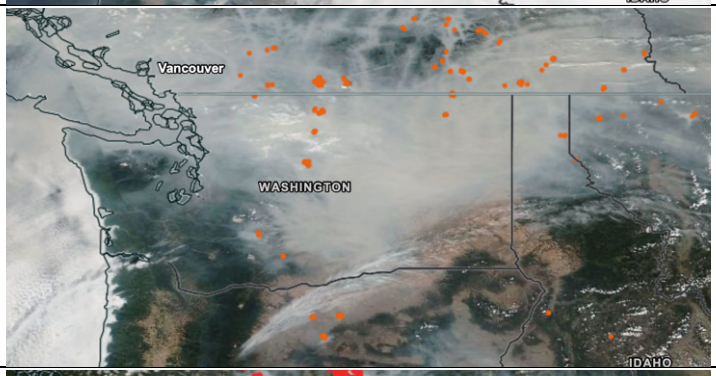
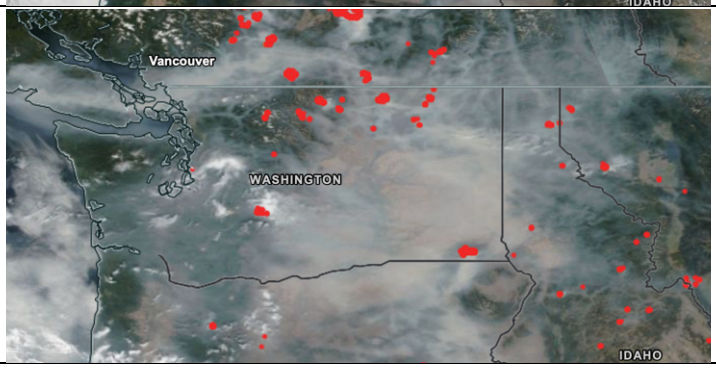

2070-2099 mapping of low to high projections of increased wildfire risk.

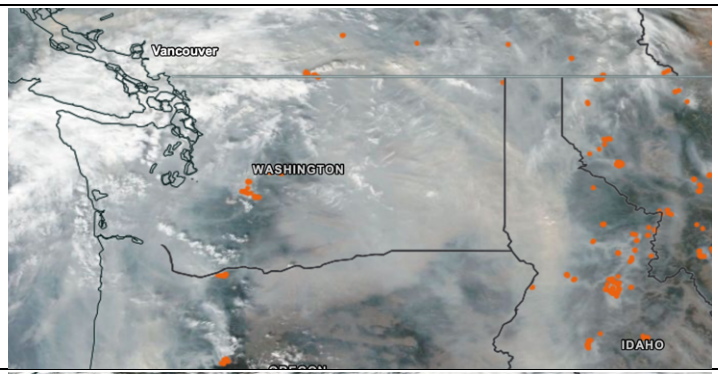
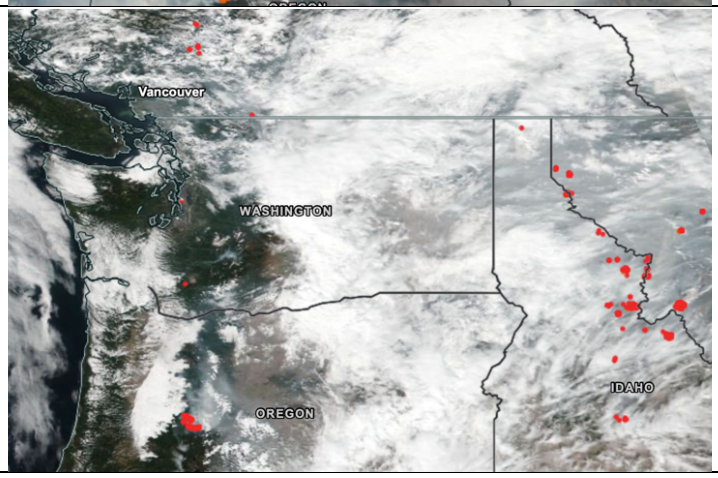
Reviewing Air Quality Index data from Moses Lake monitors from 2013-2025[22], poor air quality events are corelated with wildfire events from nearby brushfires to as far away as Canada. See data below. Since that the City is surrounded by an area with increased risk of wildfire through 2099, the impacts to the City's air quality are directly impacted.




The worst AQI events are dated in the table below and satellite imagery from NASA are matched[23], showing smoke clouds responsible for the poor air quality and highlighting the air quality impacts from surrounding wildfires as far as Oregon, Idaho, and Canada.

[22] https://www.epa.gov/outdoor-air-quality-data/air-data-multiyear-tile-plot
[23] https://worldview.earthdata.nasa.gov

| Max. Air Quality Index (AQI) | Event Date Range | Peak Date | Satellite Image |
|---|---|---|---|
| 316 | 9/9-18/2020 | 14 |  |
| 301 | 8/19-21/2023 | 20 |  |
| 273 | 8/13-19/2018 | 19 |  |
| 202 | 8/12-14/2021 | 13 |  |

| Max. Air Quality Index (AQI) | Event Date Range | Peak Date | Satellite Image |
|---|---|---|---|
| 197 | 9/4-8/2017 | 5 |  |
| 165 | 9/12/2022 | 12 |  |

## Exposure and Consequences

Each of the assets described above through the lens of 11 sectors may face consequences from the 4 main climate impacts reviewed, based on their exposure to those climate changes. The following tables organize each asset, pairs them with an impacting hazard(s), and ranks them with a low to high exposure rating. Then particular consequences are described for the assets with the highest exposures for consideration. Preliminary gaps and missing assets are also identified for further consideration.

| Climate Impacts Key | | | |
|---|---|---|---|
|  |  |  |  |
| Drought | Increased Heat | Extreme Precipitation | Smoke and Air Quality |

### Human Well Being and Emergency Management

| Sector & Assets | Climate Impacts | | | | Exposure (High - Medium - Low) | Consequences |
|---|---|---|---|---|---|---|
| |  |  |  |  | | |
| School | | ☑ | | ☑ | High | Increased demand as shelter and indoor space conditioning |
| Regional Health Centers | | ☑ | | ☑ | Medium | Increased demand for service, access more difficult |
| Library | | ☑ | | ☑ | Low | Increased demand as shelter |
| Fire Dept. | ☑ | ☑ | | ☑ | Medium | Increased Demand for Service |
| Sheriff's Office | ☑ | ☑ | | ☑ | Low | Increased Demand for Service |
| GAPS | | | | | | |
| Cooling Centers | | ☑ | | ☑ | High | Indoor Air Quality impacts |
| Local Clinics | | ☑ | | ☑ | Medium | |

## Cultural and Natural Resources

| Sector & Assets | Climate Impacts | | | | Exposure (High - Medium - Low) | Consequences |
|---|---|---|---|---|---|---|
| |  |  |  |  | | |
| Farms & Ranches (growing) | ☑ | ☑ | ☑ | ☑ | High | Shifting growing seasons |
| Ag Resource (processing) | ☑ | ☑ | | | High | Increased energy demand |
| City Events | ☑ | ☑ | ☑ | ☑ | Medium | Weather cancellations |
| Water Master Quarters | | ☑ | | | Low | Material Longevity |
| Martha's Inn Sign | | | | | Low | Material Longevity |
| Community Hall | | ☑ | ☑ | ☑ | Medium | Increased demand on service, complaints |
| City Parks | ☑ | ☑ | ☑ | ☑ | High | Increased maintenance, irrigation cost |
| Trails | | ☑ | ☑ | | High | Increased maintenance cost, lower use |
| Colonial Market | | ☑ | | ☑ | Medium | HVAC upgrades needed |
| GAPS | | | | | | |
| Social Space | ☑ | ☑ | ☑ | ☑ | Medium | Not prioritized |

## Infrastructure

| Sector & Assets | Climate Impacts | | | | Exposure (High - Medium - Low) | Consequences |
|---|---|---|---|---|---|---|
| |  |  |  |  | | |
| City Streets | | ☑ | ☑ | | Medium | Temporary puddles/washouts. Thermal fractures. Increased maintenance cost |
| Sewer System | | | | | None | |
| Water System | ☑ | ☑ | | | High | Potable Water Shortage, |
| Stormwater Facilities | | | ☑ | | Low | Overburdened and uncontrolled water flow |
| I-90 | | ☑ | ☑ | ☑ | Med | Visibility limitations, Thermal fractures for increased maintenance |
| Overpass | | ☑ | | | Low | Increased Maintenance cost |
| Canal Bridges | | ☑ | | | Low | Increased Maintenance cost |
| GAPS | | | | | | |
| | | | | | | |

## Ecosystems and Water Resources

| Sector & Assets | Climate Impacts | | | | Exposure (High - Medium - Low) | Consequences |
|---|---|---|---|---|---|---|
| |  |  |  |  | | |
| Shrub Steppe | | | | ☑ | Medium | Wildfire impacts and resulting weed growth |
| Wetlands | ☑ | | ☑ | | Low | Algae or Insect growth changes |
| USBR Canals | ☑ | | | | High | Reduction of irrigation capacity |
| Crop Lands | ☑ | ☑ | | ☑ | High | Shifting growth seasons, changing pest habits, Increased production cost |
| GAPS | | | | | | |
| | | | | | | |

## Community Design, Land Use, and Economic Development

| Sector & Assets | Climate Impacts | | | | Exposure (High - Medium - Low) | Consequences |
|---|---|---|---|---|---|---|
| |  |  |  |  | | |
| Industrial Park | ☑ | ☑ | | ☑ | Medium | Competing for Power Availability, |
| Trucking Ind. | | ☑ | ☑ | ☑ | High | Reduces Product, weather and poor visibility events can stop travel |
| Proximity to Gorge Amp. | ☑ | ☑ | ☑ | ☑ | Medium | Discourages Attendance |
| Housing | ☑ | ☑ | | ☑ | High | Need Air Filtration and AC. Potable Water Supply needs to be conserved |
| Undeveloped Land | ☑ | | | ☑ | High | Fire and Weed Risk |
| Commercial Core Plan | | ☑ | ☑ | | Low | Competing Energy Demands, Erosion of Hill |
| Lodging | ☑ | ☑ | ☑ | ☑ | Medium | Discourages Attendance |
| GAPS | | | | | | |
| | | | | | | |

## 4. Prioritizing

Understanding the climate hazard impacts to the City, the following should be contemplated as priorities in policy development. These will be discussed further through comprehensive planning workshops and reassessed as the community continues to provide input as they better understand climate hazards. These provide a starting point for engagement.

**Schools-** Outdoor spaces have high exposure to hotter days, smoke & dust, putting greater burden on the indoor school facilities. As school facilities accommodate children, they can also be used to support the greater community, increasing the school's burden to address climate resiliency.

**Healthcare-** While George doesn't have health care assets within its City Limits, the pressures on regional facilities will increase, potentially increasing health disparities for people in George with limited transit capabilities, outdoor work conditions, aged housing, and limited financial means.

**Parks and Trails-** Outdoor spaces have high exposure to hotter days, smoke & dust. Use may decrease due to extreme weather reducing healthy activity and transportation opportunity.

**Agriculture Related Economy-** High exposure to drought caused by shifting growing seasons, and crop and worker vulnerability from high exposure to heat and smoke/dust, will have negative health and economic impacts.

**Housing-** Older housing stock and mobiles homes have high exposure to high heat, and poor air quality. Increased energy costs to poorly insulated structures, and health impacts for unfiltered air through smoke/dust events.

**Undeveloped Land-** High exposure to extreme rain events, high heat, and drought. These climate hazards promote weed growth that quickly die and dry, increasing fire hazards within the City.

## 5. Gaps

### Policy Audit, SWOT Analysis, and Workshop

To further understanding of the gaps in the City's climate hazard policies, existing policies will be audited to see where City assets are prepared to address climate hazards and where they are lacking. This work entails a thorough review of existing policy set in the City's Comprehensive plan, development regulations, design standards, and municipal codes. Working backwards from relevant policy, the climate hazard and assets being protected will be identified, and how the consequences of the pairing are being mitigated by the policy. If there are gaps, this will be a time to suggest improvements. Using this data, in conjunction with the 2027 periodic update,

doing a Strengths, Weaknesses, Opportunities, and Threats (SWOT) analysis will be a useful community workshop to hold.

### Vulnerability and Risk Assessment

The vulnerability of these assets and the level risk to them from climate impacts will be assessed further to assist the City in choosing goals and policies to be integrated into the City Comprehensive Plan 2027 Periodic Update.

## Appendices

### Appendix A: Demographic Charts