8 ENVIRONMENTAL ANALYSIS

This section identifies the major environmental features in the study area that should be considered as part of the Alternatives Analysis. This is based on available existing data and studies, with new data collection occurring in future phases.

EXTREME HEAT AND HEALTH

Southern Nevada has one of the hottest climates in the country and is also one of the fastest-warming regions. Research by the Regional Transportation Commission of Southern Nevada (RTC) and partner agencies suggests that the frequency and intensity of extreme heat events is likely to increase in the future. Increasing temperatures have negative implications for air quality and infrastructure maintenance, while extreme heat events can have serious consequences for human health and wellbeing. According to the Clark County Coroner's Office, almost 500 heat-related deaths occurred in the region in 2024.

The City of Las Vegas' 2050 Master Plan includes several policies related to extreme heat, public health, and safety. The Urban Forestry chapter speaks to the benefits of street trees and their relationship to balancing equity and urban heat island effects. Trees help reduce the urban heat island effect and overall temperatures, improve the quality of stormwater and air, and provide visual aesthetics that improve personal wellness. For transit corridors in particular, riders may be required to spend several minutes outside in the extreme heat, with no shade. This may exacerbate health issues for heat-susceptible populations, like children, elderly, low-income, or minority populations – groups that also fall under the definition of environmental justice populations.

RTC has conducted several studies to better understand the implications of rising temperatures, particularly as it relates to vulnerable populations. Extreme heat affects all residents but can be particularly problematic for individuals who are walking, bicycling, or waiting at transit stops. Urban environments like Charleston Boulevard are impacted by the urban heat island effect, where heat is trapped in asphalt, concrete, and other hard surfaces, raising both surface and ambient air temperatures. According to the Extreme Heat Vulnerability Webmap, much of the corridor has a moderate to high combined score for extreme heat vulnerability, with the eastern segment part of one of three "hottest" or most vulnerable areas in the Las Vegas Valley for heat-related health impacts.

In a survey conducted by RTC, about half of transit customers reported experiencing symptoms of heat-related illness while traveling to or from bus stops. When asked what measures would improve conditions, the top responses included:

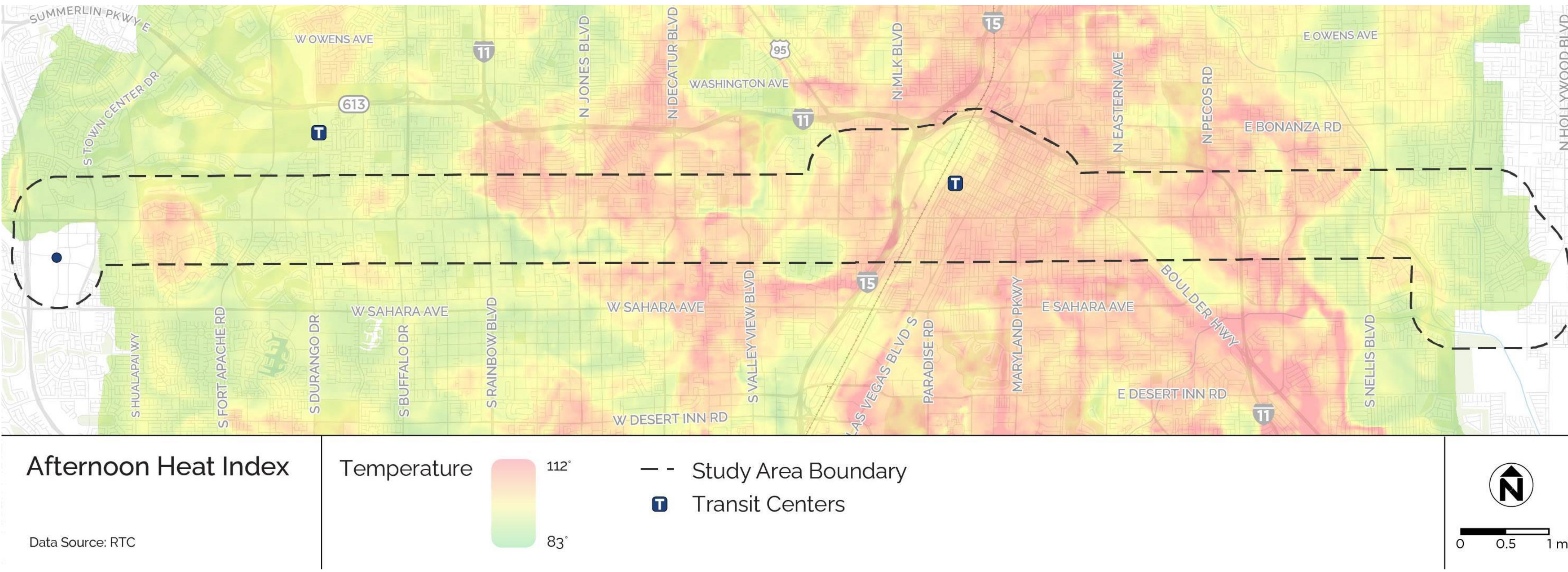
- Provide more frequent transit service to reduce wait times.
- Provie water refill stations near transit stops.
- Provide better or more sharing at bus stops.

Segments of sidewalk and transit stops along Charleston Boulevard that lack street trees or man-made shade structures can be uncomfortable for pedestrians, bicyclists, and transit riders, and can be dangerous in the summer months. Some transit stops that include shelters do not provide shade at many times of the day, as shown in the image below, near the intersection of Charleston Boulevard and Eastern Avenue.

Additional resources are available to further explain [Extreme Heat Vulnerability]() on the RTC website.

Bus stop along Charleston Boulevard in full sun.

Figure 140 Extreme Heat Vulnerability along Charleston Boulevard



COMMUNITY RESOURCES/FACILITIES

There are a number of community resources and facilities along the corridor, including schools, colleges, universities, parks, recreation areas, and medical facilities. These facilities are shown in Figure 2 to Figure 3 and summarized as follows.

Figure 141 Community Facilities

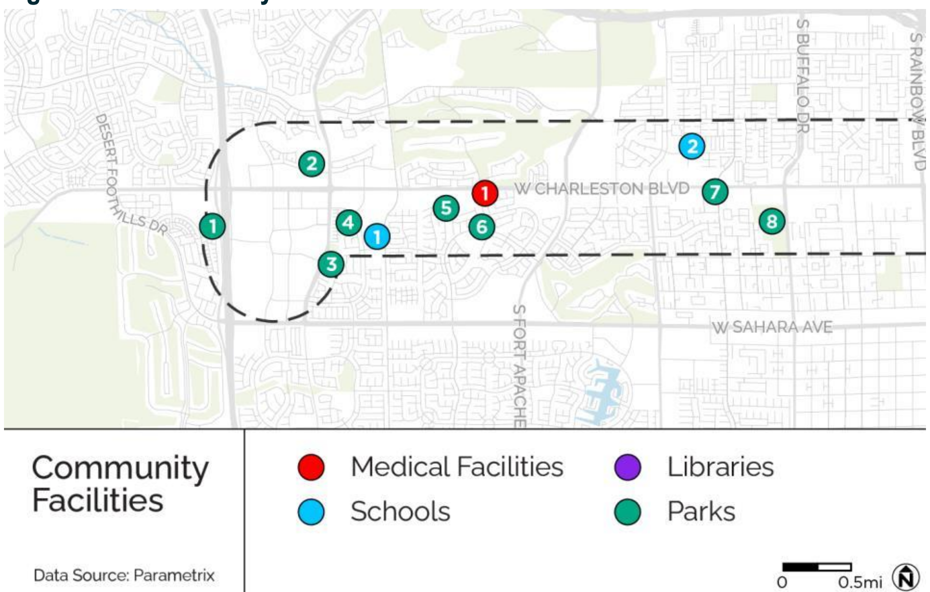
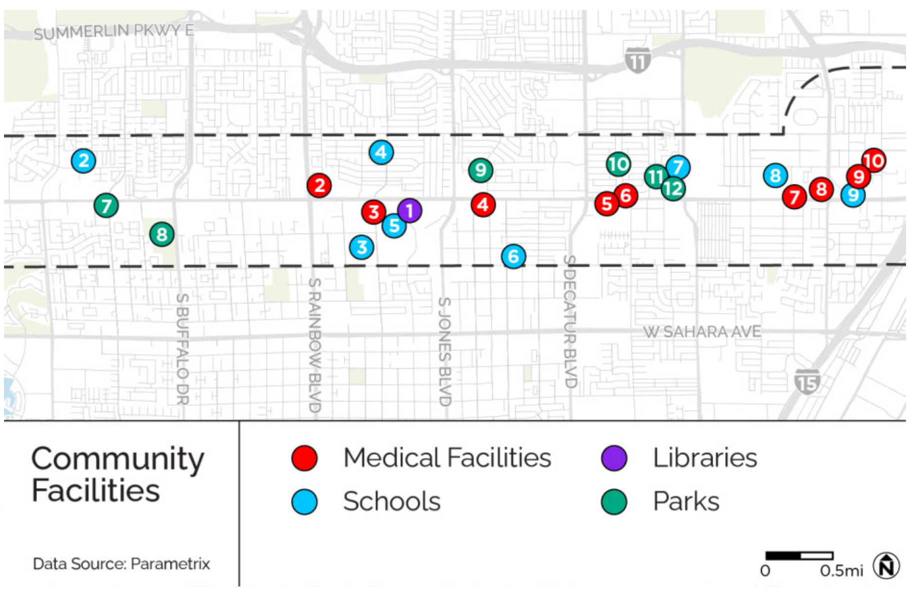


Figure 142 Community Facilities



Schools and Colleges/Universities

There are several schools, colleges, and universities located along or near Charleston Boulevard, including twelve elementary schools, four middle schools, three high schools, and two college/university facilities. These include:

1. The Faith Lutheran Middle School/High School campus is located on the western end of the study corridor, on the south side of the corridor, just east of Town Center Drive.
2. Walter E. Jacobsen Elementary School is located on the north side of the corridor, between Captains Hill Road and Roland Wiley Road.
3. Bonanza High School is located just south of the corridor and is bordered by Redwood Street and Torrey Pines Drive.
4. Rose Warren Elementary School is located on the north side of the corridor, just west of S. Torrey Pines Drive.
5. The College of Southern Nevada is located on the south side of the corridor between Torrey Pines Drive and Community College Drive.
6. Doris Hancock Elementary School is located on the south side of the corridor, just east of S. Lindell Road.
7. Hyde Park Middle School is located about two blocks north of the corridor, next to Cragin-Hinson Park, west of Valley View Drive.
8. Wasden Elementary School is located about a block north of the corridor, just west of Shetland Road.
9. The University of Nevada School of Medicine building is located on the north side of the corridor, just east of Tonopah Drive.
10. John S. Park Elementary School is located on the south side of the corridor, between S. Las Vegas Boulevard and S. Maryland Parkway.

11. Las Vegas Academy of the Arts is located on the north side of the corridor, just east of Las Vegas Boulevard.
12. Crestwood Elementary School is located on the south side of the corridor, south of the East Charleston Plaza.
13. Howard E. Hollingsworth Elementary School is located on the north side of the corridor, just east of N. Bruce Street.
14. Sunrise Acres Elementary School is located on the north side of the corridor, east of Eastern Avenue, near Ry W. Martin Middle School and the Variety School.
15. The Variety School is located on the north side of the corridor, east of Eastern Avenue, near Sunrise Acres Elementary School and Roy W. Martin Middle School.
16. Roy W. Martin Middle School is located on the north side of the corridor, east of Eastern Avenue, near the Variety School and Sunrise Acres Elementary School.
17. William Snyder Elementary School is located on the south side of the corridor, between S. Lamb Boulevard and Joe Shoong Park.
18. John F. Mendoza Elementary School is located on the south side of the corridor, just east of S. Sloan Drive.
19. Daniel F. Goldfarb Elementary School is located on the south side of the corridor, just east of Tree Line Drive, near Lewis Family Park.
20. Duane D. Keller Middle School is located on the north side of the corridor, just west of Fogg Street.
21. Las Vegas High School is located on the south side of the corridor, between Tree Line Drive and S Hollywood Boulevard.
22. Mervin Iverson Elementary School is located on the south side of the corridor, just west of S. Hollywood Boulevard and Hollywood Regional Park.

Figure 143 Community Facilities

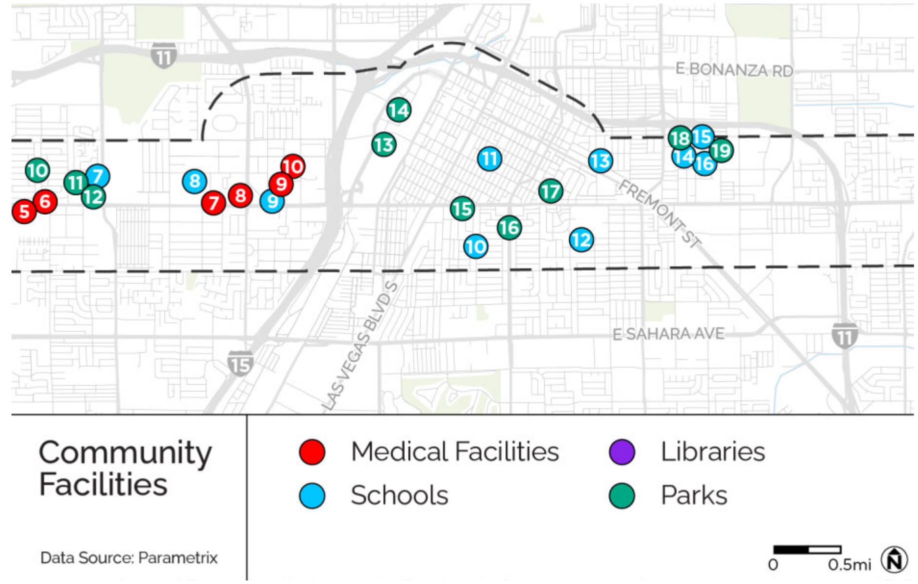
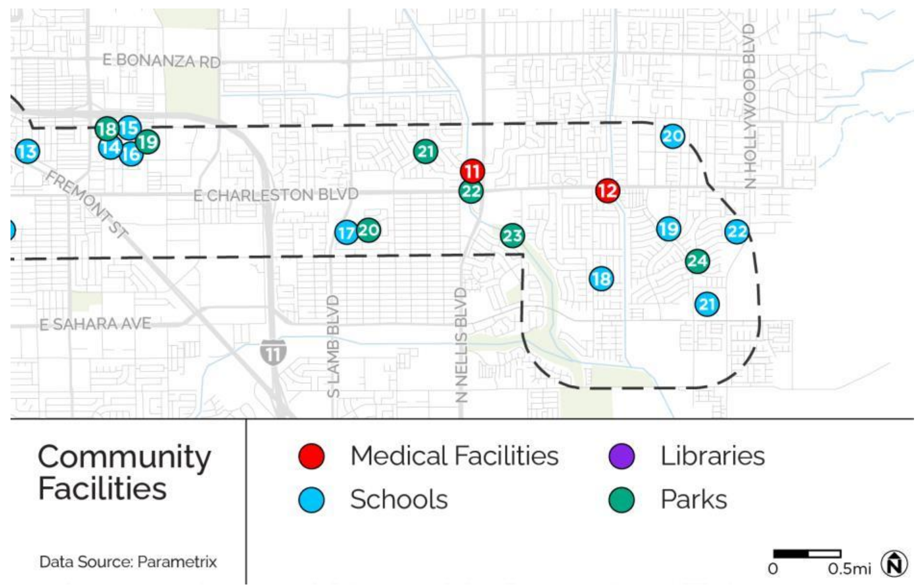


Figure 144 Community Facilities



Parks and Recreation Areas

There are several parks and recreation areas located along or adjacent to the corridor. Some of these facilities are likely subject to Section 4(f) of the US Department of Transportation Act of 1966, as considered under a future NEPA study. These amenities vary in size and purpose, as described below:

1. Sagemont Park is located on the south side of the corridor, just west of CC 215.
2. Desert Park/Cottonwood Canyon is located about a block north of the corridor, just east of Town Center Drive.
3. Summerlin Centre Community Park is located on the south side of the corridor, just east of S. Town center Drive, near the Faith Lutheran Middle and High School Campus.
4. The Village Green Park and Faith Lutheran Football/Baseball fields are located on the south side of the corridor, between Town Center Drive and Hualapai Way.
5. The Peccole Ranch Trail runs roughly parallel to the corridor, about ¼ mile to the south, between Hualapai Way and just past Apple Drive.
6. The Peccole Ranch Disc Golf Course is located a few blocks south of the corridor, just west of Apple Drive.
7. The Red Rock Climbing Center is located at the southwest corner of Charleston Boulevard and Cimarron Road.
8. All American Park is located about a block south of the corridor on the west side of Buffalo Drive. The park includes seven large playing fields, a dog park, tennis courts, and other amenities.
9. Gary Dexter Park is located on the north side of the corridor, east of S. Jones Boulevard.
10. West Charleston Lions/Essex Park is located on the north side of the corridor and is bordered by Essex Circle.
11. The Cragin-Hinson Park is located just north of the corridor, on the west side of S. Valley View Boulevard.
12. Rotary Park is co-located with the Cragin-Hinson Park, just north of the corridor, on the west side of S. Valley View Boulevard.
13. The Clark County Amphitheater Park is located on the north side of the corridor, just east of I-15.
14. Symphony Park is located on the north side of the corridor, just east of I-15, near the Discovery Children's Museum and Fremont Street Experience.
15. Mary Dutton Park is located on the south side of the corridor, just west of S. 8th Street.
16. Huntridge Circle Park is located on the south side of the corridor and is bordered by Maryland Parkway on the east and west.
17. Mayfair Place Park is located just north of the corridor, between 15th and 16th Street.
18. Hadland Park is located on the north side of the corridor, east of Eastern Avenue, and west of the Variety School.
19. Rafael Rivera Park is located on the north side of the corridor, just east of the Variety School.
20. Joe Shoong Park is located on the south side of the corridor, just east of Lamb Boulevard and William Snyder Elementary School.
21. Stewart Place Park is located on the north side of the corridor, just west of Nellis Boulevard.
22. The Las Vegas Wash Trail runs under the corridor just west of Nellis Boulevard.
23. The Club at Sunrise Golf Course is located on the south side of the corridor, just east of Nellis Boulevard.
24. Lewis Family Park is located on the south side of the corridor, just east of Tree Line Drive.

Medical Facilities

There are several large medical centers located along the corridor, as described below. In addition to these medical centers, there are a number of smaller medical-related businesses, including dental offices, ophthalmologists, pediatrics, and animal hospitals.

1. The Thomas & Mack Medical Plaza is located on the south side of Charleston Boulevard, just east of Apple Drive.
2. The Intermountain Health Rainbow Primary Care Clinic is located on the north side of the corridor, just east of Rainbow Boulevard.
3. The Silver Ridge Healthcare Center is located on the south side of the corridor, just west of Torrey Pines Drive.
4. The El Dorado Medical Center is located on the south side of the corridor, just west of Westwind Road.
5. CareNow Urgent Care - Charleston & Decatur is located on the south side of the corridor, between Decatur Boulevard and Arville Street.
6. The Serru Medical Center is located on the north side of the corridor, just east of Essex Drive.
7. The Spine and Neurotrauma Center, Breast Care Center, and Southwest Medical Rancho Urgent care are located on the north side of the corridor, just west of Rancho Drive.
8. The Southwest Medical Rancho Urgent Care Center is located on the north side of the corridor, just west of Rancho Drive.
9. The UMC Trauma/Medical Center is located on the north side of the corridor, just behind the University of Nevada School of Medicine. The medical center is bordered by Tonopah Drive to the west and Shadow Lane to the east.
10. The Valley Hospital Medical Center is located on the north side of the corridor, just west of I-15.
11. UMC Quick Care – Nellis is located on the north side of the corridor, just west of Nellis Boulevard.
12. CareNow Urgent Care/Charleston & Sloan is located on the south side of the corridor, just east of Sloan Lane, in the Albertsons shopping center.

Libraries and Community Centers

1. The West Charleston Library is located at 6301 W. Charleston Boulevard.

SOCIOECONOMICS

The Charleston corridor is home to diverse communities and families, with about 21% of residents under 18 and 16% over age 65. The average household size is 2.28 and 34% of households include married couples.

As shown in Table 1, 18% of corridor residents have incomes below poverty and 15% do not have access to a vehicle.

The Charleston Boulevard corridor has a variety of languages spoken at home. According to the US Census Bureau 5-year estimates; 56% of the population speak English at home, 36% speak Spanish, and 3% speak Tagalog.

As shown in Table 2, about 10% of residents identify as Black or African American and 45% identify as Hispanic.

Table 45 Socioeconomic and Demographic Characteristics

	Corridor	City of Las Vegas	Clark County
Under 18	21.1%	22.6%	22.2%
65+	15.7%	15.9%	15.8%
Household Size	2.7	2.7	2.7
Married Households	34	40.9	43.8
Population in Poverty	18.0%	14.1%	13.1%
Zero Vehicle Households	15.2	8.7	7.7
Single Vehicle Households	38.3	37.5	36.6
English as a Second Language	44.0	36.9	36.3

Source: 2022 ACS 5-Year

Table 2 Race and Ethnicity

	Corridor	City of Las Vegas	Clark County
White	**33%**	39.6%	37.6%
Black/African American	**9.6%**	11.5%	11.7%
American Indian & Alaska Native	**0.3%**	0.2%	0.3%
Asian	**6.7%**	7.7%	10.7%
Native Hawaiian & Other Pacific Islander	**0.4%**	0.5%	0.7%
Some Other Race	**0.7%**	0.6%	0.6%
Two or More Races	**4.2%**	5.8%	5.9%
Hispanic	**45.1%**	34.1%	32.5%

Source: 2022 ACS 5-Year

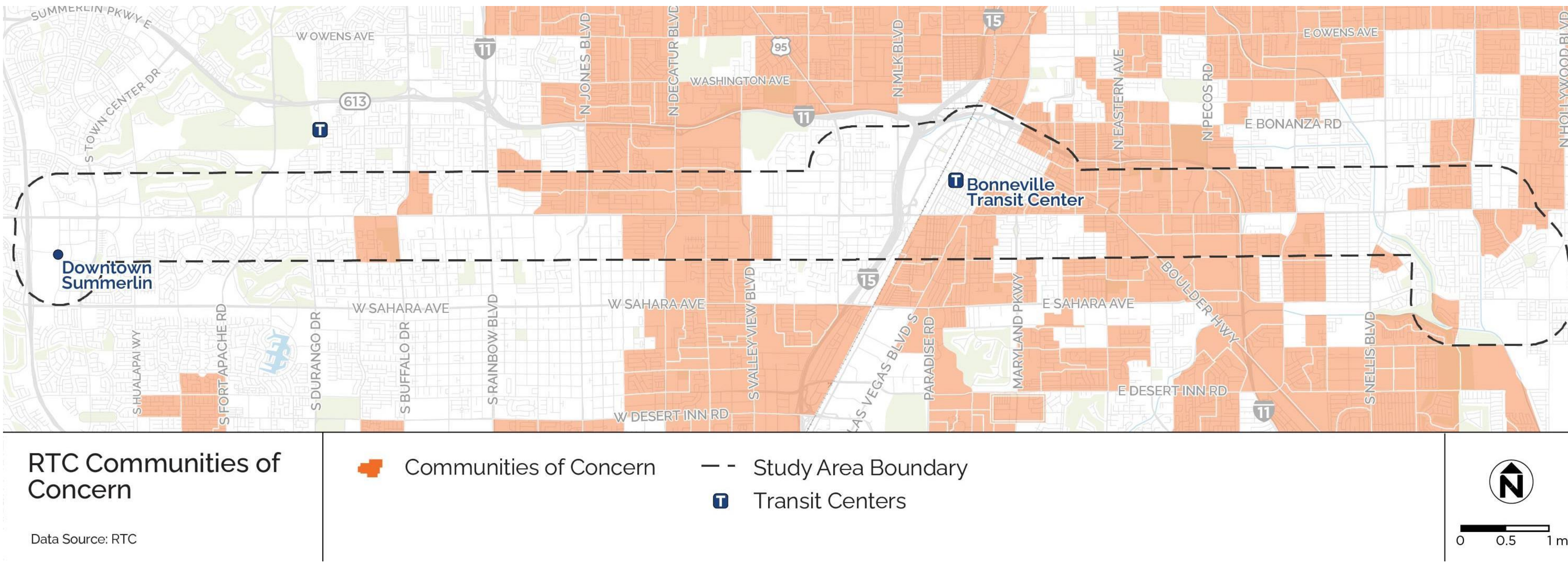
Communities of Concern

Studies conducted by the RTC about health, extreme heat, and traffic safety have shown that the most adverse outcomes for these factors tend to be concentrated in the central Las Vegas Valley and extend alongside some of the region's high-speed arterials. The RTC has identified areas with the greatest health, and safety challenges as communities of concern, as shown in Figure 6. The communities of concern designation is based on the 2022 RTC Transportation Health Study. It incorporates data related to three primary categories:

- Vulnerability – social equity and prevalence of chronic health conditions.
- Transportation-related health risk – traffic safety, environmental exposure, and physical inactivity.
- Health-related transportation access – walkability, bicycle network access, transit access, health related goods and services, job access, and greenspace access.

These areas generally have higher proportions of low-income residents, indicating that the greatest burdens are borne by residents with limited resources. Many segments of the Charleston corridor have been identified as communities of concern by RTC, including the segments from Rainbow Boulevard to Valley View Boulevard and from I-15 to Lamb Boulevard.

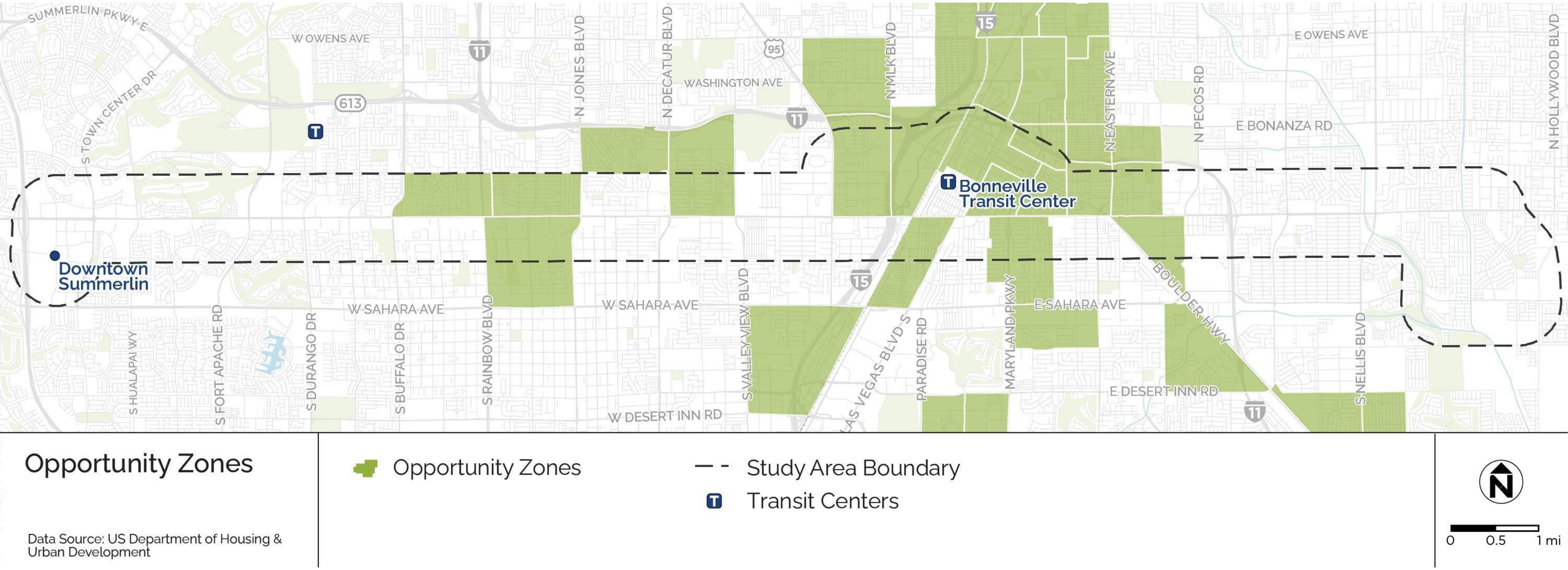
Figure 145 Communities of Concern



Opportunity Zones

Opportunity zones were created in the Tax Cuts and Jobs Act of 2017. The purpose of opportunity zones is to generate economic growth and job creation in low-income communities and provide tax benefits to investors. In the Charlston Boulevard corridor, opportunity zones are generally located from Mojave Road to Rancho Drive and from Valley View Boulevard to Buffalo Drive. In the Charlston Boulevard corridor, opportunity zones are generally located from Mojave Road to Rancho Drive and from Valley View Boulevard to Buffalo Drive.

Figure 146 Opportunity Zones



VISUAL QUALITY

The Charleston Boulevard project area is characterized by visual elements associated with urban and suburban development, including commercial, light industrial, residential, parks, public facilities, and transportation development (buses).

Buildings adjacent to the Charleston Boulevard corridor include retail establishments, hospitals and medical facilities, apartment buildings, office buildings, university buildings, and single-family and multi-family homes. The topography is flat and the mountains surrounding the Las Vegas Valley can be seen from both ends of the corridor. In the center of the corridor, prominent views can be seen of Las Vegas skyline landmarks, including Downtown Las Vegas to the north and portions of the Las Vegas Strip to the south, including the STRAT Hotel, Casino, and Tower.

Charleston Boulevard has an east-west orientation, with views of several key mountain peaks and ranges in each direction. To Red Rock Canyon, the La Madre Mountain, and Mount Charleston. To the east, the Sunrise, Frenchman, and River Mountains are visible.

Charleston Boulevard, looking West toward the Las Vegas Strip

Charleston Boulevard, looking West towards the Red Rock Canyon.

Charleston Boulevard, looking east, towards the Frenchman Mountain

A cursory review was conducted for the visual quality of existing conditions, as well as for the viewer's visual sensitivity. Viewer groups include:

- **Community Residents/Regular Motorists:** Residents/commuters can be expected to have the highest sensitivity and be the most aware of any visual changes, since the project is located within their immediate environment or surroundings, and they have frequent exposure to views. In the case of the project, residents at the easternmost and westernmost ends would likely be impacted the most.

  Charleston Boulevard to the east includes several visual obstructions today, including extensive power lines on both sides and crossing the roadway, as well as a pedestrian bridge near the Las Vegas Wash.

  To the west, Charleston Boulevard is developed as a Complete Street with robust landscaping on both sides and in the median, which can make the corridor feel more enclosed.
- **Transit patrons, bicyclists and pedestrians:** This user group includes those using the transit system, those walking or bicycling to/from the bus stops, and other pedestrians and bicyclists traveling through the corridor. These viewers have the most direct exposure to the physical environment and awareness of the visual environment.
- **Business Owners, Employees, and Customers:** This group would be associated with the existing offices and businesses within the study area. A principal concern is likely to be the effect of any construction on business access for employees or customers. These viewers are anticipated to have a low level of concern regarding the changes to the visual environment.

NATURAL RESOURCES

Wetlands and Floodplains

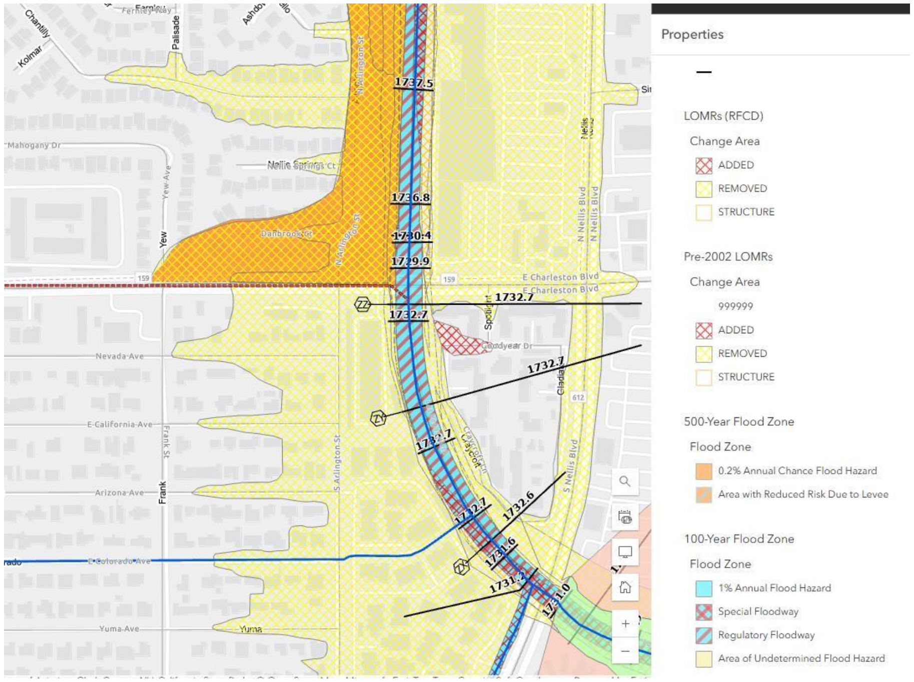
The City is within the Las Vegas Valley Hydrographic Basin, and has only one drainageway: the Las Vegas Wash, which empties to Lake Mead and the Colorado River. Much of the watershed within the City has been developed through funded projects and facilities of the Clark County Regional Flood Control District. Concrete open flow channels, detention basins, and culverts have helped control stormwater during flooding events.

From a regulatory perspective, the northern side of Charleston Boulevard between Yew Avenue and the Las Vegas Wash is within the 500-Year Flood Zone. The south side of the corridor between Frank Street and the Las Vegas Wash is considered an Area of Undetermined Flood Hazard. There are additional Areas of Undetermined Flood Hazard between the Wash and Nellis Boulevard, as shown in Figure 8. The area along the Wash itself is within the 100-Year Flood Zone and is considered a Regulatory Floodway.

Despite no regulatory definitions, there is a history of extensive flooding within the core of the Las Vegas metropolitan area. In particular, the Charleston Boulevard/UPRR underpass is a topographic low point in the region, and severe flash flooding events were commonplace. A project to replace the bridge, reduce the flooding impacts, and complete regional flood control improvements is currently underway.

Flooding usually results in disruptions to transportation, emergency response, minor property damage, and the impact of flash flood events. Severe storms can also have the secondary effect of increasing traffic accidents, sometimes involving the rescue of motorists from flooded areas.

Figure 147 Floodplain Designation near Charleston and Nellis ([Source](#))



The City of Las Vegas' [2050 Master Plan](#) includes several recommendations and actions related to minimizing risk related to flooding and other natural hazards, including constructing a reinforced box culvert along Charleston Boulevard for flood conveyance. As it relates to natural hazards, more general recommendations are to lessen the economic severity of hazards, address risks to the City's most vulnerable populations first, and minimize flooding risks to prevent damage to property and infrastructure.

Water Quality and Navigable Waterways

The Las Vegas Wash runs underneath Charleston Boulevard just west of Nellis Boulevard. This 12-mile long "urban river" feeds much of the Las Vegas Valley's excess water into Lake Mead. The wash is fed by urban runoff, shallow ground water, reclaimed water used at parks and golf courses, and stormwater. The Las Vegas Wash is prone to flooding, especially during monsoons and other significant rain events. Additional development, particularly with impervious surface area, has strained the capacity of the Wash to handle runoff.

Ecologically Sensitive Areas and Endangered Species

The majority of the area surrounding Charleston Boulevard (i.e., within the ½ mile planning buffer) is already developed. Thus, there is low potential for impacts to ecologically sensitive areas or endangered species. Any such impacts would have been identified and mitigated during the planning, design, and construction of the roadway and/or surrounding development. The majority of work to be performed as part of this project is likely to be within the existing right-of-way, which further limits the likelihood of such impacts.

Air Quality

The Las Vegas Valley – also known as Hydrographic Area 212 - is a moderate nonattainment area for the 2015 O_3 National Ambient Air Quality Standards (NAAQS) and an attainment area subject to a maintenance plan for the CO and PM_{10} NAAQS. Hydrographic Areas 164A, 164B, 165, 166, 167, 212, 213, 214, 216, 217, and 218 (excluding the Moapa River Indian Reservation and the Fort Mohave Indian Reservation) are attainment areas subject to a maintenance plan for the 1997 O_3 NAAQS. Clark County is in attainment/unclassifiable for the $PM_{2.5}$, SO_2, Pb, NO_2 and 2008 O_3 NAAQS (Source). RTC indicates that the region is likely to be designated as a serious nonattainment area in the future.

SAFETY AND SECURITY

The City of Las Vegas' 2050 Master Plan includes the goal to reduce crime and create safe, friendly communities that elevate social equity. Public safety is particularly relevant along the transit system.

There are two key elements of safety and security, particularly for pedestrians and/or individuals waiting at transit stops: environmental design (e.g., lighting, visibility) and the presence of security personnel and/or monitoring.

Environmental Design

The 2050 Master Plan outlines the principle of crime prevention through environmental design (CPTED), which is the process of designing the built environment to reduce the opportunity for, and fear of, stranger-to-stranger predatory crime. It is implemented electronically, using mechanical or technological products or techniques, through building layout and architecture, and organizationally with physical presence. Good design that is in place at the beginning can negate the need for other, potentially more expensive deterrents to crime that may need to be added later as deficiencies in design become problems.

Lighting is a key component of ensuring safety through environmental design. Although streetlights are provided consistently, the provision of pedestrian-scale lighting varies throughout the corridor. Many existing transit stops lack dedicated lighting. RTC is investing in the installation of solar lighting at bus stops across the region. Some stops also benefit from lighting at nearby commercial development, as shown in the image to the right.

Bus stop near Charleston Boulevard and Decatur Boulevard

Visibility is also an important element of safety and security, namely as a crime deterrent. Most of the transit stops and walkways along the corridor are relatively open/exposed, and transit shelters are generally designed with mostly transparent or translucent walls. Similarly, much of the corridor is relatively well traveled, lending a consistent set of eyes on sidewalks and transit stops.

Eyes on the street at bus stop on Charleston Boulevard

Security/Monitoring

Security personnel and electronic monitoring are used to further enhance safety and security, both along walkways and at transit stops and stations. RTC has dedicated security personnel who patrol transit stops and stations, and ride buses on select routes. RTC recently added 300 transit security officers to the regional transit system, including 50 who will ride the buses.

"Riders will notice an increased security presence and stronger enforcement of the fare policy and rider rules, offering peace of mind and assistance when needed," said Tom Atteberry, RTC Senior Director of Safety and Security Operations.

When more serious incidents occur, the Las Vegas Metropolitan Police Department is contacted, due to limitations on the types of enforcement transit security are able to provide.

SUMMARY AND OPPORTUNITIES

The Let's Go Charleston study area is primarily built out, and therefore the project poses minimal potential for adverse environmental impacts. Indeed, the project offers great potential to improve the quality of life and access to opportunity for community residents in the corridor. It will be important to study several areas in more detail as the study progresses:

- Extreme heat will be a critical consideration in the design of supportive facilities for a future high-capacity transit line. The corridor runs through one of the region's "hottest" and most vulnerable areas.
- There are a number of community resources and facilities along the corridor, including schools, colleges, universities, parks, recreation areas, and medical facilities. These will be important destinations and should be considered in the placement and design of stops and stations.
- The population along the corridor has higher incidence of populations in poverty, zero-vehicle households, and Hispanic residents than the City of Las Vegas or Clark County. These demographics will influence appropriate outreach methods during the study, as well as the design and location of access to the HCT service. The project is expected to improve access to employment and educational opportunities for residents, as well as access to essential services.
- The eastern end of the corridor, near the Las Vegas Wash, is in the 500-Year Flood Zone. Only the area along the Wash itself is within the 100-Year Flood Zone and is considered a Regulatory Floodway.
- Environmental design, security, and monitoring will be important considerations in the design of stops and stations.
- Due to the developed character of the corridor, this project is expected to have no or very minimal impacts on natural and visual resources.
- A hazardous materials analysis will be conducted as part of future NEPA studies, as will a more detailed noise analysis and study of historic and cultural resources.