

Strengthening Heat Resiliency in Communities of Color in Southern Nevada

2021

Guinn
CENTER

Table of Contents

I. Introduction.....	3
II. Extreme Heat as a Natural Disaster	5
Impact of COVID-19	7
III. Study Design	12
Landscape Analysis.....	12
Summary of Existing Policy Infrastructure	12
Community Needs Assessment	16
The Impacts of Extreme Heat	18
The Impact of COVID-19.....	20
Gap Analysis.....	20
Public Spaces	21
Private Spaces	23
Transit	26
Workplace	29
IV. Policy Recommendations	31
References	35

This work is funded by the Walmart Foundation as part of its research initiative, “Impact of COVID-19 on Communities of Color,” (Grant ID 61390707).

List of Figures and Tables

Figure 1. Summary of Case Study, Las Vegas.....	4
Figure 2. Days Exceeding 100° Fahrenheit in Southern Nevada.....	6
Figure 3. Emergency Room Visits in Region 9 and Heat Index.....	7
Figure 4. COVID-19 Deaths and the Average Heat Index in Southern Nevada.....	8
Figure 5. Exposure to Heat, Southern Nevada.....	9
Figure 6. Adaptive Capacity to Heat, Southern Nevada.....	10
Figure 7. Extreme Heat Vulnerability, Southern Nevada.....	11
Figure 8. Community Attitudes about the Risks Posed by Extreme Heat.....	17
Figure 9. Community Attitudes about Government Actions.....	17
Figure 10. Percent of Households who Reduced Expenses ‘Some Months’ to Pay an Energy Bill.....	20
Figure 11. Community Member Allocation of Time at Home during 2020.....	24
Figure 12. Decision Space Where Community Members most Experience Extreme Heat.....	26
Figure 13. Public Bus Stops, Southern Nevada.....	26
Figure 14. Water Fountain from 50-year-old public school, Clark County, Nevada.....	27
Figure 15. Water Fountain and Water Bottle Refilling Station in Newly Remodeled School, Clark County.....	27
Table 1. Existing Heat-Related Policy Landscape in Southern Nevada.....	14-15
Table 2. Characteristics of Community Members Surveyed.....	16
Table 3. Public Services and Programs Listed by Community Members in Southern Nevada to Help Address Heat-Related Challenges.....	24

I. Introduction

Extreme heat events are becoming more common and more severe. Exceptionally high temperatures can lead to significant increases in hospital visits for heat-related illnesses, emergency calls, and even death. In fact, extreme heat is responsible for the highest number of annual deaths among all weather-related hazards. In many built environments fashioned from cement and asphalt, extreme heat disproportionately affects communities of color and/or low-income communities.¹ These disparities have prompted governments, researchers, and community groups to advocate for policy interventions that can mitigate the impacts of climate change on vulnerable populations.

As reported by the Guinn Center and others, the recent public health crisis has disproportionately affected communities of color.² COVID-19 is a system shock that may have exposed and exacerbated individual and household vulnerability to extreme heat and tested the policy infrastructure intended to manage climate-related hazards and mitigate their impacts. The pandemic thus presents an opportunity to both examine the extent to which existing policies address the vulnerabilities of people to extreme heat and to identify opportunities to strengthen their adaptive capacity, defined as the capacity of institutions, systems, and individuals to respond to potential damage, take advantage of opportunities, and/or to react to consequences.

Temperatures in southern Nevada are rising, exacerbated by rapid urbanization in recent decades. Las Vegas is now the fastest warming city in the United States.³ Additionally, southern Nevada is one of the most diverse regions of the country, fueled by immigration and the increasing population of Asian American and Pacific Islanders and Latinos.⁴ Nevada also ranks in the top 10 of states with significant Native American populations.

This study has three research questions (see Figure 1):

1. What vulnerabilities to extreme heat did the COVID-19 pandemic expose or exacerbate?
2. Which policies and programs have helped address these vulnerabilities? What gaps exist?
3. How can policy enhance adaptive capacity to extreme heat?

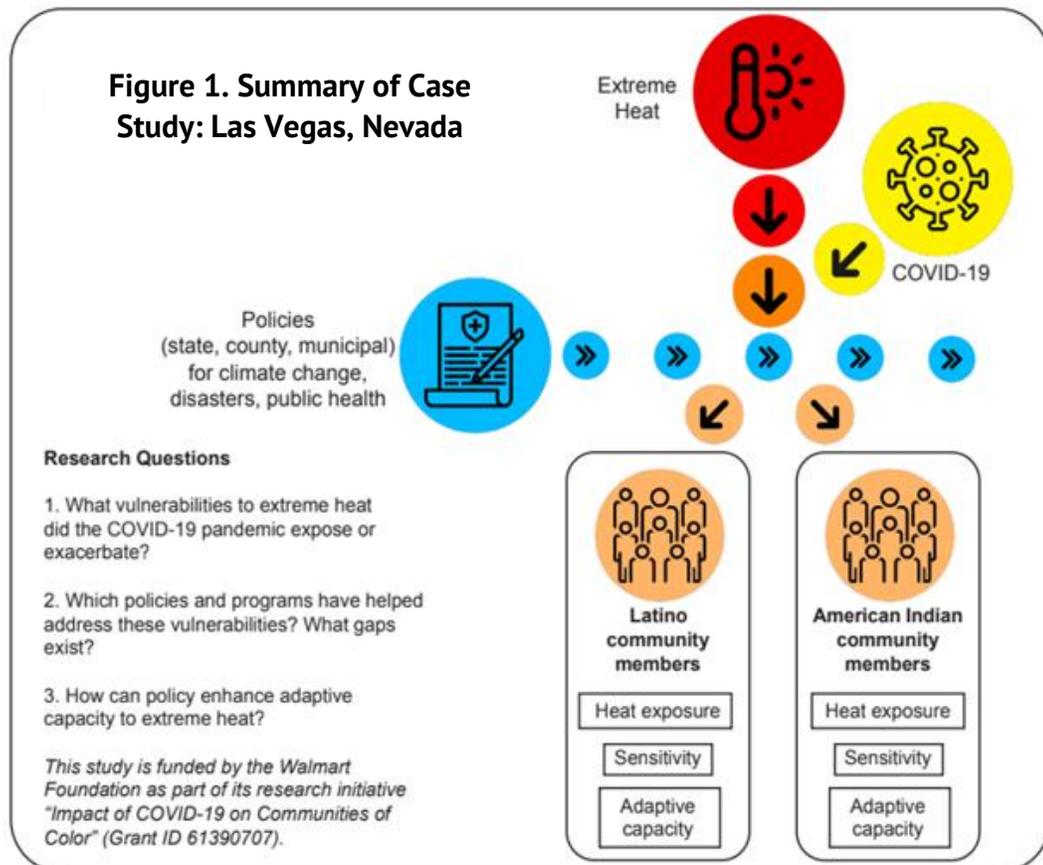
To answer these questions, we completed the following tasks, which provide an organizational framework for this report:

- (A) Landscape Analysis: This section summarizes the existing government policies and programs that have helped mitigate vulnerabilities of communities of color in southern Nevada to extreme heat.
- (B) Community Needs Assessment: This section examines the extent to which the COVID-19 pandemic exposed and/or exacerbated the vulnerabilities of communities of color in southern Nevada to extreme heat.
- (C) Gap Analysis: This section identifies gaps in the extent to which existing government-sponsored policies and programs address the heat-related challenges experienced by members of communities of color in southern Nevada that may have been exacerbated during COVID-19.

(D) Development of Policies: Our team concludes by offering a set of recommendations that decision-makers may want to take under advisement. These recommendations include policies and programs that could address some of the gaps our researchers identified and could enhance individual and community adaptive capacity to extreme heat.

There are few points of clarification and context regarding the scope of the study. This study was funded by the Walmart Foundation and completed in partnership with Arizona State University’s Morrison Institute, a nonpartisan applied policy center. Due to grant requirements, our research teams limited the scope of the report. Specifically, we focused on an examination of the ways in which COVID-19 exposed existing vulnerabilities among Native Americans and Latinos in Phoenix and Las Vegas to extreme heat. At the time this grant was funded, there was concern about the high COVID-19 rates among Native Americans in Arizona, who account for over five percent of the state’s population.⁵ There was also concern about the impact of COVID-19 on Latinos. Both Arizona and Nevada have experienced significant growth in the Latino population in recent years.

While the needs assessment was informed largely by the interviews with Latino and Native American community members (as well as community leaders), the recommendations our research team developed are comprehensive and broad-based. As such, they are applicable to any individual and/or household who is vulnerable to extreme heat in southern Nevada. Vulnerable populations might include individuals who live in neighborhoods without significant trees or shade cover, individuals who rely on public transportation, laborers who work outside, isolated senior citizens, and individuals on a fixed income.



II. Background: Extreme Heat as a Natural Disaster

Researchers and public health officials acknowledge that heat is the most dangerous weather phenomenon, causing more deaths annually in the United States than tornadoes, floods, or hurricanes. “Heat waves kill more people in the United States than any other disaster. [O]n average, 1,500 American city dwellers die each year due to heat. By comparison, annual deaths from tornados, earthquakes and floods combined average fewer than 200 nationwide. Excessive heat during the nighttime hours is a predictor of heat-related injury and deaths. Nighttime temperatures in the 85th percentile of the temperature distribution are likely to set the stage for an increase in heat-related deaths and injuries.”⁶

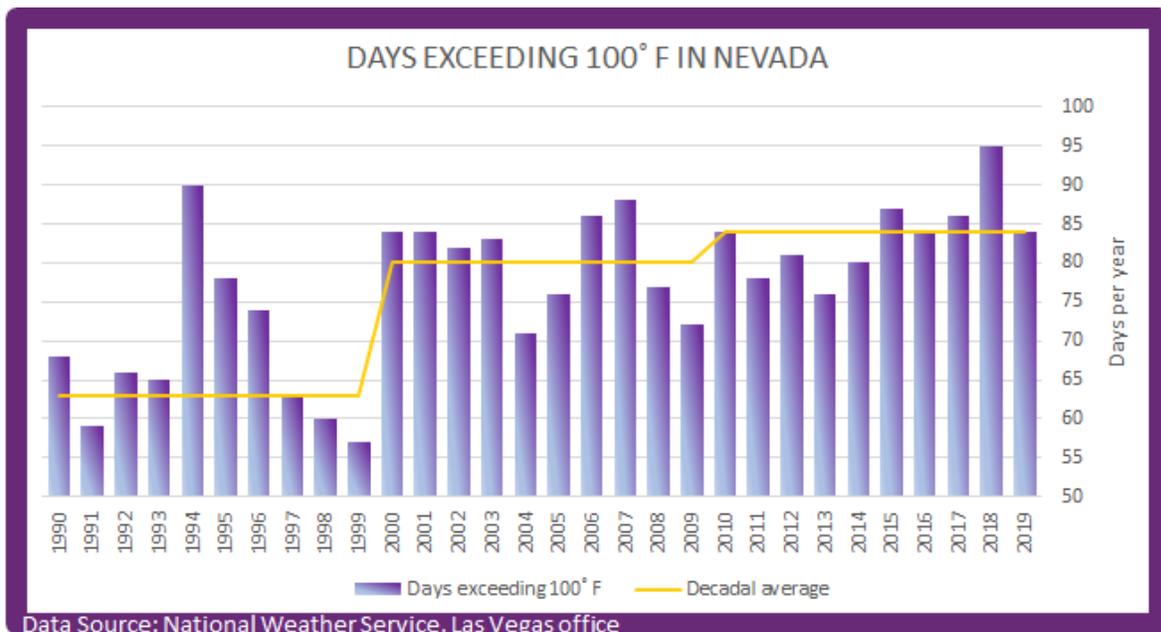
The National Weather Service (NWS) issues a heat advisory when the heat index surpasses 95 degrees Fahrenheit, and an excessive heat (or extreme heat) warning when the heat index exceeds 105 degrees Fahrenheit for more than two hours. A 2019 study by the Union of Concerned Scientists estimated that, absent significant policy interventions, the number of days each year when the heat index will exceed 100 degrees Fahrenheit is expected to more than double by the end of the century.⁷

These projections are cause for serious concern for residents of Nevada. On average, Nevada has historically seen around 12 days per year with a heat index above 90 degrees. Barring significant policy change, that number could climb to 39 days per year by midcentury and 68 by 2100.⁸ The estimates are even more alarming for southern Nevada, which currently experiences about 99 days per year when the heat index reaches more than 90 degrees. By the year 2100, that number could increase to 150 days per year. And the number of days with a heat index above 100 degrees could reach as high as 96 days per year (or more than three months) by the end of the century. Absent any action, southern Nevada could expect to experience more than 30 days of extreme heat (105 degrees Fahrenheit) by 2100.⁹ (Data indicate that Las Vegas is the fastest warming city in the United States. Over the period 1970-2018, average temperatures in Las Vegas have increased 5.76 degrees Fahrenheit.)¹⁰ Figure 2 reveals the number of days exceeding 100 degrees Fahrenheit in southern Nevada over the period 1990-2019. As illustrated, the number of days has been increasing as has the decadal average.

Increasing temperatures and the projection of more frequent days of extreme heat are the direct result of climate change and the rise in greenhouse gases.¹¹ Also driving the hotter temperatures is rapid urbanization.¹² Nevada has been the fastest-growing state for five straight decades; it is the only state that maintained a growth rate of 25 percent or greater for the last three decades.¹³ The state demographer estimated Nevada’s population in 2020 was 3.10 million, which reflects an increase of 1.078 million (54 percent) since 2000.

Within Nevada, Clark County is the fastest growing county in the state with an overall population growth rate of 65.0 percent from 2000 to 2020. Clark County’s population grew 42.0 percent during 2000-2010, and 16.0 percent from 2010 to 2020.

Figure 2. Days Exceeding 100° Fahrenheit in Southern Nevada



Source: Reprinted from Regional Transportation Commission, *Extreme Heat Vulnerability Analysis*, 2021.

The rapid growth and subsequent urbanization have resulted in the construction of asphalt roads and concrete buildings and structures. Concrete absorbs and retains the sun’s heat, giving rise to urban heat islands. “When temperatures rise, the countless miles of concrete streets, sidewalks, walls and roofs in cities magnify that effect, creating a phenomenon known as urban heat islands. When combined with the heat released by vehicle engines, paved areas can boost the temperature in cities by as much as 22°F, according to the Environmental Protection Agency.”¹⁴ A 2019 study found that Las Vegas is the worst city for the urban heat island during both the day and night.¹⁵

Increasing temperatures could lead to more heat-related illness and strain energy systems as the demand for cooling continues to increase. According to the U.S. Centers on Disease Control (CDC), extreme heat elevates the risk of dehydration and heat stroke and can affect people’s cardiovascular, respiratory, and nervous systems – resulting in increased hospital admissions for heat-related illness. “Extreme heat events can trigger a variety of heat stress conditions, such as heat stroke. Small children, the elderly, and certain other groups including people with chronic diseases, low-income populations, and outdoor workers have higher risk for heat-related illness. Higher temperatures and respiratory problems are also linked.”¹⁶

A 2019 Desert Research Institute (DRI) study identified “a clear correlation between heat wave episodes and heat-related deaths in Las Vegas over the last ten years.”¹⁷ Over the period 2007 to 2016, there were 437 heat-related deaths in Las Vegas, with the greatest number occurring in 2016. “Interestingly, 2016 also shows one of the highest heat index measures over the last 35 years. This shows a clear relationship between increasingly intense heat events in our area and public health effects.” More recent data indicates that there were 130 heat-related deaths among Clark County residents in 2018, 78 in 2019, and 82 in 2020.¹⁸

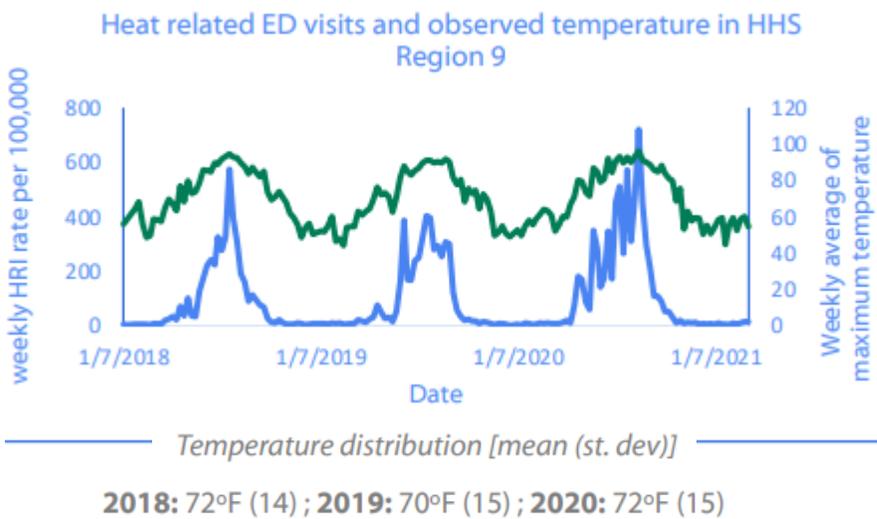
Warmer temperatures mean less snowpack flowing into the Colorado River, which supplies southern Nevada’s water. Southern Nevada’s response to extreme heat and the urban heat island effect is challenged because traditionally effective heat mitigation efforts, such as increasing vegetation coverage, are complicated by the region’s environmental and developmental considerations brought about by factors related to population growth and sustained urban and suburban development. These hazards contribute to the ongoing drought in the region, impact infrastructure, and lead to more intense and localized flash flooding. Prolonged drought conditions could also contribute to increased wildfire risks, which further worsen air quality in the region.

Policymakers in southern Nevada have acknowledged the dangerous impacts of extreme heat. Several government-led efforts – including master plans and hazard mitigation plans – published within the last decade have specifically identified extreme heat. Some of these efforts have included a discussion of the impact of extreme heat and included measures or interventions designed to mitigate the impact of extreme heat.

The Impact of COVID-19

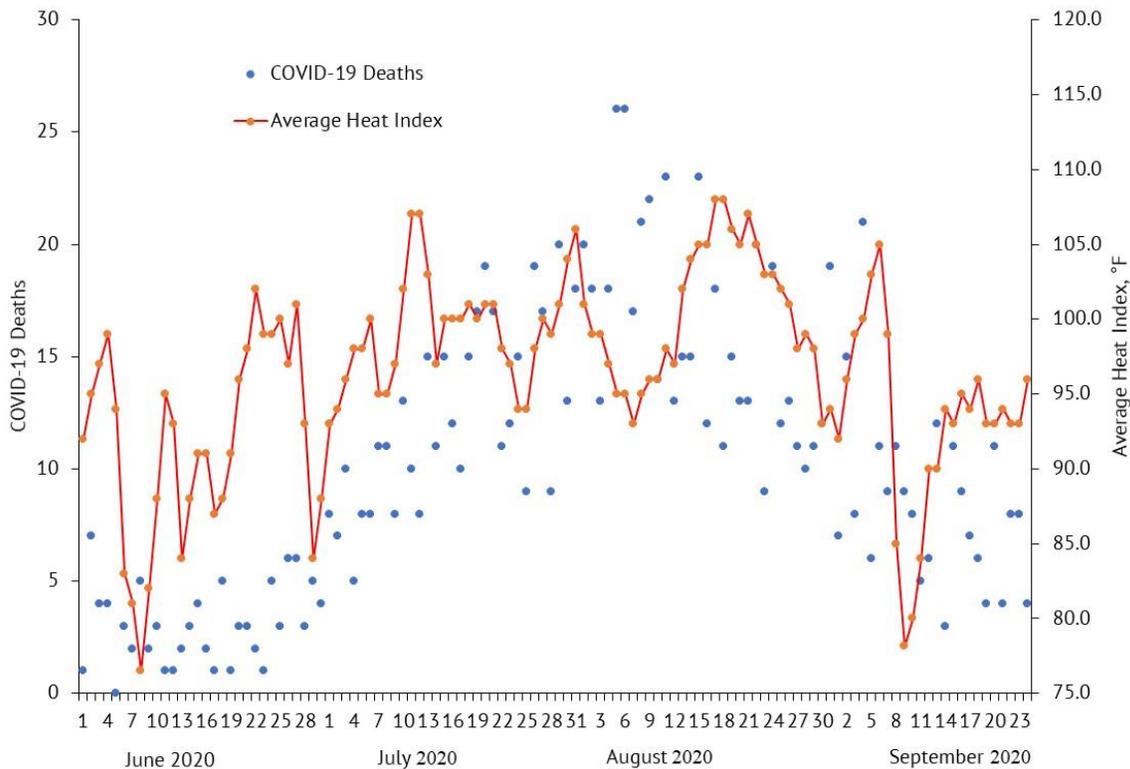
Given the magnitude of the recent public health crisis, researchers have been examining the impact of heat during COVID-19. The CDC found that in some areas, such as Health and Human Services Region 9 which includes Nevada, there was a sharp increase in heat-related emergency room visits during the summer months of 2021 (see Figure 3). Similarly, DRI research scientist Erick Bandala examined the average heat index in Nevada and COVID-19 related deaths in 2020 and found a slightly positive and significant correlation (0.52) (see Figure 4).

Figure 3. Emergency Room Visits in Region 9 and Heat Index



Source: U.S. Centers on Disease Control (CDC).

Figure 4. COVID-19 Deaths and the Average Heat Index in Southern Nevada



Source: Erick Bandala, Ph.D., Desert Research Institute, 2021.

Moreover, in its 2020 report, *The Impact of COVID-19 on Communities of Color*, the Guinn Center found that many of the risk factors that increase vulnerability to heat also increase vulnerability to COVID-19. Health factors such as heart disease and chronic pulmonary disease are associated with higher risk of COVID-19. For example, the overall prevalence of heart disease in Nevada is the highest among Native Americans (5.8 percent).¹⁹ Individuals working in front-line industries and sectors most affected by the pandemic also faced greater exposure to COVID-19. In the accommodations and food services sector, Latinos account for 36 percent of employment, but represent only 30 percent of the population. The presence of these risk factors in Native American and Latino communities have led to disproportionately adverse outcomes during COVID-19. For example, as noted, Latinos represent 30 percent of Nevada’s population but account for 36 percent of COVID-19 cases. Native Americans comprise 1.1 percent of Nevada’s population and represent 0.6 percent of COVID-19 cases. While the number of COVID-19 cases among Nevada’s Native American communities appears low, it has been reported that “tribal case counts don’t seem to be reflected in state tallies.”²⁰

Even within a given setting, such as a city, vulnerability to heat is not equally distributed.²¹ Uneven patterns of investment, dislocation, and zoning laws have resulted in some of Nevada’s communities—disproportionately minorities and people experiencing poverty—facing a state of heightened exposure and vulnerability to climate-related threats.²² Generally, residents who are not white, have low or fixed incomes, are homeless, and those in other historically

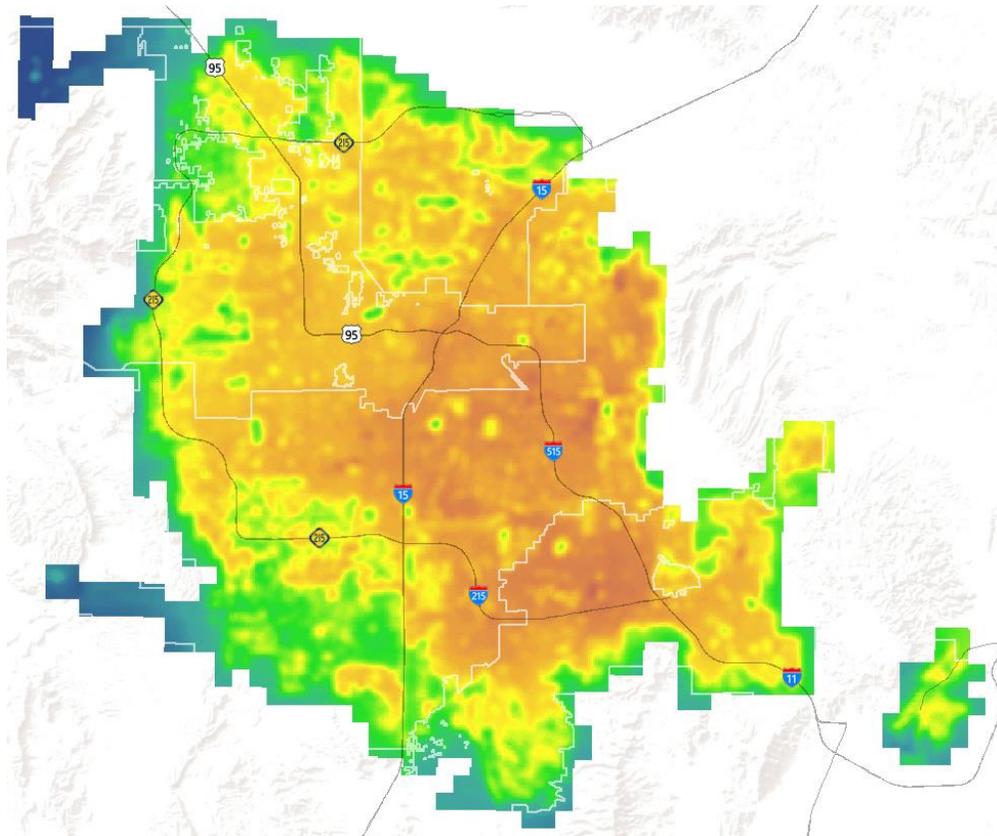
disenfranchised groups are particularly at risk of heat-related illness and injury for a multitude of reasons, including lack of access to air-conditioning or transportation to cooling centers and residence in the hottest parts of cities.²³

Southern Nevada is an increasingly multiracial community.²⁴ According to the 2020 U.S. Census Bureau data, there are 701,416 Latinos in Clark County, accounting for 31 percent of the population. There are approximately 23,735 Native Americans, totaling one percent of the population.²⁵ The median household income in Clark County is \$57,000.

A 2021 study examining urban locations in the southwestern region of the United States found that, on average, the poorest 10 percent of neighborhoods in an urban setting region were 2.2°C (4°F) hotter than the wealthiest 10 percent of neighborhoods on both extreme heat days and average summer days and that these patterns of inequalities also held for Latino neighborhoods.²⁶

Figure 5 reveals the extreme heat exposure in southern Nevada based on the analysis conducted by the Regional Transportation Commission of Southern Nevada (RTC) and published in its 2021 *Extreme Heat Vulnerability Analysis*.²⁷ Darker red shaded areas reflect geographic neighborhoods that have higher heat exposure. These areas include the Bracken, Paradise, Whitney, and Winchester neighborhoods, as well as parts of East Las Vegas, North Las Vegas, West Las Vegas, and north Henderson.

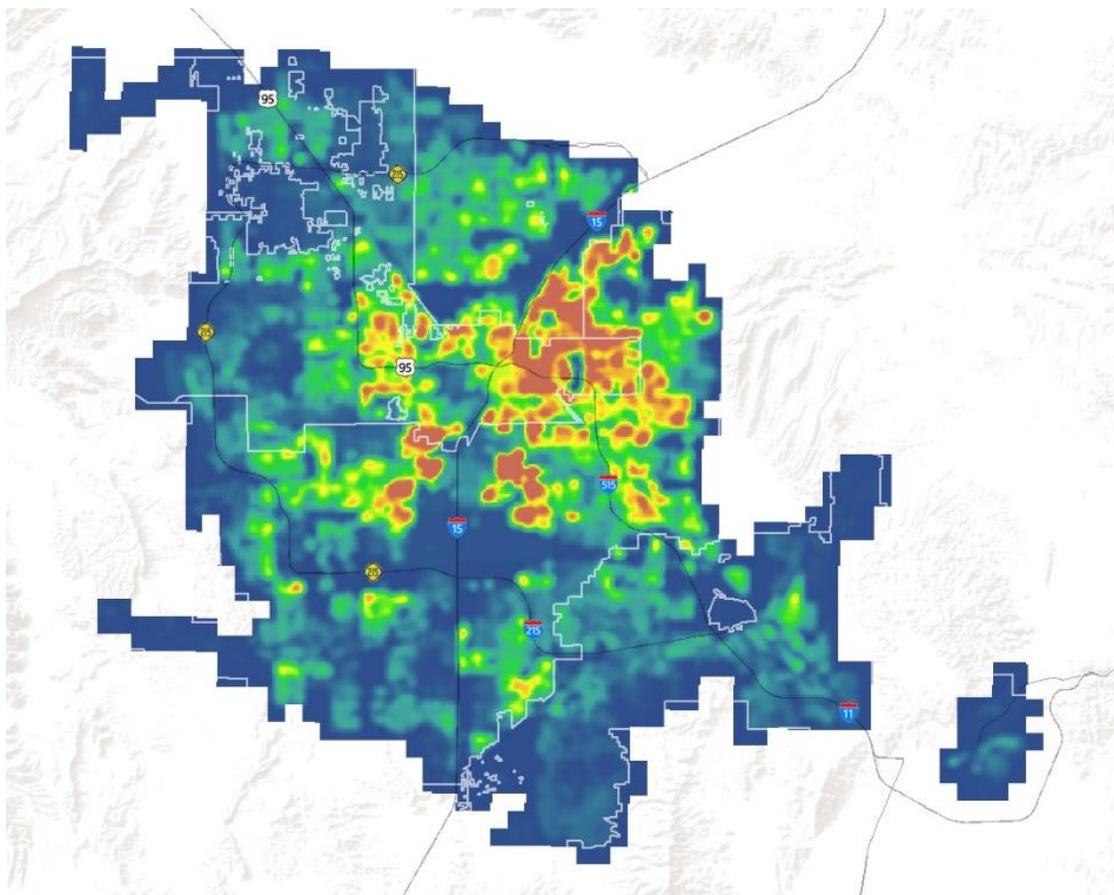
Figure 5. Exposure to Heat, Southern Nevada



Source: Regional Transportation Commission of Southern Nevada. 2021. Extreme Heat Vulnerability Analysis.

Similarly, the ability to respond to, avoid, and mitigate exposure to heat is not evenly distributed. Economic inequalities, health care disparities, unequal patterns of investment, and zoning laws result in some communities having reduced ability to respond, leaving those communities more vulnerable to the impacts of heat. Figure 6 illustrates the adaptive capacity of neighborhoods in southern Nevada. Darker red areas represent the neighborhoods with greater vulnerability to extreme heat. Communities with less adaptive capacity are concentrated in the areas of East Las Vegas, West Las Vegas, and North Las Vegas. These are also communities which report higher rates of poverty and unemployment and less access to health care facilities. The darker blue areas reflect communities with higher adaptive capacity. These areas include Summerlin, Northwest Las Vegas, and parts of Henderson.

Figure 6. Adaptive Capacity to Heat, Southern Nevada



Source: Regional Transportation Commission of Southern Nevada. 2021. Extreme Heat Vulnerability Analysis.

Integrating information about extreme heat exposure and the ability of individuals and communities to respond (“adaptive capacity”) can help policy makers identify overall levels of the vulnerability of a community to extreme heat. Specifically, assessing population vulnerability to extreme heat weather entails an analysis of the sensitivity to exposure and a population’s proficiency to adapt or respond accordingly.²⁸ Not surprisingly, certain populations may be more at risk to extreme heat due to demographic, economic, physiological, and socio-economic factors.

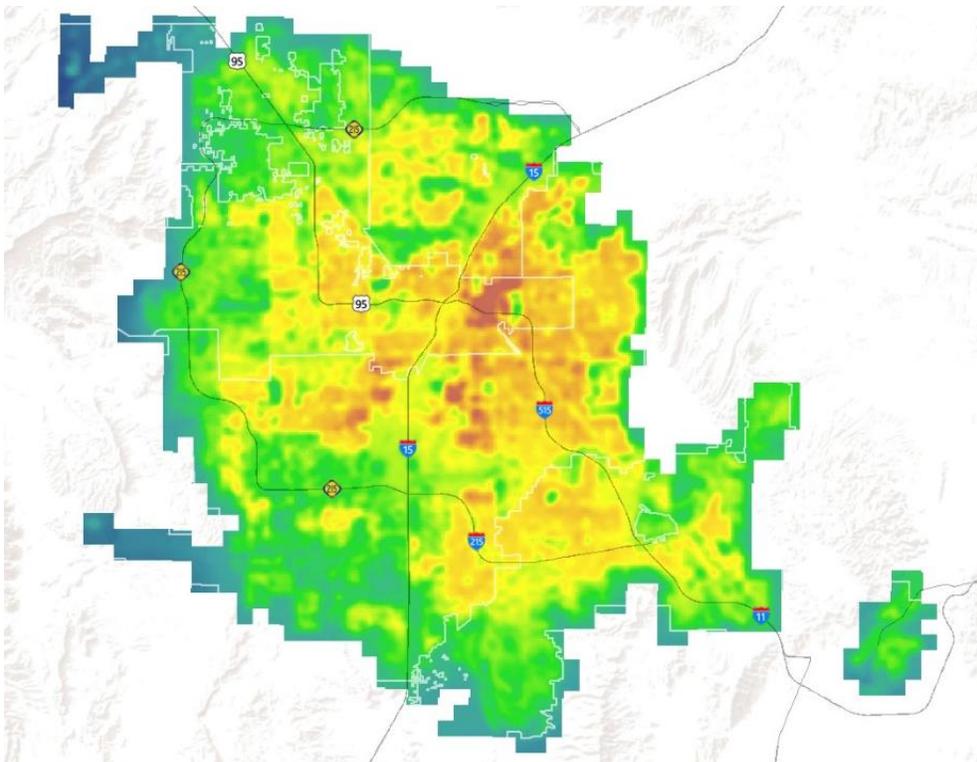
Armed with information about population vulnerability to heat, policy makers and planners can design and adopt measures and policies that will help reduce said vulnerability to extreme heat.²⁹

Figure 7 presents illustrates the estimated vulnerability of communities in Southern Nevada to extreme heat, with red areas indicating greater vulnerability. Some of the most vulnerable communities include neighborhoods in East Las Vegas, North Las Vegas, West Las Vegas, Spring Valley, and Winchester. As reported in the RTC’s report, *Extreme Heat Vulnerability Analysis*, the geographic locations most vulnerable to extreme heat

“are located in and around the region’s urban core and the east side. These areas include many of the region’s older neighborhoods. The populations in these areas are typically more racially and ethnically diverse than other parts of the region, and more economically challenged. In total, an estimated 115,000 people live in the highly vulnerable areas. A full 80 percent are people of color – more than half identify as Hispanic/Latino, 17 percent as Black/African American, and 6 percent as Asian. Approximately 25 percent of residents are 50 or older, and nearly 20 percent of residents in these areas live alone. The average median income among households is \$31,000, and nearly one-in-five people of working age live below the poverty level.”³⁰

It is this vulnerability that we seek to address: *What vulnerabilities to extreme heat did the COVID-19 pandemic exacerbate among Latino and Native American communities in southern Nevada?*

Figure 7. Extreme Heat Vulnerability, Southern Nevada



Source: Regional Transportation Commission of Southern Nevada. 2021. Extreme Heat Vulnerability Analysis.

III. Study Design

Researchers at the Guinn Center, an affiliate of University of Nevada, Reno, worked collaboratively with a research team at Arizona State University's Morrison Institute to execute this project, develop research instruments, and analyze the results. The team at each research center conducted interviews in their respective cities. At the outset of the project, each research team assembled a local advisory board of leaders in government, the nonprofit sector, and academia with specific expertise in heat, climate, and/or public health. Each team met with the advisory board periodically throughout the course of the project.

To examine the study's research questions), our team undertook the following tasks:

- Landscape Analysis
- Community Needs Assessment
- Gap Analysis, and
- Development of Policy Recommendations

A. Landscape Analysis

Our team conducted a landscape analysis of policy infrastructure in Clark County, Nevada to identify how existing policies, programs, and laws acknowledge and address individual and household vulnerability to extreme heat. Policy infrastructure included state, county, and municipal plans, policies, and programs related to disaster management, climate change, planning, infrastructure, and public health published in the preceding decade. Our review identified **45 heat-related plans, programs, statutes, codes, and studies** from the last ten years (2010-2021) initiated, directed, and/or managed by agencies or departments of the State of Nevada, Clark County, and City of Las Vegas governments (see Table 1 for a list of the policies, programs, and statutes we identified). Private and nonprofit programs were excluded from this analysis.

Our team analyzed the plans, programs, and statues and categorized them by four decision spaces in which individuals make choices to adapt to extreme heat: public, private, transit, and workplace. Public decision spaces include publicly accessible areas such as parks, pools, and malls. Private decision spaces include private dwellings. The transit space includes decisions that may not be location-specific and may include movement (to and from a location) in either a private (car) or public (bus) vehicle.

Summary of Existing Public Policy Infrastructure

The landscape analysis of items listed in Table 1 reveals the following:

- The heat issue most addressed in these policies was thermal comfort, defined as a person's perception of comfort and well-being related to temperature and air quality. This was followed by education and public health.

- Most of the plans, programs, and statutes address the public decision space. (This is not surprising, given that our team focused on government-sponsored plans, programs, and initiatives).
- Less than half of the plans specifically address the *impacts* of extreme heat and vulnerabilities of residents to extreme heat in specific ways.
- Very few of the plans include specific policies and/or interventions for mitigating extreme heat.
 - The most frequently proffered recommendations include expanded tree canopy and green streets.
- Compared to other cities, southern Nevada has very few programs to address extreme heat (e.g., cool roofs, cool sidewalks – both of which are designed in ways to reflect more sunlight and absorb less heat than a standard roof).
- In general, the plans, programs, and statutes do not identify the vulnerabilities of specific communities/subgroups.
- Only the following plans and studies explicitly acknowledge the relationship between extreme heat and health:
 - City of Las Vegas Master Plan 2020: Conservation Element (2012)
 - State of Nevada Enhanced Hazard Mitigation Plan (2018)
 - Nevada State Climate Strategy (2020)
 - It’s Hot and Getting Hotter: Implications of Extreme Heat on Water Utility Staff and Infrastructure, and Ideas for Adapting (2020), and
 - Regional Transportation Commission Extreme Heat Vulnerability Analysis (2021).
- None of the plans and programs specified that they directly sought community input from vulnerable communities (e.g., Latino and Native American communities).
- Only one state policy (regulation) addresses the vulnerability of workers to extreme heat (Regulation R053-20).
- Only two statutes address requirements about residences and extreme heat as it relates to air-conditioning units.
 - Habitability of Dwelling Unit (Nevada Revised Statute 118A.380): “The landlord shall at all times during the tenancy maintain the dwelling unit in a habitable condition. A dwelling unit is not habitable if it violates provisions of housing or health codes concerning the health, safety, sanitation or fitness for habitation of the dwelling unit or if it substantially lacks: (i) Ventilating, air-conditioning and other facilities and appliances, including elevators, maintained in good repair *if supplied or required to be supplied by the landlord* [italics author].³¹
 - Heating, Air Conditioning and Ventilation (North Las Vegas Ordinance 15.20.030, Ch. 7, Section 701): “Dwelling units, guest rooms and congregate residences shall be provided with heating and air conditioning facilities, capable of maintaining a room temperature of 70 degrees Fahrenheit (21.1 degrees Celsius) at a point three feet (914 mm) above the floor in all habitable rooms. Such facilities shall be installed and maintained in a safe condition and in accordance with Section 3102 of the Uniform Building Code, Mechanical Code, and all other applicable laws.”³²

Table 1. Existing Heat-Related Policy Landscape in Southern Nevada

Type	Program/Initiative	Focus Area										Decision Space
		Climate Change Adaptation	Community Engagement	Thermal Comfort	Coordination	Education	Energy Use	Health	Research			
Plan	Clark County Multi-Jurisdictional Hazard Mitigation Plan (2018)		•		•							Public
Plan	State of Nevada Enhanced Hazard Mitigation Plan (2018)				•	•			•	•		Public
Plan	RTC Regional Walkability Plan		•	•	•							Public
Plan	City of Las Vegas 2050 Master Plan Draft (2021 Ordinance to Adopt 2050 Master Plan)		•		•	•						Public
Plan	Downtown Las Vegas Civic Space and Trails Master Plan (2019)		•	•								Public
Plan	Southern Nevada Strong Regional Plan (2016)	•	•	•	•			•	•			Public
Plan	Southern Nevada Regional Housing Authority Annual Plan, Draft (2020)			•		•						Public
Plan	Vision 2045: Downtown Las Vegas Master Plan (2016)		•	•	•	•						Public
Plan	2020 Water Resource Plan	•				•				•		Public
Plan	Clark County Comprehensive Master Plan: Land Use Element, Goals and Policies	•		•	•	•						Public
Plan	Nevada State Climate Strategy (2020)	•	•			•	•			•		Private, Public, Transit, Workplace
Plan	All in Clark County: Sustainability and Climate Action Plan (2021)	•	•			•	•			•		Private, Public, Transit
Plan	The City of Las Vegas Master Plan 2020: Conservation Element (2012)	•		•		•		•				Public
Plan	Nevada Climate Change Advisory Committee Final Report	•				•		•	•			Private, Public
Program	Nevada 211 Utility Assistance							•				Private
Program	Nevada 211 Housing/Shelter Assistance											Private
Program	Urban Forestry Grants	•		•								Public
Program	All-In Clark County Sustainability/Climate Fellowship Program		•		•					•		Public (Workplace)
Program	Nevada Weatherization Assistance Program							•				Private
Program	CARES Housing Assistance Program											Private
Program	Nevada State Energy Assistance Program (EAP)							•				Private
Program	Cooling Centers			•								Private (Body), Public
Program	Energy Star for Efficient HVAC systems							•				Private
Program	Low income Solar Energy Panel (LISEP)							•				Private
Program	Nevada Tree City USA Program			•								Public

Table 1, continued. Existing Heat-Related Policy Landscape in Southern Nevada

Type	Program/Initiative	Focus Area								Decision Space	
		Climate Change Adaptation	Community Engagement	Thermal Comfort	Coordination	Education	Energy Use	Health	Research		
Regulation	Nevada Department of Business and Industry Proposed Regulation R053-20								•	Private, Public, Workplace	
Statute	Nevada Residential Eviction Moratorium									Private	
Statute	Habitability of Dwelling Unit (NRS 118A.380): Statute for failure of landlord to supply essential items or services (including air conditioning)			•					•	Private (Body), Public	
Statute	Heating, Air Conditioning and Ventilation (North Las Vegas Ordinance 15.20.030, Ch. 7, Section 701)			•						Private (Body), Public	
Statute	Termination of utility service: Postponement when dangerous to health (NAC 704.370)			•					•	Private (Body), Public	
Statute	Design and Layout of Parking (Clark County Ordinance 30.60.050)			•						Public	
Statute	Site Landscape and Screening Standards (Clark County Ordinance 30.64)			•						Public	
Statute	Asian Design Overlay District Site Development Standards (Clark County Ordinance 30.48.860)			•						Public	
Statute	Planned Unit Development (Clark County Ordinance 30.24)			•						Public	
Statute	Midtown Maryland Parkway District Mandatory Design and Development Standards (Clark County Ordinance 30.48.1870)			•						Public	
Statute	Mixed Use Overlay District Evaluative Criteria (Clark County Ordinance 30.48.770)			•						Public	
Statute	Interior temperature in dwelling units (Clark County Ordinance 22.02.067)			•						Private (Body), Public	
Statute	Animal Cruelty (Las Vegas Ordinance 7.32), (Clark County Ordinance 10.32)								•	Private (Body)	
Statute	Professional Animal Handlers: Indoor enclosures (Las Vegas Ordinance 7.40.180)								•	Private	
Statute	Residential Districts: Purpose and Development and Design Standards (Las Vegas Unified Development Code 19.06.020)			•						Public	
Statute	Commercial and Industrial Districts: Purpose and Development and Design Standards (Las Vegas Unified Development Code 19.08.020)			•						Public	
Statute	Development Standards (Las Vegas Unified Development Code 19.08.040)			•						Public	
Statute	Minimum Standards for Professional Animal Care Facilities (Clark County Ordinance 10.30)								•	Private	
Study	Regional Transportation Commission Extreme Heat Vulnerability Analysis (2021)	•		•		•			•	•	Public
Study	Implications of Extreme Heat on Water Utility Staff and Infrastructure, and Ideas for Adapting			•		•		•		•	Private (Body), Public (Workplace)

B. Community Needs Assessment

Our researchers conducted a community needs assessment to identify concerns, experiences, and needs around the vulnerability (exposure, adaptive capacity, and sensitivity) of Latino and Native American community members in southern Nevada to extreme heat, particularly during pandemic conditions. Capturing these experiences and concerns allowed our researchers to examine the extent to which existing policies and programs in southern Nevada address community members sensitivity and vulnerability to extreme heat. Our team completed this task by conducting confidential semi-structured interviews with (a) community members who live in southern Nevada and identify as Latino and/or Native American, and (b) community leaders who work with members of these communities and/or on heat-related issues.^{33, 34}

The Guinn Center team conducted interviews with community leaders and community members. Specifically, our research team interviewed 15 community leaders who represented a wide range of community organizations, as well as local and state government agencies. Additionally, 37 community members completed the survey; of these, 31 completed a semi-structured follow-on interview. Of the community members, 28 identified as Latino and 9 identified as Native American. More than half of the interviews with community members were conducted in Spanish.

Table 2 presents a summary of the characteristics of the 37 community members who completed the survey. Interview participants were asked about their household’s experiences of heat during a typical year and during the summer of 2020; strategies they use to manage heat; knowledge of existing policies/programs; barriers to participating in or benefiting from policies and/or programs; and recommendations for addressing heat (see endnote #35 for note about data).³⁵

Table 2. Characteristics of Community Members Surveyed

Gender		Percent	Age		Percent		
Male		32% (n=11)	18-24 years old		9% (n=3)		
Female		59% (n=20)	25-44 years old		44% (n=15)		
Income			45-54 years old		35% (n=12)		
			55 years and above		9% (n=3)		
			Ethnic/Racial Identification				
			Latino/a		76% (n=28)		
Less than \$25,000		35% (n=12)	Native American		24% (n=9)		
\$25,001-\$50,000		21% (n=7)	Employment				
\$50,001-\$75,000		21% (n=7)	Full-time		39% (n=13)		
\$75,001 and above		18% (n=6)	Part-time		18% (n=6)		
Employment			Unemployed		12% (n=4)		
			Student		3% (n=1)		
			Frontline Worker?				
			Yes		50% (n=12)		
Work Domain Most of the Time			No		33% (n=8)		
Indoors		66% (n=24)	Not sure		17% (n=4)		
Outdoors		4% (n=1)	Primary Mode of Transportation				
Equally Indoors/Outdoors		29% (n=7)	Personal Vehicle		64% (n=21)		
Housing			Public Transportation		24% (n=8)		
			Vehicle of Friend, Family		12% (n=4)		
			Home Ownership				
Live in single-family home		44% (n=15)	Rent home		53% (n=18)		
Live in apartment		38% (n=13)	Own home		32% (n=11)		

Almost two-thirds of the community members interviewed stated they were very concerned about the risks posed by extreme heat. Just over one-fourth (27 percent) indicated they were somewhat concerned (see Figure 8). Less than one-third of community members interviewed thought the government was doing enough to help the community address extreme heat (see Figure 9).

Figure 8. Community Attitudes about the Risks Posed by Extreme Heat

How concerned are you about the risks posed by extreme heat?

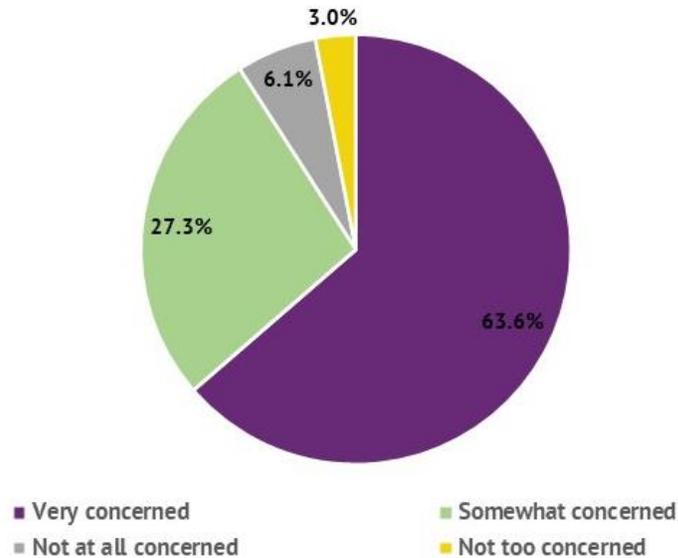
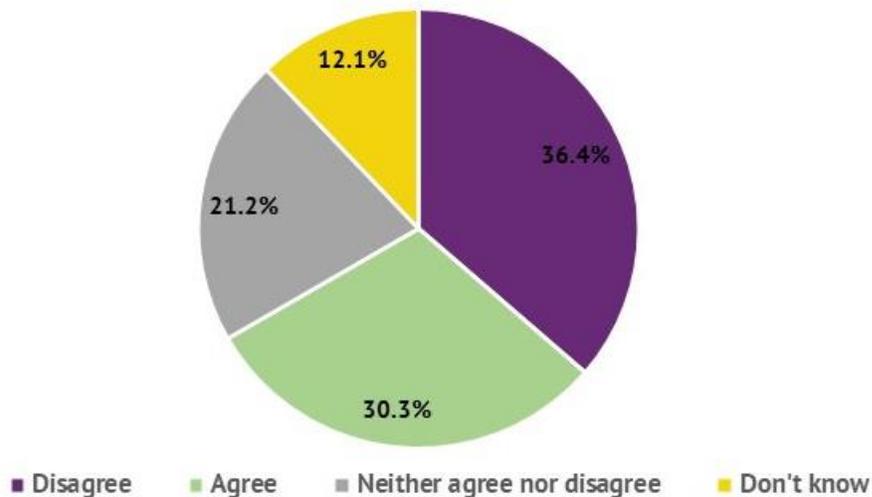


Figure 9. Community Attitudes about Government Actions

The government is doing enough to help my community respond to extreme heat



The Impacts of Extreme Heat

Interviews with community members revealed that the primary heat challenges or ways that extreme heat most affects them are:

- Thermal discomfort, both indoors and outdoors
- Health impacts
- Energy use

These heat challenges may be felt in one or more of the decision spaces our team identified: public, private, transit, and workplace.

Thermal discomfort

Thermal discomfort is another way to say a person feels uncomfortably warm or hot. Community members and leaders shared that they feel thermal discomfort both indoors and outdoors. They felt thermal discomfort in all four decision spaces: public, private, transit, and workplace. The thermal discomfort in homes was often associated with poor insulation, inefficient or old air conditioning units, and even broken air conditioning systems. Community members shared some of the strategies they use to try to reduce thermal discomfort both indoors and outdoors (see text box below).

Strategies Used to Mitigate Extreme Heat

Indoors

“Put up a blackout tent.”

“Stay indoors” and “turn the air conditioning on.”

“I use blackout blinds, I shut the curtains, and I dress less, or take a cold shower, or just avoid doing errands or anything during the prime hours when it is extremely hot.”

“Stay home or go to a casino where they have air conditioning.”

“I try not to run our AC to low and then just continue to drink water mainly.”

“We drink lots of water and we try to stay indoors.”

“We use ceiling fans.”

“I take showers and try to wear light clothing.”

“I try to cook fresh food. I avoid cooking with heat. I try to make salads or prepare fruit.”

“When we can’t go out because of the excessive heat, we make a bag of ice so that we are constantly drinking cold water.”

Outdoors

“If I am working outside, I use a wet towel, water, and once in a while, I go into a store with air conditioning to refresh.”

“Going to the pool and drinking lots of water.”

“We try to go to places where there are swimming pools or rivers.”

Health Impacts

Many community members discussed the direct health impacts and general concerns as they relate to extreme heat. The symptoms most mentioned were sweating, dizziness, dehydration, sunstroke, sunburn, and nose bleeds. Individuals also mentioned the ways that extreme heat exacerbates underlying health conditions such as asthma.

Energy Use

Residents of southern Nevada frequently attempt to reduce thermal discomfort in their homes (or offices) by using the air conditioning system and/or fans. This, however, gives rise to an additional set of challenges. The first set of challenges relates to broken or inefficient air conditioners. The second set of challenges relates to the cost of using energy to maintain thermal comfort in their homes and the financial impact of higher utility bills during the summer months. Almost two-thirds (66 percent) of community members with whom we spoke mentioned the use of air conditioners to help reduce thermal discomfort in their homes. Many noted the expenses they incurred by keeping their homes cool and/or buying air conditioning units.

“So last year during the summertime, our AC unit gave out on us. And they're pretty expensive. So, it did take us a little bit to go ahead and replace it. So, during those months it was really, really hard to just even be home, even at nighttime. I mean, for my kids, it was difficult. Like I said, the weather out here is very dry. So, I noticed that my kids did start getting a lot of nosebleeds during the night.”

– Southern Nevada community member

“I don't know what the government is doing. They should help people living in apartments and houses, because air conditioners break down, and they are the only thing that helps us. There should be more help for the community. Instead of charging us, it should be free, because our people need it. It should be a priority, because the heat can eventually kill.”

– Southern Nevada community member

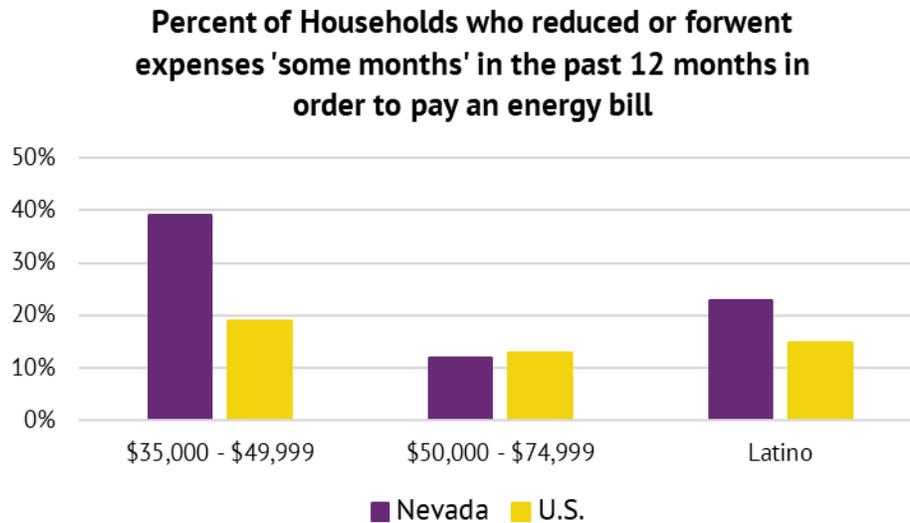
“Well, the problem here in Las Vegas, not only for me and my family, for all families are, for example, the summer. Especially when the temperature is the highest, or right now it is starting to get a little hot, it is the high price we have to pay for the electricity service to be able to use our air conditioning, because without it, here in Las Vegas, a family cannot live well, it will have consequences.”

– Southern Nevada community member

Recent data affirms the financial burden that utility costs may have on some households in Nevada. Using data from the U.S. Census Bureau Household Pulse Survey, Figure 10 provides data on the percentage of households that “reduced or forwent expenses for basic household necessities, such as medicine or food, in order to pay an energy bill” some months over the past 12 months. As shown, 39 percent of Nevada households (surveyed during August 4–16, 2021) stated they reduced or forwent other expenses to pay an energy bill some months during the last 12 months. This percentage for Nevada was higher than the national average (19 percent). Additionally, 23 percent of Latino households in Nevada reduced or forwent expenses to pay a

utility bill some months during the last 12 months, compared to the national average of 15 percent.

Figure 10. Percent of Households who Reduced Expenses ‘Some Months’ to Pay an Energy Bill



The Impact of COVID-19

As stated previously, this study is interested in how COVID-19 exacerbated existing vulnerabilities of members of communities of color in southern Nevada to extreme heat. Many community members and leaders interviewed reported that COVID-19 had negatively affected their “experience of heat or heat-related challenges” (see text box below).

How has COVID-19 affected your experience of heat or heat-related challenges?

“I did get COVID last year, and I felt like I noticed that it altered my vision. Every time it’s bright outside or the sun gets into my eyes, I get instant headaches.”

“We didn’t want to go into big places where there’s a lot of people. So, we would go to the park, but it was really, really hot.”

“When there was no pandemic, we could freely go to the parks where you can find those splashpads. But now, with the pandemic, everything is closed. There is nothing you could go to and cool off because of the pandemic.”

“Because of the pandemic, it has changed because you don’t go out. Because we were at home, there was more power consumption, and therefore, it [energy usage] was more costly.”

Those community members who reported COVID-19 had positively affected their family referenced the additional “family time together” and the ability to “work remotely.”

C. Gap Analysis

Our team completed a gap analysis to assess the extent to which Nevada’s existing heat-related policy infrastructure addresses the vulnerabilities and concerns identified in the needs assessment. Researchers executed this task by comparing the results of the landscape analysis and needs assessment for the most salient community concerns. We also used the landscape analysis to highlight policies addressing specific concerns or programs that are available to community members to help them mitigate the impacts of extreme heat.

The primary heat challenges faced by community members in interviews were thermal discomfort, health impacts, and energy use. Community members discussed the impact of extreme heat and their subsequent challenges in four primary decision spaces: public spaces, private spaces, transit, and workplace. Individuals make decisions in each of these decision spaces to avoid or mitigate the impact of extreme heat. In the sections that follow, we present key findings or conclusions from the community needs assessment, organized by domain, and identify gaps. Additionally, we highlight the impact of COVID-19 on community members and their ability to adapt to and/or manage exposure to extreme heat.

Public Spaces

Community members acknowledged that they often face exposure to extreme heat in public spaces. Some Latino community members noted that parks in their neighborhood or streets and sidewalks to libraries and schools did not have shade coverage. The information shared with our research team has been reported on elsewhere. In early August 2021, the *Las Vegas Review-Journal* reported, “East Las Vegas residents are predominately affected [by extreme heat] because there is significantly lower tree canopy and older buildings that can’t regulate heat well, according to a new study.”³⁶ According to the report, Las Vegas city planners are working with community stakeholders “to develop a long-term strategy to mitigate its effect by planting close to 60,000 trees across the city by 2050.”³⁷

Concurrently, most community members interviewed also shared that they frequently seek out public spaces to reduce their exposure to extreme heat and achieve thermal comfort. Specifically, community members and leaders interviewed consistently identified public spaces as critically important places that enable them (and others) to manage and mitigate their exposure to extreme heat. Among the public spaces identified were public parks, public pools, splash pads, public lands/trails (e.g., Mount Charleston), libraries, cooling stations, and public universities and colleges. Community members also identified gyms, movie theaters, shopping malls, and casinos as ‘public spaces’ that they visited to reduce their exposure to extreme heat.

The Impact of COVID-19: The impacts of COVID-19 are far-reaching: the pandemic has led to business closures, job losses, stalled academic progress, and loss of human life. COVID-19 has also affected the ability of community members to address and manage heat. Individuals with whom we spoke reported that many of the public spaces typically available to them (and their family members) to avoid extreme heat were not available during the pandemic. During the

summer months of 2020, public pools and libraries were closed, as were movie theaters, gyms, malls, and casinos. As students transitioned to remote learning, universities and colleges remained closed. In April 2020, cooling stations in southern Nevada were not opened due to the pandemic. But after an excessive heat warning, officials announced that they would “activat[e] a limited number of cooling stations throughout the valley to allow individuals respite from the heat.”³⁸

Additionally, COVID-19 presented challenges to staying hydrated in public spaces. As one nonprofit community leader stated, “Sometimes you take big water coolers. Given that we’re environmental, you don’t want a ton of plastic water bottles at sites. But then [during COVID] it’s like if you have one big jug of water that everyone’s touching and getting water from, that turned out to not be very safe during the pandemic. It was a very interesting place and a unique place to navigate during these last couple of months.”



 **Gap:** As the pandemic revealed, during a public health crisis, places or locations that southern Nevada residents typically access to mitigate their exposure to extreme heat may be severely restricted. With the experience of this pandemic, city and health officials may need to explore ways to maintain or expand publicly available places and locations for residents to mitigate their exposure to extreme heat during a public health emergency.

 **Gap:** Community members mentioned public options for escaping the heat (such as pools, splash pads, and parks, etc.). However, there does not appear to be a comprehensive listing of publicly available options that community members can access to seek respite from the heat. For example, Clark County Parks and Recreation Department lists all parks in the region but the department website does not indicate which parks have splash pads. Nevada 2-1-1, a web-based social service program locator hosted by the Nevada Department of Health and Human Services, does not list programs and resources available to mitigate exposure to (and impacts of) extreme heat (or extreme weather).

 **Gap:** Many community members interviewed did not know about (or failed to mention) publicly available programs (e.g., cooling stations, utility assistance programs) to help them address heat-related challenges.



Private Spaces

With few exceptions, community members emphasized their efforts to address thermal comfort in private settings – including their home, car, and workspace. Within the domain of the home, two concerns were raised repeatedly. One was related to the physical effects of extreme heat and the impact on underlying health conditions. Community members described the physical effects of extreme heat in terms of excessive sweating, dehydration, and dizziness. One community member worried about the impacts of heat on underlying heart conditions. The second significant concern for most community residents was energy use and the financial impacts of high utility bills during the summer months.

"I think it's a false narrative to say, 'Oh, there's air conditioning available' as a kind of a reduction in vulnerability because just because you have it, it doesn't mean, number one, that it works or that your landlords fixed it or that it's working. As somebody who rents and just had to call the landlord to get the HVAC fixed over the weekend. And then second, doesn't mean you have the dollars to turn it on or that the programs are necessarily in place to help subsidize those. I think we have to pay a lot of attention to that."

– Southern Nevada community member

"My husband tries to do many things ... in order not to turn up the air conditioning too much and prevent the bill from increasing. That is kind of our challenge. Trying to keep the air cool without paying too much."

– Southern Nevada community member

The challenge to achieving thermal comfort in the home were due to broken air conditioners, inefficient air conditioning systems, poorly insulated homes, and homes that lack proper weatherization. A few community members interviewed stated their landlord or property manager had not responded to calls about broken air conditioners in a timely manner.

Even though individuals mentioned efforts to maintain thermal comfort in the private decision space of their home and expressed concerns about the financial impacts of using their home air conditioning units, less than half of those interviewed were able to name any government (or even private and/or nonprofit) program that could help them address this heat-related challenge. Table 3 below summarizes the list of programs mentioned by community residents in response to the following question: "During an average year [or During COVID-19], which public aid or programs help to deal with the heat and the challenges related to the heat?"¹

¹ Our focus is government policies and programs. Here we note that several community members also referenced the following private and/or nonprofit programs: home energy assessments, solar roofs, and the NV Energy Powershift program. The PowerShift program offers the following: a free in-home energy assessment, sealing or upgrading of ductwork, free air conditioner tune-up, free LED bulbs, installation of programmable controls and thermostats, investments in energy efficient appliances and amenities (e.g., dryers and refrigerators), and rebates for the purchase of an electric vehicle and/or energy efficient air conditioners. Source: NV Energy.

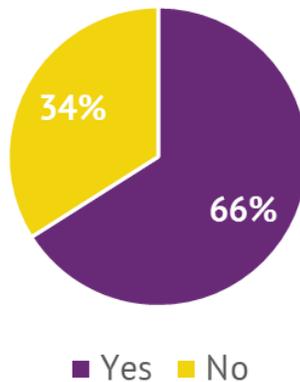
Table 3. Public Services and Programs Listed by Community Members in Southern Nevada to Help Address Heat-Related Challenges

Table 3. Public Services and Programs Listed by Community Members	
During a normal year	During COVID-19
Utility assistance programs	Utility debt forgiveness program
Cooling stations	CARES funding
Donated water at bus stops (dependent on donations)	CARES Housing Assistance Program (CHAP)
Home weatherization programs	

The Impact of COVID-19: Community residents shared that one of the consequences of COVID-19 and the shutdown was increased energy use (and higher utility bills). Community members shared that in a normal year, family members attended school and work during the day, which allowed them to adjust their thermostats and/or turn off their air conditioning. Household members were also able to venture to public places (e.g., malls) or other private places (e.g., stores, restaurants) to seek refuge from the heat. In response to COVID-19, family members were confined to their homes (see Figure 11). And to reduce thermal discomfort, they had to maintain lower room temperatures, which resulted in higher utility bills.

Figure 11. Community Member Allocation of Time at Home during 2020

During 2020, did you work from home and/or spend the majority of the day at home?





Gap: Many residents we interviewed could not identify a single program that could help them address heat-related challenges in their private decision space. As noted, Nevada 211 does not currently have a resource tab for extreme heat (or extreme weather). And there is no centralized website in (southern) Nevada that contains information about all resources available to mitigate the impacts of extreme heat. Additionally, some of the programs that exist do not publish the information in languages other than English.



Gap: Several residents with whom we spoke mentioned broken and/or inefficient air conditioning systems and the financial challenges which prevented them from repairing the air conditioning systems or buying new ones. Nevada has a utility assistance program to help qualifying households (who meet income requirements) pay utility bills. However, there does not appear to be a public program in southern Nevada that provides support to households to repair and/or purchase new air conditioning units.²



Gap: Some of the social service assistance programs available to help individuals and households address extreme heat-related challenges have eligibility requirements. These include immigration status and/or income. One community member shared that her income slightly exceeded the income threshold to qualify for assistance, and the cost of replacing the old air conditioning system (which can run as high as \$12,000, according to an industry expert) was significant and prohibitive.

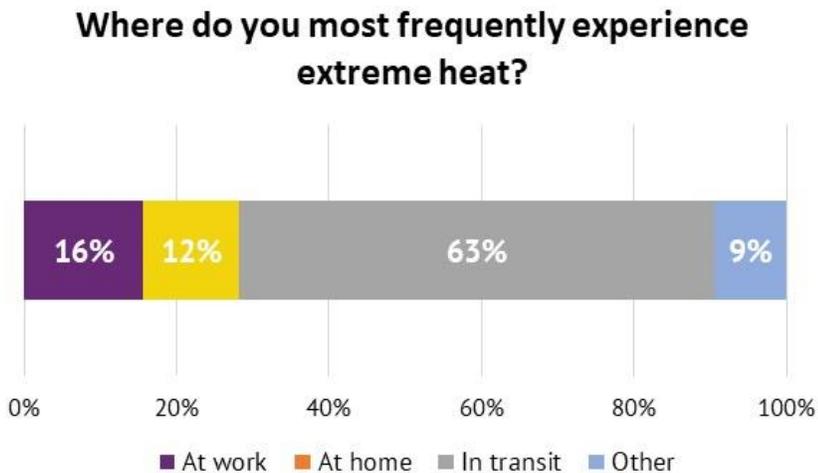


² There are several nonprofit/private sector programs that are available to qualifying households to help them address heat-related challenges in homes. One private program includes the NV Energy Powershift program, which offers the following: a free in-home energy assessment, sealing or upgrading of ductwork, free air conditioner tune-up, installation of programmable controls and thermostats, investments in energy efficient appliances and amenities (e.g., dryers, refrigerators), and rebates for the purchase of an electric vehicle and/or purchase of energy efficient home air conditioning system.

Transit

Community members reported they are most likely to experience extreme heat in transit. Almost two-thirds (63 percent) of Latino and Native American community members interviewed indicated that they are most likely to experience extreme heat in transit (see Figure 12).

Figure 12. Decision Space Where Community Members most Experience Extreme Heat



Residents of southern Nevada reported that they are exposed to extreme heat when they travel in their car (with broken or inefficient air conditioning systems), walk to catch public transit and wait at bus shelters, walk to the library, and walk their children to and from school, walk to the library. One Native American community member shared that when her car air conditioning system was broken, she borrowed a car from a friend so that she could arrive at an event perspiration-free. Some community members with broken car air conditioning systems reported that they would visit stores or restaurants during the day to seek respite from the heat.

Very few bus shelters in southern Nevada have shade coverings (see Figure 13). And many of the covered shelters that do exist are not located in the areas that reflect vulnerability to extreme heat, such as West Las Vegas, East Las Vegas, North Las Vegas. Additionally, bus shelters are constructed from material that attract and retain heat (e.g., steel).

Figure 13. Public Bus Stops, Southern Nevada



“Our pedestrian realm is just a torture chamber for people to be able to access transit. People won’t sit on the benches at a bus stop because they’ll get a second-degree burn.”

- Southern Nevada community leader

“My mother-in-law rides the bus to work and so during extreme weather, and usually it’s extreme heat, there’s extra preparation and precautions that have to be taken because there’s usually not shaded bus stops. Even walking from where one bus drops you off to where the next one might pick you up, the next line, that’s a walk through heat. If you’re not thinking through it, again, you might not have enough water, you might not have brought a hat or an umbrella or something to shade you from the heat.”

– Southern Nevada community leader

Additionally, many families in the urban core areas of Clark County – including those communities that have been identified as vulnerable to extreme heat – walk their children to school. Clark County School District (CCSD) is the fifth-largest school district in the United States. There are more than 350 schools and, during the 2019-2020 school year, 76 percent of CCSD’s students qualified for free- and reduced-price lunch, which is a proxy for poverty.

Currently, very few of the neighborhood schools located in southern Nevada’s urban core, some of which are 40-60 years old, have functioning or clean water fountains (see Figure 14). In recent years, new and/or renovated schools have placed both water-bottle refilling stations and new water fountains in the school buildings (see Figure 15).

“Now that our children have gone back to school, they should provide a bus to take them home rather than have them walk from school under the sun. Schools don’t provide a bus if the kids live two stoplights away. Kids sometimes get heat stroke through those two stoplights. That is the type of help I think the government should provide. If a kid lives down the block, the bus isn’t necessary, but when it is a mile, it is. That is important to me because of my girls. I take them to school before work, but when they come home, they walk under the sun rays. They leave school at 2 in the afternoon with a lot of heat, and they have a long walk from school. It is dangerous.”

– Southern Nevada community member

Figure 14. Photo of Water Fountain Located at 50-year-old Middle School, Clark County



Figure 15. Photo of Water Fountain and Water-Bottle Refilling Station at Newly Remodeled Elementary School, Clark County



Impact of COVID-19: COVID-19 has affected how community residents respond to extreme heat in transit in several ways. First, public buses ran less frequently during the COVID-19 shutdown of non-essential businesses in Nevada so individuals may have had to wait longer at the bus stops for public transportation. Second, individuals whose cars have broken or inefficient air conditioning systems who would frequent restaurants or stores to briefly escape extreme heat during the day were no longer able to do so during the pandemic-driven shutdown of non-essential businesses.

“Before, if you got too hot walking from one stop to another, usually you could pop into a restaurant, a fast-food restaurant, or a convenient store and cool down for a couple of seconds. Maybe, get a drink and sit down and cool off. But that wasn’t allowed [during the pandemic] because in restaurant dining was not allowed. You had to pop in and get your drink and pop out, which really doesn’t provide the time for people to cool down if they’re getting overheated.”

– Southern Nevada community leader



Gap: Most of the government programs and initiatives designed to mitigate the impact of extreme heat on individuals and households are location-based – including home weatherization programs and utility assistance programs. However, community members reported that the decision space where they are most likely to experience extreme heat is during transit. Currently there are very few – if any – government (or private) programs designed to address heat-related challenges in the transit decision space.



Gap: A related gap is that southern Nevada does not have any public or private programs or initiatives in place that provide assistance to (low-income) individuals and households to repair or replace old and/or broken *car* air conditioning systems.



Gap: Currently, most public bus stops in southern Nevada lack shelter. Moreover, the bus stops that do have a physical shelter are constructed with materials that retain heat.



Gap: Families that our team interviewed indicated that they experience extreme heat in transit as they walk their children to and from their neighborhood school. Clark County School District is the fifth-largest school district in the United States, with over 350 schools. Many of these schools, particularly those in the urban core where many Latino families live, do not have functioning water fountains.



Source: *Las Vegas Review-Journal*. Reprinted with permission.

Workplace

Many individuals in southern Nevada are exposed to extreme heat in the decision space of the workplace. Community members and leaders with whom our researchers spoke expressed concern about the exposure of workers in southern Nevada to extreme heat. Many members of communities of color in southern Nevada are employed in sectors that may be more vulnerable to extreme heat. Latinos represent 30 percent of Nevada's population and account for 34 percent of employment in the construction sector. Native Americans comprise 1.1 percent of Nevada's population and account for 2.1 percent of employment in the construction sector.³⁹ Other workers including utility workers, landscapers, and street vendors are also vulnerable to extreme heat.

"There aren't many worker protections that protect from the sun specifically, right? We don't name worker protections when we talk about climate justice. [Outdoor workers] are more prone [to heat-related illness]; they're more apt to skin cancers and asthma and respiratory illnesses, cardiac illnesses and cardiac disease because of their time spent outdoors. But there's little mitigation efforts."
– Southern Nevada community leader

"I worry about construction workers because my husband works in construction. He gets little blisters on his back, caused by the heat. It burns his skin."
– Southern Nevada community member

The Impact of COVID-19: Prior to COVID-19, it was widely recognized that workers in some industries were more vulnerable to extreme heat exposure. Among these were construction workers, landscapers, street vendors, airport workers, and utility workers. The coronavirus pandemic and the collective response to it exposed more workers to extreme heat, including many that were considered frontline workers. Similarly, it served to raise awareness about a broader range of workers that may be exposed to extreme heat in the workplace. Community leaders spoke of greater exposure to extreme heat in the workplace by grocery store workers, health care workers (including those administering vaccinations in outdoor pop-ups), and delivery service workers. Specifically, during the height of the response to the pandemic (and the closure of non-essential businesses), grocery store workers spent time on the loading dock exposed to the elements (including extreme heat) as they worked to fill grocery pick-up and delivery orders. Individuals who worked with food delivery companies (e.g., UberEats) and have cars with broken or inefficient car air conditioning systems may have faced greater exposure to extreme heat. To illustrate, one community leader shared:

During the beginning of the pandemic until the summer [of 2020], we were told to try to minimize the amount of time that you were inside grocery stores. We all flocked to do the grocery pickups and in one of those trips where I was picking up groceries, the poor woman who came out from the grocery store was so red, you could clearly see that it was really hot. I said to her, "Wow, I feel like you need to go inside and cool down." She was like, "Well, there's nowhere to cool down inside. The back area where we load up all of these groceries for you all and drag them out was like a back warehouse area and there is no like heating

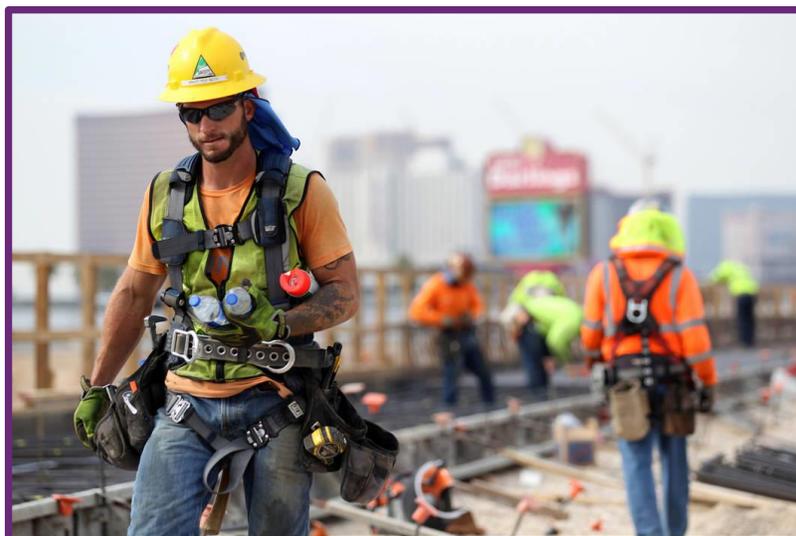
or cooling. All that's here are the freezers where we hold your groceries, we load them up and then we get them out so there's really no place for us to cool down when we go in there." She mentioned that the staff, when they get so hot from the situation that she was in, they would go into the freezers to cool down. To me, it was really mind boggling because the rest of the store clearly has air conditioning so why not provide folks some time to just go into the full part of the store and maybe sit down and cool down for a minute in shifts? I feel like things shifted so quickly in the pandemic for stores to be able to accommodate grocery pickups, that stuff wasn't fully thought through and there were the workers suffering.

"I saw delivery drivers parked on the side of the road and you could see that they were eating their lunch there and the car was running the entire time. For folks who live in Las Vegas and Phoenix, I don't care if you have your AC blasting full in your car, it is not cool in your car during the summer. Having to sit there for an hour and try to eat your lunch and that be your cool-down time, I think it's not very humane for folks." - Southern Nevada community leader



 **Gap:** None of the existing government-led policies and programs in southern Nevada (see Table 1) address the impact of extreme heat on workers.

 **Gap:** While employers are required to provide personal protective equipment (PPE) and hand sanitizers, there is no employer requirement to provide water, protective gear, or sunscreen to employees who spend significant hours outside.



IV. Policy Recommendations

Interview participants were asked to offer recommendations on how policies and programs could address their concerns and reduce their vulnerability to extreme heat. Additionally, our team, based on the gap analysis, developed a set of recommendations that policy makers could take under advisement to address gaps in existing policy infrastructure in ways that increase the resiliency of the most vulnerable community members in Nevada to extreme heat.

Information and Outreach

Community members and leaders emphasized the need for greater education, dissemination of information, and awareness about the impacts of extreme heat, especially on physical health. As a resource, Southern Nevada Health District (SNHD) has educational materials that emphasize the importance of personal preparedness as one tool in overall efforts to address the challenges of extreme heat. Underscoring the importance of personal preparedness, one local climate expert noted:

One of the biggest challenges that remains unaddressed or has not been adequately addressed is communicating the real dangers of extreme heat so people so people have a working knowledge. Regarding individual activities and coping mechanisms [to extreme heat], neither are very well understood and aren't integrated yet with policy systems. What do folks actually do in these communities when there's an extreme heat event? We can make some assumptions, but it would be better to actually understand real behavior before we start designing what we think are appropriate interventions. There are lots of extreme heat events. We need to gather data directly on what those coping mechanisms were, and if there were any long-term adaptation actions. But the short-term coping needs to be what we're designing those interventions to look around to make sure those are adaptive.

"A most helpful strategy has been educating the community in how heat is affecting them, because a lot of the times we find that the community doesn't relate the extreme heat to the changes in their own health. They understand that it's every year it's getting hotter and hotter, but they don't understand how this has been increasing or the reason behind that is causing us to experience extreme temperatures every summer. So, it has been really educating the community in understanding why this is happening. This has been our biggest effort because our community doesn't always understand the cause of this extreme heat."

– Southern Nevada community leader

We saw a huge spike of Latino families where families across Southern Nevada were going out to nature at the beginning of the pandemic, but there was an education gap, particularly on being safe when it is extremely hot. We saw a lot of folks going out with no sun block protection, no hat to reduce the heat impact. Sometimes only one water bottle, which could lead to some dehydration situations for folks who were enjoying the outdoors, but maybe hadn't enjoyed them before in extreme heat. How is it safe to go out? When is it not safe?

– Southern Nevada community leader



Improve the dissemination of information about existing programs and services that can help individuals and households mitigate the impacts of extreme heat and/or address heat-related challenges.

- Establish a centralized website in Nevada that hosts information about existing resources, policies, and programs that can assist individuals and households mitigate extreme heat. Provide this information in multiple languages.
- Update Nevada 211 Social Services to include an “Extreme Heat” [or Weather] tab.³
- Expand marketing and outreach efforts around SNHD’s “Personal Preparedness” campaign that strengthens education and awareness about the effects of extreme heat.
- Disseminate information to families about safety measures, ways to mitigate extreme heat, and programs to address heat-related challenges through public schools.
- Develop education and outreach campaigns that are culturally appropriate. As one community member remarked, “There are a lot of campaigns, but also those items need to be more accessible to our community.”

Public Spaces



Support ongoing efforts to expand tree canopy in highly vulnerable communities. As was reported, the City of Las Vegas intends to plant roughly 60,000 trees across the city by 2050.



Explore the adoption of cool roof programs, which can help reduce the urban heat island effect, improve air quality, and combat climate change. Several urban cities – including New York City and Phoenix – have adopted cool roof programs to mitigate the urban heat island effect.

Private Spaces



Establish a public (government) fund to help residents buy or modernize home air conditioning units. State and county officials should explore earmarking American Recovery Plan funds to support vulnerable households (e.g., low-income, immigrant, seniors) repair and/or purchase new air conditioning units. Consider ways to expand existing private and/or nonprofit programs that help households purchase energy efficient appliances and/or offer rebates on the purchase of air conditioning units.



Clark County should explore adoption of the existing North Las Vegas ordinance 15.20.030, Ch. 7, Section 701, which states: “Dwelling units, guest rooms and congregate residences shall be provided with heating and air conditioning facilities, capable of

³ Following the conclusion of our research, our team has contacted the Nevada Department of Health and Human Services, which hosts Nevada 211, and the team is working to update the Nevada 211 website.

maintaining a room temperature of 70 degrees Fahrenheit. This ordinance could ensure some individuals and households are able to reduce thermal discomfort in private spaces. Again, public decision makers should explore ways to leverage American Recovery Plan funds to assist landlords provide dwelling units with new and/or efficient air conditioning systems.



Explore the feasibility of expanding solar roof programs to townhomes, condominiums, and even apartment complexes. Several community members expressed an interest in installing solar rooftop energy system but noted the program is currently only available for homes and not for condominiums or townhomes.



Ensure that elderly residents, particularly those that are more vulnerable, are connected to nonprofits who provide services to mitigate the impacts of extreme heat. During periods of extreme weather, use social applications (e.g., Nextdoor) to check on vulnerable seniors. Several community leaders noted that elderly residents, particularly Native American community residents, “tend to be a little more isolated, which means that giving care for the elderly in extreme heat events is a much heavier lift and has to rely on more informal mechanisms rather than formal.”⁴⁰

Transit



Establish a public fund to help residents repair car air conditioning units. Decision makers may want to explore ways to leverage American Recovery Plan funds to establish this fund.



Expand cooling stations, water stations, and even public showers in communities that are most vulnerable to extreme heat.



Install water bottle refilling stations at all schools and at public bus stops. Many vulnerable families living in communities without significant shade coverings or tree canopy walk their children to school. Water bottle refilling stations at schools could help families mitigate the effects of extreme heat in transit. Additionally, water bottle refilling stations could help improve access to water for many housing-insecure students and students in the foster care system. Clark County School District should explore ways to dedicate American Recovery Plan funds to installing water bottle refilling stations at all schools.



Improve ways to mitigate extreme heat at public bus shelters. Among the measures public decision makers may want to consider are installation of shade covers and misters, application of sun-reflecting film, and construction of bus shelters from materials that deflect (rather than absorb) heat. Some cities across the United States are exploring ways to make public bus stop shelters more effective in protecting riders against extreme heat.

Phoenix has installed a misted bus shelter; Tempe, Arizona is experimenting with a project to apply a sun-reflecting film on the shelter structures.⁴¹

Workplace



Support adoption of regulation R053-20, proposed by Nevada’s Department of Business and Industry.⁴² If adopted, this proposed rule would require an employer of employees who are exposed to certain high temperatures (extreme heat) to: (1) include a program for the management of heat stress in the written safety program; and (2) encourage employees to frequently consume water or certain other beverages to ensure hydration. Nevada’s proposed extreme heat standard is similar to those adopted by four other states (e.g., California, Minnesota, Oregon, and Washington) (and to legislation – Asunción Valdivia Heat Illness and Fatality Prevention Act – that Congress has considered in recent years). Recently, the federal Occupational Health and Safety Administration “announced that in October it will begin exploring the possibility of creating a heat standard.”⁴³



Cover construction sites (and other outdoor work sites) with a tarp or shaded structure, where possible. One community leader remarked, “When we’re constructing houses, why can’t they cover the construction site with a tarp. They can do it for conventions. Why can’t they do it for home construction?”

“I know we have cool-down centers for folks who don’t maybe have a home or workplace to cool down in, and maybe that’s something for community members who work outdoors and maybe can’t be inside of a restaurant or something like that. I think [we need] cool-down centers for folks who are also workers and not just maybe folks who don’t have homes.”

–Southern Nevada community leader

Conclusion

- An examination of existing policies and programs reveals that most are place-based (e.g., weatherization programs for a dwelling). However, almost two-thirds of the community members we interviewed indicated that they are most likely to experience extreme heat in transit. Decision-makers should explore programs and policies that are not location-based and address heat-related challenges in the transit decision space.
- Decision makers should accelerate ways to ‘reimagine’ Nevada’s built environment to protect its residents, particularly those most vulnerable, from extreme heat. These could include reimagined bus shelters, the location of public showers and water bottle refilling stations, cool roof programs, and new materials.



References

- ¹ Angel Hsu, Glenn Sheriff, Tirthankar Chakraborty and Diego Manya. 2021. Disproportionate exposure to urban heat island intensity across major U.S. cities. *Nature Communications*, Volume 12, No. 2721. <https://www.nature.com/articles/s41467-021-22799-5>
- ² Guinn Center. 2020. The Impact of COVID-19 on Communities of Color. <https://guinncenter.org/wp-content/uploads/2020/09/Guinn-Center-Impact-of-COVID-19-on-Communities-of-Color-in-Nevada.pdf>
- ³ Climate Central. American Warming: The Fastest-Warming Cities and States in the U.S. April 17, 2019. <https://www.climatecentral.org/news/report-american-warming-us-heats-up-earth-day>
- ⁴ Alan Greenblatt. Nevada Shines Light onto America's Future. *Governing*. September 21, 2015. <https://www.governing.com/archive/gov-las-vegas-nevada-demographics.html>; U.S. Census Bureau 2021.
- ⁵ Nellie Payton. Celebrities call for more help for Navajo Nation to fight coronavirus. *Reuters*. May 6, 2020. <https://www.reuters.com/article/us-health-coronavirus-navajo-celebrities-idUSKBN22I39H>
- ⁶ State of Nevada. Nevada Enhanced Hazard Mitigation Plan. 2018. <https://data.nbmg.unr.edu/Public/NEHMP/StateOfNevadaEnhancedHazardMitigationPlan2018.pdf>; John Dialesandro, Noli Brazil, Stephen Wheeler, and Yaser Abunnasr. Dimensions of Thermal Inequity: Neighborhood Social Demographics and Urban Heat in the Southwestern U.S. *Environmental Research and Public Health*. 2021, 18(3), 941. <https://www.mdpi.com/1660-4601/18/3/941#>. Jason Vogel, Karen M. Carney, Joel B. Smith, et al. Climate Adaptation: The State of Practice in U.S. Communities. November 2016 <https://kresge.org/sites/default/files/library/climate-adaptation-the-state-of-practice-in-us-communities-full-report.pdf>. Nevada Legislative Counsel Bureau. Nevada's Population Change. April 14, 2021. <https://storymaps.arcgis.com/stories/a7162079243d4f1dab82cc908cf8cf29>. Bandala, E.R., Kebede, K., Jonsson, N. et al. Extreme heat and mortality rates in Las Vegas, Nevada: inter-annual variations and thresholds. *International Journal of Environmental Science and Technology*, vol 16, 7175–7186 (2019). <https://doi.org/10.1007/s13762-019-02357-9>.
- ⁷ Union of Concerned Scientists. 2019. Killer Heat in the United States Climate Choices and the Future of Dangerously Hot Days. <https://www.ucsusa.org/sites/default/files/attach/2019/07/killer-heat-analysis-full-report.pdf>
- ⁸ Union of Concerned Scientists. 2019.
- ⁹ Union of Concerned Scientists. 2019.
- ¹⁰ Climate Central. 2019. <https://www.climatecentral.org/news/report-american-warming-us-heats-up-earth-day>.
- ¹¹ Center for Climate and Energy Solutions. Heat Wave and Climate Change. <https://www.c2es.org/content/heat-waves-and-climate-change/>
- ¹² Shen Zhongping, Shi Jun, Tan Jianguo, Yang Hanwei. 2020. The Migration of the Warming Center and Urban Heat Island Effect in Shanghai During Urbanization. *Frontiers in Earth Science*, Volume 8. <https://www.frontiersin.org/article/10.3389/feart.2020.00340>; Xueqin Li ,Lindsay C. Stringer,Sarah Chapman, Martin Dallimer. How urbanisation alters the intensity of the urban heat island in a tropical African city. *Plos One*. July 13, 2021.

<https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0254371>

¹³ University of Nevada, Las Vegas Center for Business and Economic Research. Population. <https://cber.unlv.edu/SNBDI/population.html>

¹⁴ Vince Beiser. Feeling the Heat? Blame Concrete. *Time*. August 20, 2019. <https://time.com/5655074/concrete-urban-heat/>; Angel Hsu, Glenn Sheriff, Tirthankar Chakraborty & Diego Manya. 2021. <https://www.nature.com/articles/s41467-021-22799-5>; Climate Reality Project. How the Climate Crisis is Impacting Nevada. November 13, 2019. <https://www.climaterealityproject.org/blog/how-climate-crisis-impacting-nevada>;

¹⁵ Reprinted from Regional Transportation Commission of Southern Nevada (RTC). September 2021. Extreme Heat Vulnerability Analysis.

¹⁶ U.S. Department of Health and Human Services. Centers for Disease Control and Prevention. Extreme Heat. https://www.cdc.gov/climateandhealth/pubs/extreme-heat-final_508.pdf

¹⁷ Bandala et al, 2019; Climate Central. 2019; Union of Concerned Scientists. Southwest Region Areas to Endure Seven Weeks or More a Year When “Feels Like” Temperature Exceeds 105 Degrees. July 16, 2019. <https://www.ucsusa.org/sites/default/files/attach/2019/07/killer-heat-analysis-full-report.pdf>.

¹⁸ Stephanie Castillo. More trees may help east Las Vegas cool down from urban heat islands. *Las Vegas Review-Journal*, August 8, 2021. <https://www.reviewjournal.com/local/local-las-vegas/more-trees-may-help-east-las-vegas-cool-down-from-urban-heat-islands-2416028/>

¹⁹ Guinn Center 2020. The impact of COVID-19 on Communities of Color.

²⁰ Rachel Crosby. Nevada’s 27 tribal nations say they were left behind amid pandemic. *Las Vegas Review-Journal*. June 24, 2020. <https://www.reviewjournal.com/investigations/nevadas-27-tribal-nations-say-they-were-left-behind-amid-pandemic-2059778/>

²¹ S.L. Harlan, J.H. Deplet-Barreto, W.L. Stefanov, and D.B. Petitti, D. B. 2013. Neighborhood effects on heat deaths: Social and environmental predictors of vulnerability in Maricopa County, Arizona. *Environmental Health Perspectives*, 121(2), 197-204. <https://doi.org/10.1289/ehp.1104625>; Colleen E. Reid, Marie S. O’Neill, Carina J. Gronlund, Shannon J. Brines, Daniel G. Brown, Ana V. Diez-Roux and Joel Schwartz. November 2009. Mapping Community Determinants of Heat Vulnerability. *Environmental Health Perspectives*, Volume 117, No. 11, pp. 1730-1736. <https://www.coolrooftoolkit.org/wp-content/uploads/2013/03/Reid-Heat-vulnerability-mapping-2009.pdf>; S.L. Harlan, A. J. Brazel, L. Prashad, W.L. Stefanov, and L. Larsen. 2006. Neighborhood microclimates and vulnerability to heat stress. *Social Science and Medicine*, 63 (11), 2847-2863. <https://doi.org/10.1016/j.socscimed.2006.07.030>; J. Park, M. Bangalore, S. Hallegatte, and E. Sandhoefner. 2018. Households and heat stress: estimating the distributional consequences of climate change. *Environment and Development Economics*, Vol. 23(349). <https://www.cambridge.org/core/journals/environment-and-development-economics/article/abs/households-and-heat-stress-estimating-the-distributional-consequences-of-climate-change/8F99718D1EB402EEF82EE4C2D7579586>

²² Sharon Harlan, P. Chakalian, J. Deplet-Barreto, D.M. Hondula, and G.D. Jenerette. 2019. Pathways to climate justice in a desert metropolis. In *People and climate change: Vulnerability, adaptation, and social justice*, edited by L. Reyes Mason and J. Rigg. New York: Oxford University Press.

²³ Sharon Harlan, J.H. Deplet-Barreto, W.L. Stefanov, and D.B. Petitti. 2013. Neighborhood effects on heat deaths: Social and environmental predictors of vulnerability in Maricopa County, Arizona. *Environmental Health Perspectives* 12; M.T. Schmeltz, E.P. Petkova, J.L. Gamble. Economic Burden of Hospitalizations for

Heat-Related Illnesses in the United States, 2001-2010. *International Journal of Environmental Research and Public Health*. 2016. 13(9): 894.

²⁴ Nancy Brune and Kenny Retzl. First Cut on Census Data: Nevada is Diversifying but it's Complicated. *The Nevada Independent*. August 23, 2021. <https://thenevadaindependent.com/article/first-cut-on-census-data-nevada-is-diversifying-but-its-complicated>

²⁵ U.S. Census Bureau 2021.

²⁶ Dialesandro et al, 2021. Dimensions of Thermal Inequity: Neighborhood Social Demographics and Urban Heat in the Southwestern U.S.

²⁷ Regional Transportation Commission (RTC). September 2021. Extreme Heat Vulnerability Analysis.

²⁸ W.C. Chuang, A. Karner, N. Selover, D.M. Hondula, N. Chhetri, A. Middel, M. Roach, and B. Dufour. 2015. Arizona extreme weather, climate and health synthesis report. Arizona Department of Health Services. <https://www.azdhs.gov/documents/preparedness/epidemiology-diseasecontrol/extreme-weather/pubs/climate-and-health-profile-synthesis-report2015.pdf>

²⁹ Chuang et al., 2015; H.E. Guyer, H. F. Putnam, M. Roach, P. Iñiguez, and D.M. Hondula. 2019. Cross-sector management of extreme heat risks in Arizona. *Bulletin of the American Meteorological Society*, 100(3), ES101-ES104. <https://doi.org/10.1175/bams-d18-0183.1>; Regional Transportation Commission of Southern Nevada. September 2021. Extreme Heat Vulnerability Analysis.

³⁰ Regional Transportation Commission (RTC). September 2021. Extreme Heat Vulnerability Analysis.

³¹ Nevada Legislature. Nevada Revised Statute. Habitability of Dwelling Unit. NRS 118A.380. <https://www.leg.state.nv.us/Statutes/74th/Stats200711.html#Stats200711page1284>

³² City of North Las Vegas. Code of Ordinances. Heating, Air Conditioning and Ventilation. Ordinance 15.20.030, Chapter 7, Section 701. https://library.municode.com/nv/north_las_vegas/codes/code_of_ordinances?nodeId=TIT15BUCO_CH15.20_UNHOCO_15.20.030CH7SE701AM

³³ This study received ethical approval and cultural review under IRB ID STUDY00013131 at Arizona State University.

³⁴ Community members were recruited to participate in the study in several ways. Advisory board members and community leaders helped us connect with southern Nevada-based organizations and community leaders who work on heat-related issues and/or work with Native American and Latino community members. We used targeted Facebook advertising. Participating community members were given a \$50 gift card for their time participating in the study. To be eligible to participate, they had to self-identify as Native American and/or Latino and as a resident of Clark County. Prior to the interview, participants were asked to complete a brief questionnaire to provide contextual and demographic information. The questionnaire was offered in English and Spanish, and included questions about heat exposure, level of concern about extreme heat in southern Nevada, their housing, age, education, and other demographic information.

³⁵ Values do not add to 100 percent because we did not report all answers, just those that were most relevant. The total number (n) may vary across questions because individuals did not answer all questions.

³⁶ S. Castillo. More trees may help east Las Vegas cool down from urban heat islands. *Las Vegas Review-Journal*, August 8, 2021.

³⁷ S. Castillo. 2021.

³⁸ News3. Southern Nevada cooling stations activated due to extreme heat. May 27, 2020. <https://news3lv.com/news/local/southern-nevada-cooling-stations-activated-due-to-extreme-heat>

³⁹ Guinn Center. The Impact of COVID-19 on Communities of Color. 2020.

⁴⁰ Interview with community leader.

⁴¹ Tim Folger. This new technology could help cool people down—without electricity. *National Geographic*. August 5, 2021. <https://www.nationalgeographic.com/environment/article/this-new-technology-could-help-cool-people-down-without-electricity>. Michael Scott Davidson. Local laws don't require AC in most Southern Nevada homes. *Las Vegas Review-Journal*. June 27, 2017. <https://www.reviewjournal.com/local/local-las-vegas/local-laws-dont-require-ac-in-most-southern-nevada-homes/>

⁴² Proposed Regulation of the Division of Industrial Relations of the Department of Business and Industry LCB File No. R053-20. January 25, 2021. <https://dir.nv.gov/uploadedFiles/dirnv.gov/content/Governance/R053-20P%201-25-21.pdf>

⁴³ U.S. Congress. Senate 1068 - Asuncion Valdivia Heat Illness and Fatality Prevention Act of 2021. <https://www.congress.gov/bill/117th-congress/senate-bill/1068/text?r=5&s=1>; Alex Brown. Scorching Heat Is Killing Workers. Some States Are Stepping In. Pew Trusts. August 23, 2021. <https://www.pewtrusts.org/en/research-and-analysis/blogs/stateline/2021/08/23/scorching-heat-is-killing-workers-some-states-are-stepping-in>.

© 2021. All rights reserved. Kenny Guinn Center for Policy Priorities.

Citation: Guinn Center. 2021. Strengthening Heat Resiliency in Communities of Color in Southern Nevada. Las Vegas: Nevada.

For more information, contact:

Guinn Center
3200 E. Cheyenne Avenue
North Las Vegas, Nevada 89030
Website: www.guinncenter.org
Phone: 702-427-7509
Email: info@guinncenter.org