APPENDIX A: CONDITIONS ASSESSMENT REPORT

FINAL DRAFT

I-11 Las Vegas Metropolitan Area

Conditions Assessment Report

Nevada Department of Transportation

Las Vegas, Nevada

April 29, 2022

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1.1 PROJECT OVERVIEW

1.1.1 What Is the Purpose of the I-11 Corridor through the Las Vegas Metropolitan Area?

Favorable transportation infrastructure is one key component for attracting and retaining industry and increasing an area's competitiveness and economic vitality. The 2014 Nevada Department of Transportation (NDOT) and Arizona Department of Transportation (ADOT) jointly-completed Interstate 11 (I-11) and Intermountain West Corridor Study (IWCS) identified I-11 as a critical piece of multimodal infrastructure that would diversify, support, and connect the economies of Arizona and Nevada, and serve the nation's north-south, multimodal transportation needs from Mexico to Canada. By promoting freight linkages crucial to distributing goods across North America, I-11 would stimulate the development of new crossroads, spurring community and economic development opportunities spanning the entire corridor.

Economic return on investment analysis conducted for the IWCS predicted that the I-11 has the potential to bring up to an additional 240,000 jobs and $22 billion in economic output to the region over the next 25 years. I-11 would connect regional economies to each other and to global markets creating opportunities for integrated manufacturing and advancement of the economic development initiatives of Nevada and Arizona.

The Las Vegas metropolitan area is comprised of separate and distinct activity centers for residents and visitors, such as Downtown Las Vegas, the Las Vegas Strip, McCarran International Airport, and the Las Vegas Convention Center, which account for over $57 billion in total annual output, supporting approximately 42 percent of private employment in Southern Nevada, and generating over $15 billion in wages and salaries (Las Vegas Economic Impact Series Report, 2019). The disparate locations of these facilities result in a variety of travel patterns of peak and off-peak travel. Major routes through the Las Vegas Valley, including I-215, Clark County (CC) 215, I-515, U.S. Highway 95 (US 95), and I-15, experience bottlenecks during peak travel periods. Congestion is expected to increase through the year 2040 as a result of planned activity center expansions and other development.

Existing congestion in the Las Vegas Valley hinders access for emergency services and is of concern regarding efficiency for evacuations during natural or manmade disasters including flash floods, and earthquakes. With Nellis Air Force Base, the premier training facility for the Air Force, located northeast of the city, mobility in support of national defense is also of concern.

The 2014 IWCS identified a western corridor and a central corridor through the Las Vegas metropolitan area, as well as a general eastern corridor area. The IWCS concludes that all three alternatives would be reasonable and feasible and should be carried forward for further study.

After a detailed evaluation, in 2021, NDOT and the Federal Highway Administration (FHWA) concluded that an eastern corridor alternative would not be feasible as the I-11 link through the Las Vegas Metropolitan Area (see the *Alternatives Development Report*[1]). As a result, this Planning and Environmental Linkages (PEL) study evaluates two potential corridor alternatives – a western and a central – to identify a preferred route through the Las Vegas Metropolitan Area.

1.1.2 Why Are NDOT and FHWA Completing a PEL Study?

In late 2020, NDOT and FHWA determined that a PEL study is the most appropriate approach moving forward to accomplish the goal of selecting a corridor for I-11 through the Las Vegas metropolitan area. The PEL study would be used to identify transportation issues and environmental concerns in the proposed corridor alternatives and refine the corridor alternatives. The 2014 IWCS, also a PEL study, was conducted for a much larger, regional corridor and not specifically focused on the Las Vegas metropolitan area. The current I-11 Las Vegas Metropolitan Area PEL study considers corridor alternatives through Las Vegas to further the progress beyond the 2014 IWCS. Although a Tier 1 EIS was initially considered to develop and evaluate corridor alternatives, and to recommend a preferred corridor to advance to a project-level Tier 2 environmental process for compliance with NEPA, NDOT and FHWA determined that a focused PEL study would achieve the same objectives within a shorter time period. At the conclusion of the I-11 PEL study, NDOT and FHWA will consider future actions necessary to designate a single corridor along which to build future I-11 projects through the Las Vegas metropolitan area.

1.2 PEL Study Coordination

1.2.1 What Collaboration with Stakeholders Has Been Completed to Date?

Collaboration with partner agencies, stakeholders, and the public is critical to the PEL study. Following PEL requirements for community engagement, there have been numerous opportunities throughout the process for agencies, stakeholders, and the public to learn about the study and provide input at key decision milestones.

Engagement to Inform the Alternatives Development Report

To inform the *Alternatives Development Report*, the project team held 29 virtual meetings with individual stakeholders during the COVID-19 pandemic, in addition to two in-person Technical Advisory Committee, one virtual Cooperating and Participating Agency, and one virtual Community Working Group meeting. Between July 31 and August 31, 2020, an on-line virtual public meeting was held to gain public input on the project alternatives, and within this time frame a Telephone Town Hall was held on August 27, 2020. Details of these engagement activities can be found in the *Alternatives Development Report.*

[1] https://i11nv.com/wp-content/uploads/2021/06/20210607-NDOT-I-11-Final-Draft-ADR-Complete-PDF.pdf

Engagement with Stakeholder Working Groups

Since the development of the *Alternatives Development Report*, continued collaboration was re-initiated in spring 2021, and several virtual meetings were held with Cooperating and Participating Agencies, the Technical Advisory Committee, and the Community Working Group, as noted below:

- Agency Stakeholder Meetings:
  - June 16, 2021: Cooperating and Participating Agencies
  - June 24, 2021: Technical Advisory Committee
  - October 12, 2021: combined Cooperating, Participating, and Technical Advisory Committee agencies
- Community Working Group Meetings:
  - June 29, 2021
  - October 19, 2021

Public Outreach Events

In late summer 2021, NDOT launched both virtual and in-person public meetings with a public comment period that commenced on August 17, 2021 and closed on September 30, 2021. During this timeframe, the following methods of engagement were available to the public to provide study updates to the public and to solicit their input into the preparation of the PEL and the recommended corridor:

- Five in-person public meetings to share project information and solicit public feedback regarding the corridor alternatives:
  - August 31: 4 – 7 p.m. | Sahara West Library; 9600 W Sahara Ave, Las Vegas, NV 89117
  - September 1: 4 – 7 p.m. | Centennial Hills Community Center YMCA; Fun Zone, 6601 N Buffalo Drive, Las Vegas, NV 89131
  - September 7: 4 – 7 p.m. | Lifeguard Arena, Center Ice Room, 222 S Water Street, Henderson, NV 89015
  - September 14: 4 – 7 p.m. | RTC Southern Nevada, Conference Room 108, 600 S Grand Central Pkwy, Las Vegas, NV 89106
  - September 16: 2:30 – 5:30 p.m. | Windmill Library; 7060 W. Windmill Lane, Las Vegas, NV 89113
- Bilingual Telephone Town Hall hosted on September 2, 2021, 5:30 – 6:30 pm to engage community members who may not have a secure or reliable internet connection or those who may have disabilities or physical limitations precluding them from attending in person.
- Virtual on-line public meeting for the duration of the public comment period to allow members of the public to review materials at their own pace, on their own schedules, and provide comments through an interactive webmap and participate in an optional survey.

1.2.2 What On-going Engagement Methods are Part of the PEL Study?

As specific stakeholder and public engagement informs the evaluation of proposed corridor alternatives, soliciting community input at key decision milestones is important throughout the project. NDOT will provide consistent communication throughout this process to the stakeholders and public. NDOT is committed to conducting a process that is equitable and responsive to the needs of traditionally underserved communities. This means:

- ***Providing accessible, inclusive, and convenient opportunities to engage.*** The team will provide information in multiple languages and in formats that are compliant with the Americans with Disabilities Act (ADA). The team will also offer multiple ways to engage, including online, over the phone, and in person.
- **Reaching out to and integrating feedback from individuals and groups that are traditionally underserved by existing transportation systems.** This includes Black, Indigenous, and people of color; people with limited English proficiency; seniors; youth; people with low income; people with disabilities; and people who depend on public transportation.
- ***Being accountable to feedback received.*** The project team will clearly communicate how community input shapes outcomes throughout the study.

The following describes the PEL study's primary outreach strategies to keep stakeholders and the public informed and to solicit their feedback throughout the PEL process. Stakeholders and the public can visit the study website (i11nv.com) for up-to-date information about the study. The website serves as a central information hub with infographics, documents, and project updates and informs the public about ways to get involved and share input.

Informational Materials

NDOT has provided educational materials via email and on the "Resources" page of the project website. These materials include a fact sheet, a document with answers to frequently asked questions, and the *Alternatives Development Report*.

Study Hotline

Community members can call the study hotline (702-472-8018) 24/7 for study information. Callers will hear a pre-recorded message that directs them to the website for the most up-to-date information and to sign up for project updates. Each call will be added to the Zoho tracking management system for monitoring and documentation.

Stakeholder Email Distributions (Eblasts)

The stakeholder email distribution list currently has 900 subscribers that receive emails on a regular basis about the status of the study. Emails inform subscribers about the corridor alternatives and opportunities for public engagement. To date, seven emails have been sent to stakeholders, and an additional six emails were sent to promote the upcoming on-line meeting, in-person public meetings, and telephone town hall beginning August 10, 2021.

Social Media

Existing NDOT social media accounts have been leveraged to share key messaging and project updates, promote public involvement opportunities, and engage with target audiences. Eleven social media posts were created to promote the upcoming online meeting, in-person public meetings, and telephone town hall. Social media posts were posted on both Twitter and Facebook on the following dates:

- August 17 - Sept 30, 2021 (Social Media paid ad)
- Tuesday, August 10, 2021
- Tuesday, August 17, 2021
- Tuesday, August 24, 2021
- Tuesday, August 31, 2021

- Thursday, September 2, 2021
- Tuesday, September 7, 2021
- Tuesday, September 14, 2021
- Tuesday, September 21, 2021
- Tuesday, September 28, 2021
- Thursday, September 30, 2021

1.2.3 How Will the Public Be Able to Provide Comments on the Draft PEL?

Similar to the engagement conducted in late summer 2021, NDOT will launch a series of public engagement opportunities for the review of the draft PEL document which is anticipated in spring 2022. These will include virtual on-line public meeting, and bilingual Telephone Town Hall supported and advertised through the project website, stakeholder e-blasts, direct mailers, local newspaper advertisements, and social media posts.

1.3 Project Study Area and Corridor Alternatives

1.3.1 What Is the Project Study Area?

The I-11 Las Vegas Metropolitan Area Study Area (Study Area) includes the Las Vegas Valley (Valley) from the Henderson Interchange (I-11/1-215/I-515) in the southeast to just north of the Kyle Canyon Road interchange along US 95 in the northwest (Figure 1-1). Currently, I-11 exists in Nevada along the southeastern portion of the study limits, extending from the Arizona border to the Henderson Spaghetti Bowl interchange.

This PEL process informs the identification of a corridor in which the extension of I-11 through the Las Vegas metropolitan area would be located. With the elimination of an Eastern Corridor option (see the *Alternatives Development Report*), the existing I-11 shall remain as previously designated from the Arizona border to the Henderson Spaghetti Bowl interchange and the decision informed by the PEL process is for a recommended route north or west of the Henderson Spaghetti Bowl. As such, while the existing I-11 is a component of the corridor alternatives under consideration in this PEL, existing I-11 is not further evaluated in this corridor Assessment Report and the PEL.

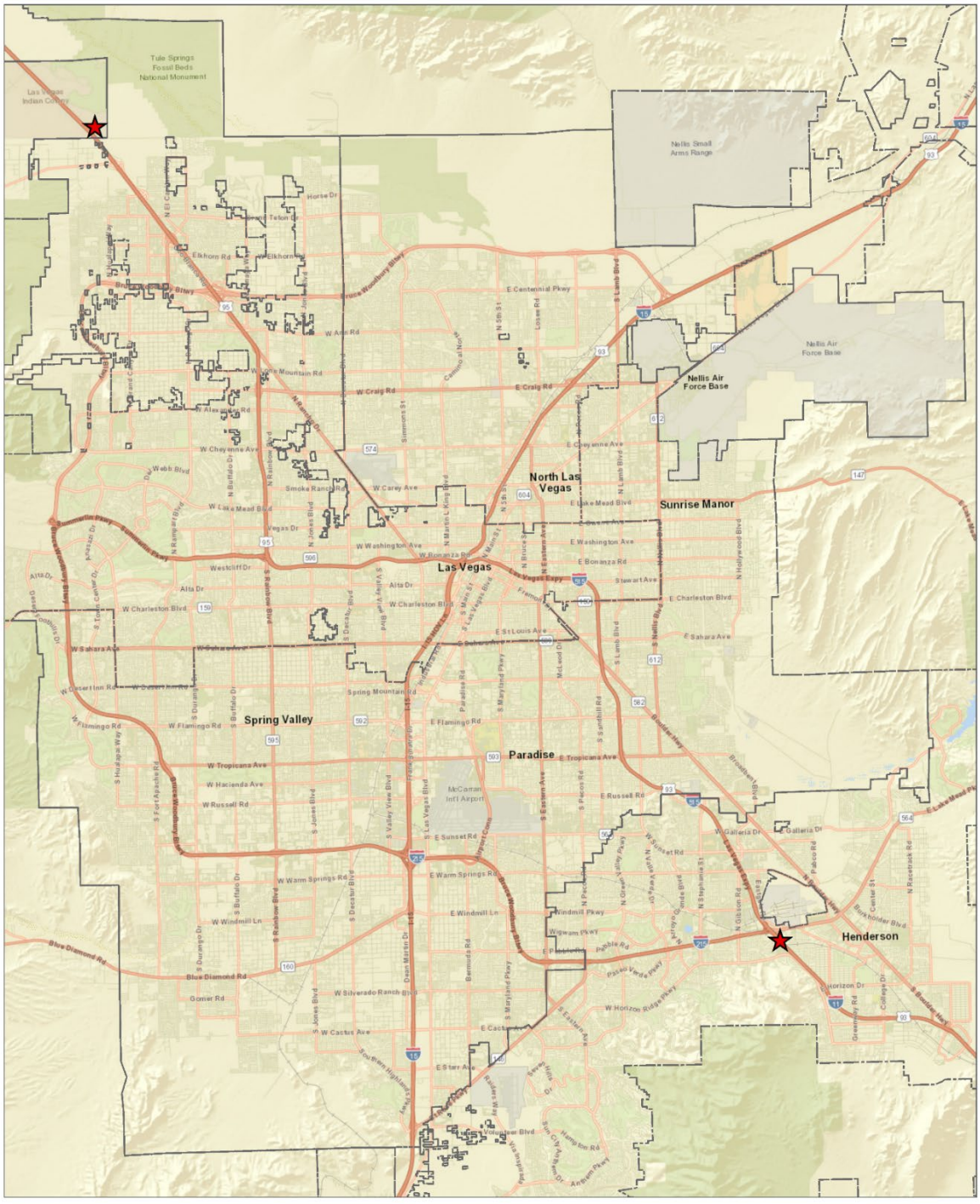
1.3.2 What Corridor Alternatives Are Considered?

At the conclusion of the *Alternatives Development Report*, two potentially feasible full-length corridor alternatives were recommended for further study. These corridors are described below.

Resource Identification Corridors

The full-length corridor alternatives advancing in the PEL utilize 500-foot-wide “resource identification corridors” (RICs) to identify human and natural resources that could potentiality be affected by future improvements associated with an I-11 corridor in the future. The 500-foot-wide RICs are generally centered along the existing freeway centerline and expand at interchanges to 1,000 feet wide or more to include existing interchange ramps. Any future improvements to an I-11 corridor will require compliance with the National Environmental Policy Act (NEPA).

Figure 1-1. I-11 Las Vegas Metropolitan Area PEL Study Area



Central Corridor Alternative

The Central Corridor Alternative would travel along the existing 22.8-mile four-lane I-11 freeway, and at the Henderson Interchange the Central Corridor Alternative would follow the generally six-lane I-515 through downtown Las Vegas to the Las Vegas Spaghetti Bowl (US 95 / US 93 / I-15 / I-515) interchange. The Central Corridor Alternative would continue west on the generally eight-lane US 95 corridor from downtown Las Vegas to the CC 215 / US 95 interchange (Centennial Bowl) where the Corridor would continue along four-lane US 95 to north of the Kyle Canyon Road interchange. Figure 1-2 and Figure 1-3 illustrate the defined RIC for this corridor alternative.

The I-515 portion of this Corridor is approximately 14.4 miles, and the US 95 portion of this Corridor is approximately 17.8 miles. In total, the Central Corridor Alternative is approximately 32.2 miles.

Western Corridor Alternative

The Western Corridor Alternative would travel along the existing 22.8-mile four-lane I-11 freeway and at the Henderson Interchange the Western Corridor would turn west and follow the Southern and Western Beltway (I-215 and CC 215), which is generally a six- to eight-lane corridor. At approximately one half mile north of the Ann Road interchange, before the Beltway turns east (to the Northern Beltway portion), the Western Corridor Alternative can follow two possible routes in the northwest. The first corridor option would follow a planned highway facility that originates at this location, Sheep Mountain Parkway, traveling north from the northwest elbow of CC 215, connecting to US 95 north of Kyle Canyon Road. The second corridor option would continue along CC 215 along the Northern Beltway to the CC 215/US 95 interchange (Centennial Bowl) where the Corridor would turn northwest and follow four-lane US 95 to the northwest, about a half mile past the Kyle Canyon Road interchange. The Western Corridor Alternative options are shown in Figure 1-4.

The section of the Western Corridor Alternative along the Southern and Western Beltway before the decision point of the two options (start of the Sheep Mountain Parkway alignment) is 32.9 miles. The Sheep Mountain option is approximately 5.5 miles, and the option that uses existing CC 215 to US 95 (Centennial Bowl option) is 9.6 miles. In total, the Western Corridor Alternative ranges from 38.4 miles to 42.5 miles.

Figure 1-2. Corridor Alternatives Under Consideration – Sheet 1

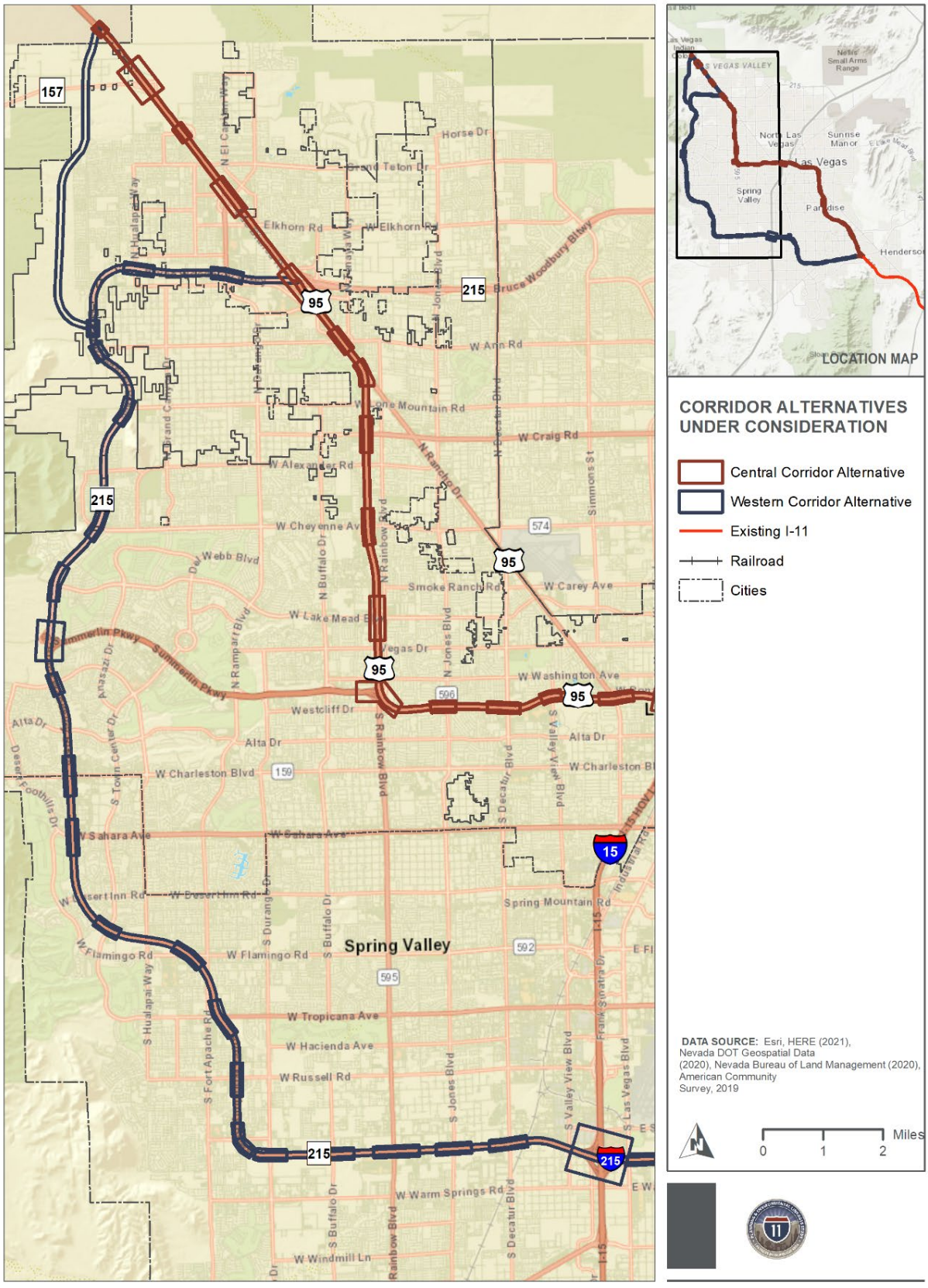


Figure 1-3. Corridor Alternatives Under Consideration – Sheet 2

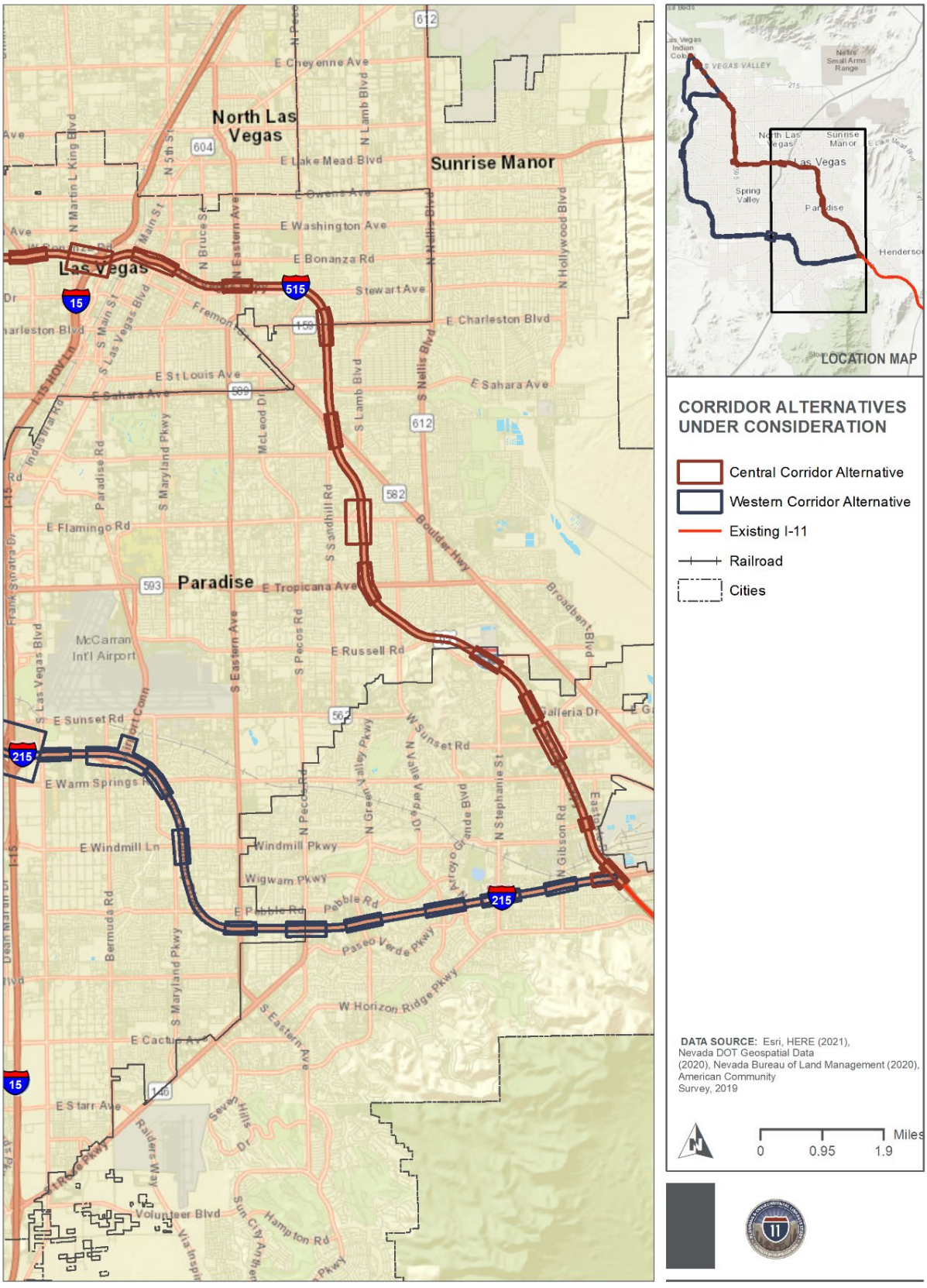
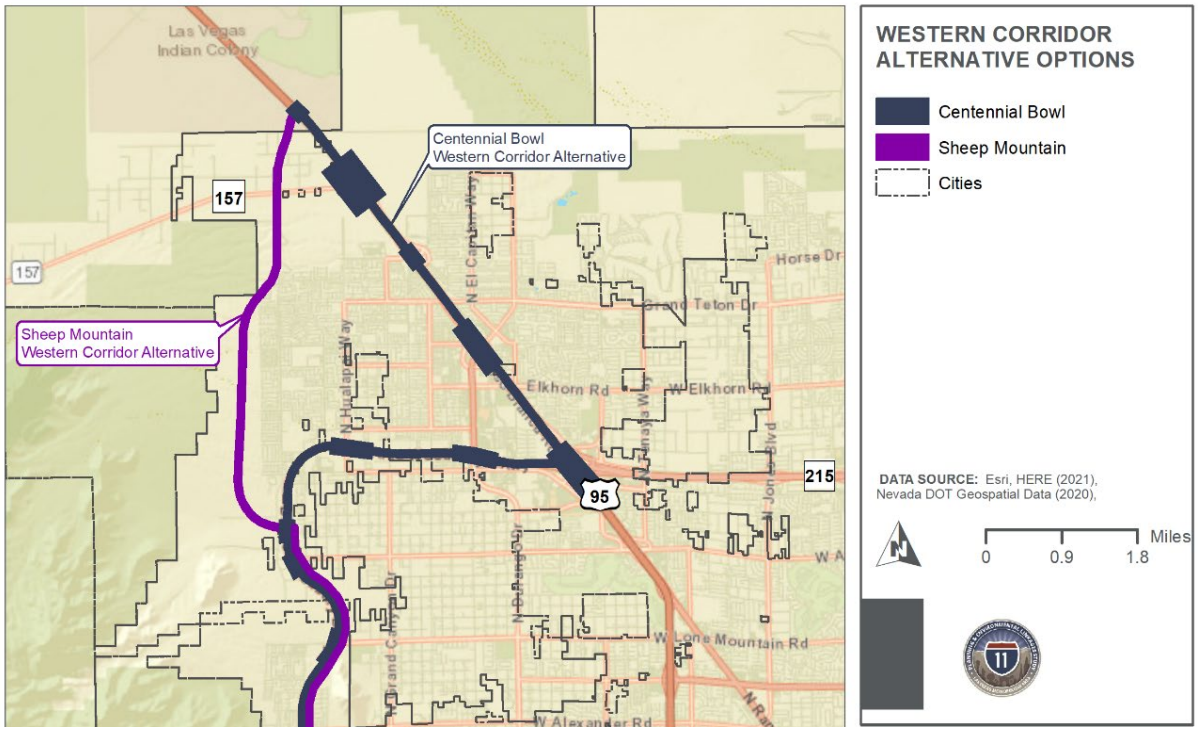


Figure 1-4. Western Corridor Alternative Options



1.4 RELEVANT TRANSPORTATION PLANS

This section identifies some of the key transportation plans guiding transportation improvements in the Las Vegas Valley and relevant to the PEL study.

Access 2050: Regional Transportation Plan

Access 2050 is the federally-required Regional Transportation Plan (RTP) for Southern Nevada and the state-required Regional Plan for Transportation. It was developed by the Regional Transportation Commission of Southern Nevada (RTC), the metropolitan planning organization (MPO) for Southern Nevada. *Access 2050* provides a roadmap for mobility improvements and a flexible and adaptable strategy that responds to short- and longer-term regional transportation needs. It is the primary vehicle through which the RTC's planning process is implemented.

Informed by a Transportation Vision Survey conducted by RTC, *Access 2050* established the following three goals to support the growing needs of the region and move the regional vision forward: (1.) strengthen regional economic competitiveness, (2.) maintain and enhance quality of life for Southern Nevadans, and (3.) ensure sustainable use of infrastructure and resources.

Access 2050 includes several projects along the freeways that comprise the PEL corridor alternatives, and any improvements proposed as part of an I-11 project during a future phase of study would be in addition to these programmed project improvements.

Southern Nevada Strong Regional Plan

The Southern Nevada Strong Regional Plan is a community-driven guide outlining regional goals and presenting a set of strategies that local governments can use to address challenges and achieve these goals. The region's top priorities serve as the three main themes of the Plan, and these include: (1.) improve economic competitiveness and education; (2.) invest in complete communities; and (3.) increase transportation choice.

Goals focus on developing a world-class transportation system and coordinating future transit investments with urban development; these include:

- Developing a modern transit system that is integrated with vibrant neighborhood and employment centers, better connecting people to their destinations.
- Connecting and enhancing bike and pedestrian facilities throughout the region.
- Developing a safe, efficient road network that supports all transportation modes.

Southern Nevada Traffic Study

In 2019, NDOT published its system-wide traffic study of Southern Nevada freeways in the Las Vegas metropolitan area. The Southern Nevada Traffic Study (SNTS) included data collection, travel demand forecasting, traffic operations modeling, traffic analyses, alternatives development and evaluation, and benefit-cost analysis in coordination with ongoing projects and studies. The study evaluated the needs of the region's freeway system, developed improvement strategies to meet short-term and long-term transportation needs, and maximize benefits of the department's investments.

The goals and objectives of the Study were to:

- Develop forecast year 2040 traffic volumes for the study corridors
- Identify projects that relieve future mainline traffic congestion
- Apply benefit-cost analysis (BCA) to corridor alternatives
- Create preliminary layouts and cost estimates for future projects

The corridors alternatives with proposed recommendations include:

- I-15 from Russell Road to Sloan Rd
    - Includes additional lane of capacity in each direction for Build condition with braided ramps, ramp augmentations, and collector distributor road improvements
- Summerlin Parkway from CC 215 to US 95

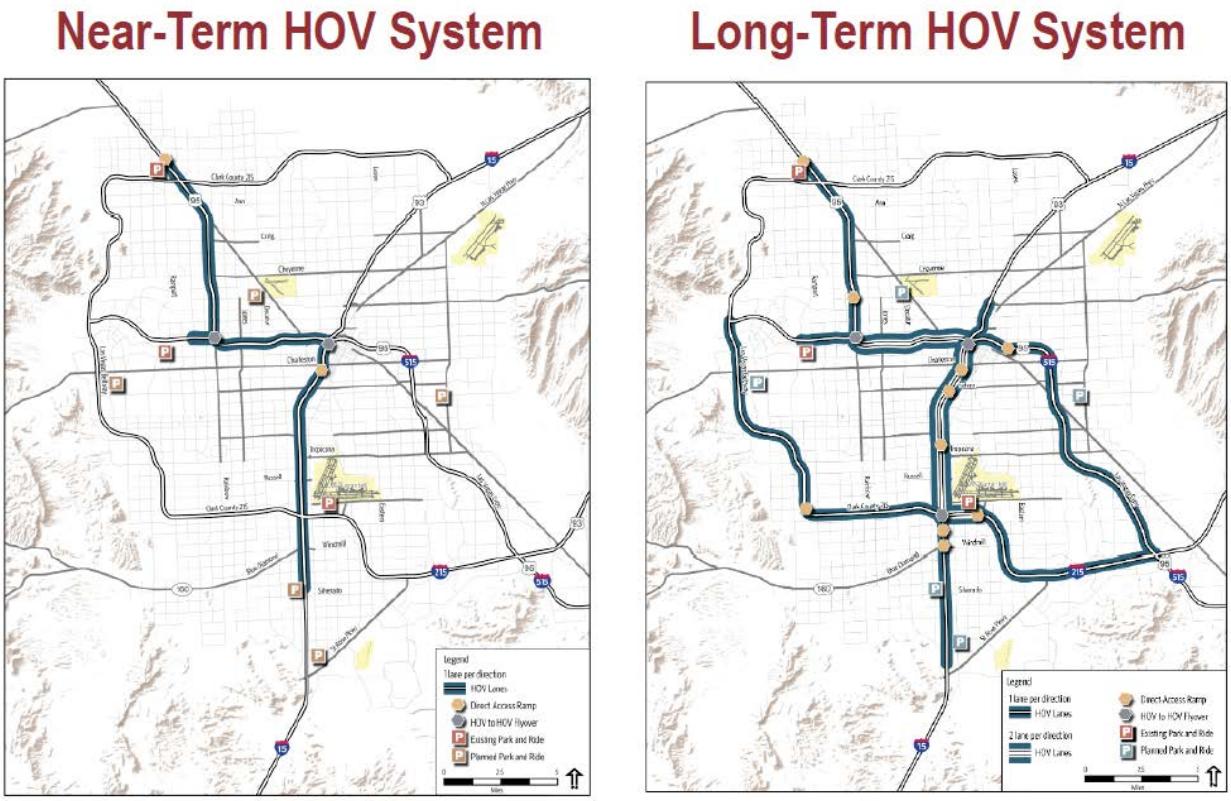
  - Includes additional lane of capacity in each direction for Build condition with braided and direct connect ramp improvements
- CC 215 from Russell Road to the I-15/I-215 System Interchange
  - Includes additional lane of capacity in each direction for Build condition with braided ramp improvements
- I-515 North from US 95/I-5151 to Charleston Boulevard
  - Includes additional lane of capacity in each direction for Build condition with collector distributor road improvements
- I-515 South from Charleston Boulevard to the I-215/I-515 System Interchange
  - Includes additional lane of capacity in each direction for Build condition with braided ramps, auxiliary lanes, and ramp augmentations
- I-215 from Windmill Ln to the I-515/I-215 System Interchange
- I-15/US 95/I-515 System Interchange

Southern Nevada HOV Plan

In 2018, NDOT updated the Southern Nevada High-Occupancy Vehicle (HOV) Plan to reflect current conditions in Southern Nevada and recently completed projects (e.g., Project NEON) and to use the most recent analysis tools.

The HOV system was evaluated utilizing the RTC's 2035 Regional Travel Demand Model with the Mode Choice Element, focusing on the near-term HOV system in Southern Nevada (Figure 1-5), including Project NEON's direct connector between I-15 and US 95 and the conversion of existing I-15 express lanes to one HOV lane and one additional general purpose lane. In addition, evaluations and recommendations for the long-term HOV system, direct access ramp locations, and operations of the HOV system were included in the HOV Plan Update.

Figure 1-5. Near-Term and Long-Term System Improvements in the Southern Nevada HOV Plan



City of Las Vegas Mobility Master Plan

The Mobility Master Plan is one of several efforts to foster the City's vision for the future. This plan identifies projects that will improve mobility for all users; provide City residents, visitors, employers, and employees options for safely arriving at their destinations; and support continued investment in Las Vegas – *transportation investments are key to economic success*.

The Mobility Master Plan includes over 180 multimodal transportation improvement projects for the City of Las Vegas, spanning the 135 square miles of the city and addressing all modes of transportation. The plan is organized into the following four categories of transportation improvements:

- Transit Improvements
- Bicycle/Multi-use Facility Improvements
- Vehicular Mobility Improvements
- Pedestrian Safety and Mobility/Complete Streets Improvements

On Board Mobility Plan

The RTC developed the On Board Mobility Plan as a roadmap to modernize and transform the way people travel in Southern Nevada. The Plan is built around a proposed High Capacity Transit (HCT) network that will link residential areas with employment, education facilities, medical services, and major recreational destinations. HCT investments will significantly improve the speed, reliability, and comfort of public transportation, increasing the ability for people to use transit for all types of trips.

2 TRANSPORTATION SYSTEM

2.1 TRANSPORTATION FACILITIES AND NETWORKS

2.1.1 What are the Existing and Planned Highway and Roadway Facilities?

Existing Network

The Las Vegas Valley's transportation network is built upon its freeway system. As shown in Figure 1-1, the major freeways in the Study Area include:

- ***I-15:*** The predominant north-south route through the center of the Valley, connecting California southwest of the Study Area with Utah northeast of the Study Area
- ***I-215:*** The portion of the Southern Beltway between the Henderson Spaghetti Bowl interchange with I-515 and the interchange with I-15
- ***CC 215:*** The portion of the Southern Beltway west of the I-15 interchange and the Western and Northern Beltway segments; all 215 segments comprise the Bruce Woodbury Beltway
- ***I-515:*** The section of freeway that extends from the Henderson Spaghetti Bowl interchange with I-215 to the Las Vegas Spaghetti Bowl interchange with I-15 in the eastern Valley
- ***US 93:*** Connects Nevada with Arizona (crossing the Hoover Dam) Boulder City) and Idaho, following an easterly route through Nevada; runs concurrent with I-515 and a portion of I-15
- ***US 95:*** Connects Nevada with California/Arizona and Oregon/Idaho, following a westerly route through Nevada; runs concurrent with existing I-11 and I-515
- ***I-11:*** Existing I-11 in Nevada starts at the Arizona border just west of the Hoover Dam, follows the recently constructed Boulder City Bypass, and terminates at the Henderson Spaghetti Bowl; runs concurrent with US 93 and US 95

In addition to these freeways, the roadway network consists of four system interchanges:

- I-15/I-215/CC 215 – just southwest of the McCarran International Airport
- I-11/I-515/I-215 – near Henderson, also known as the Henderson Spaghetti Bowl
- I-15/I-515/US 95 – near downtown Las Vegas, also known as the Las Vegas Spaghetti Bowl
- US 95/CC 215 – in the northwestern Valley, also known as the Centennial Bowl

The grid-based arterial roadway system provides local and regional mobility. Major north-south arterials from east to west include Nellis Boulevard (SR 612), Stephanie Street, Eastern Avenue, Maryland Parkway, Las Vegas Boulevard, Decatur Boulevard, Jones Boulevard (SR 596) Rainbow Boulevard (SR 595), and Durango Drive.

Major east-west arterials from south to north include Windmill Lane, Warm Springs Road, Sunset Road (SR 562), Tropicana Avenue (SR 593), Sahara Avenue (SR 589), Charleston Boulevard (SR 159), Lake Mead Boulevard (SR 147), Cheyenne Avenue (SR 574), Lake Mead Parkway (SR 564), Craig Road (SR 573), Ann Road, and Grand Teton Drive.

Additional arterials not on the standard grid system include N. Rancho Drive, Boulder Highway (SR 582), St. Rose Parkway (SR 146), and Blue Diamond Road (SR 160).

Planned Improvements

SHEEP MOUNTAIN PARKWAY

The City of Las Vegas is proposing a new four-lane access-controlled transportation facility in the northwestern section of the Las Vegas metropolitan area to improve connectivity between the CC 215 Western Beltway and US 95 via Kyle Canyon Road. A four-lane limited-access segment of Sheep Mountain Parkway would follow a general north-south alignment from the CC 215 Western Beltway between Ann Road and Kyle Canyon Road just east of BLM's Red Rock Canyon National Conservation Area and various flood control facilities. North of Kyle Canyon Road, a two-lane local roadway would continue along a widened existing Shaumber Road to Moccasin Road. Interchanges are proposed at Centennial Parkway, Grand Teton Drive, Dorrell Lane, and Kyle Canyon Road, with extensions of these cross streets to the new Sheep Mountain Parkway facility included in the project.

Several segments of the Parkway are moving forward by the City of Las Vegas. The segment from Grand Teton Drive to Iron Mountain Road through the Skye Canyon development is currently in construction, which is expected to be completed in 2022. The segment from Iron Mountain Road to Kyle Canyon Road is in final design and the segment from Shaumber Road to Grand Teton Drive is expected to start design shortly. Therefore, this PEL considers these portions of Sheep Mountain Parkway part of the No Build condition to be constructed whether or not it is recommended to be a component of I-11. Improvements to extend to US 95 and to bring the planned Sheep Mountain Parkway segments up to interstate highway standards would be part of a future I-11 project should this option be recommended as the conclusion of this PEL study.

DOWNTOWN ACCESS PROJECT

NDOT's Downtown Access Project (DAP) is located along I-515/US-95 from Mojave Road to Rancho Drive and would improve portions of the Central Corridor Alternative. This project's EIS is currently underway. DAP includes the following overall goals:

- Improving safety and operations
- Improving downtown access
- Addressing aging infrastructure
- Extending HOV network to downtown along I-515
- Improving air quality

The long-term improvements proposed as part of the DAP include:

- Replacing or removing the 1.6 viaduct
- Fixing on and off ramps located too close together
- Adding freeway capacity
- Adding new HOV interchanges at City Parkway and Maryland Parkway
- Braiding ramps to/from I-15 and I-515

HENDERSON INTERCHANGE

The Henderson Interchange connects I-515 from the north, I-215 from the west, I-11 from the south, and Lake Mead Parkway (SR-564) from the east, and it a key component of both the Western Corridor Alternative and the Central Corridor Alternative. The purpose of the study is to define improvements that would:

- Resolve existing roadway deficiencies, such as weaving, congestion areas, and areas of higher accident frequency and severity;
- Provide transportation improvements to serve existing and future growth areas to meet anticipated growth of the Las Vegas area;
- Restore local traffic connectivity such as access from Lake Mead Parkway to Gibson Road; and
- Accommodate regional and local plans including future high-occupancy vehicle (HOV) lanes and a future I-11.

Two options were screened and evaluated against various criteria – *such as design elements, right-of-way impacts, traffic operations analysis, costs* – and one Build Alternative has been identified to advance through project development. NDOT is currently preparing an Environmental Assessment to evaluate the potential impacts of the one Build Alternative for compliance with NEPA.

I-515 Viaduct Rehab Project

The I-515 Viaduct Rehab Project is located on I-515 in downtown Las Vegas, along the Central Corridor Alternative, extending from I-15 to the Eastern Avenue Interchange, and including the I-515/Desert Inn Road Bridge. The project will extend the near-term service life of the I-515 viaduct (elevated bridge structure) in downtown Las Vegas. There are three major construction components to this project:

- Rehabilitation of the I-515 viaduct between the Union Pacific Railroad tracks and 21st Street
- Addition of a southbound auxiliary lane between the Spaghetti Bowl and Eastern Avenue
- Bridge replacements at Eastern Avenue and Desert Inn Road

THIS PROJECT IS UNDER CONSTRUCTION AND IS EXPECTED TO BE FINISHED IN LATE 2022.OTHER PLANNED PROJECTS

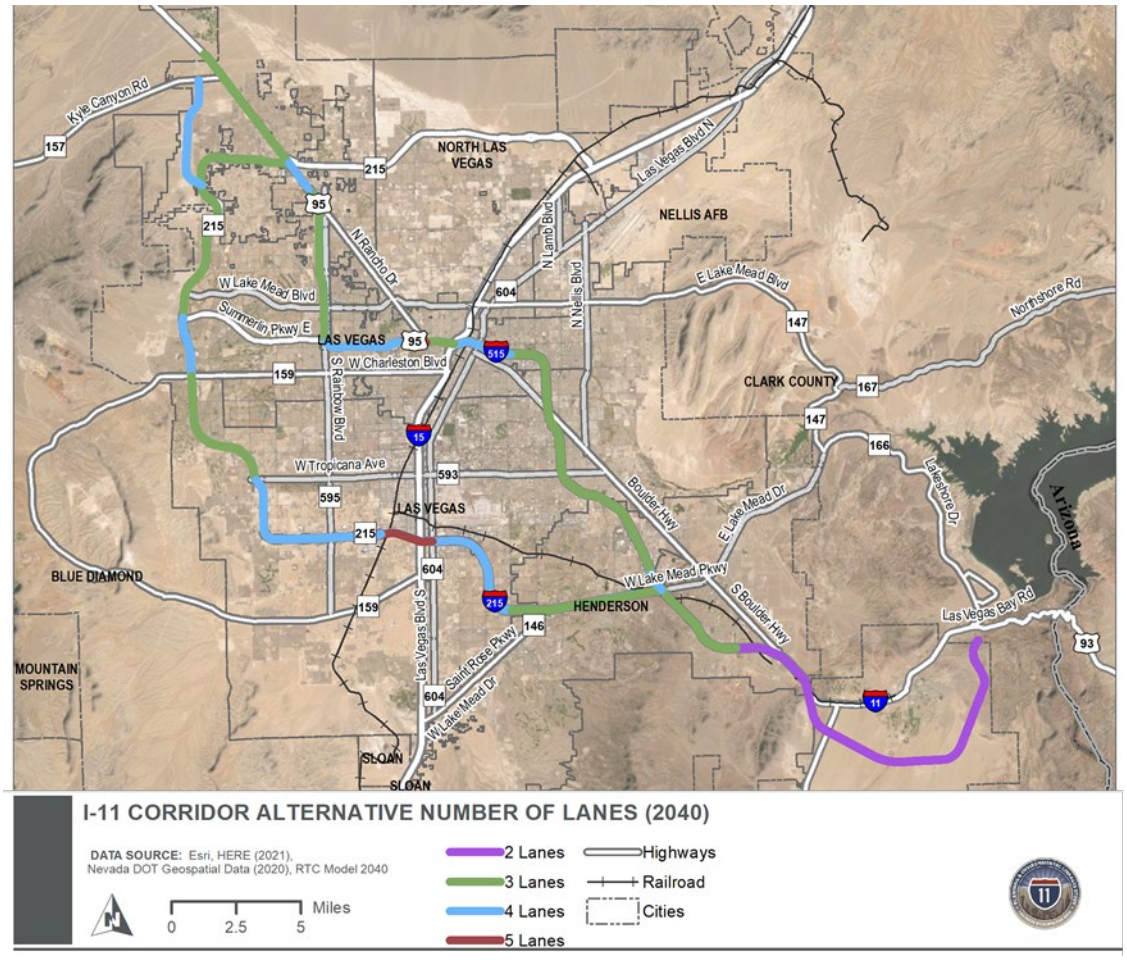
In addition to the projects briefly discussed in Section 1.4.2, according to the NDOT and the RTC Regional Project Coordination Committee Webmap, there are numerous planned roadway improvement projects along both corridor alternatives, including:

- ***Western Corridor Alternative***
    - Interchange improvements along I-215 at Green Valley Parkway, Pecos Road, and Eastern Avenue
    - Interchange improvements along CC-215 at Charleston Boulevard
    - CC 215 widening from Decatur Boulevard to I-15 and from Craig Road to Grand Montecito Parkway

  - Summerlin Parkway Interchange improvements
  - Improvements along CC-215 ramps from Sunset Boulevard to Durango Drive
  - Improvements along mainline CC-215:
    - Charleston to Cheyenne widening (2023)
    - Cheyenne to Hualapai widening (2025)
    - Pecos to Stephanie widening ((2024)
    - Revere to I-15 widening (2026)
    - US 95 to Revere Widening (2027)
- ***Central Corridor Alternative***
  - Interchange improvements along I-515 at Flamingo Road, Tropicana Avenue, and Charleston Boulevard
  - I-515 viaduct rehabilitation
  - Reconstruction of I-515 MSE walls and soundwalls at Flamingo Road
  - Overpass improvements along US 95 at Alexander Road, Lone Mountain Road, and Grand Teton Drive

Figure 2-1 shows the RTC's 2040 planned number of lanes in the I-11 corridor Alternatives. The Western Corridor Alternative is planned for three to four lanes, with the segment near I-15 planned for five lanes in each direction. The planned Sheep Mountain segment is planned for two lanes in each direction. The majority of the Central Corridor Alternative is planned for three lanes in each direction, with two segments planned for four lanes in each direction.

Figure 2-1. I-11 Corridor Alternatives – Number of Lanes (2040)



2.1.2 What Are the Existing and Planned Transit Facilities?

Bus Transit Services

The RTC is the public transit operator in the Las Vegas Valley with a service area of 280 square miles and service population of over 2 million. In 2019, it served 65.8 million trips with an average of 197,072 trips on a weekday. Existing RTC routes are shown in Figure 2-2.

Figure 2-2. Existing RTC Transit Services

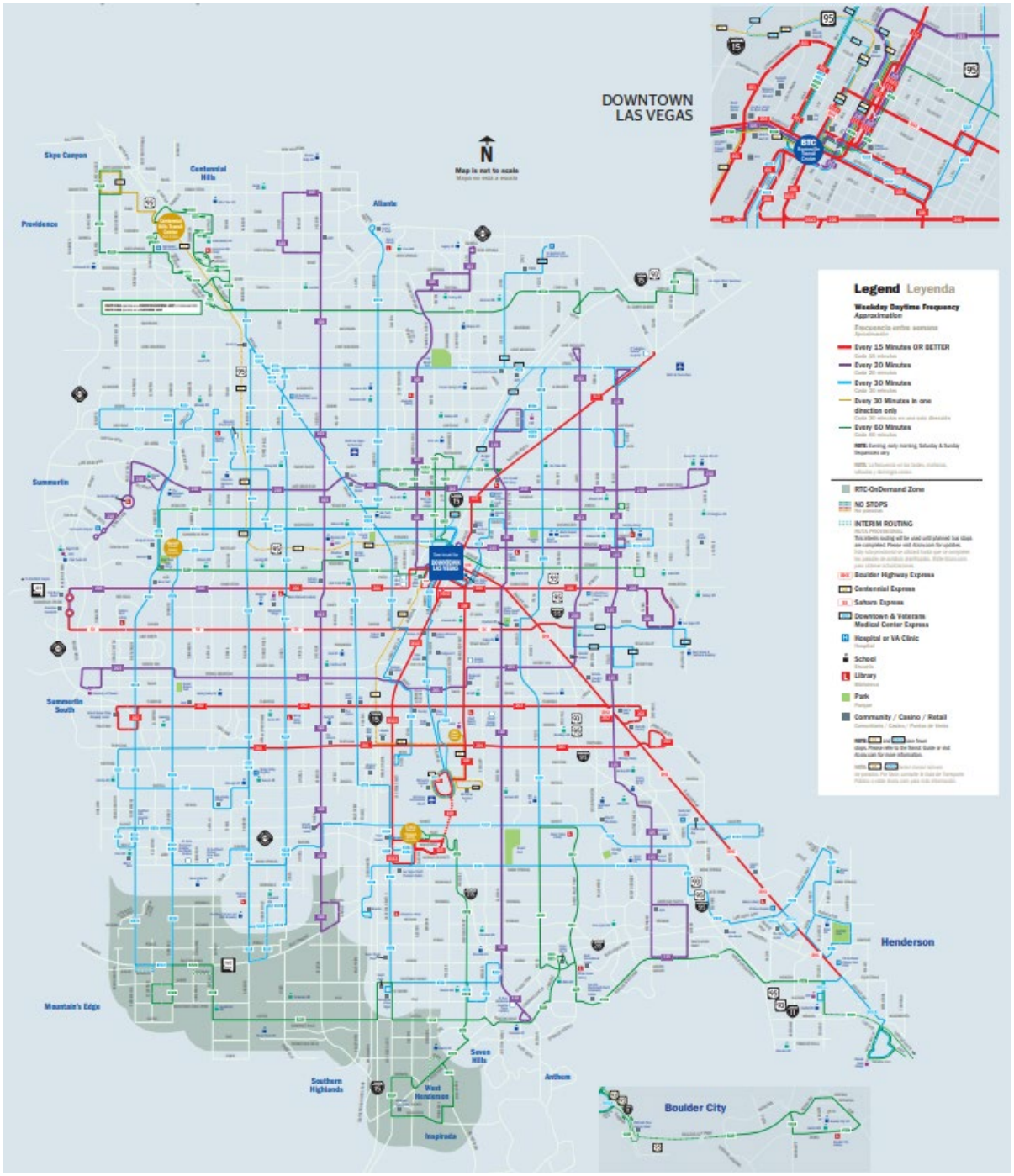


Table 2-1 shows the service details of RTC's transit operation. The RTC operates 31 residential bus routes that contributes to most of its ridership. Residential bus service accesses HOV lanes/direct connection interchanges and incorporates bus-priority technology where available. The RTC has express routes serving Henderson, Boulder City, and the Veterans Medical Center. There are nine frequent service routes with a minimum of every 15 minutes between

buses during weekday daytime hours and every 20 minutes or better during evenings and weekends. Thirteen routes provide 24-hour service.

Table 2-1. Southern Nevada Transit System Snapshot

Description	Route Miles	Annual Trips	Annual Passenger Miles
Bus Routes	71.2 Miles	64.4 Million	244.4 Million
Demand Response/ Paratransit	N/A	1.3 Million	14.5 Million
Total	71.2 Miles	65.7 Million	258.9 Million

Source: Access 2050 Final Plan, 2018 National Transit Database

RTC operates six transit centers, three of which include park-and-ride facilities. Transit centers in the vicinity of the Western Corridor Alternative are South Strip Transit Terminal, Centennial Hills Transit Center, and Downtown Summerlin, while the only transit center in the vicinity of the Central Corridor Alternative is Bonneville Transit Center. There are 19 primary routes that cross the Western Corridor Alternative and 29 that cross the Central Corridor Alternative. Despite the many bus routes serving riders within the study area, there is only one route that uses a freeway – the Centennial Express (CX). The CX runs from the Centennial Hills Transit Center and Park-and-Ride to McCarran Airport Terminal 3, with eight stops in between, using US 95 to provide non-stop service from Centennial Hills to the downtown area and then I-15 to the Strip and Airport.

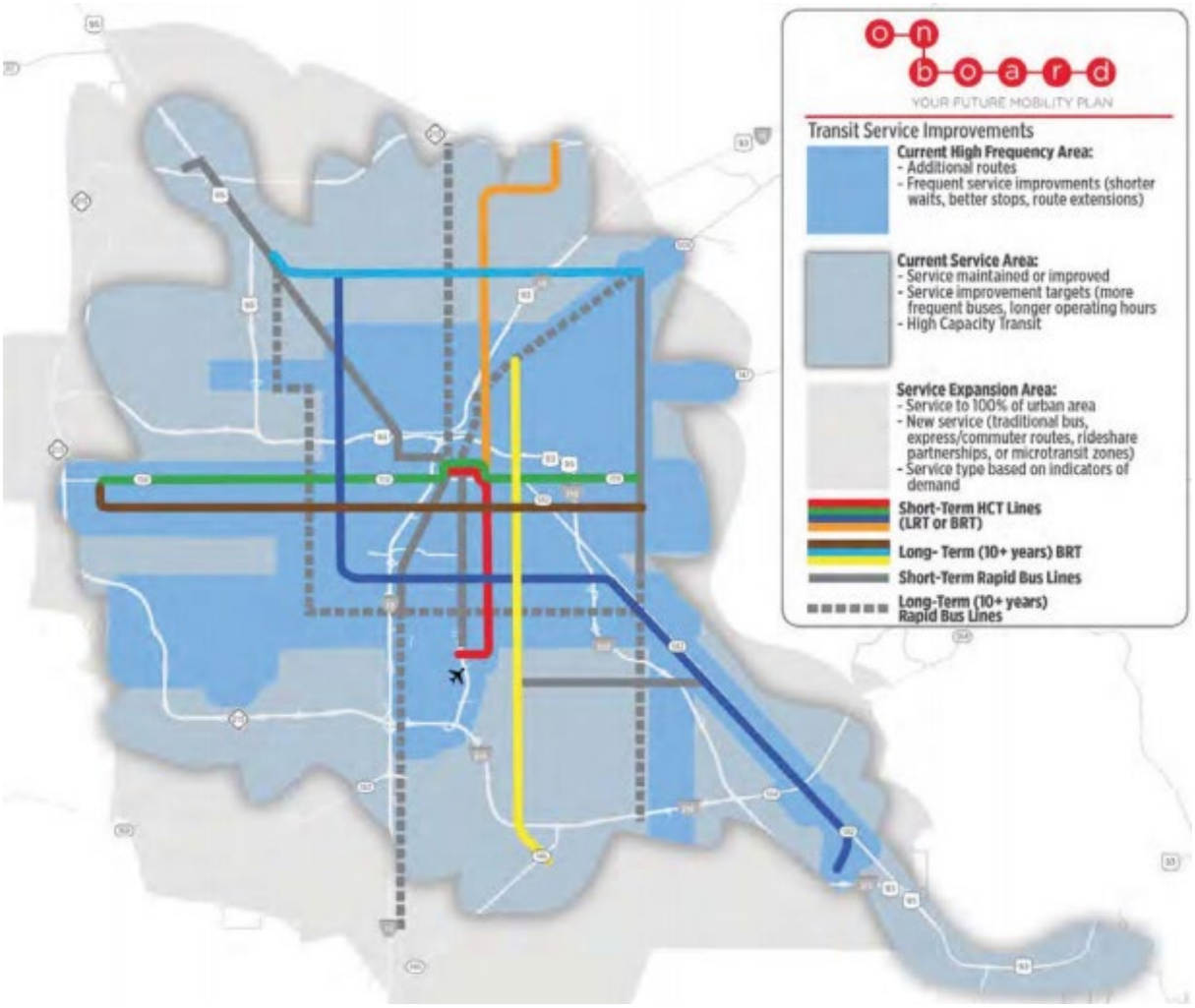
RTC's On Board Mobility Plan (On Board), published in 2020, laid out a broad vision of goals and projects that would strengthen and transform the region's transportation network. The final document provides a strategy targeted around 8 Big Moves and 64 supporting projects. The eight Big Moves are:

- Build High Capacity Transit System
- Expand Transit Service to Maximize Access to Jobs and Housing
- Make All Travel Options Safer and More Secure
- Make Short Trips Easier
- Expand Service for Seniors, Veterans, and People with Disabilities
- Improve Connections to Major Destinations
- Provide Reliable Transit for Resort Corridor Employees
- Leverage New Technology to Improve Mobility

On Board has a goal to increase the current 75 percent of the region's population within one-half mile of some type of transit service to 100 percent. RTC's nine frequent routes currently serve 24 percent of residents and On Board aims to increase its frequent transit coverage to over 50 percent of Southern Nevada's residents.

On Board's recommended high capacity transit investments encompass a total of 200 miles of high capacity transit (HCT) in 17 corridors, including Maryland Parkway which is currently under development as a BRT corridor. Also, On Board plans to build three LRT or BRT corridors, three additional BRT routes, and eleven rapid bus routes (Figure 2-3).

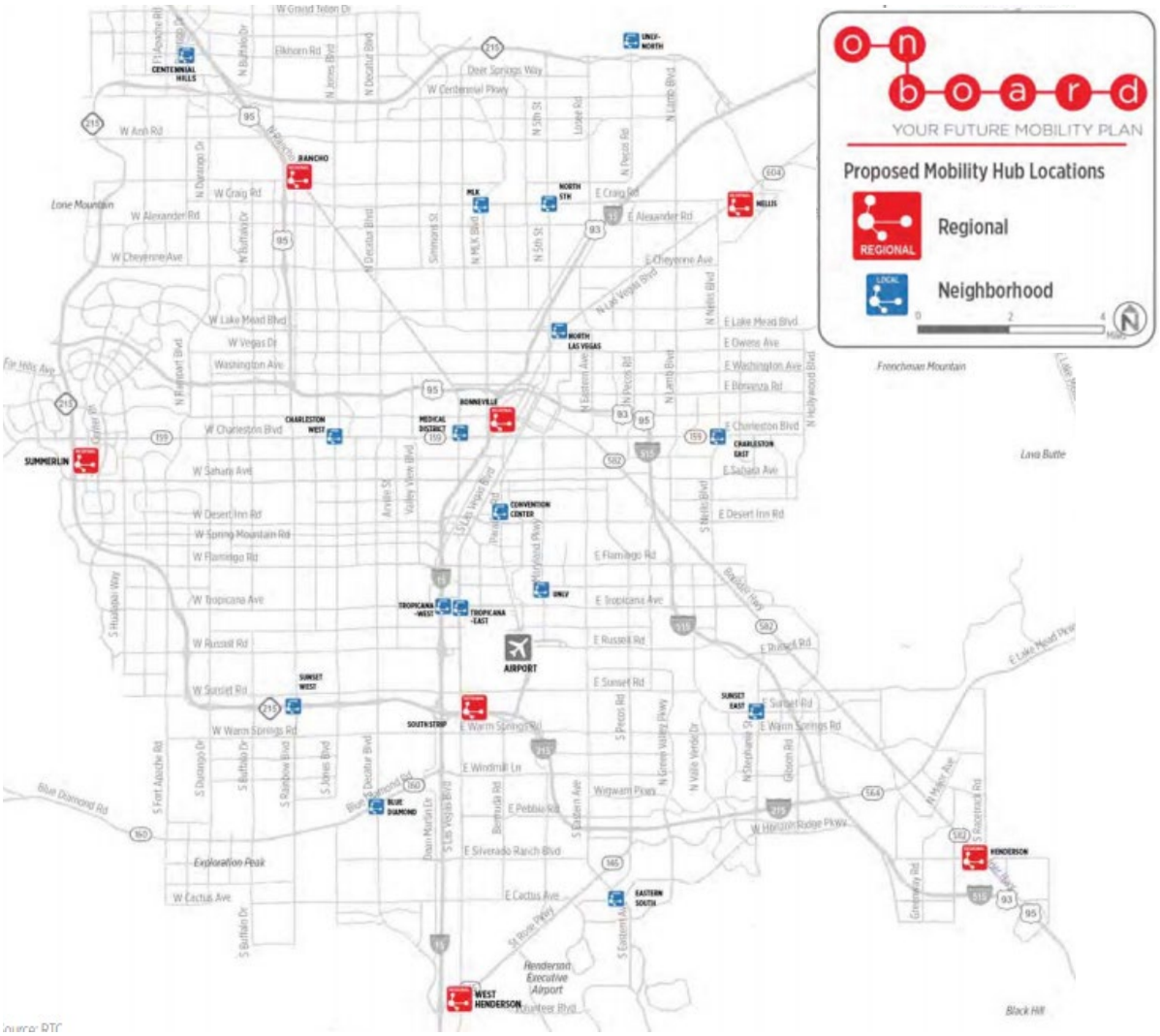
Figure 2-3. Southern Nevada Transit Service Zones: Existing Service and Service Expansion Areas



Source: RTC On Board Mobility Plan

On Board also proposes to develop regional mobility hubs, which go beyond transit stations and integrates a variety of modes including rideshare, first mile/last mile connections, carshare and bikeshare, transit, and more. On Board identified seven possible regional mobility hubs and 16 neighborhood level mobility hubs that would connect people and transportation in the region. Figure 2-4 shows the locations of the potential mobility hubs.

Figure 2-4. Identified Mobility Hub Locations



Source: RTC On Board Mobility Plan

Paratransit Services

RTC also oversees scheduling and operations for ADA Paratransit Services that is provided within a 0.75-mile radius of RTC's fixed-route stops. In 2018, RTC serviced 1.3 million passenger trips via demand response dispatch. the paratransit services include:

- ***Silver STAR***: Series of fixed bus routes that primarily serves seniors, connecting several senior communities, senior centers, shopping centers, and nearby regular RTC bus stops
- ***Flexible Demand Response***: Services are door-to-door rides provided by the RTC for residents to call for rides on a public transit system without having fixed-route services nearby
- ***Veterans Transportation****:* a transportation network for Senior and Disabled Veterans is a door-to-door service for riders that qualify for treatment though the VA's Southern Nevada Healthcare System with advanced reservations
- ***Silver Rider***: Southern Nevada Transit Coalition's service with both fixed-route and ADA compliant paratransit options, providing access to Las Vegas from Laughlin, Mesquite, Indian Springs, and Sandy Valley.

Rail and People-Mover Services

LAS VEGAS MONORAIL

The Las Vegas Monorail is a 3.9-mile automated monorail system with seven stations serving passengers from the SAHARA Las Vegas Station to the MGM Grand Station (Figure 2-5). The monorail trains arrive at approximately every four to eight minutes and operates from 7 AM to past midnight on most days of the week. According to the National Transit Database, it served 4.8 million passenger trips with an average of 12,323 trips on a weekday in 2017. This monorail system is one of the few services that saw more trips on Saturdays and Sundays compared to weekdays, with an average of 15,020 Saturday trips and 13,034 Sunday trips in 2017 due to its nature of being in a recreational and tourist-heavy location and primarily serving customers of that are usually traveling.

Figure 2-5. Las Vegas Monorail System

Source: Las Vegas Monorail. Las Vegas Monorail Map

BRIGHTLINE WEST

Brightline West is a high-speed passenger rail system that is proposed to connect Los Angeles and Las Vegas through multiple intercity projects. Brightline West is designed to take cars off the road and offer millions of travelers a green way to travel between one of the country's largest cities and the entertainment capital of the world. The proposed Brightline West system is shown in Figure 2-6.

Figure 2-6. Proposed Brightline West System

LAS VEGAS CONVENTION CENTER UNDERGROUND PEOPLE MOVER

The Las Vegas Convention and Visitors Authority (LVCVA) is currently partnering with The Boring Company to construct and operate the Las Vegas Convention Center Underground People Mover to transport convention attendees throughout the 200-acre convention center campus. The people mover will feature two tunnels of approximately one-mile each in length and is designed to replace a 15-minute walk with a two-minute ride by the use of modified Tesla electric vehicles for passenger transport.

2.1.3 What Are the Existing and Planned Bicycle and Pedestrian Facilities?

Bicycle Facilities

Clark County currently has approximately 868 miles of on-street bikeways and off-street, shared-use paved facilities. There are 370 miles of shared-use paths, sometimes called trails, that are paved facilities shared by bicyclists, pedestrians, runners, and other non-motorized modes, which make up about 42 percent of the current network.[2] In addition, there are 2 miles of separated bike lanes, also known as cycle tracks or protected bike lanes, 27 miles of buffered bike lanes, 468 miles of bike lanes, and 96 miles of shared roadways (Figure 2-7).

In the study area along both corridors, most of the existing bicycle facilities are bike lanes. There is one extensive shared use path that runs parallel to a portion of the Western Corridor Alternative on I-215 and some buffered bike lanes where the two alternatives meet at the interchange of US 95 and I-215.

Table 2-2 shows the existing mileage of types of bike facilities in the RICs of each corridor alternative within each jurisdiction. There is a total of 162.1 miles of existing bike facilities in the Western Corridor Alternative Centennial Bowl Option and most of them (54 percent) are bike lanes, followed by shared-use paths (30 percent). With the Sheep Mountain Option, there are 124.7 miles of bike facilities in total and 52 percent are bike lanes. The Central Corridor Alternative has slightly fewer miles of bike facilities (135.8 miles).

The Regional Bicycle and Pedestrian Plan included in RTC Access 2050 RTP identified 1,336 miles of new bike lanes and bicycle boulevards. This will expand the existing network to a total of 2,023 miles in the future (Figure 2-6). In the Western Corridor Alternative Centennial Bowl Option, 36 percent of the 290 miles of planned bike facilities are shared-use paths; with the Sheep Mountain Option, almost 100 miles (38 percent) of the 263 miles of planned bike facilities are shared-use paths (see Table 2-3). In the Central Corridor Alternative, the City of Las Vegas would have the largest share of bike facilities in the future with 218.4 miles of planned bike facilities (57 percent), an 82.6-mile increase from the existing network. Shared use paths would also be the predominant type of bike facility in the Central Corridor Alternative.

[2] RTC Access 2050 Regional Transportation Plan. Regional Bicycle and Pedestrian Plan https://assets.rtcsnv.com/wp-content/uploads/sites/4/2020/10/20135858/Appendix-O-Regional-Bicycle-Pedestrian-Plan.pdf

Figure 2-7. Existing and Proposed Bicycle Facilities Network

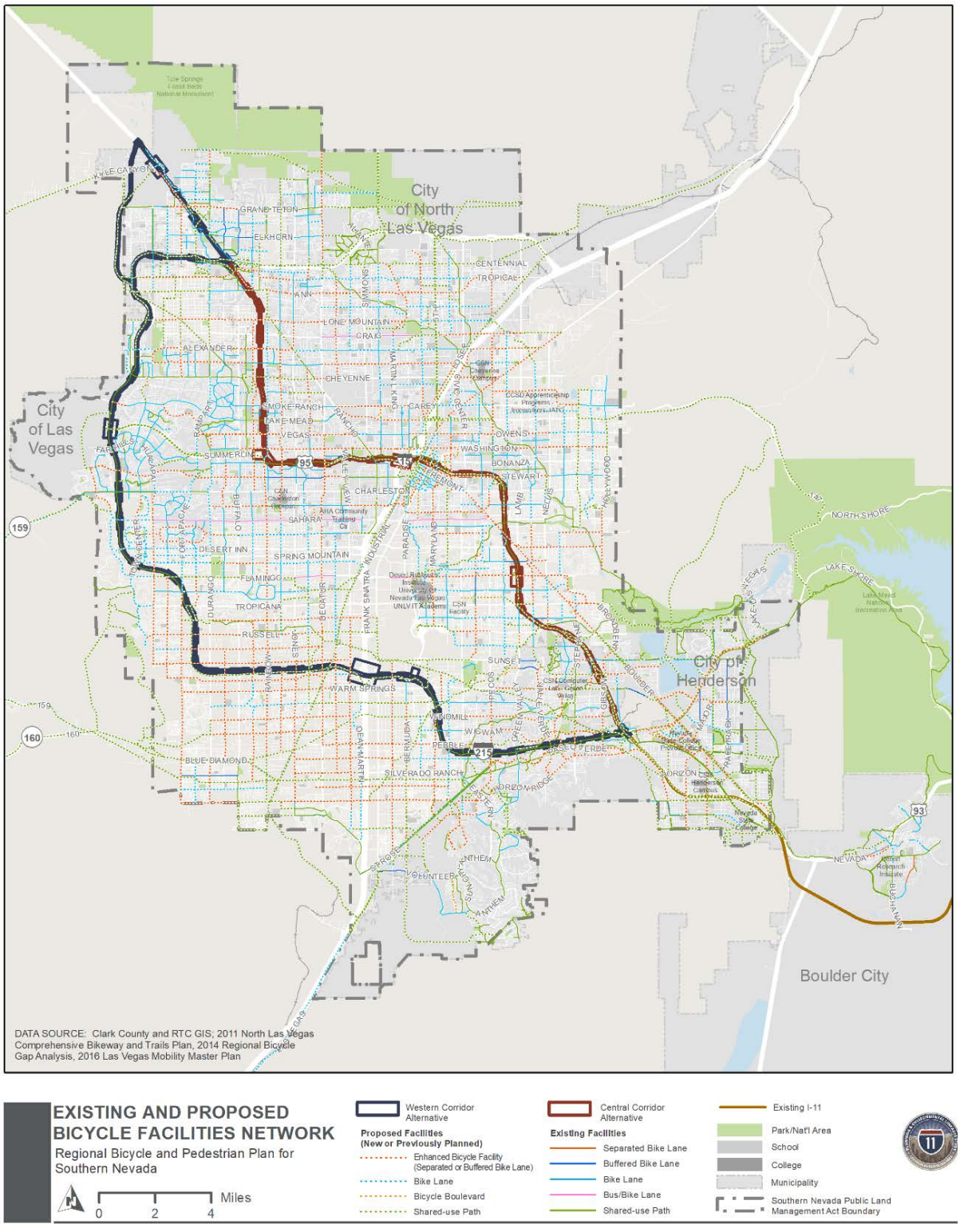


Table 2-2. Existing Bike Facilities in the Study Area

Jurisdiction	Mileage	Percentage	Mileage	Percentage	Mileage	Percentage
	Western Corridor Alternative Centennial Bowl Option		Western Corridor Alternative Sheep Mountain Option		Central Corridor Alternative	
CLARK COUNTY	44.6	27.6%	43.3	34.7%	28.0	16.8%
Bike lane	21.1	47.3%	20.0	46.2%	11.8	42.1%
Bike route	9.7	21.8%	9.7	22.5%	0.9	3.2%
Buffered bike lane	-	-	-	-	1.4	5.1%
Shared use path	11.1	24.9%	10.9	25.1%	8.5	30.2%
Sidepath	2.7	6.0%	2.7	6.2%	-	-
Bus/Bike lane	-	-	-	-	5.4	19.4%
CITY OF HENDERSON	46.6	28.7%	46.6	37.3%	26.4	15.9%
Bike lane	24.2	52.0%	24.2	52.0%	16.5	62.3%
Bike route	0.5	1.1%	0.5	1.1%	0.4	1.5%
Buffered bike lane	-	-	-	-	1.7	6.3%
Shared use path	15.6	33.5%	15.6	33.5%	4.2	15.9%
Sidepath	6.3	13.5%	6.3	13.5%	2.8	10.5%
Separated bike lane	-	-	-	-	0.9	3.6%
CITY OF LAS VEGAS	70.8	43.7%	34.9	28.0%	112.0	67.3%
Bike lane	42.5	60.0%	20.9	59.9%	63.6	56.8%
Bike route	-	-	-	-	7.2	6.4%
Buffered bike lane	2.6	3.6%	-	-	4.7	4.2%
Shared use path	22.5	31.7%	13.2	37.9%	16.2	14.5%
Sidepath	3.3	4.6%	0.8	2.2%	20.3	18.1%
Total	162.1	100%	124.7	100%	166.5	100.0%

Source: RTC Access 2050 Appx O Regional Bicycle and Pedestrian Plan. Values calculated using source data.

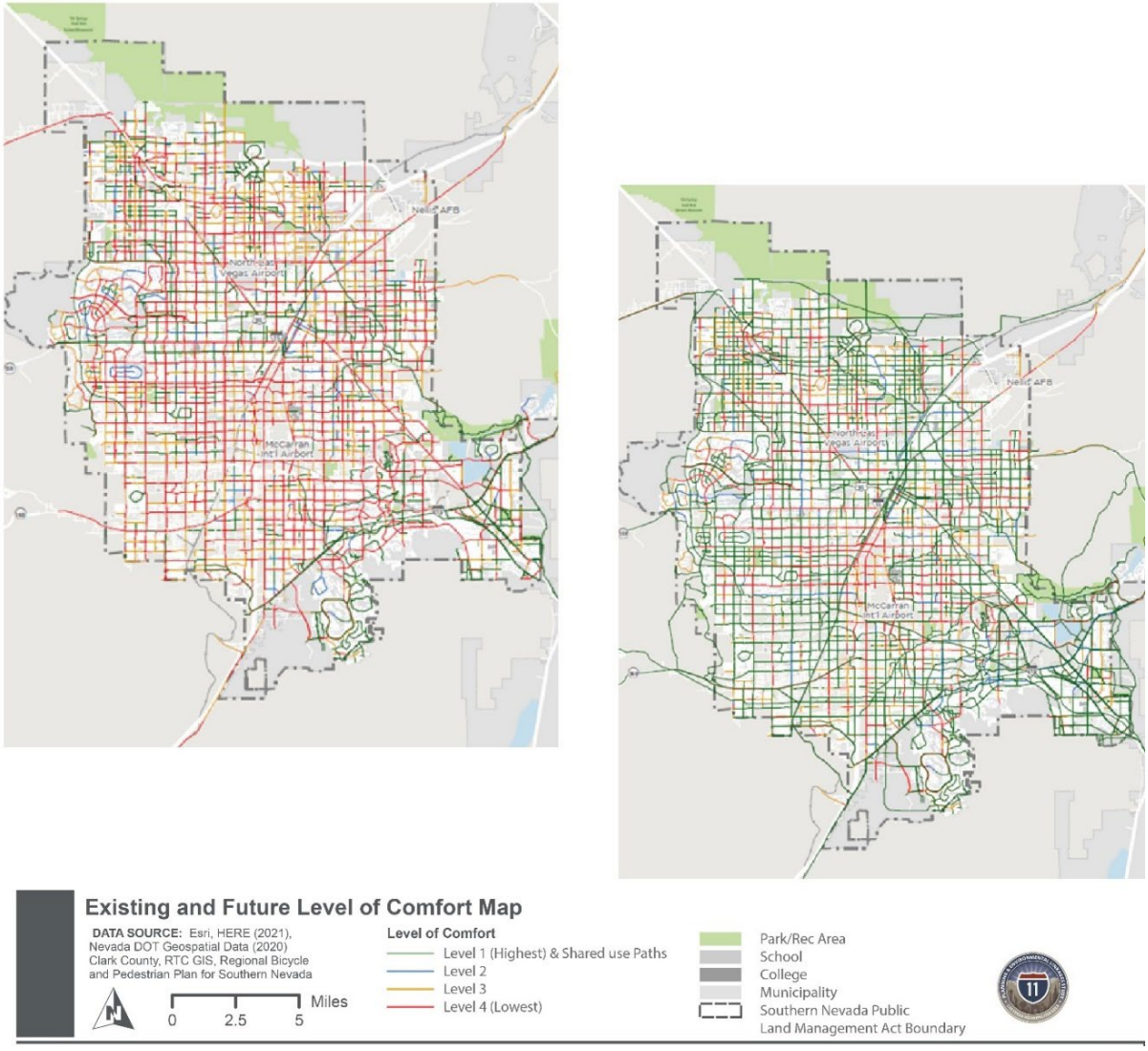
Table 2-3. Planned Bike Facilities in the Study Area

Jurisdiction	Mileage	Percentage	Mileage	Percentage	Mileage	Percentage
	Western Corridor Alternative Centennial Bowl Option		Western Corridor Alternative Sheep Mountain Option			Central Corridor Alternative
CLARK COUNTY	175.0	60.4%	172.0	65.4%	40.6	21.3%
Bicycle boulevard	-	-	-	-	1.5	3.7%
Bike lane	25.1	14.3%	22.9	13.3%	7.7	18.9%
Buffered bike lane	39.4	22.5%	38.7	22.5%	10.2	25.0%
Separated bike lane	46.2	26.4%	46.2	26.9%	12.6	31.0%
Shared use path	47.6	27.2%	47.5	27.6%	7.5	18.6%
Sidepath	16.8	9.6%	16.7	9.7%	1.1	2.7%
CITY OF HENDERSON	54.9	18.9%	54.9	20.9	45.9	24.1%
Bike lane	-	-	-	-	0.5	1.1%
Buffered bike lane	12.0	21.8%	12.0	21.8%	3.7	8.0%
Separated bike lane	9.4	17.2%	9.4	17.2%	5.1	11.2%
Shared use path	28.9	52.7%	28.9	52.7%	25.2	54.9%
Sidepath	4.6	8.3%	4.6	8.3%	11.4	24.8%
CITY OF LAS VEGAS	60.1	20.7%	36.1	13.7%	104.1	54.6%
Bicycle boulevard	0.3	0.5%	0.3	0.9%	2.4	2.3%
Bike lane	12.1	20.1%	4.9	13.7%	16.3	15.6%
Buffered bike lane	15.6	25.9%	6.6	18.2%	22.4	21.5%
Separated bike lane	0.7	1.2%	0.5	1.4%	31.7	30.5%
Shared use path	27.5	45.8%	22.8	63.3%	23.5	22.6%
Sidepath	3.8	6.4%	1.0	2.7%	7.8	7.5%
Total	290.2	100.0%	263.0	100.0%	190.6	100.0%

Source: RTC Access 2050 Appx O Regional Bicycle and Pedestrian Plan. Values calculated using source data.

In RTC's Regional Bicycle and Pedestrian Plan, existing Level of Comfort on current bicycle facilities was measured and assessed using metrics like number of travel lanes, traffic volume, and shared street design speed. Figure 2-8 shows that most of the streets in proximity to the two corridor alternatives are at Level 4, which is the lowest level of comfort that are only acceptable to "strong and fearless" bicyclists. The shared use path along the Western Corridor Alternative RIC on I-215 is rated a Level 1 facility, which is the highest level of comfort and is assigned to roads that would be tolerable for all ages and abilities.

Figure 2-8. Existing and Future Level of Comfort



Since the plan's overarching goal is to provide high comfort facilities to residents of all ages and abilities, measuring the level of comfort before and after the planned improvements is imperative to assess the effectiveness of the recommendations in this plan. According to RTC, currently 15 percent of non-freeway, collector and above roadways are at level of comfort 1 or 2.

After plan implementation, it is estimated that 46 percent of those roadways will be at level of comfort 1 or 2. That is a 31 percent increase in bike facilities that are high comfort and would be crucial to increasing bicycle and pedestrian mode share.

The Regional Bicycle and Pedestrian Plan notes that the future bicycle network would mostly consist of high comfort facilities (73 percent). According to RTC, not only would the total facility mileage increase by 133 percent, but the network of high comfort facilities would increase by 267 percent (Figure 2-9).

Figure 2-9. System Mileage Increases and Future High Comfort Share in Southern Nevada

Source: RTC Access 2050 Regional Transportation Plan. Appendix O – Regional Bicycle and Pedestrian Plan.

Pedestrian Facilities

NDOT is building approximately $10 million in pedestrian safety improvements, including enhanced crosswalks, pedestrian-activated flashing beacons, and other safety enhancements in Nevada's urban areas. In Las Vegas, the projects include the following:

- Boulder Highway (SR 582) Pedestrian Safety Project
- Lake Mead Boulevard (SR 147) from Civic Center Drive to Pecos Road
- Charleston Boulevard (SR 159) from Hillside Place to Burnham Avenue and between Arden Street and Nellis Boulevard
- Craig Road (SR 573) between Decatur Boulevard and North Fifth Street

2.1.4 What Are the Existing and Planned Freight Facilities?

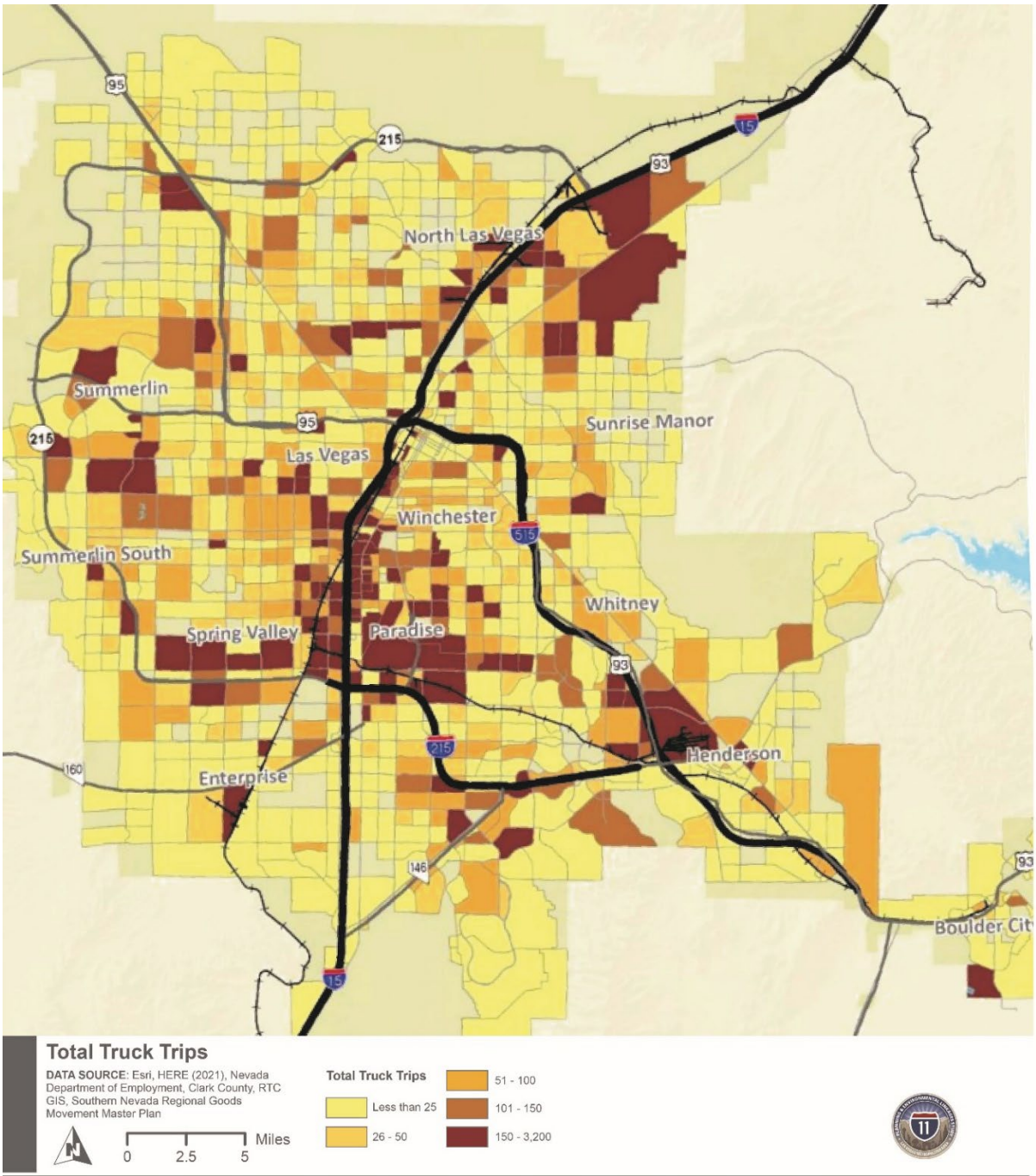
RTC's Southern Nevada Regional Goods Movement Master plan, published in 2015, evaluated the freight infrastructure capacity and usage in the Las Vegas Valley. The report stated that most goods within the Las Vegas metropolitan area are transported by truck – 87.9 percent of the total tonnage and 77.8 percent of the total value of goods that flow through the area are by truck. Truck routes through the Las Vegas Valley include the two corridors under consideration for I-11. As seen in Figure 2-11, both corridor alternatives currently carry between 1,600 and 7,000 trucks per day for the majority of their length. In addition, both corridor alternatives connect with heaviest stretch of I-15, which services an average of 7,001 to 12,000 trucks per day.

Figure 2-10. Goods Movement Facilities and Average Truck Volumes

Source: RTC Access 2050 Regional Transportation Plan, Appendix S – Southern Nevada Regional Goods Movement Master Plan

Currently, there are several clusters in the Valley that experience substantial truck traffic per day, as shown in Figure 2-12. Along the Western Corridor Alternative, there is heavy truck volume in the Spring Valley and Paradise areas, and along the Central Corridor Alternative, the Henderson industrial area has heavy truck volumes.

Figure 2-11. Total Truck Trips



Source: RTC Access 2050 Regional Transportation Plan, Appendix S – Southern Nevada Regional Goods Movement Master Plan

Railroad transportation is also used for goods movement in and out of the Las Vegas region. Rail constitutes 3.3 percent of shipments that go through Las Vegas. The main freight rail corridor in Southern Nevada is the Union Pacific Railroad (UP) South Central Route that parallels I-15 and extends from Long Beach to Salt Lake City. There are 19 trains that pass through the Las Vegas metropolitan area per day with 22 grade-separated crossings, three at-

grade crossings, one intermodal facility, and one rail yard. The South-Central Route includes the BMI Branch which starts at Spring Valley and extends nearly to Boulder City.

The Goods Movement Master Plan emphasized the importance in addressing first and last mile bottlenecks by capacity and operational improvements to the arterial network by examining the intensity of existing and future warehouse space. The Plan showed that the Spring Valley neighborhood within the Western Corridor Alternative RIC is slated to be home to 10 million to 20 million square feet of warehousing space in the future. The RTC has recently initiated an update to this plan, the Southern Nevada Freight Plan is anticipated to be complete in 2022. This plan will build on previously collected information and other studies to assess infrastructure capabilities to support and facilitate freight movement. It will leverage the recommendations and findings of the Nevada State Freight Plan, which laid a strategic framework for freight mobility and economic competitiveness for the State of Nevada.

2.2 TRANSPORTATION SYSTEM PERFORMANCE

2.2.1 What Are the Traffic Operations in the Existing and Future No Build Conditions?

This section details the traffic operations analysis and final results. The analysis, as noted above, is performed in HCS7 and results calculated and compiled for individual highway segments along the potential corridors. The results include volume-to-capacity (v/c) ratios and level of service (LOS) under existing conditions and in year 2040. The future year analysis includes the 2040 No Build scenario and the 2040 Build scenarios.

Existing Traffic Operations

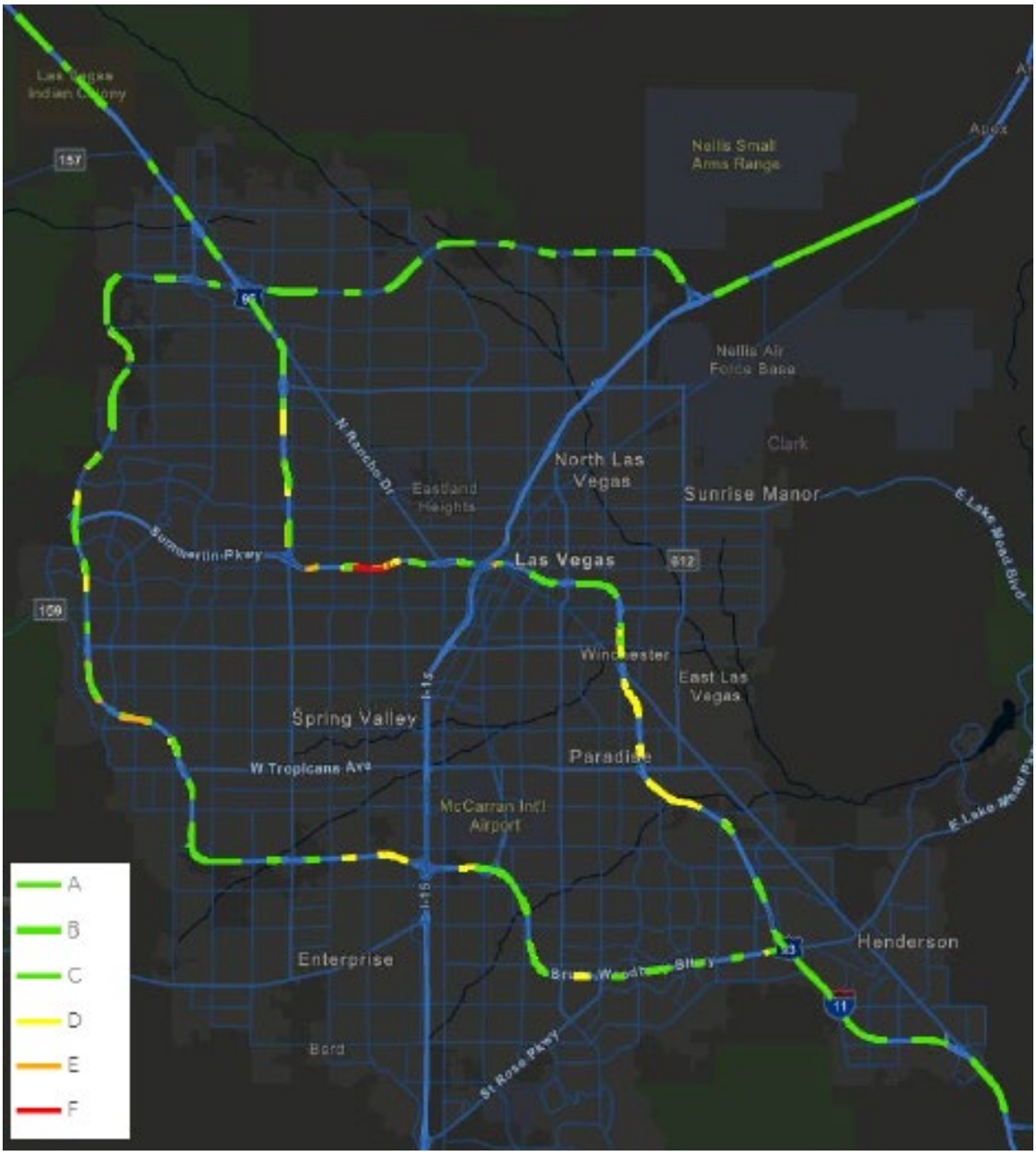
Analysis of the 2020 Base Year conditions along the Western and Central Corridor Alternatives is described below. Table 2-4 illustrates the number of freeway segments, by corridor, that currently exceed acceptable performance of LOS D during one or more hours of the AM and PM peak periods.

Table 2-4. 2020 Base Year Freeway Performance

Alternative	Number of Segments at LOS E or F			
	1 or 2 hours	3 or 4 hours	5 or 6 hours	Total
Central Corridor Alternative	9	4	0	13
Western Corridor Alternative	6	0	0	6

The Central Corridor Alternative has 13 freeway segments operating at LOS E or F during at least one hour of the peak periods. The Western Corridor Alternative has six freeway segments operating at LOS E or F during at least one hour of the peak periods. Figure 2-13 depicts the existing corridor infrastructure conditions for 7:00 to 8:00 AM LOS.

Figure 2-12. Existing Conditions 7:00 to 8:00 AM Level of Service



Future No Build Traffic Operations

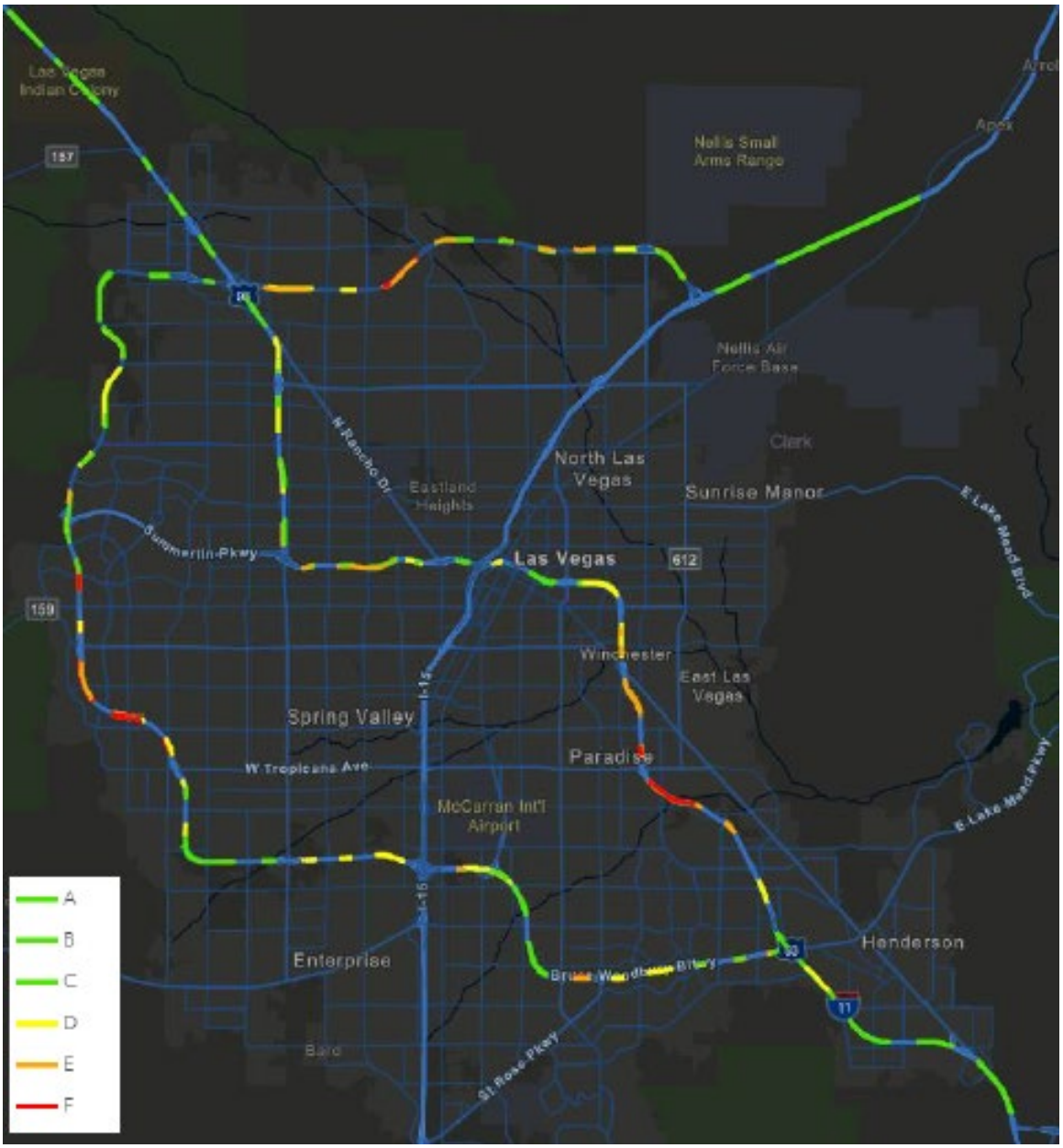
Analysis of the 2040 No Build conditions along the Western and Central Corridor Alternatives is described below. Table 2-5 illustrates the number of freeway segments (by corridor) that are projected to exceed acceptable performance of LOS D during one or more hours of the AM and PM peak periods.

Table 2-5. 2040 No Build Freeway Performance

Alternative	Number of Segments at LOS E or F			
	1 or 2 hours	3 or 4 hours	5 or 6 hours	Total
Central Corridor Alternative	17	10	1	28
Western Corridor – Centennial Bowl Alternative	5	10	6	21

Of the freeway segments located along the Central Corridor Alternative, 28 are projected to operate at LOS E or F during at least one hour of the peak periods. The Western Corridor Alternative has 21 freeway segments operating at LOS E or F during at least 1 hour of the peak periods. Figure 2-14 shows the 2040 No Action condition for 7:00 to 8:00 AM.

Figure 2-13. 2040 No Build 7:00 to 8:00 AM LOS



2.2.2 What Are Typical Travel Times in the Study Area

A sampling of typical existing travel times for both Central and Western corridor alternatives is shown in Table 2-6.

Table 2-6. Typical Travel Times in the Study Area

Origin-Destination	Time of Day	Corridor	Estimated Travel Time	Distance
Southeastern Las Vegas[1] to Downtown[2]	Morning Peak	Central	27 minutes	15.1 miles
	Midday	Central	25 minutes	15.1 miles
	Evening Peak	Central	25 minutes	15.1 miles
	Morning Peak	Western	28 minutes	21.2 miles
	Midday	Western	30 minutes	15.1 miles
	Evening Peak	Western	33 minutes	21.2 miles
Southeastern Las Vegas to McCarran Airport[3]	Morning Peak	Central	19 minutes	9.3 miles
	Midday	Central	18 minutes	9.3 miles
	Evening Peak	Central	19 minutes	9.3 miles
	Morning Peak	Western	18 minutes	11.4 miles
	Midday	Western	14 minutes	11.4 miles
	Evening Peak	Western	13 minutes	11.4 miles
Summerlin[4] to McCarran Airport	Morning Peak	Central	25 minutes	17.8 miles
	Midday	Central	26 minutes	17.8 miles
	Evening Peak	Central	29 Minutes	17.8 miles
	Morning Peak	Western	25 minutes	21 miles
	Midday	Western	21 minutes	21 miles
	Evening Peak	Western	31 minutes	21 miles
Summerlin to Downtown	Morning Peak	Central	15 minutes	11.4 miles
	Midday	Central	16 minutes	11.4 miles
	Evening Peak	Central	17 minutes	11.4 miles
	Morning Peak	Western	N/A	N/A
	Midday	Western	N/A	N/A
	Evening Peak	Western	N/A	N/A

Notes:
1. Southeastern Las Vegas is measured at the intersection of Fiesta Henderson Blvd and Waterwheel Falls Dr
2. Downtown Las Vegas is measured at Fremont St near the Plaza Hotel and Casino
3. McCarran Airport is measured at location of the Terminal 1 Short Term Parking Lot
4. Summerlin is measured at the intersection of Anasazi Dr and Thomas W Ryan Blvd

2.2.3 What Parallel or Alternate Routes are Available?

Corridor resiliency is important in transportation planning to account for alternative routes in the event of major traffic incidents, local emergencies, or even evacuations. Parallel principal arterials within one mile of each corridor were counted, and the Western Corridor has 1.67 parallel principal arterials within a one-mile radius per mile length of the corridor and the Central Corridor has 1.71 parallel principal arterials within a one-mile radius of the corridor per mile.

3 POPULATION AND TRAVEL CHARACTERISTICS

3.1 POPULATION CHARACTERISTICS

The following section provides the existing conditions for population and community characteristics along the corridor alternatives. For this study, existing demographic data were analyzed on a countywide level and within a half-mile buffer of the Western and Central Corridor Alternatives using American Community Survey (ACS) 2015 – 2019 5-year estimates for census tracts block groups. In addition, the U.S. Environmental Protection Agency's EJSCREEN Environmental Justice Screening and Mapping Tool was used. Future demographic projections were identified from the Access 2050 RTP analysis of population, household, employment, income, and travel behavior data within Transportation Analysis Zones (TAZs).

3.1.1 Who Lives and Works in the Study Area?

According to the ACS data (2015-2019 5-year estimates), the population of Clark County is 2,182,004. Within the defined half-mile buffer of the two corridor alternatives, the population in the Western Corridor is 358,176 and in the Central Corridor is 297,698. Figure 3-1 and Figure 3-2 illustrate the current population densities (number of residents per square mile) along the two corridor alternatives. The Central Corridor Alternative has more areas with higher population density than the Western Corridor Alternative.

The distribution of population in the study area by age is presented in Table 3-1, which shows the distribution of ages across the two corridor alternatives and Clark Count is very similar.

Table 3-1. Population by Age

Population by Age	Western Corridor Alternative Centennial Bowl Option	Western Corridor Alternative Sheep Mountain Option	Central Corridor Alternative	Clark County
Age 0-17	23%	22%	23%	23%
Age 18 - 64	62%	63%	64%	63%
Age 65+	15%	15%	13%	14%

Source: 2015-2019 American Community Survey (ACS) 5-Year Estimates

As shown in Table 3-2, there are more renter occupied households in the Central Corridor Alternative (53 percent) than the Western Corridor Alternative (40 to 41 percent) and Clark County (46 percent). The geographic distribution of renter-occupied households is illustrated in Figure 3-3 and Figure 3-4.

Table 3-2. Household by Tenure

Household by Tenure	Western Corridor Alternative Centennial Bowl Option	Western Corridor Alternative Sheep Mountain Option	Central Corridor Alternative	Clark County
Owner Occupied	60%	59%	47%	54%
Renter Occupied	40%	41%	53%	46%
Total Occupied Units	132,872	115,562	107,872	783,524

Source: United States Environmental Protection Agency. EJSCREEN: Environmental Justice Screening and Mapping Tool. Values calculated using source data.

Figure 3-1. Population Density in the Study Area – Sheet 1

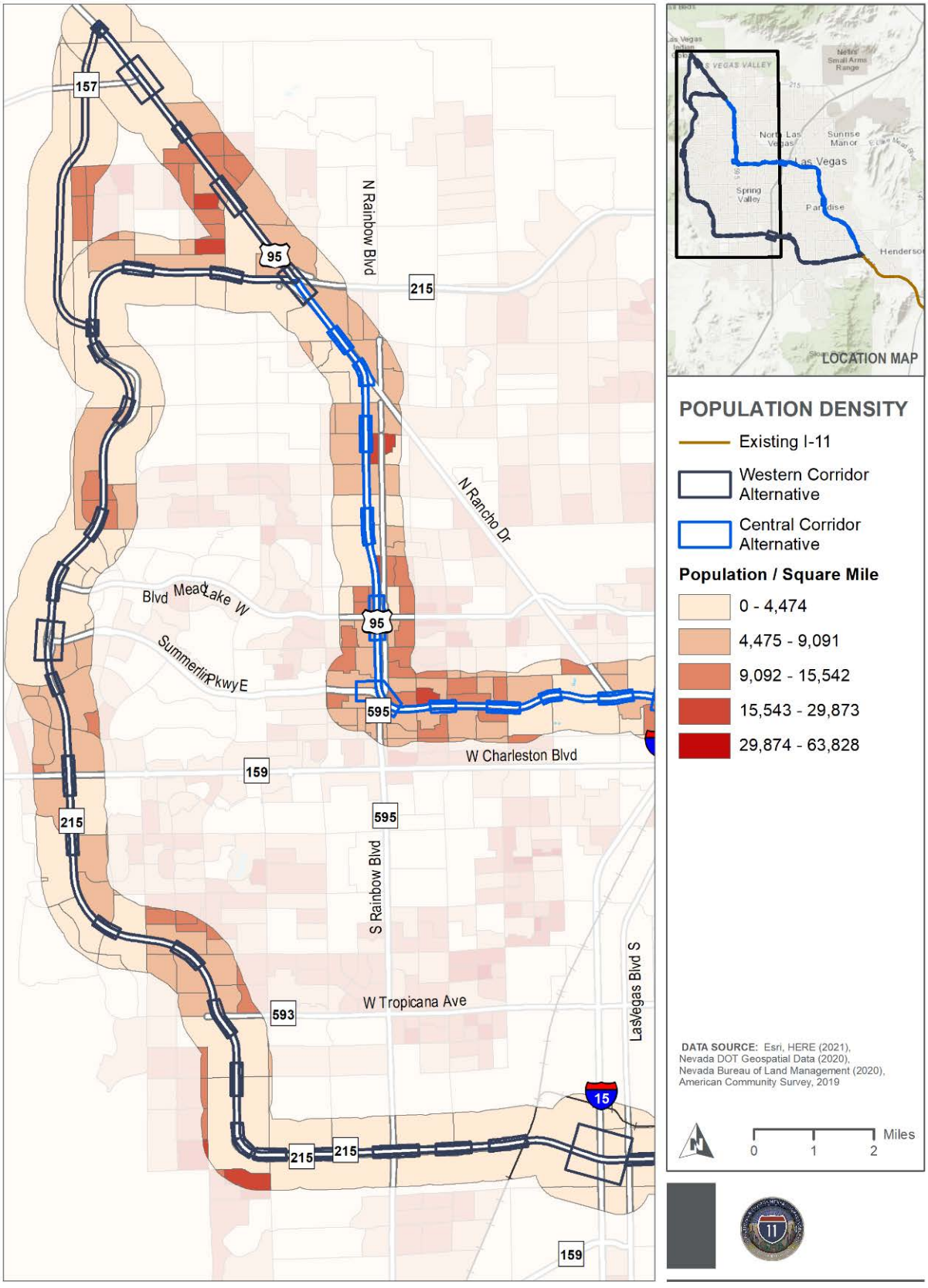


Figure 3-2. Population Density in the Study Area – Sheet 2

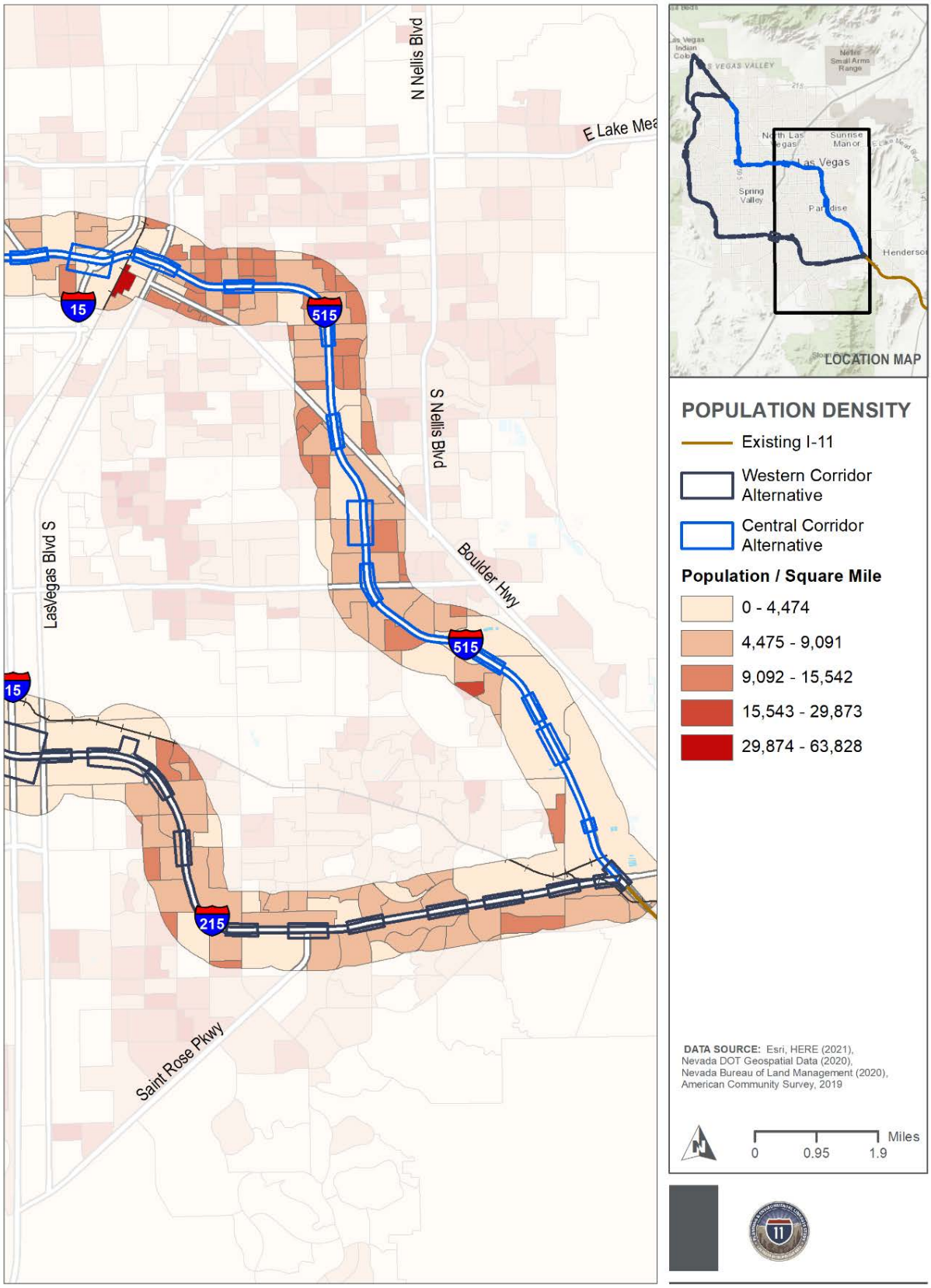


Figure 3-3. Renter Occupied Households – Sheet 1

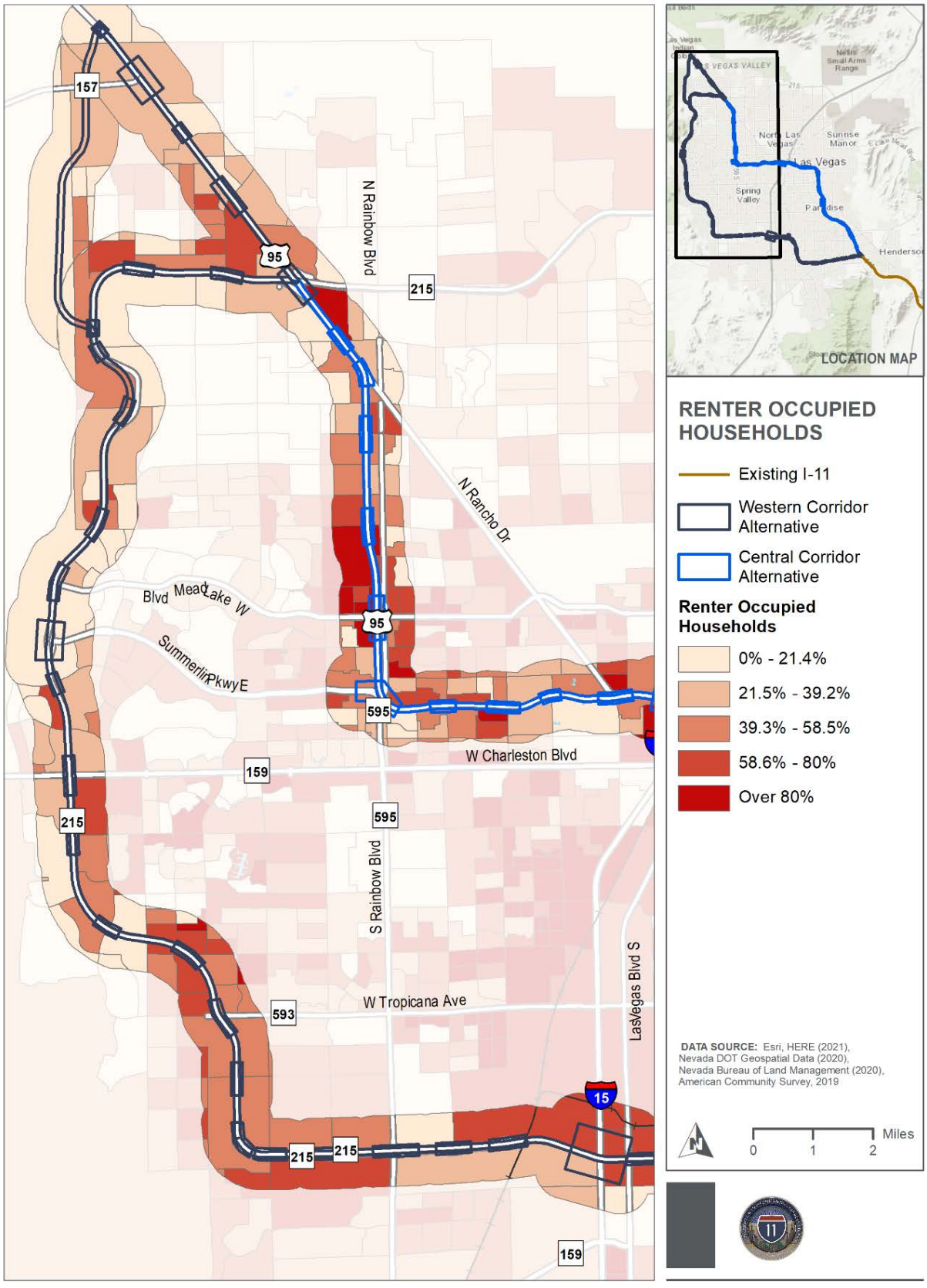


Figure 3-4. Renter Occupied Households – Sheet 2

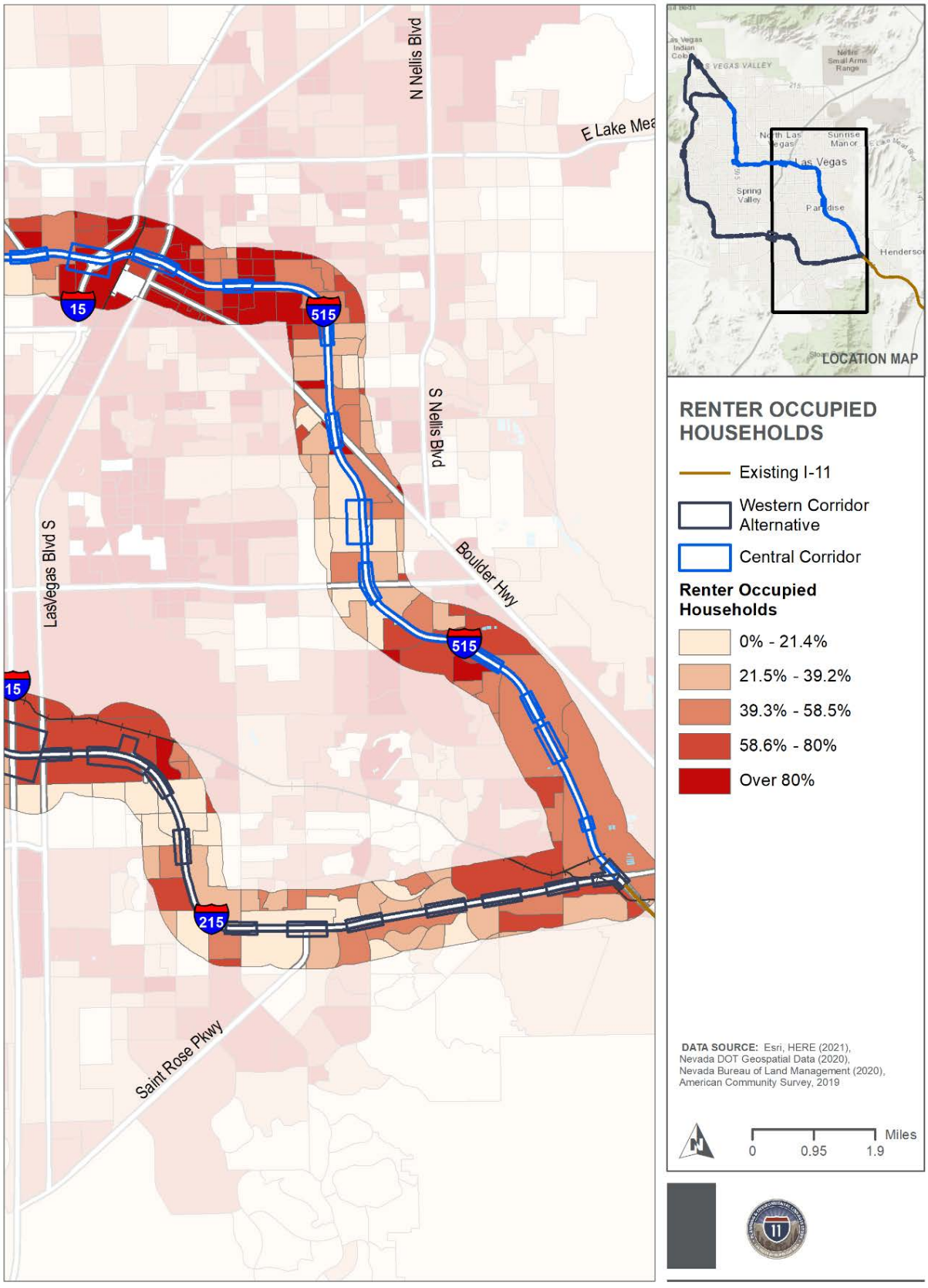


Table 3-3 shows existing households and employment for the two corridor alternatives. Although the Central Corridor Alternative includes downtown Las Vegas, census data indicate more households and jobs within a half-mile distance of the Western Corridor Alternative than the Central Corridor Alternative. Jobs outnumber households along both corridors.

Table 3-3. Households and Employment in the Study Area

Indicator	Western Corridor Alternative Centennial Bowl Option	Western Corridor Alternative Sheep Mountain Option	Central Corridor Alternative	Clark County
Households	132,872	115,562	107,872	783,524
Employment	156,025	179,789	137,013	1,031,774

Source: 2015-2019 American Community Survey (ACS) 5-Year Estimates

By 2050, the RTC projects that there will be over three million people and over 1.3 million jobs in Clark County. Figure 3-5 and Figure 3-6 display the geographic distribution of future population and employment growth by traffic analysis zones.

3.1.2 What Are the Environmental Justice Considerations?

Environmental Justice is the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income, with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies.[3] Executive Order 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-income Populations*, was signed by President Bill Clinton on February 11, 1994 and directs federal agencies to take the appropriate and necessary steps to identify and address disproportionately high and adverse effects of federal projects on the health or environment of minority and low-income populations to the greatest extent practicable and permitted by law. In addition, Executive Order 13985, *Advancing Racial Equity and Support for Underserved Communities through the Federal Government,* signed by President Joe Biden on January 20, 2021, provides a framework for federal agencies, including FHWA, to develop a project that delivers resources and benefits equitably to all.

Locations of minority and low-income should be considered early in project planning and development to identify potential benefits and burdens to these populations and avoid any disproportionately high and adverse effects on these communities. Using the American Community Survey's data from its 2015-2019 5-year estimates for the block groups within 500 feet of the Western and Central Corridor Alternatives, high-minority and low-income areas are identified in the following sections by comparing block group data to those of the county as a whole.

Minority Populations

A *minority* is a person who is Black, Hispanic, Asian American, or American Indian or Alaska Native (FHWA Order 6640.23). Also considering those who identify as "two or more races" and

[3] Environmental Justice | US EPA

"other", minority populations include all racial and ethnic groups that are not non-Hispanic White and one race only.

High-minority areas are identified in block groups where the percentage of minority persons exceeds the average percentage of minority persons in Clark County. According to the ACS 2015–2019 5-Year Estimates, 40 percent of the Clark County population is identified as one or the minority races or ethnicity designations; therefore, this analysis focuses on census block groups within which the percentage of the minority population is at or above 40 percent.

Figure 3-5. 2019- 2050 Total Population Growth

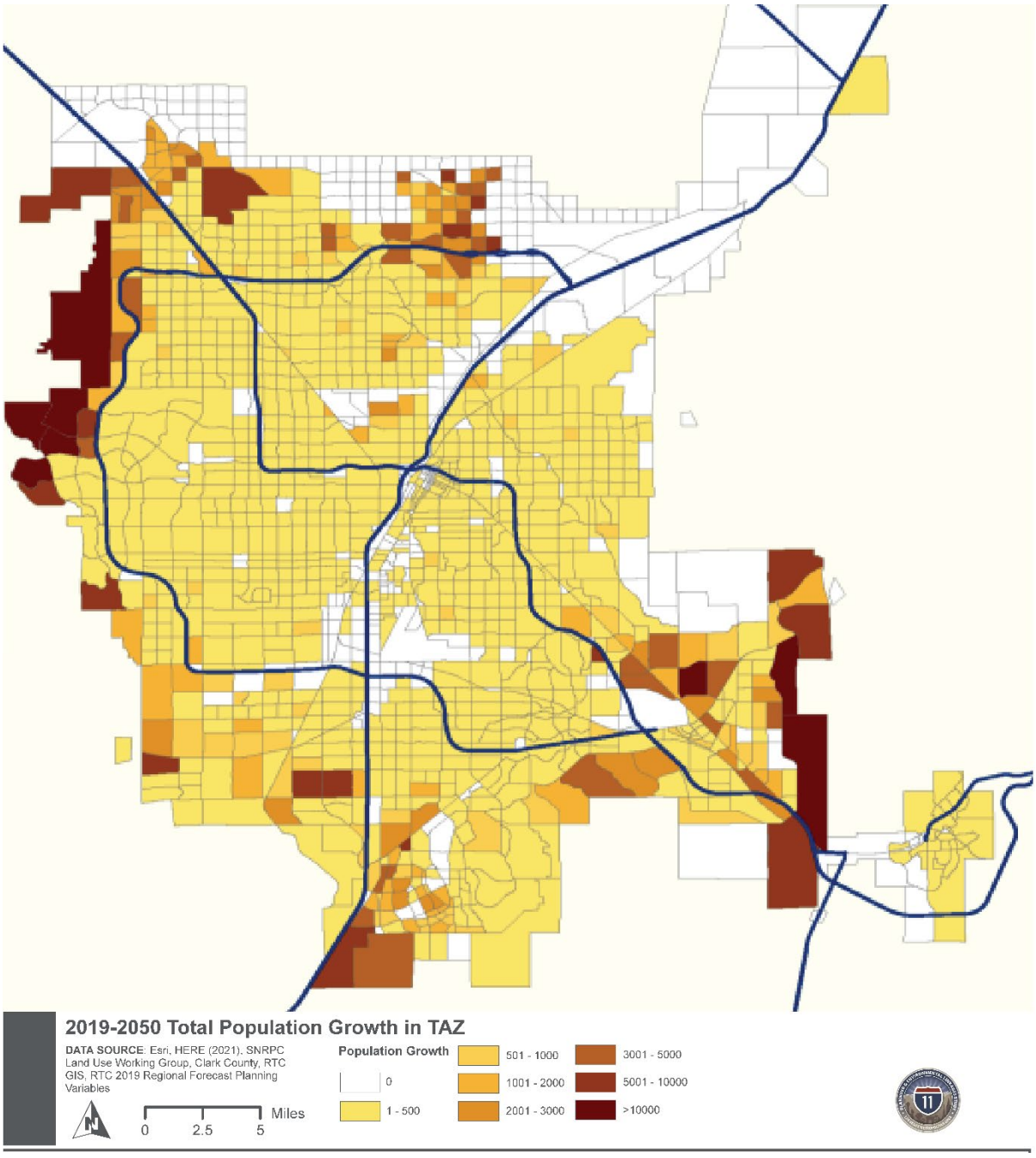
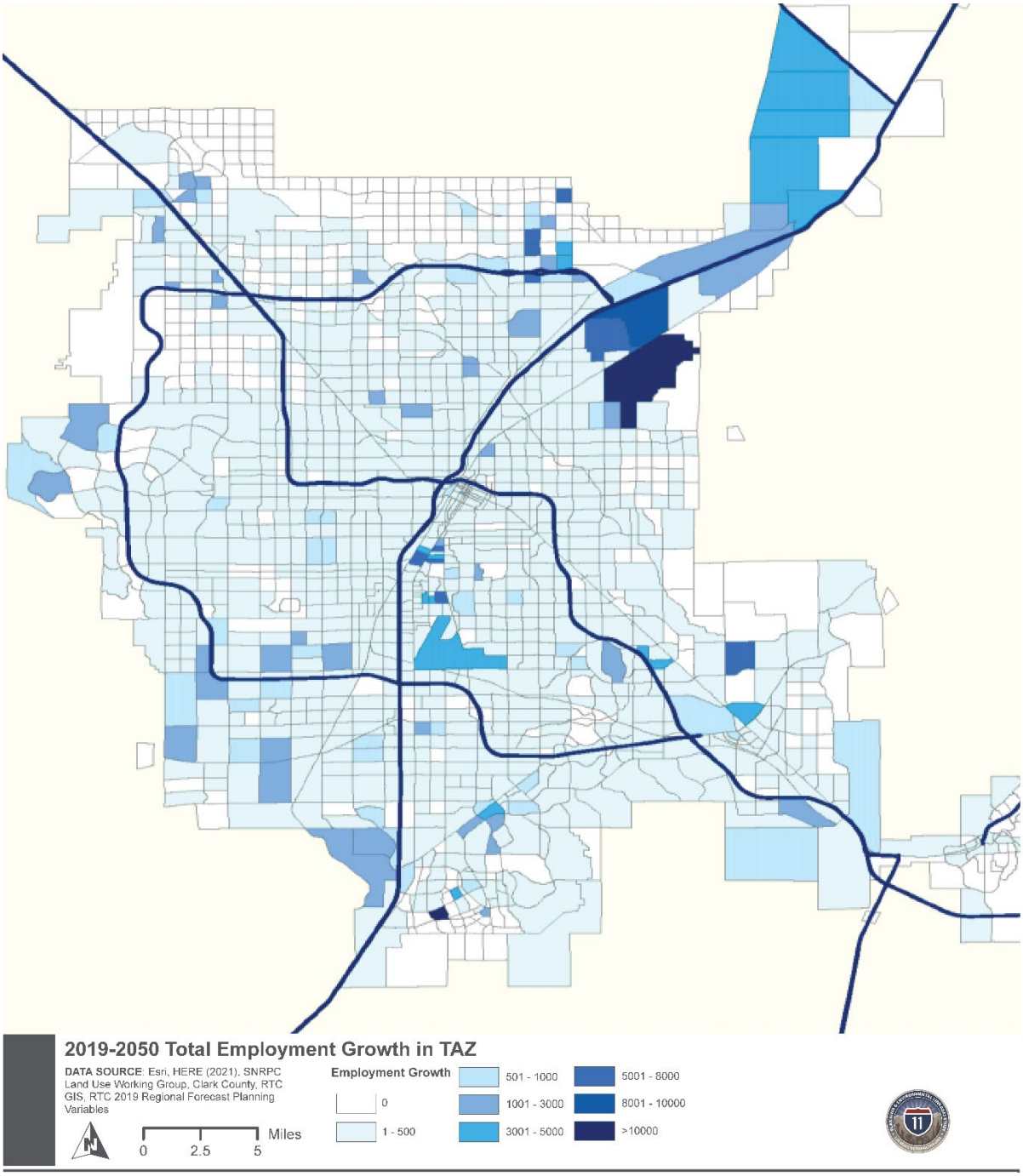


Figure 3-6. 2019 - 2050 Total Employment Growth



Within the Central Corridor Alternative, 42 percent of the population is identified as minority, which exceeds the 40 percent threshold of the County. Out of 231 block groups along the Central Corridor Alternative, 121 block groups have a percentage of minority residents that exceed the county average. Along the two Western Corridor Alternative options, 33 percent of

the population is identified as minority, which is below the 40 percent threshold of the County (Table 3-4). Figure 3-7 and Figure 3-8 illustrate the locations of the high-minority populations.

Table 3-4. Race and Ethnicity Characteristics

Race/Ethnicity	Western Corridor Alternative Centennial Bowl Option	Western Corridor Alternative Sheep Mountain Option	Central Corridor Alternative	Clark County
White	67%	67%	58%	60%
Black	9%	9%	12%	12%
Native American	1%	1%	1%	1%
Asian	12%	13%	6%	10%
Pacific Islander	1%	1%	1%	1%
Other Race	11%	11%	23%	17%
Minority Population	33%	33%	42%	40%
Hispanic Population	18%	17%	41%	31%
Total Population	358,176	308,627	297,698	2,182,004

Source: U.S. Census Bureau American Community Survey 2015–2019 5-Year Estimates Table B03002: Hispanic or Latino Population by Race

Low-Income Populations

Low-Income households are identified as households with annual income at or below the federal poverty level. Low-income areas for this analysis are those block groups with a percentage of households at or below the federal poverty level that is greater than that of the county. According to ACS 2015–2019 5-year estimates, 13 percent of Clark County households have incomes at or below the federal poverty level and are therefore considered low-income.

Within the Central Corridor Alternative, 19 percent of the households have incomes below the federal poverty level (therefore, low-income), which exceeds the 13 percent threshold of the County. Out of 231 block groups along the Central Corridor Alternative, 124 block groups have a percentage of low-income households greater than the 13 percent county percentage. Along the two Western Corridor Alternative options, only 8 percent of the households are low-income. Figure 3-9 and Figure 3-10 illustrate the locations of the low-income areas, showing that none of the block groups along the Western Corridor Alternative has more than 27.6 percent of households under the federal poverty level, whereas along the Central Corridor Alternative there is a very high concentration of low-income block groups (exceeding 27.6 percent of households below the federal poverty level) in downtown Las Vegas.

Figure 3-7. All Minority Populations along the Corridor Alternatives – Sheet 1

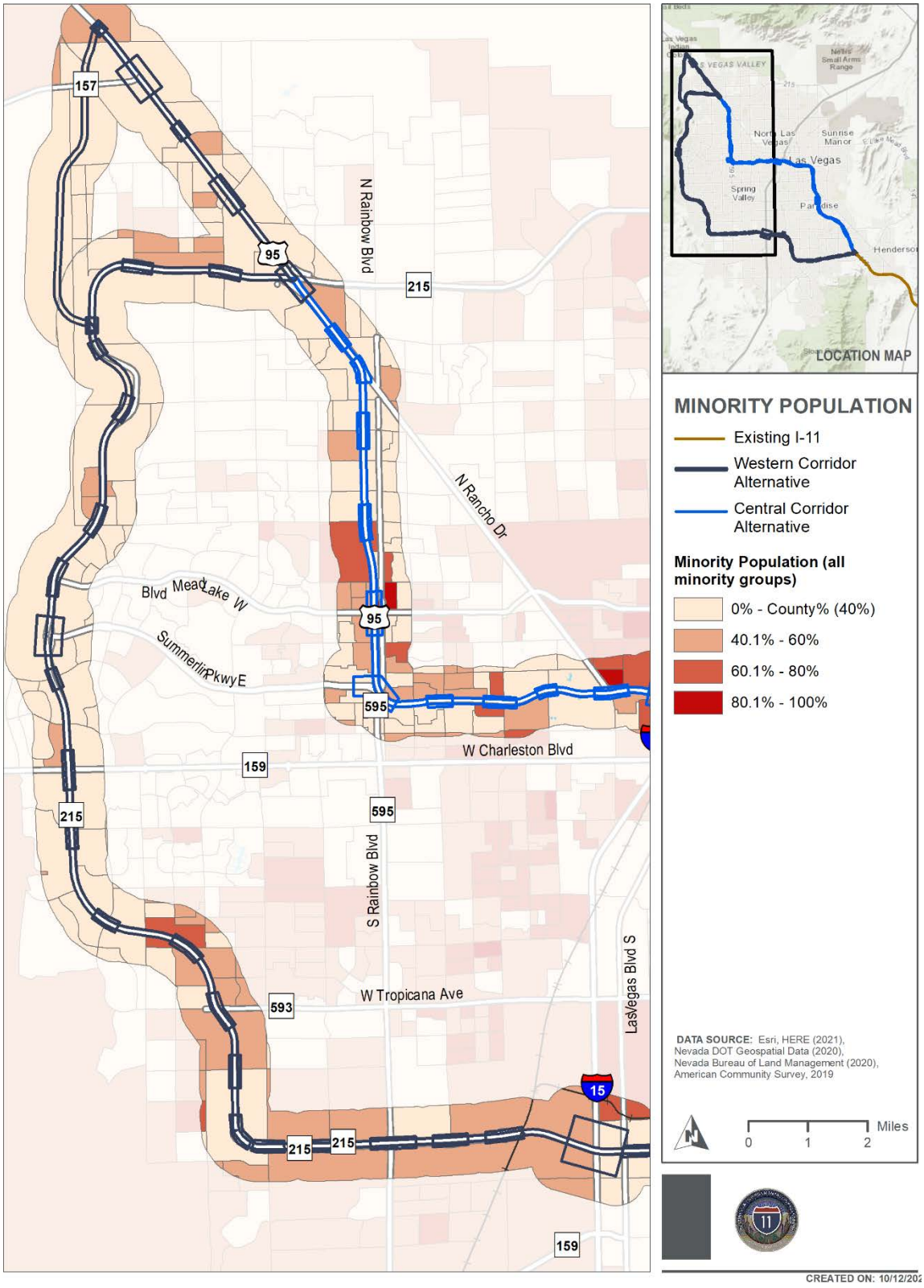


Figure 3-8. All Minority Populations along the Corridor Alternatives – Sheet 2

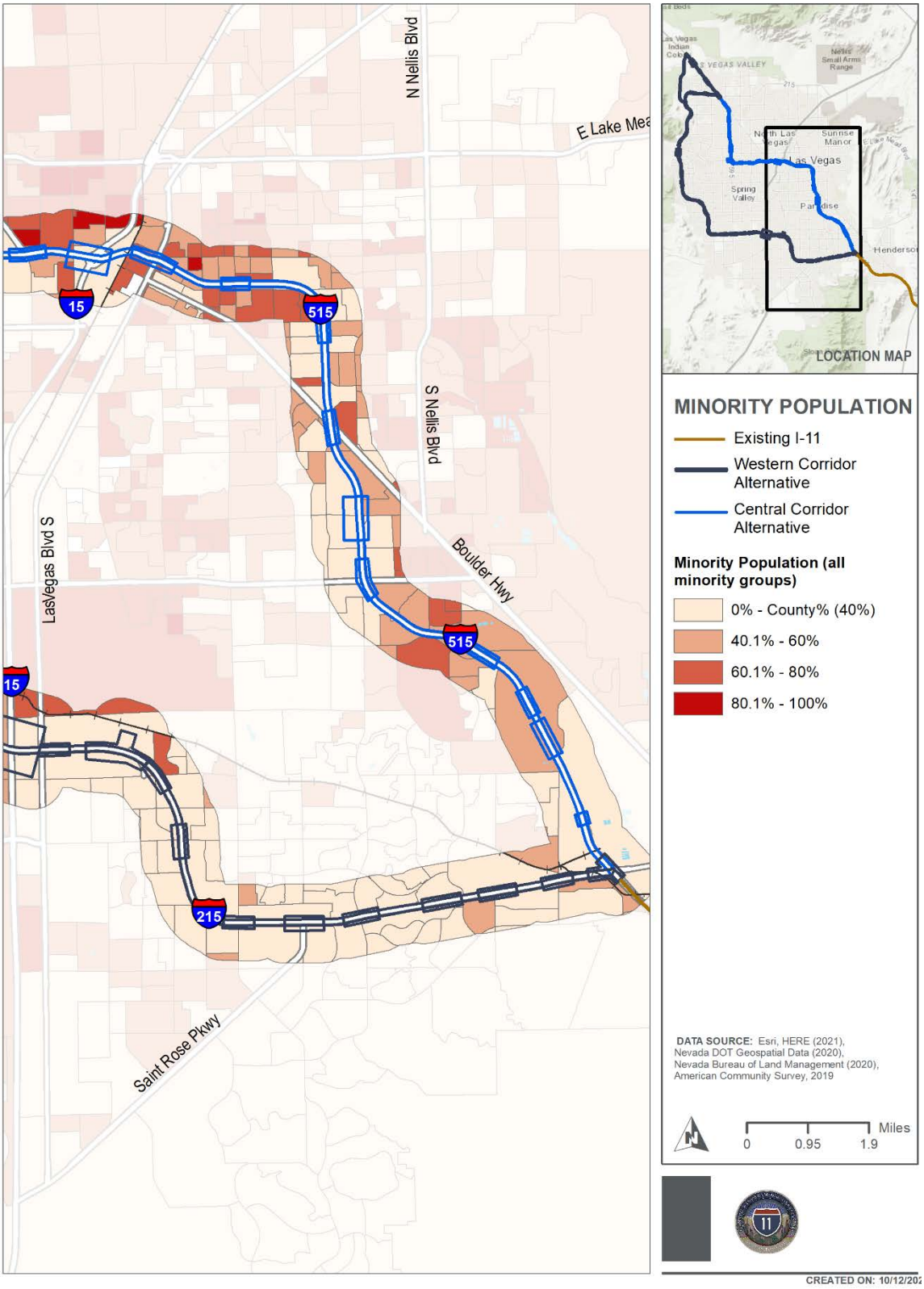


Figure 3-9. Households Below Poverty Level along Corridor Alternatives – Sheet 1

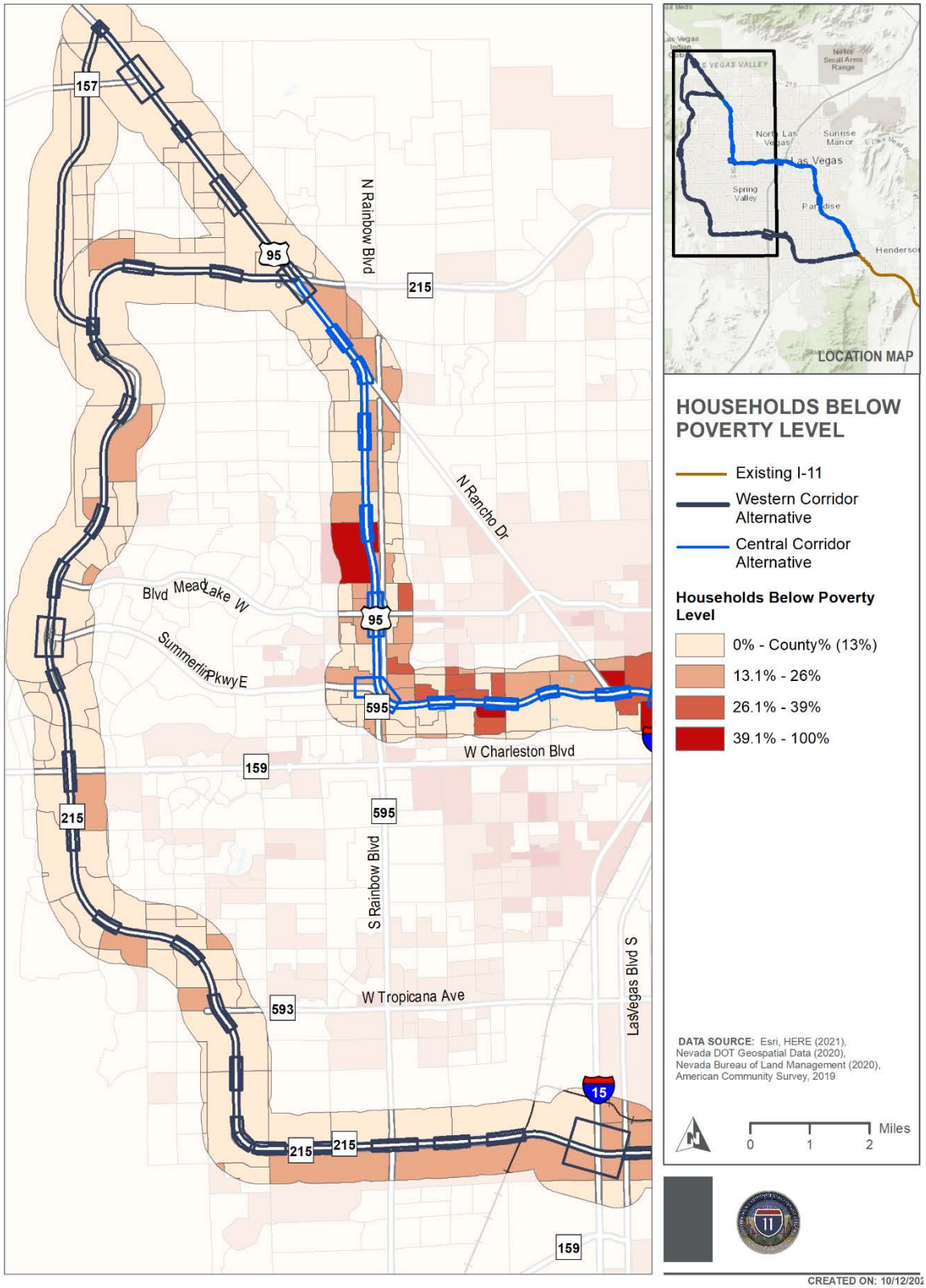
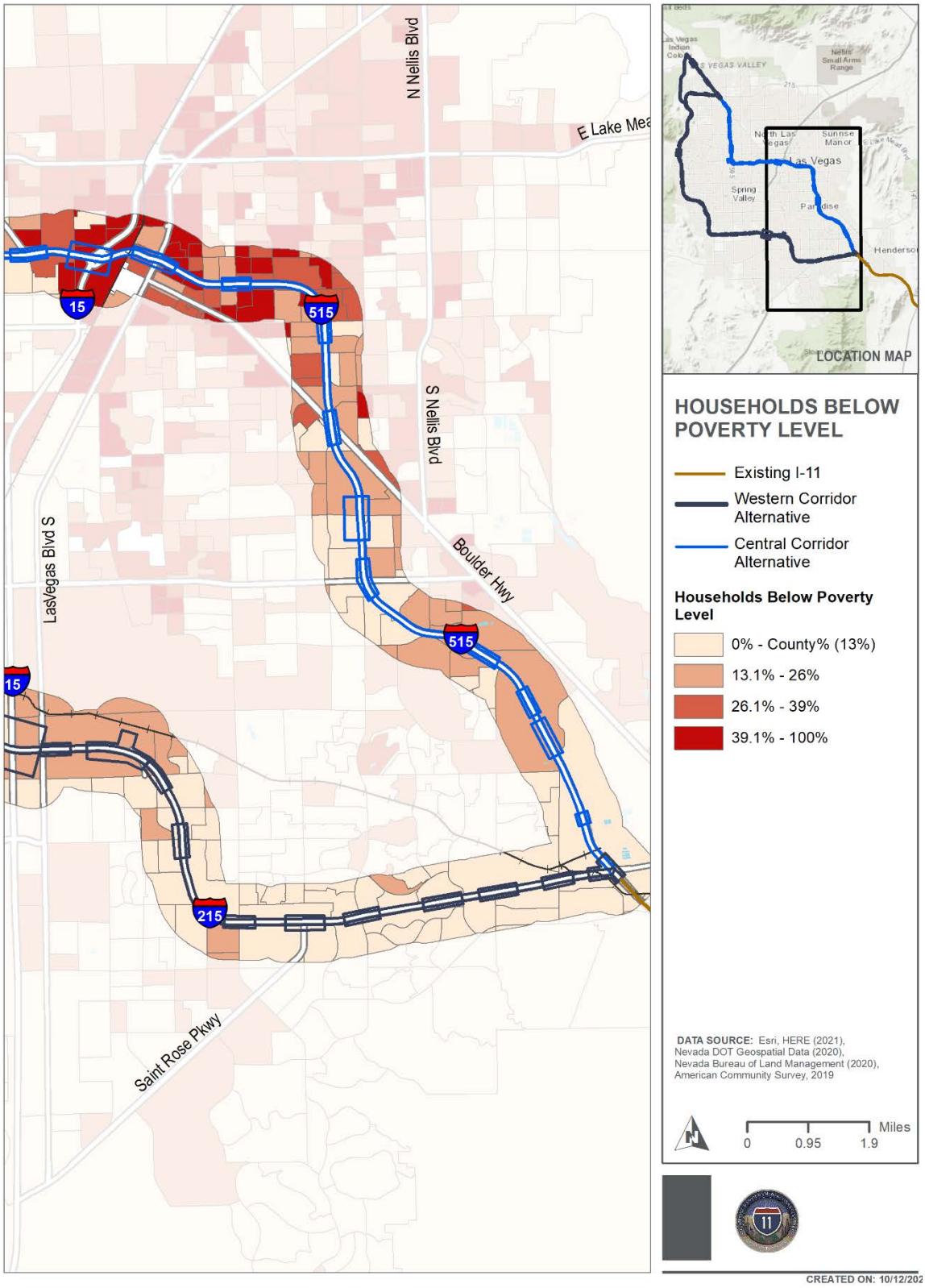


Figure 3-10. Households Below Poverty Level along Corridor Alternatives – Sheet 2



Other Environmental Justice Considerations

Three additional community characteristics are presented below to better understand and identify the diversity of underrepresented and vulnerable populations, in particular those with communication and mobility needs, relevant to the PEL: limited English proficiency (also referred to as linguistically isolated households), households with disability, and zero vehicle households. For all three characteristics examined, the percentages for the block groups along the Central Corridor Alternative exceeded those of the county; on the other hand, for all three characteristics examined, the percentages for the block groups along both Western Corridor Alternative was lower than those of the county. Table 3-5 summarizes the percentages of linguistically isolated households, households with disability, and zero vehicle households, as well as low-income households, along the two corridor alternatives and in Clark County as a whole.

Table 3-5. Other Environmental Justice Characteristics

	Western Corridor Alternative Centennial Bowl Option	Western Corridor Alternative Sheep Mountain Option	Central Corridor Alternative	Clark County
Total Households	132,872	115,562	107,872	783,524
Households Below Poverty Level	8%	8%	19%	13%
Linguistically Isolated Households	3%	3%	9%	7%
Households with Disability	20%	20%	28%	25%
Zero Vehicle Households	3%	3%	13%	8%

Source: 2015-2019 American Community Survey (ACS) 5-Year Estimates

3.2 TRAVEL CHARACTERISTICS

3.2.1 How Do Residents Travel to Work?

Table 3-6 shows the mode of travel for residents along the two corridor alternatives and in Clark County based on ACS 2015-2019 5-year estimates.

Table 3-6. Primary Means of Transportation to Work

Mode of Travel	Western Corridor Alternative Centennial Bowl Option	Western Corridor Alternative Sheep Mountain Option	Central Corridor Alternative	Clark County
Car/Truck (alone)	82.0%	82.1%	76.1%	78.8%
Carpool	8.4%	8.1%	11.3%	9.8%
Public Transit	1.1%	1.2%	4.7%	3.4%
Bike	0.2%	0.1%	0.3%	0.3%
Walk	0.9%	0.9%	1.9%	1.5%
Other	7.5%	7.6%	5.7%	6.3%

Source: 2015-2019 American Community Survey (ACS) 5-Year Estimates

*Note: * The "Other" category includes residents that commute by taxi, motorcycle, or those who work from home.*

Along both Western Corridor Alternative options, over 82 percent of residents commute to jobs by driving alone. There are more residents carpooling (12 percent) along the Central Corridor Alternative than along the Western Corridor Alternative options (8 percent). Similarly, there are more residents using public transit (over 4 percent) along the Central Corridor Alternative than along the Western Corridor Alternative options (around 1 percent). The Central Corridor Alternative also has a slightly higher number of residents biking and walking to work compared to the two Western Corridor Alternative options.

3.2.2 How Long Are Commute Times?

For both corridor alternatives, the majority of residents' commute times are less than 30 minutes (68 percent for Western Corridor and 63 percent for Central Corridor). Very low percentages of commuters take more than an hour to get to work. In general, commuters along the two Western Corridor Alternative options experience a faster commute than those along the Central Corridor Alternative (see Table 3-7).

Table 3-7. Travel Time to Work

Trip Duration	Western Corridor Alternative Centennial Bowl Option	Western Corridor Alternative Sheep Mountain Option	Central Corridor Alternative	Clark County
0-14 Minutes	20.7%	21.3%	18.9%	19.0%
15-29 Minutes	47.4%	49.5%	44.3%	44.9%
30-59 Minutes	28.7%	26.2%	31.3%	31.5%
60-89 Minutes	1.5%	1.3%	2.8%	2.7%
90+ Minutes	1.6%	1.6%	2.7%	1.9%

Source: 2015-2019 American Community Survey (ACS) 5-Year Estimates

3.2.3 When Do Commuters Leave for Work?

As Table 3-8 shows, the time that residents leave home for work is consistent across both corridor alternatives and options with the largest percentage of commuters (over 37 percent) leaving home after the 9AM peak and the second largest group leaving home between 7:00 AM and 7:59 AM (over 20 percent).

Table 3-8. Time Commuters Leave for Work

	Western Corridor Alternative Centennial Bowl Option	Western Corridor Alternative Sheep Mountain Option	Central Corridor Alternative	Clark County
5:00 AM to 5:59 AM	7.2%	6.5%	9.7%	8.8%
6:00 AM to 6:59 AM	16.1%	15.0%	17.2%	16.4%
7:00 AM to 7:59 AM	21.9%	22.4%	20.4%	20.3%
8:00 AM to 8:59 AM	17.0%	17.6%	12.6%	13.8%
Other	37.9%	38.5%	40.1%	40.7%

Source: 2015-2019 American Community Survey (ACS) 5-Year Estimates

4 LAND USE, RECREATION, AND ECONOMIC CONDITIONS

This chapter presents the existing and future land uses, parks and recreational facilities, community resources, and economic conditions along the Western and Central Corridor Alternatives.

4.1 LAND USE

4.1.1 What Are the Applicable Laws, Regulations, and Guidance Documents?

The applicable laws, regulations, and guidance documents for land use include:

- ***Nevada Revised Statutes, Chapter 278:*** Current codified laws of the State of Nevada; Chapter 278 of the Revised Statutes discusses the planning and zoning of the State
- ***City of Las Vegas Master Plan 2020:*** establishes standards, guidelines, objectives, and priorities for the development and maintenance of Las Vegas.
- ***Clark County Comprehensive Plan:*** policy document for the physical development of the unincorporated Clark County
- ***Henderson Strong Comprehensive Plan:*** communicates the vision, long-term goals and strategies that guide the physical development and orderly management of growth in the city over the next 20 years
- ***City of North Las Vegas Comprehensive Master Plan:*** policy document that will guide city decision makers as they work over the next 20 years to implement the plan and achieve the envisioned future for the city
- ***Lone Mountain Land Use Plan:*** guide for land use decisions for the Lone Mountain Planning Area that covers 28.3 square miles in the northwest Las Vegas Valley
- ***Spring Valley Land Use Plan:*** guide for growth and development decisions for the Town of Spring Valley that covers approximately 35 square miles in the southwest Las Vegas Valley
- ***Winchester/Paradise Land Use Plan:*** guide for growth and development decisions for the Towns of Winchester and Paradise that covers approximately 47.2 square miles in the south/central Las Vegas Valley
- ***Enterprise Land Use Plan:*** guide for growth and development decisions for the Town of Enterprise that covers 66.7 square miles in the southwest Las Vegas Valley

STAKEHOLDERS INVOLVED IN LAND USE CONSIDERATONS

- U.S. Bureau of Land Management
- U.S. Department of the Interior
- U.S. Forest Service
- National Park Service
- Cities
- Clark County
- RTC
- Private landowners

4.1.2 What Data Sources Are Used to Identify Land Use?

Several data sources were utilized to identify existing and future land uses along the Western and Central Corridor Alternatives:

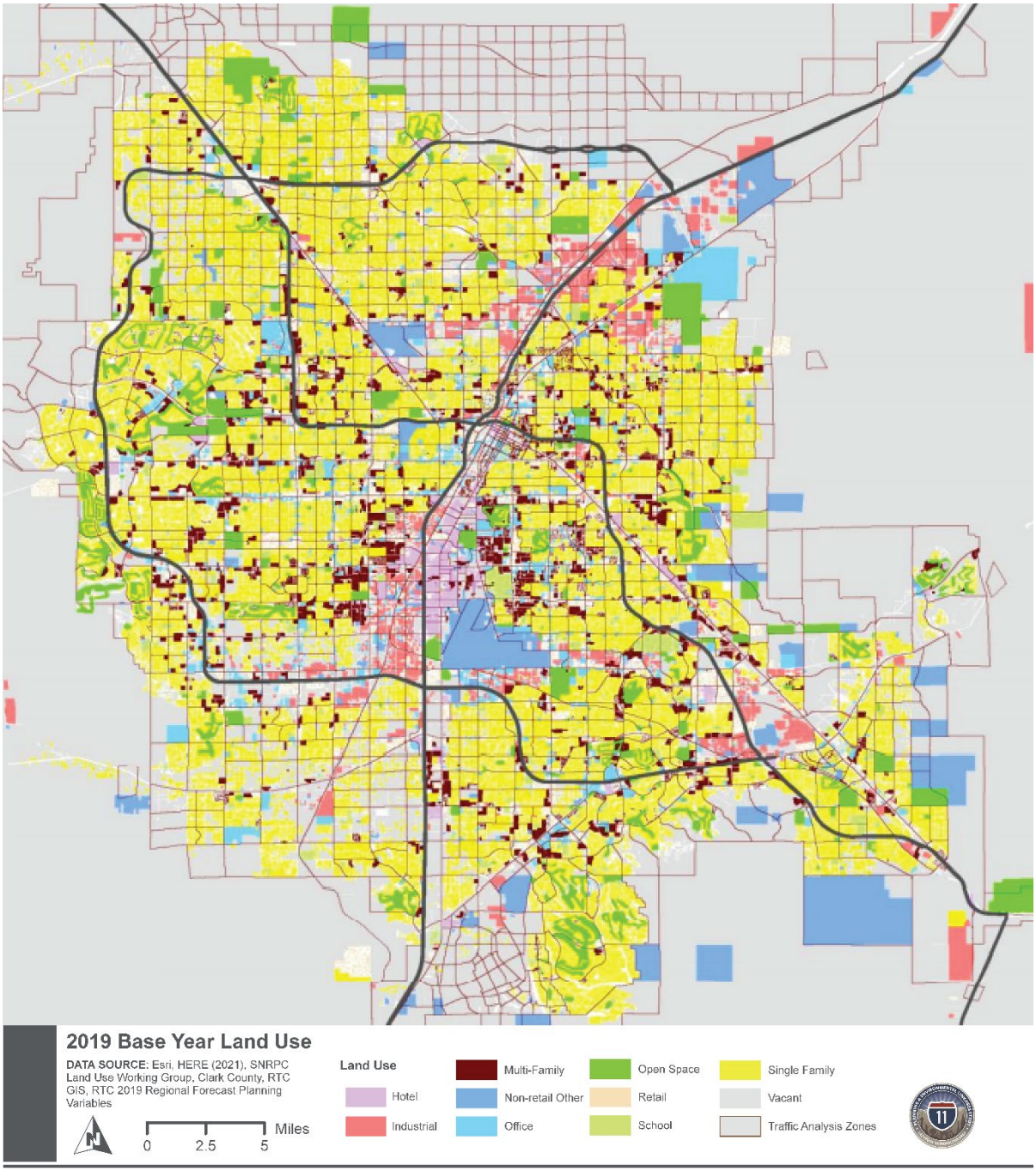
- GIS datasets from Clark County GISMO and RTC
- Clark County Comprehensive Master Plan
- Southern Nevada Regional Planning Coalition (SNRPC) Land Use Working Group (LUWG)
- RTC Access 2020

4.1.3 What Are the Existing and Planned Land Uses in the Study Area?

Existing Land Use

Figure 4-1 illustrates the existing land use of the Las Vegas Valley in 2019. The land uses surrounding both the Western and Central Corridor Alternatives are primarily single-family residential use, with smaller pockets of multi-family residential, open space, retail, and other uses mixed in.

Figure 4-1. Regional Transportation Commission Las Vegas Valley Land Use 2019



Industrial land uses are prominent near the Henderson Spaghetti Bowl and in the central part of the study area near McCarran International Airport. Hotel land uses are prevalent along the Central Corridor Alternative where it passes through downtown Las Vegas.

The Western Corridor Alternative includes sections of Bureau of Land Management jurisdiction near Lone Mountain, west of the location of the planned Sheep Mountain Parkway which is one of the north options for the Western Corridor. At the far northwest end of the study area, both the Western and Central Corridor Alternatives would pass a portion of Bureau of Indian Affairs jurisdiction.

Planned Land Use

Planned land uses along the Western and Central Corridor Alternatives are shown in Figure 4-2 and Figure 4-3. As the figures show, single-family residential land uses will continue to be prominent in the future; however, increased and intensive commercial land uses are planned along the Southern Beltway and near the Centennial Bowl interchange.

In response to anticipated population increases, both the City of Henderson and City of Las Vegas are planning higher density areas with transit-oriented development to sustainably accommodate the growth.

The Regional Transportation Commission Land Use Working Group projected the locations of growth by land use type between 2019 and 2050 based on the member entities' estimate of parcels available for development. The type of growth considered by RTC includes dwelling unit growth, hotel employment, retail employment, industrial employment, non-retail employment, and office employment growth.

As seen in Figure 4-4, there is a projection of substantial dwelling unit growth along the Western Corridor Alternative. Included in the estimated dwelling unit growth are some known development projects such as Summerlin Village which is already under construction. Along the Central Corridor Alternative, there is anticipated significant growth in the City of Henderson and unincorporated Clark County east of I-515.

4.1.4 What Special Considerations Should Be Incorporated in the impact Assessment?

Should the Western Corridor Alternative Sheep Mountain option be advanced, avoidance of encroachment into BLM's Red Rock Canyon National Conservation Area is recommended.

Figure 4-2. Planned Land Use in the Study Area - Sheet 1

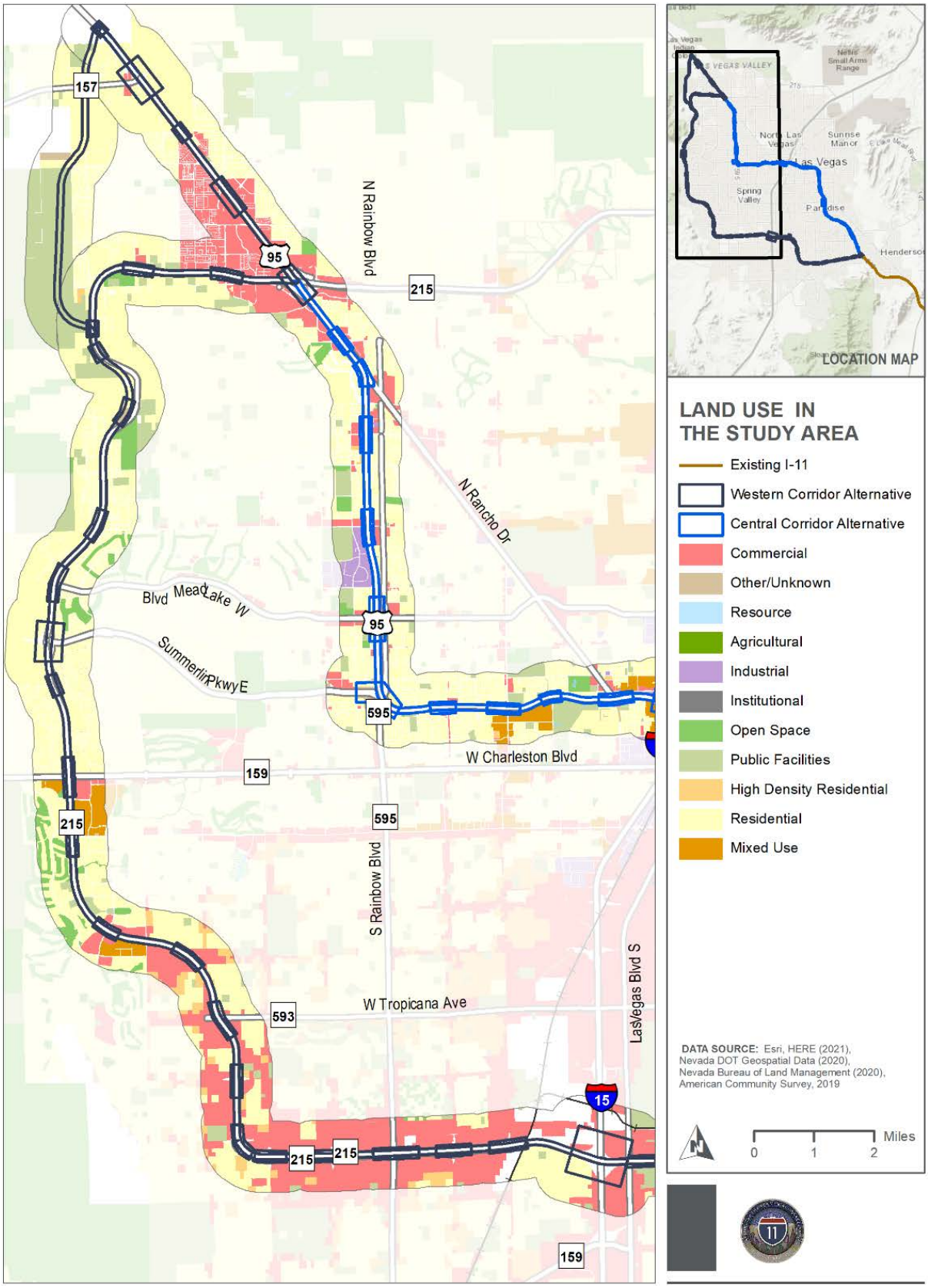


Figure 4-3. Planned Land Use in the Study Area - Sheet 2

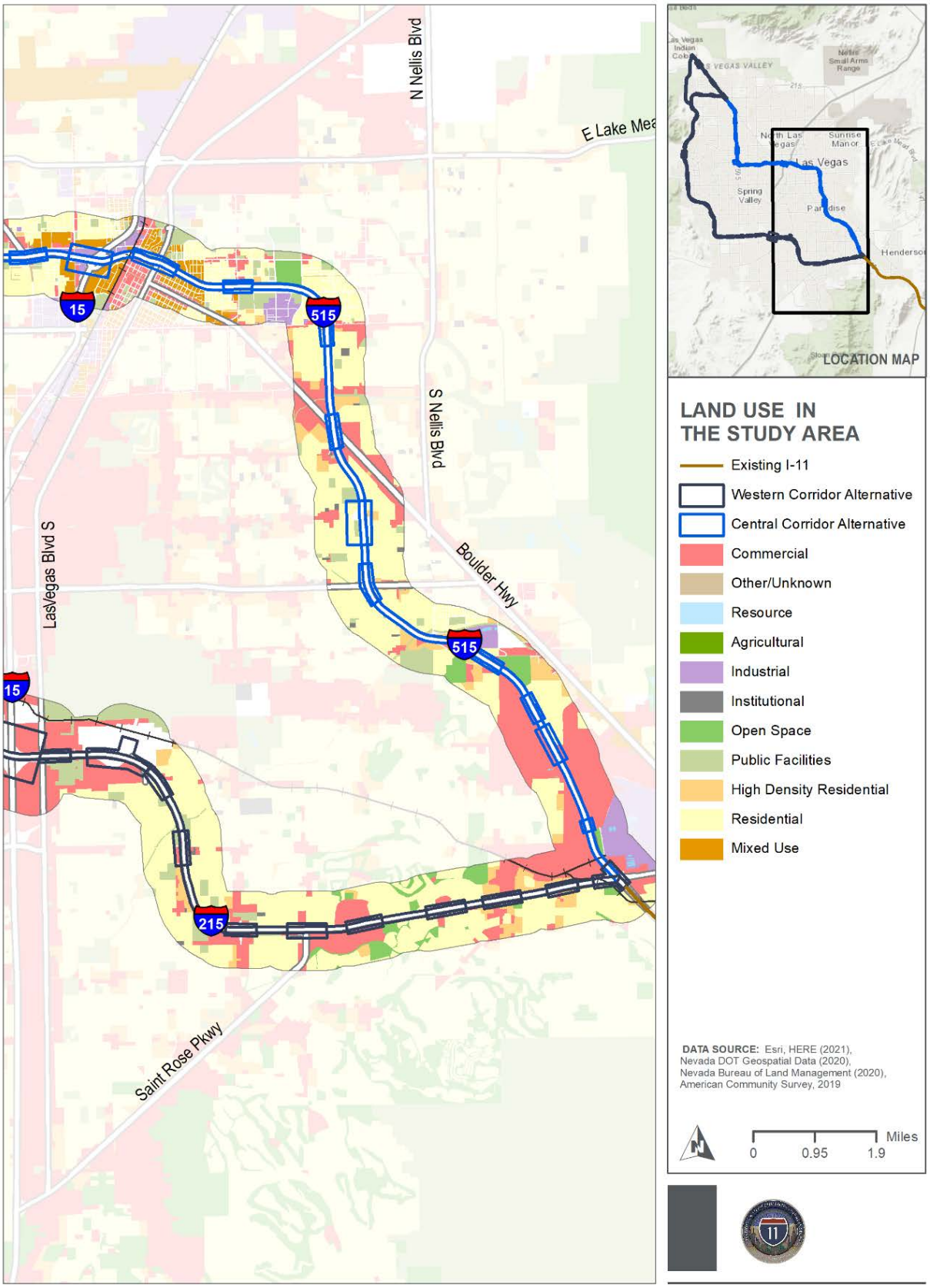
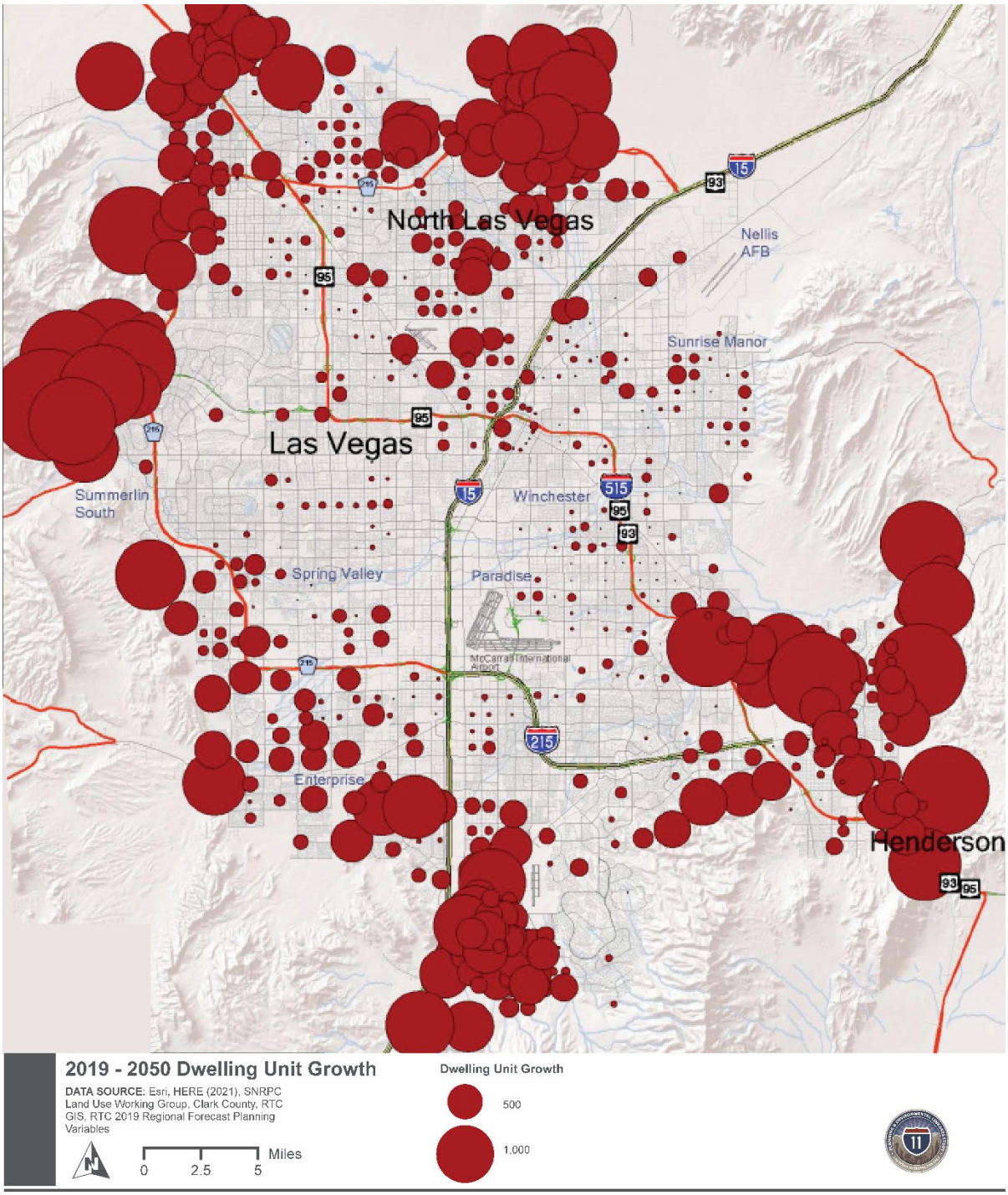


Figure 4-4. Dwelling Unit Growth



4.2 Parks, Recreation, and Community Resources

STAKEHOLDERS INVOLVED IN PARKS AND RECREATION CONSIDERATONS

- FHWA
- U.S. Department of the Interior
- U.S. Forest Service
- National Park Service
- Nevada State Parks
- Nevada Department of Environmental Protection
- Nevada Department of Wildlife
- Cities
- Clark County
- RTC
- Private landowners

4.2.1 What Are the Applicable Laws, Regulations, and Guidance Documents?

The applicable laws, regulations, and guidance documents for parks, recreation, and community resources include:

- ***Section 4(f) of the U.S. Department of Transportation (USDOT) Act of 1966 (23 CFR 774)***: Section 4(f) properties are publicly owned lands of a park, recreation area, or wildlife and waterfowl refuge; or a historical site, publicly or privately owned, that is listed or determined eligible for listing in the National Register of Historic Places (NRHP). USDOT may not approve a project that uses protected properties unless there are no prudent or feasible alternatives to such use and the project includes all possible planning to minimize harm to such properties.
- ***Section 6(f) of the Land and Water Conservation Fund (LWCF) Act of 1965***: Prohibits the conversion of any parks and recreation areas or improvements therein funded with grants obtained through the LWCF to a non-recreational use without the approval of the National Park Service. Requires the replacement of lands of comparable value and function, location, and usefulness as conditions to such conversions.
- ***Nevada Comprehensive Outdoor Recreation Plan***: Requirement for the State to receive LWCF funding for its outdoor recreation. Provides the current status of existing recreation in the state and proposed specific priorities to improve recreational opportunities for citizens.
- ***Clark County Parks, Trails, and Open Space Report***: Part of the Clark County Comprehensive Master Plan that provides a strategic plan for park and recreation facilities in the County to the year 2035

4.2.2 What Data Sources Are Used to Identify Parks, Recreation, and Community Resources?

Several data sources were utilized to identify parks, recreation, and community resources within the Western and Central Corridor Alternatives:

- GIS datasets which include community facilities (i.e., community centers, hospitals, schools) and recreation features (i.e., trails, parks)
- Aerial imagery provided by Google Maps and Google Earth
- Clark County Parks, Trails, and Open Space Report
- Nevada Comprehensive Outdoor Recreation Plan

4.2.3 What Are the Existing and Planned Parks, Recreation, and Community Resources in the Study Area?

The parks, recreation, and community resources along the Western and Central Corridor Alternatives are shown in Figure 4-5 and Figure 4-6.

Figure 4-5. Parks, Schools, and Community Resources - Sheet 1

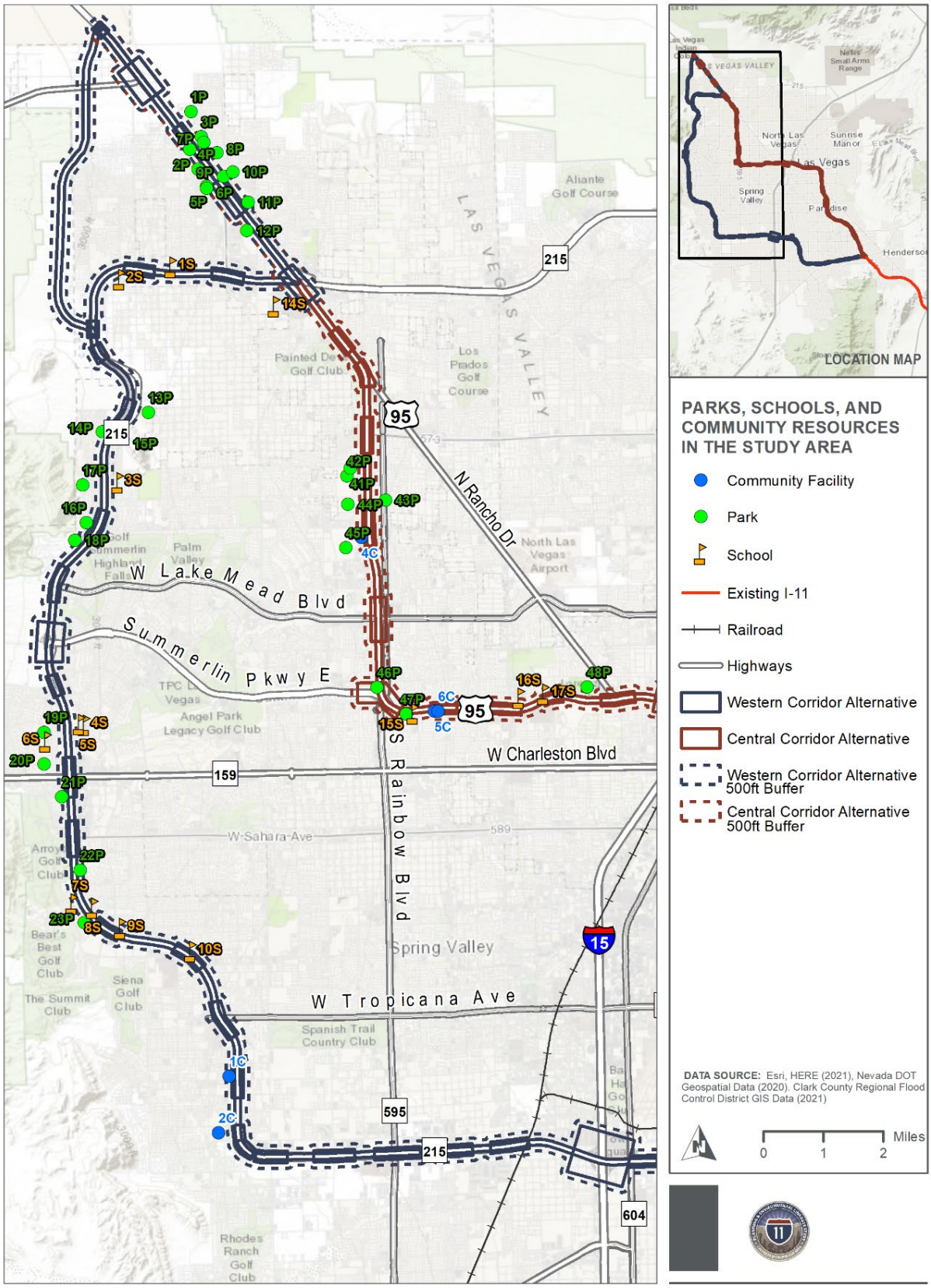
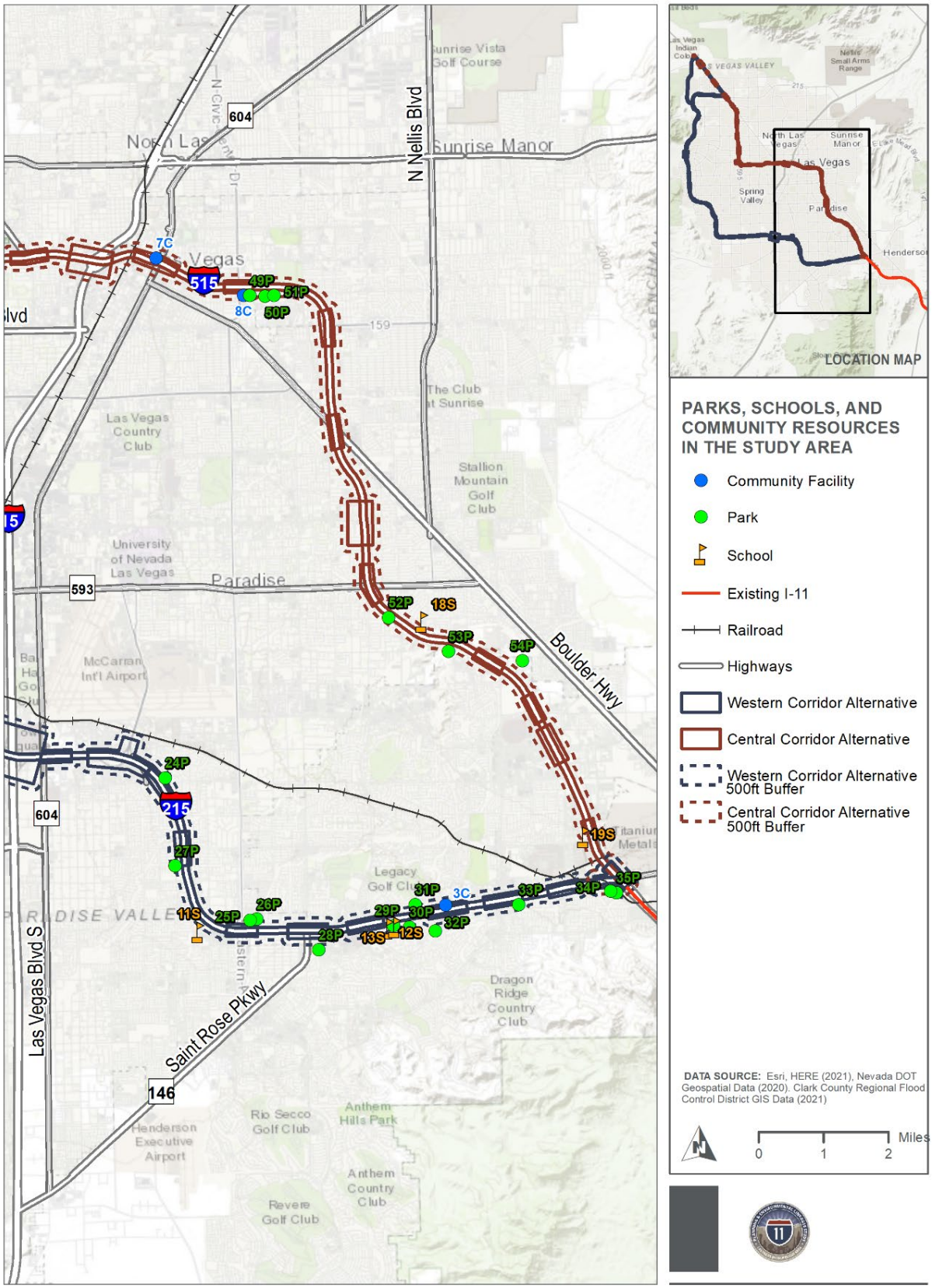


Figure 4-6. Parks, Schools, and Community Resources - Sheet 2



The types of parks, recreational, and community resources in the study area include:

- ***Neighborhood Parks:*** parks typically serving local community residents
- ***Community Parks:*** parks typically larger than neighborhood parks, serving multiple neighborhoods
- ***Regional Parks:*** Regionally significant serving communities across the Las Vegas Valley
- ***Trails:*** Multi-use recreational trails that allow walking, running, and biking
- ***Community Resources:*** Include community centers, hospitals, schools, and cultural centers

Table 4-1 summarizes the parks and recreational facilities within the corridor 500-foot resource buffers. The ID number references the resource's location in Figure 4-5 and Figure 4-6.

Table 4-1. Parks and Recreational Facilities along the Central and Western Corridors

ID	Name	Corridor	ID	Name	Corridor
1P	Alyn Beck Memorial Park	Western, Central	**28P**	Paseo Vista Park	Western
2P	Grass Park	Western, Central	**29P**	Dos Escuelas Park	Western
3P	Spring Mountain Ranch Community Park	Western, Central	**30P**	Strawberry Hill Park	Western
4P	Unnamed Residential Park #1	Western, Central	**31P**	Mountain View Park	Western
5P	The North Commons Park	Western, Central	**32P**	Paseo Verde Park	Western
6P	The South Commons Park	Western, Central	**33P**	Reunion Trails Park & Amargosa Trailhead	Western
7P	Community Playground	Western, Central	**34P**	Acacia Park	Western
8P	Forest Fire Park	Western, Central	**35P**	Acacia Demonstration Gardens	Western
9P	Sleeping Pines Park	Western, Central	**36P**	McCullough Vista Park	Western
10P	Hidden Pines Park	Western, Central	**37P**	Mission Hills Park	Western
11P	Pop Squires Park	Western, Central	**38P**	Black Mountain Ranch Park	Western
12P	Mountain Ridge Skatepark	Western, Central	**39P**	Unnamed Park #1	Western
13P	Lone Mountain Regional Park	Western	**40P**	Union Pacific Trailhead	Western
14P	Skyridge Park	Western	**41P**	W. Wayne Bunker Family Park	Central
15P	Lone Mountain Trailhead	Western	**42P**	Barkin Basin Park	Central
16P	Buckskin Cliff Shadows	Western	**43P**	Children's Memorial Park	Central
17P	Trigono Hills Park	Western	**44P**	Buckskin Park	Central
18P	Reverence Park	Western	**45P**	Doc Romeo Park	Central
19P	The Vistas Park	Western	**46P**	Bill Briare Park	Central
20P	South Tower Park	Western	**47P**	Charleston Neighborhood Preservation Park	Central
21P	Sagemont Park	Western	**48P**	Lorenzi Park	Central
22P	Spotted Leaf Park	Western	**49P**	Hadland Park	Central
23P	Ridgebrook Park	Western	**50P**	Rafael Rivera Park	Central
24P	Engelstad Park	Western	**51P**	Chuck Minker Sports Complex	Central
25P	Jesse Ellyson Picnic Area	Western	**52P**	Grapevine Springs Park	Central
26P	Pebble Park	Western	**53P**	Stephanie Lynn Craig Park	Central
27P	Desert Bloom Park	Western	**54P**	Russell Road Recreation Complex	Central

Three Park properties along the corridor alternatives are protected by Section 6(f) of the LWCF Act and are thereby subject to a separate review process with NPS, including identification of replacement park property. These include: City of Las Vegas' Lorenzi Park and Desert Pines Golf Club Nature Park; and City of Henderson's Acacia Demonstration Gardens.

Table 4-2 summarizes schools that are within the 500-foot resource buffer for both corridor alternatives. The ID number references the resource's location in Figures 4-5 and 4-6.

Table 4-2. Schools along the Central and Western Corridors

ID	Name	Corridor		ID	Name	Corridor
1S	Edmundo Escobedo Sr. Middle School	Western		11S	Silverado High School	Western
2S	Centennial High School	Western		12S	Neil C Teitchell Elementary	Western
3S	Eileen Conners Elementary School	Western		13S	John C Vanderburg Elementary	Western
4S	Palo Verde High School	Western		14S	Northwest Career and Technical Academy	Central
5S	College of Southern Nevada – Summerlin Center	Western		15S	O. K. Adcock Elementary School	Central
6S	Linda Rankins Givens Elementary School	Western		16S	College of Southern Nevada: Western Center	Central
7S	John and Judy Goolsby Elementary School	Western		17S	Fyfe Elementary School	Central
8S	Alexander Dawson School at Rainbow Mountain	Western		18S	Harley A Harmon Elementary School	Central
9S	Roseman University of Health Sciences	Western		19S	Touro University Nevada	Central
10S	Doral Academy - Saddle	Western				

Table 4-3 summarizes community resources that are within the 500-foot resource buffer for both corridors. The ID number references the resource's location in Figures 4-5 and 4-6.

Table 4-3. Community Resources within the Central and Western Corridors

ID	Name	Corridor		ID	Name	Corridor
1C	West Russell Animal Hospital	Western		5C	Howard Lieburn Senior Center	Central
2C	Southern Hills Hospital and Medical Center	Western		6C	Mirabelli Community Center	Central
3C	Valley Ranch Animal Hospital	Western		7C	Dula Community Center	Central
4C	Mountain View Hospital	Central		8C	East Las Vegas Community Center	Central

Another sensitive recreational resource is the Red Rock Canyon National Conservation Area which includes a trail access point in close proximity to the Western Corridor Alternative Sheep Mountain option. Red Rock Canyon was designated as Nevada's first National Conservation Area and it provides several recreational opportunities such as hiking trails, mountain biking trails, and horseback riding trails. Managed by the Bureau of Land Management, this National Conservation Area receives funding to protect and improve the area.

4.2.4 What Special Considerations Should Be Incorporated in the Impact Assessment?

Special consideration should be taken by the project proponent if the future I-11 improvement use any portion of a Section 4(f) property or would result in a conversion of any Section 6(f) property. Coordination with FHWA, NDOT, and the officials with jurisdictional during planning and design of the transportation improvements is crucial to compliance with these laws. Any potential impacts to the Red Rock Canyon National Conservation Area would require additional coordination with the BLM.

4.3 Economic Conditions

4.3.1 What Are the Applicable Laws, Regulations, and Guidance Documents?

Inclusion of an overview of economic conditions complies with Title I, Section 101(a), of NEPA to "fulfill the social, economic and other requirements of present and future generations of Americans."

4.3.2 What Data Sources Are Used to Identify Economic Conditions?

The following data sources were utilized to collect and summarize economic conditions data:

- U.S. Census Bureau data on payroll, business and owner characteristics, industries, occupations, unemployment, labor force participation and other information
- RTC ACCESS 2050 RTP's Planning Variable Development and Methodology Appendix

STAKEHOLDERS INVOLVED IN ECONOMIC CONDITIONS

- Nevada Governor's Office of Economic Development
- City of Las Vegas Economic and Urban Development Department
- Clark County Community and Economic Development
- Las Vegas Global Economic Alliance
- RTC

4.3.3 What Are the Existing Economic Conditions in the Study Area?

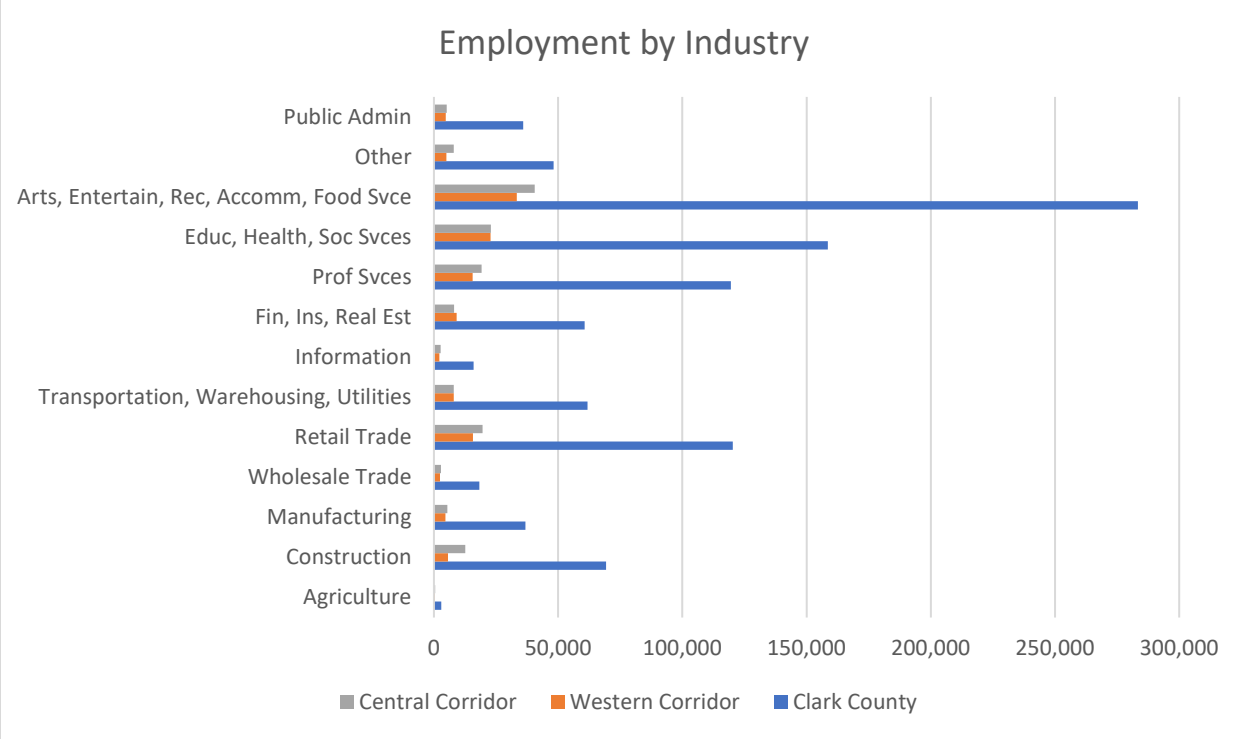
Income and Employment

In the State of Nevada, which is home to more than three million people, the median household income is $63,276 and 60 percent of the people in the state are presently employed. There are 227,156 firms in Nevada, many of which are located in the greater Las Vegas area.[4]

In Clark County, there are more than one million people over the age of 16 who are employed. Most of these employees (over 27 percent) work in the Arts, Entertainment, Recreation, Accommodation, and Food Services industry. Other industries that employ a significant share of Clark County residents include Education, Healthcare, and Social Services, as well as the Retail Trade sector. The Western and Central Corridor Alternatives are similar to the county as a whole, with relative concentrations in the Arts, Entertainment, Recreation, Accommodation and Food Services industry (Figure 4-7).

[4] https://data.census.gov/cedsci/all?q=Nevada%20Business%20and%20Economy

Figure 4-7. Employed Population over Age 16 by Industry for Clark County, Western Corridor, Central Corridor

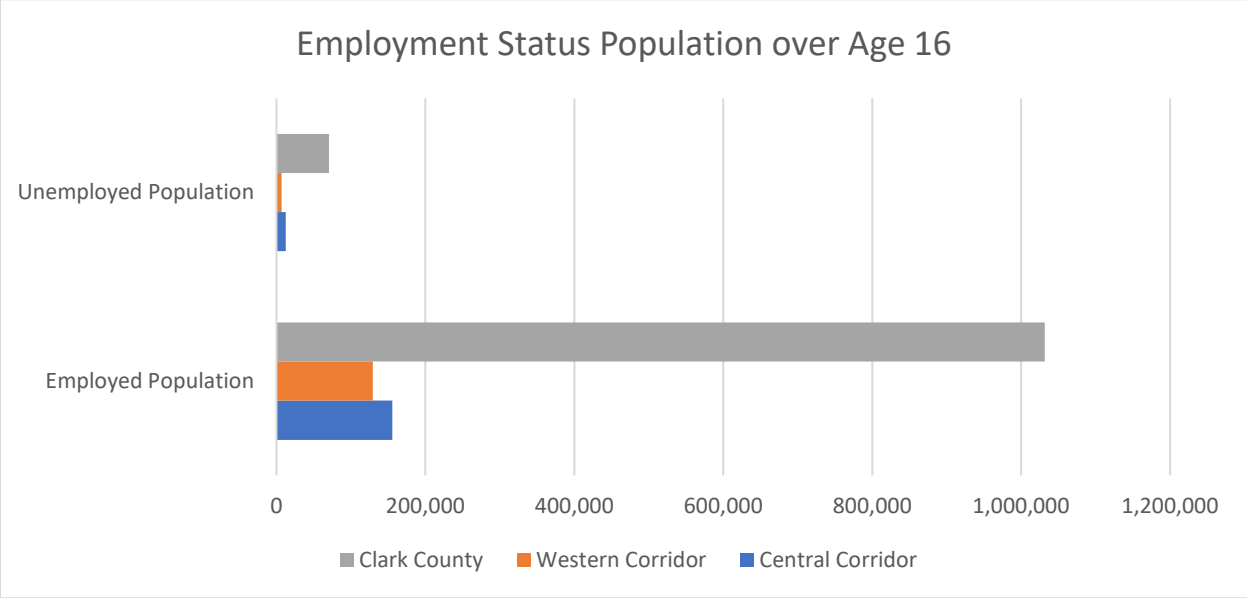


Source: US Bureau of the Census, Center for Economic Studies, LEHD 2019

Along the Central Corridor, there are 155,503 people over the age of 16 who are employed. Approximately 12,000 people are reported as unemployed in this area. There are 148,961 workers identified in this area, with none reporting that they work from home. Along the Western Corridor, fewer people are employed and reported as unemployed. Specifically, 129,576 people over the age of 16 are employed, with approximately 6,800 people unemployed. In terms of workers, there are 120,084 located in the Western Corridor area. Figure 4-8 compares the employment status of residents over the age of 16 located in the corridor alternative areas to the overall county. Employment in the Central Corridor accounts for roughly 15 percent of total Clark County employment. The Western Corridor share of total county employment is approximately 13 percent.

Along the Central Corridor, 20,871 households fall below the poverty line. Significantly fewer fall below the poverty line in the Western Corridor area, 7,333 households. Specifically, Central Corridor households falling below the poverty line account for 20 percent of all impoverished households in the county. For the Western Corridor, the share is seven percent.

Figure 4-8. Employment Status for Western Corridor, Central Corridor, and Clark County



Source: US Bureau of the Census, Center for Economic Studies, LEHD 2019

Location Quotients

Although there are similarities between Clark County and the corridor areas, based on industry concentration of employment, they do differ slightly when location quotients are calculated for each of the corridor geographies. Location quotients (LQs) are ratios that allow an area's distribution of employment by industry, ownership, and size class to be compared to a reference area's distribution. If an LQ is equal to 1, then the industry has the same share of its area employment as it does in the broader area (i.e., Clark County). An LQ greater than 1 indicates an industry with a greater share of the local area employment than is the case county-wide.

LQs are calculated by first, dividing local industry employment by the all-industry total of local employment. Second, broader (i.e., Clark County) industry employment is divided by the industry total for the nation. Finally, the local ratio is divided by the broader ratio; for example, Western Corridor ratio divided by Clark County ratio.

Based on the LQ calculations, the Western Corridor has a larger share of employment in all except the Construction industry. The Central Corridor more closely mirrors the county industry concentrations, with relatively higher concentrations of employment in Agriculture, Construction, Retail Trade, Information, and other industries.

Table 4-4 presents the location quotients for each corridor alternative compared to Clark County.

Table 4-4. Location Quotients for Corridors Compared to Clark County

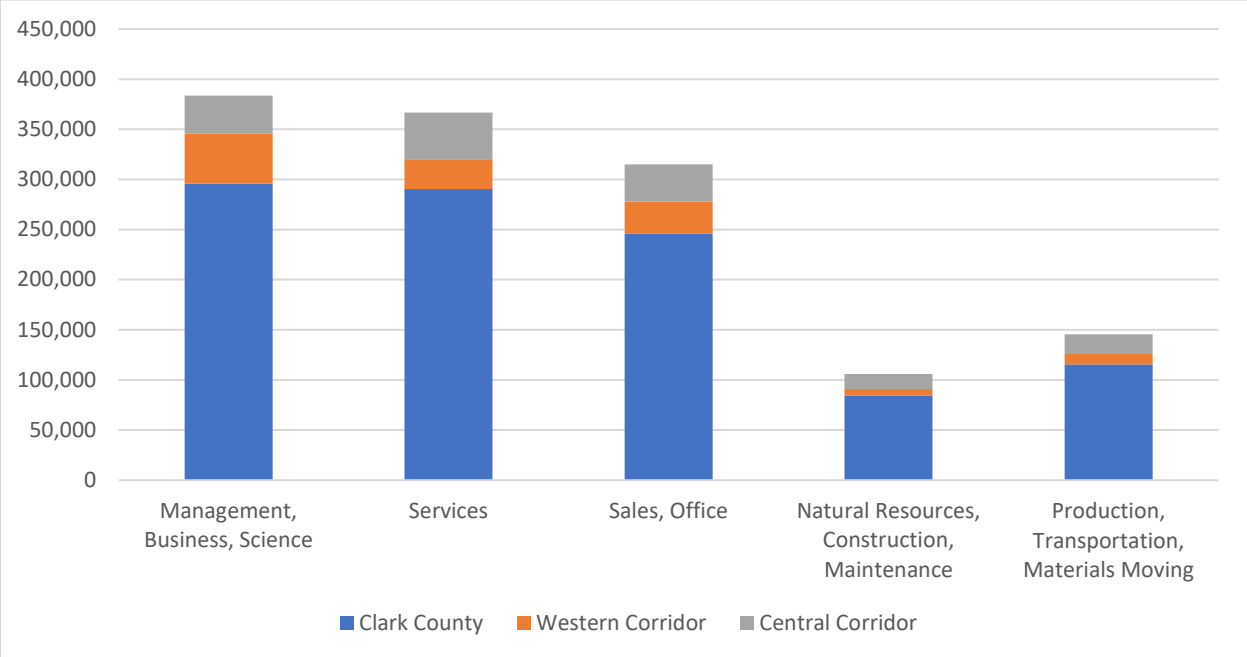
	Western Corridor	Central Corridor
Agriculture	1.41	1.11
Construction	0.83	1.12
Manufacturing	1.28	0.90
Wholesale Trade	1.39	0.96
Retail Trade	1.34	1.01
Transportation, Warehousing, Utilities	1.32	0.81
Information	1.38	1.03
Finance, Insurance, Real Estate	1.54	0.83
Professional Services	1.33	0.99
Education, Health, Social Services	1.47	0.90
Arts, Entertainment, Recreation, Accommodations, Food Service	1.21	0.89
Other	1.07	1.03
Public Administration	1.38	0.90

Source: US Bureau of the Census, Center for Economic Studies, LEHD 2019 and HDR calculations

Occupations

As shown on Figure 4-9, For both Clark County and the Western Corridor, Management, Business, and Science occupations reflect the largest share of occupations, as compared to the other occupational categories. Central Corridor Services represent a relatively larger share of all occupations in the corridor area.

Figure 4-9. Occupations for Clark County, Western Corridor, Central Corridor



Source: US Bureau of the Census, Center for Economic Studies, LEHD 2019

5 ENVIRONMENTAL CONDITIONS

This chapter presents the natural and physical environmental conditions along the Western and Central Corridor Alternatives.

5.1 AIR QUALITY

5.1.1 What are the Applicable Laws, Regulations, and Guidance Documents?

The applicable laws, regulations, and guidance documents for air quality include:

- Title I, Air Pollution Prevention and Control, of the CAA of 1990, as amended.
- EPA (40 Code of Federal Regulations [CFR] Parts 51 and 93)

Clean Air Act and National Ambient Air Quality Standards

The EPA regulates federal air quality policies through the Clean Air Act (CAA) of 1970 and its amendments in 1977 and 1990. The CAA identifies two types of National Ambient Air Quality Standards (NAAQS): primary standards and secondary standards. Primary standards provide public health protection, including protecting the health of "sensitive" populations such as asthmatics, children, and the elderly. Secondary standards provide public welfare protection, including protection against decreased visibility and damage to animals, crops, vegetation, and buildings. In accordance with the CAA, EPA established primary NAAQS for six criteria pollutants, which can be harmful to public health and the environment: ozone (O_3), nitrogen dioxide (NO_2), carbon monoxide (CO), particulate matter less than 10 micrometers in diameter (PM_{10}), particulate matter less than 2.5 micrometers in diameter ($PM_{2.5}$), and lead (Pb). The NAAQS are summarized in Table 5-1.

STAKEHOLDERS INVOLVED IN AIR QUALITY

- FHWA
- U.S. Environmental Protection Agency
- U.S. Forest Service
- Nevada Division of Environmental Protection
- Clark County Department of Air Quality
- Cities
- RTC
- Private landowners

In addition to the criteria pollutants, EPA regulates air toxic emissions. EPA has identified the high-priority mobile source air toxics (MSAT), pollutants with significant emission contributions from mobile sources that are among the national and regional-scale cancer risk drivers and/or non-cancer hazard contributors in the 1999 National Air Toxics Assessment. These high-priority MSATs are:

- Acrolein
- Benzene
- 1,3-butadiene
- Diesel particulate matter plus diesel exhaust organic gases (diesel particulate matter [DPM])
- Ethyl Benzene
- Formaldehyde
- Naphthalene

Table 5-1. NAAQS For Criteria Pollutants

Pollutant	Primary/Secondary	Averaging Time	Level [1]	Form
Ozone (O_3)	Primary and Secondary	8 hours	0.070 ppm [2]	Annual fourth-highest daily maximum 8-hour concentration, averaged over 3 years.
Nitrogen Dioxide (NO_2)	Primary	1 hour	10 ppb	98th percentile of 1-hour daily maximum concentrations, averaged over 3 years
	Primary and Secondary	1 year	53 ppb [3]	Annual Mean
Carbon Monoxide (CO)	Primary	8 hours	9 ppm	Not to be exceeded more than once per year
		1 hour	35 ppm	
Fine Particulate Matter ($PM_{2.5}$)	Primary	1 year	12 µg/m^3	annual mean, averaged over 3 years
	Secondary	1 year	15 µg/m^3	annual mean, averaged over 3 years
	Primary and Secondary	24 hours	35 µg/m^3	98th percentile, averaged over 3 years
Respirable Particulate Matter (PM_{10})	Primary and Secondary	24 hours	150 µg/m^3	Not to be exceeded more than once per year on average over 3 years
Sulfur Dioxide (SO_2)	Primary	1 hour	75 ppb [4]	99th percentile of 1-hour daily maximum concentrations, averaged over 3 years
	Secondary	3 hours	0.5 ppm	Not to be exceeded more than once per year
Lead (Pb)	Primary and Secondary	Rollin 3-month average	0.15 µg/m^3 [5]	Not to be exceeded

Source: EPA 2021

Notes:

1. Units of measure for the standards are parts per million (ppm) by volume, parts per billion (ppb) by volume, and micrograms per cubic meter of air (µg/m^3).

2. Final rule signed October 1, 2015, and effective December 28, 2015. The previous (2008) O_3 standards are not revoked and remain in effect for designated areas. Additionally, some areas may have certain continuing implementation obligations under the prior revoked 1-hour (1979) and 8-hour (1997) O_3 standards.

3. The level of the annual NO_2 standard is 0.053 ppm. It is shown here in terms of ppb for the purposes of clearer comparison to the 1-hour standard level.

4. The previous SO_2 standards (0.14 ppm 24-hour and 0.03 ppm annual) will additionally remain in effect in certain areas: (1) any area for which it is not yet 1 year since the effective date of designation under the current (2010) standards, and (2) any area for which an implementation plan providing for attainment of the current (2010) standard has not been submitted and approved and which is designated nonattainment under the previous SO_2 standards or is not meeting the requirements of a State Implementation Plan (SIP) call under the previous SO_2 standards (40 CFR 50.4(3)). A SIP call is an EPA action requiring a state to resubmit all or part of its SIP to demonstrate attainment of the required NAAQS.

5. In areas designated nonattainment for the Pb standards prior to the promulgation of the current (2008) standards, and for which implementation plans to attain or maintain the current (2008) standards have not been submitted and approved, the previous standards (1.5 µg/m^3 as a calendar quarter average) also remain in effect.

5.1.2 What Data Sources Are Used to Identify Resources?

The data sources used to identify resources are listed below.

- Clark County Division of Air Quality
- RTC Access 2050: Regional Transportation Plan for Southern Nevada 2021-2050
- RTC 2021-2024 Transportation Improvement Program
- United States Environmental Protection Agency NAAQS table

5.1.3 What Are the Resources under Consideration?

Polycyclic Organic Matter

Transportation projects may affect the regional or local air toxics concentrations due to the MSAT emissions from vehicles. Nationwide MSAT emissions are expected to be lower than present level in future years as a result of EPA's national emissions control programs and

improving fuel economy standards. Using EPA's MOVES2014a model, FHWA estimates even if vehicle miles traveled (VMT) increases by 45 percent from 2010 to 2050 as is forecasted, a combined reduction of 91 percent in the total annual emissions for the priority MSATs is projected for the same period.

Attainment Status and Monitored Air Quality

The CAA requires EPA to designate areas as attainment, nonattainment, or unclassified for each criteria pollutant based on whether the NAAQS have been achieved. The Las Vegas Valley (Hydrographic Area 212) is designated by EPA as a marginal nonattainment area for the 2015 8-hour O_3 NAAQS and an attainment area subject to a maintenance plan for the CO and PM_{10} NAAQS (Clark County 2021a). The area is either in attainment or unclassifiable status for all other criteria pollutants.

The CCDAQ is the air pollution control agency for all of Clark County. The CCDAQ administers the air quality monitoring and the air pollution control program for the county. As part of its air quality monitoring effort, the CCDAQ operates 12 air quality monitoring stations within the Las Vegas Metropolitan area. The monitoring data show that the maximum ozone concentrations in the greater Las Vegas area exceeded the 8-hour NAAQS in the past 5 years (Clark County 2021b). NAAQS were not exceeded for other pollutants.

Conformity Rules

The CAA Amendments of 1990 and the Final Transportation Conformity Rule (40 Code of Federal Regulations [CFR] Parts 51 and 93) direct the EPA to implement environmental policies and regulations that will ensure acceptable levels of air quality. The Transportation Conformity rules (40 CFR 93, Subpart A) affect the funding and approval of proposed transportation projects. According to Title I, Section 176 (c) 2:

> *No federal agency may approve, accept, or fund any transportation plan, program, or project unless such plan, program or project has been found to conform to any applicable State Implementation Plan (SIP) in effect under this act.*

Transportation conformity is required in areas designated nonattainment and maintenance by the EPA for the transportation-related criteria pollutants: O_3, PM, NO_2, and CO. It applies to metropolitan transportation plan and transportation improvement program updates and amendments unless an amendment merely adds or deletes projects exempt from conformity (40 CFR 93.104(b) and (c)). Transportation conformity also applies to "FHWA/FTA projects", which are defined in the transportation conformity rule as "any highway or transit project which is proposed to receive funding assistance and approval through the Federal Aid Highway program or the Federal mass transit program, or requires FHWA or Federal Transit Administration (FTA) approval for some aspect of the project, such as connection to an interstate highway or deviation from applicable design standards on the interstate system." (40 CFR 93.101)

State Implementation Plan

The CAA requires that a SIP be prepared for each nonattainment area, and a maintenance plan be prepared for each former non-attainment area. The SIP outlines how the State will meet the

NAAQS under the deadlines established by the CAA. In addition, EPA's Transportation Conformity Rule requires Metropolitan Planning Organizations (the RTC for the Study Area) and the FHWA to make conformity determinations on projects before they are approved. Conformity for purposes of a SIP means that transportation activities would not cause new air quality violations, worsen existing violations, or delay timely attainment of the NAAQS.

EPA proposes to work closely with the states and jurisdictions that have potential ozone nonattainment areas to implement the revised stronger ozone standard that became effective on December 28, 2015. Nonattainment areas will have until 2020 to late 2037 to meet the standard and reduce ozone-forming pollution. According to EPA's analysis, the existing and proposed federal rules, such as Tier 3 Vehicle Emissions and Fuels Standards, Light-Duty Vehicle Tier 2 Rule, CAFÉ standards, Light and Heavy-Duty Vehicle Greenhouse Gas Rule, and others, will help the vast majority of counties nationwide to meet the updated standards by 2025 without additional action.

Sensitive Air Quality Receptors

Although air pollution can affect all segments of the population, certain groups are more susceptible to its adverse effects than others. Children, the elderly, and the chronically or acutely ill are the most sensitive population groups. Sensitive air quality receptors (land uses) include receptors such as residences, schools, daycare centers, nursing homes, and hospitals. Figure 5-1 and Figure 5-2 show the locations of sensitive receptors in the study area.

5.1.4 What Special Considerations Should Be Incorporated in the Impact Assessment?

The study area is currently in nonattainment for O_3 and in maintenance for CO and PM_{10}; therefore, the NEPA process should demonstrate that the Project meets the transportation conformity requirements at regional and project level for these pollutants. Regional conformity for a transportation project is satisfied by the project's inclusion in a federally approved RTP and Regional Transportation Improvement Program (RTIP). A project-level conformity determination evaluates if the project would cause any new violations of the NAAQS for CO or PM_{10} or increase the frequency or severity of any existing violation. Currently, no I-11 improvements are included in the RTP and for NDOT to demonstrate regional air quality conformity, the RTP and/or RTIP would need to be amended to include the I-11 project. Any future I-11 improvements may also need to be analyzed at the local level for potential "hot spot" pollutants (CO and PM_{10}) if conditions warrant.

Figure 5-1. Sensitive Air Quality Receptors in the Study Area – Sheet 1

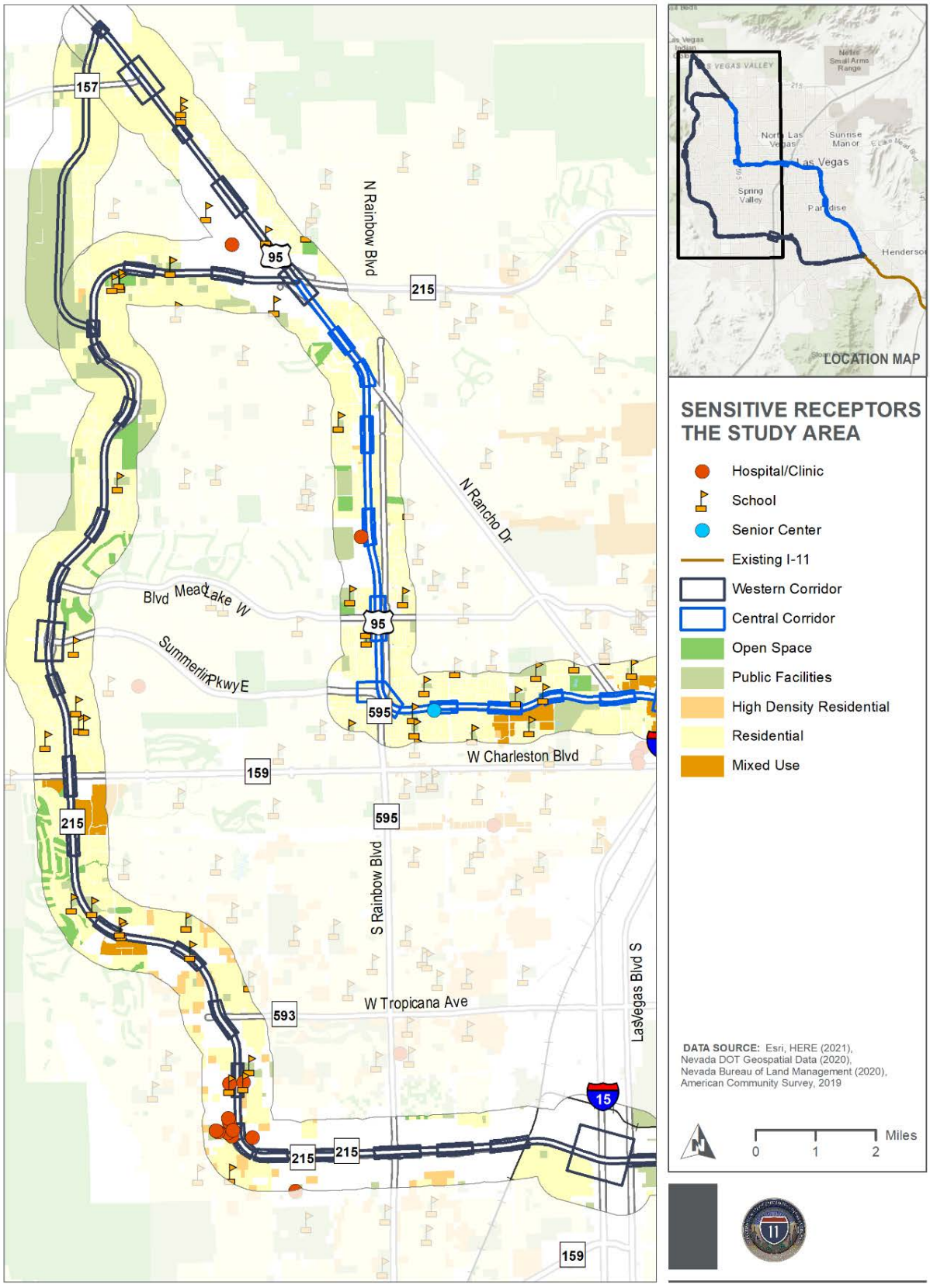


Figure 5-2. Sensitive Air Quality Receptors in the Study Area - Sheet 2

5.2 NOISE

STAKEHOLDERS INVOLVED IN NOISE

- Cities
- Clark County
- Private residences

5.2.1 What Are the Applicable Laws, Regulations, and Guidance Documents?

The applicable laws, regulations, and guidance documents for noise include:

- NDOT Traffic and Construction Noise Analysis and Abatement Policy
- FHWA Noise Standard in 23 Code of Federal Regulations (CFR) Part 772
- FHWA Highway Traffic Noise: Analysis and Abatement Guidance manual

NDOT considers potential traffic noise impact areas when levels approach within 1 dBA of FHWA Activity Criteria.

5.2.2 What Data Sources Are Used to Identify Resources?

Estimates of existing noise levels are based on the following information:

- Lane configurations (highway sections);
- Level of Service (LOS) C traffic volumes (upper range);
- Speed limit (free-flowing traffic); and
- Vehicle compositions (passenger car, medium trucks, buses, and heavy trucks).

This information was utilized to estimate locations for the 66 dBA and 71 dBA noise-sensitive land use traffic noise contour locations. Calculations were performed using the FHWA *Traffic Noise Model (TNM) v2.5.*

5.2.3 What Are the Resources under Consideration?

The FHWA Noise Abatement Criteria for various types of land uses is shown in Table 5-2. The typical land uses along the corridor alternatives are residential (category B), community resources and institutions (category C), and commercial (category E). As the table shows, the hourly noise levels requiring abatement are 67 dBA for residential and community/institution areas and 72 dBA for commercial areas.

The estimated distances from the edge of the existing outside shoulder of the freeways that comprise the Western and Central Corridors to the activity areas, as per Table 5-2, within the noise abatement criteria are shown in Table 5-3. The table shows that residential and community land uses are generally farther away from the freeways, with noise impacts starting as close as 275 feet away, while commercial land uses are nearer to the freeways, with noise impacts starting as close as 175 feet away.

Table 5-2. Noise Abatement Criteria – Hourly A-Weighted Sound Level (Decibels, dBA[1])

Activity category	Activity Leq(h)	Criteria [2] L10(h)	Evaluation Location	Activity Description
A	57	60	Exterior	Lands on which serenity and quiet are of extraordinary significance and serve an important public need and where the preservation of those qualities is essential if the area is to continue to serve its intended purpose.

B [3]	67	70	Exterior	Residential.
C [3]	67	70	Exterior	Active sport areas, amphitheaters, auditoriums, campgrounds, cemeteries, day care centers, hospitals, libraries, medical facilities, parks, picnic areas, places of worship, playgrounds, public meeting rooms, public or nonprofit institutional structures, radio studios, recording studios, recreation areas, Section 4(f) sites, schools, television studios, trails, and trail crossings.
D	52	55	Interior	Auditoriums, day care centers, hospitals, libraries, medical facilities, places of worship, public meeting rooms, public or nonprofit institutional structures, radio studios, recording studios, schools, and television studios.
E [3]	72	75	Exterior	Hotels, motels, offices, restaurants/bars, and other developed lands, properties or activities not included in A-D or F.
F				Agriculture, airports, bus yards, emergency services, industrial, logging, maintenance facilities, manufacturing, mining, rail yards, retail facilities, shipyards, utilities (water resources, water treatment, electrical), and warehousing.
G				Undeveloped lands that are not permitted.

Source: FHWA, 23 CFR Appendix Table 1 to Part 772 - Noise Abatement Criteria

Notes:

1. Either Leq(h) or L10(h) (but not both) may be used on a project.

2. The Leq(h) and L10(h) Activity Criteria values are for impact determination only and are not design standards for noise abatement measures.

3. Includes undeveloped lands permitted for this activity category.

Table 5-3. Estimated Noise Level Distances

Noise Threshold Corridor / Segment	Free way	Segment Limits		Corridor Alternative	Estimated Distance from Edge of Outside Shoulder to Activity Criteria (ft)	
		To	From		E (71 dBA)	B, C (66 dBA)
1 / A	I-515	I-515/Lake Mead Pkwy.	Eastern Ave	Central	275	450
1 / B	I-515	Eastern Ave	I-15/US-95	Central	325	525
2 / C	US-95	I-15/US-95	Valley View Blvd	Central	425	700
2 / D	US-95	Valley View Blvd	Summerlin Pkwy	Central	400	625
2 / E	US-95	Summerlin Pkwy	CC-215	Central	375	625
3 / F	US-95	CC-215	Elkhorn/ HOV ramps	Central/Western – Centennial Bowl	300	500
3 / G	US-95	Elkhorn HOV ramps	Skye Canyon Park Dr	Central/Western – Centennial Bowl	300	500
3 / H	US-95	Skye Canyon Park Dr	Future Kyle Canyon and US-95 interchange	Central/Western – Centennial Bowl	175	275
4 / I	I-215	I-11/I-515	Pecos Rd	Western - Centennial Bowl/Sheep Mtn	250	450

4 / J	I-215	Pecos Rd	Windmill Ln	Western - Centennial Bowl/Sheep Mtn	275	450
4 / K	I-215	Windmill Ln	I-15	Western - Centennial Bowl/Sheep Mtn	325	550
5 / L	CC-215	I-15	Tropicana Ave	Western - Centennial Bowl/Sheep Mtn	325	525
5 / M	CC-215	Tropicana Ave	Sahara Ave	Western - Centennial Bowl/Sheep Mtn	200	350
5 / N	CC-215	Sahara Ave	Summerlin Pkwy	Western - Centennial Bowl/Sheep Mtn	250	425
6 / O	CC-215	Summerlin Pkwy	Sheep Mtn. Pkwy	Western - Centennial Bowl/Sheep Mtn	225	400
6 / P	Sheep Mtn Pkwy	CC-215	US 95	Western – Sheep Mtn	175	300

5.2.4 What Special Considerations Should Be Incorporated in the Impact Assessment?

Any future improvements to an I-11 corridor would undergo traffic noise modeling specific to the proposed improvements and the surrounding land uses to determine impacted areas and identify traffic noise abatement measures.

5.3 AESTHETIC RESOURCES

5.3.1 What Are the Applicable Laws, Regulations, and Guidance Documents?

The applicable laws, regulations, and guidance documents for aesthetics include:

- FHWA Guidelines for the Visual Impact Assessment of Highway Projects (2015)
- NDOT Pattern and Palette of Place: A Landscape and Aesthetics Master Plan for the Nevada State Highway System (2002)
- Local Land Use Plans, Policies, and Ordinances related to the visual management, scenic resources, or the aesthetics of the natural landscape or the constructed environment

5.3.2 What Data Sources Are Used to Identify Resources?

The following sources were utilized to collect information on aesthetic resources:

- Google Earth
- Scenic Byways datasets

5.3.3 What Are the Resources under Consideration?

STAKEHOLDERS INVOLVED IN AESTHETICS

- Cities
- Clark County
- Private residences

In compliance with the State of Nevada policy that landscape and aesthetics are considered during the planning, design, construction, maintenance, and operation of state transportation corridors, NDOT has established a Landscape and Aesthetics Master Plan to provide landscape and aesthetic guidance for corridor planning and project design. To evaluate the potential beneficial and adverse effects that may be caused by a proposed highway improvement project, NDOT uses FHWA's Visual Impact Assessment (VIA) guidance to assess the visual impacts of its proposed projects. Documented as part of the project's environmental review, the FHWA VIA process concludes by identifying possible design strategies for either mitigating adverse visual impacts or for advancing beneficial visual impacts as landscape and aesthetic opportunities in accordance with NDOT's Landscape and Aesthetics Master Plan.

For this identification of aesthetic resources, scenic byways are noted as existing resources for consideration as project improvements are developed. There are four scenic byways in the study area are discussed below.

- ***Kyle Canyon Road (SR 157)***: Follows Kyle Canyon Road from US 95 through Kyle Canyon in the Spring Mountains towards Mount Charleston, crossing both corridor alternatives
- ***Las Vegas Boulevard***: Follows Las Vegas Boulevard from Sahara Avenue (SR 589) to Washington Avenue (SR 578), crossing the Central Corridor Alternative
- ***Las Vegas Strip***: Follows Las Vegas Boulevard from Russell Road (SR 594) to Sahara Avenue (SR 589); does not cross either corridor alternative
- ***Red Rock Canyon Back Country***: Follows Red Rock Canyon Road (SR 159) through the Red Rock Canyon National Conservation Area west of the Las Vegas metropolitan area; is located a

little over a quarter mile from the CC 215 / Charleston Boulevard interchange along the Western Corridor Alternative.

5.3.4 What Special Considerations Should Be Incorporated in the Impact Assessment?

None.

5.4 Cultural Resources

5.4.1 What Are the Applicable Laws, Regulations, and Guidance Documents?

The applicable laws, regulations, and guidance documents for cultural resources include:

- National Historic Preservation Act of 1966 (54 U.S.C. §§ 300101 et seq.) and its implementing regulations (36 CFR Part 800)
- Section 4(f) of the USDOT Act of 1966 (49 USC 303 and 23 USC 138)
- National Environmental Policy Act of 1970 (42 USC §§ 4321 et seq.)

STAKEHOLDERS INVOLVED IN CULTURAL RESOURCES

- FHWA
- Nevada State Historic Preservation Office
- Advisory Council on Historic Preservation
- Bureau of Indian Affairs
- Las Vegas Indian Center
- Las Vegas Paiute Tribe
- Moapa Band of Paiutes
- Cities
- Clark County

5.4.2 What Data Sources Are Used to Identify Resources?

The following sources were utilized to collect information on aesthetic resources:

- Nevada Cultural Resource Information System (NVCRIS): a collection of online GIS database services that contain recorded archaeological and architectural resources and inventories for the state.

5.4.3 What Are the Resources under Consideration?

Cultural resources include a variety of resource types, such as archaeological sites, historic architectural properties, and places of traditional cultural importance. Cultural resources are considered “historic properties” when they meet one or more of the criteria for listing in the National Register of Historic Places (National Register or NRHP) and retain sufficient integrity to convey their historical significance.

To create an understanding of the types of archaeological and architectural resources that may be included in the direct and indirect areas of potential effect (APE) for the future I-11 projects, inventories and maps of archaeological and architectural resources were compiled.

The records review identified 262 archaeological sites and 1,714 historic architectural properties within the study area. Summaries of archaeological sites and historic architectural properties by alternatives and options are presented in Table 5-4 and Table 5-5, respectively.

Table 5-4. Archaeological Sites by Corridor Alternative

National Register Status	Western Corridor Alternative Centennial Bowl Option	Western Corridor Alternative Sheep Mountain Option	Central Corridor Alternative
Within the RIC			
Listed	1	1	2
Eligible	9	8	8
Ineligible	11	12	8

Unevaluated	66	58	42
Total	87	79	60
Within 0.5 Mile of the RIC			
Listed	0	0	0
Eligible	7	7	8
Ineligible	26	26	20
Unevaluated	121	114	94
Total	154	147	122
Total Sites	241	226	182

Table 5-5. Historic Architectural Properties by Corridor Alternative

National Register Status	Western Corridor Alternative Centennial Bowl Option	Western Corridor Alternative Sheep Mountain Option	Central Corridor Alternative
Within the RIC			
Listed	2	2	4
Eligible	11	11	37
Ineligible	4	4	125
Unevaluated	0	0	4
Total	17	17	170
Within 0.5 Mile of the RIC			
Listed	2	2	15
Eligible	96	96	313
Ineligible	28	28	986
Unevaluated	20	20	224
Total	146	146	1,538
Total Sites	163	163	1,708

5.4.4 What Special Considerations Should Be Incorporated in the Impact Assessment?

Future NEPA evaluation of I-11 corridor improvements would require compliance with Section 106 of the NHPA and Section 4(f) of the USDOT Act. The I-11 corridor improvements should seek ways to avoid or minimize impacts to historic properties. As the lead federal agency, FHWA would initiate Section 106 consultations, identify the consulting parties, define the APE in consultation with those parties, identify historic properties within the APE, and evaluate potential impacts that may result for the undertaking. Furthermore, Native American Tribes will be consulted to identify places of traditional cultural importance in the APE that qualify as historic properties and that may not be detected by standard archaeological methods.

5.5 GEOLOGY AND SOILS

STAKEHOLDERS INVOLVED IN GEOLOGY AND SOILS

- Nevada Bureau of Mines and Geology (NBMG)
- U.S. Geological Survey (USGS)
- U.S. Department of Agriculture (USDA), Natural Resources Conservation Service (NRCS)

5.5.1 What Are the Applicable Laws, Regulations, and Guidance Documents?

There are no federal permitting or agency consultation requirements related to geology and soils for transportation projects on non-federal lands; however, geological and soil conditions are considered during design and construction.

5.5.2 What Data Sources Are Used to Identify Resources?

The following sources were reviewed to describe geologic conditions and identify potential geologic hazards:

- US Topo maps (USGS 2018)
- Geologic Map Database of Nevada (USGS 2007; Raines et al. 2003)
- Short-term induced seismicity models (Petersen et al. 2014)
- United States (Lower 48) Seismic Hazard Long-term Model (Petersen et al. 2020)
- USDA, NRCS soil survey data (USDA, NRCS 2021)
- Nevada geohazard datasets (NBMG 2021)
- Unpublished geotechnical data reports for the Las Vegas Valley

5.5.3 What Are the Resources under Consideration?

The resources considered include soils, land subsidence and earth fissuring, and regional seismicity and local faulting. For the geologic conditions, both corridor alternatives are largely founded in Quaternary alluvium deposited on alluvial fans that originate from the surrounding mountains. The soils within the Corridor Alternatives are largely aridisols and entisols and are rated as somewhat limited to very limited for road and street development. The Central Corridor Alternative also crosses areas with special geotechnical considerations. The Western Corridor Alternative is comprised of aridisols and entisols and is largely not limited for development. There are no special geotechnical considerations for the Sheep Mountain option, and soil map units indicate the soils have some to no limitations for development (Figure 5-4 and Figure 5-5).

The Central Corridor Alternative crosses four unnamed sections of the Las Vegas Valley fault system as well as the northeast striking Eglington fault on US 95 at the West Craig Road and North Rancho Boulevard interchanges. The Eglington fault is the only fault recognized as a source for serious earthquakes in the Las Vegas Valley. The tectonic Frenchman Mountain fault is located approximately 5 miles east of the Central Corridor Alternative. The Western Corridor Alternative crosses two unnamed sections of the Las Vegas Valley faults. There are no faults mapped within or near the Sheep Mountain Parkway Option.

5.5.4 What Special Considerations Should Be Incorporated in the Impact Assessment?

None.

Figure 5-3. Potential Geologic Hazards in the Study Area – Sheet 1

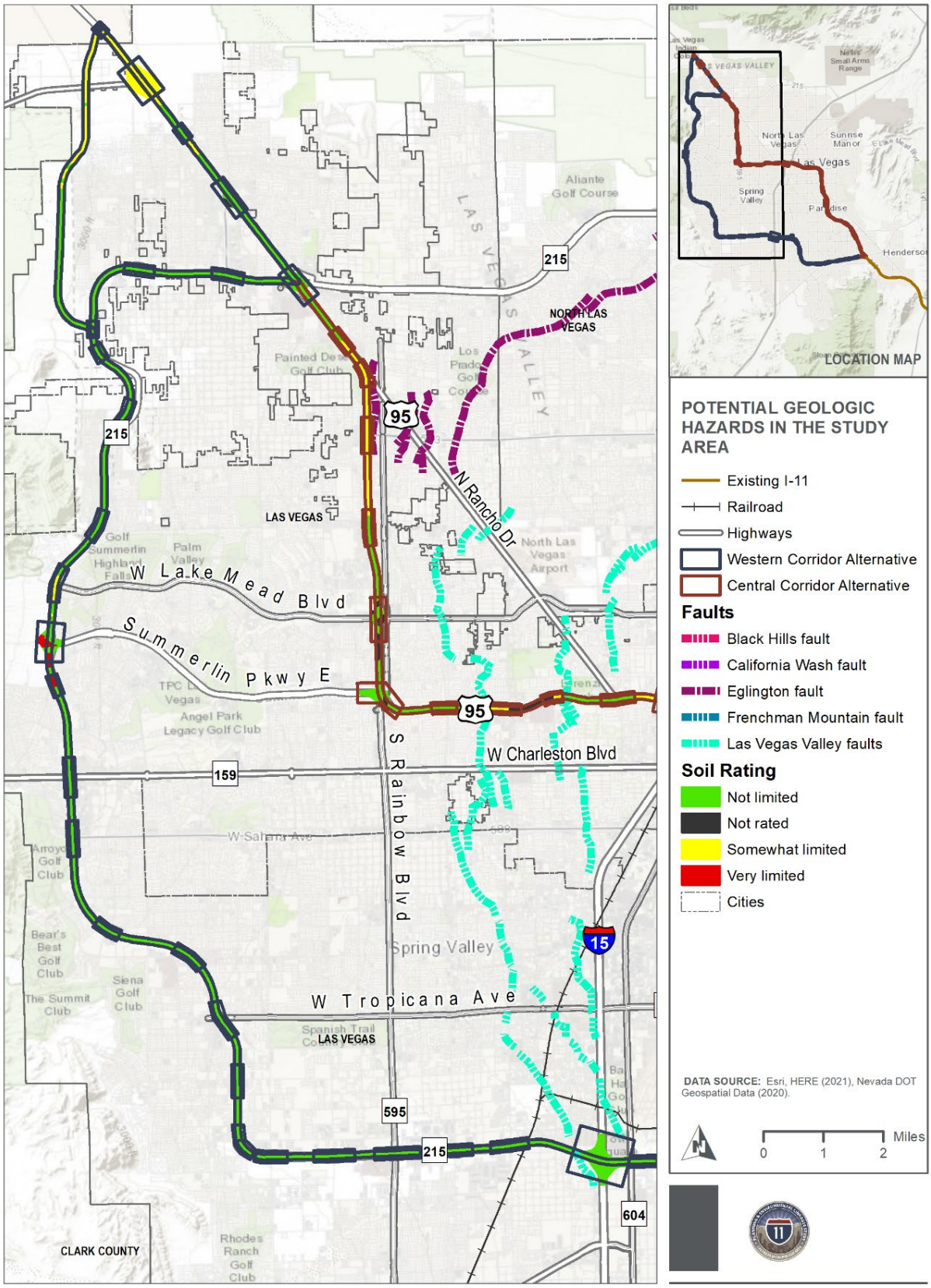
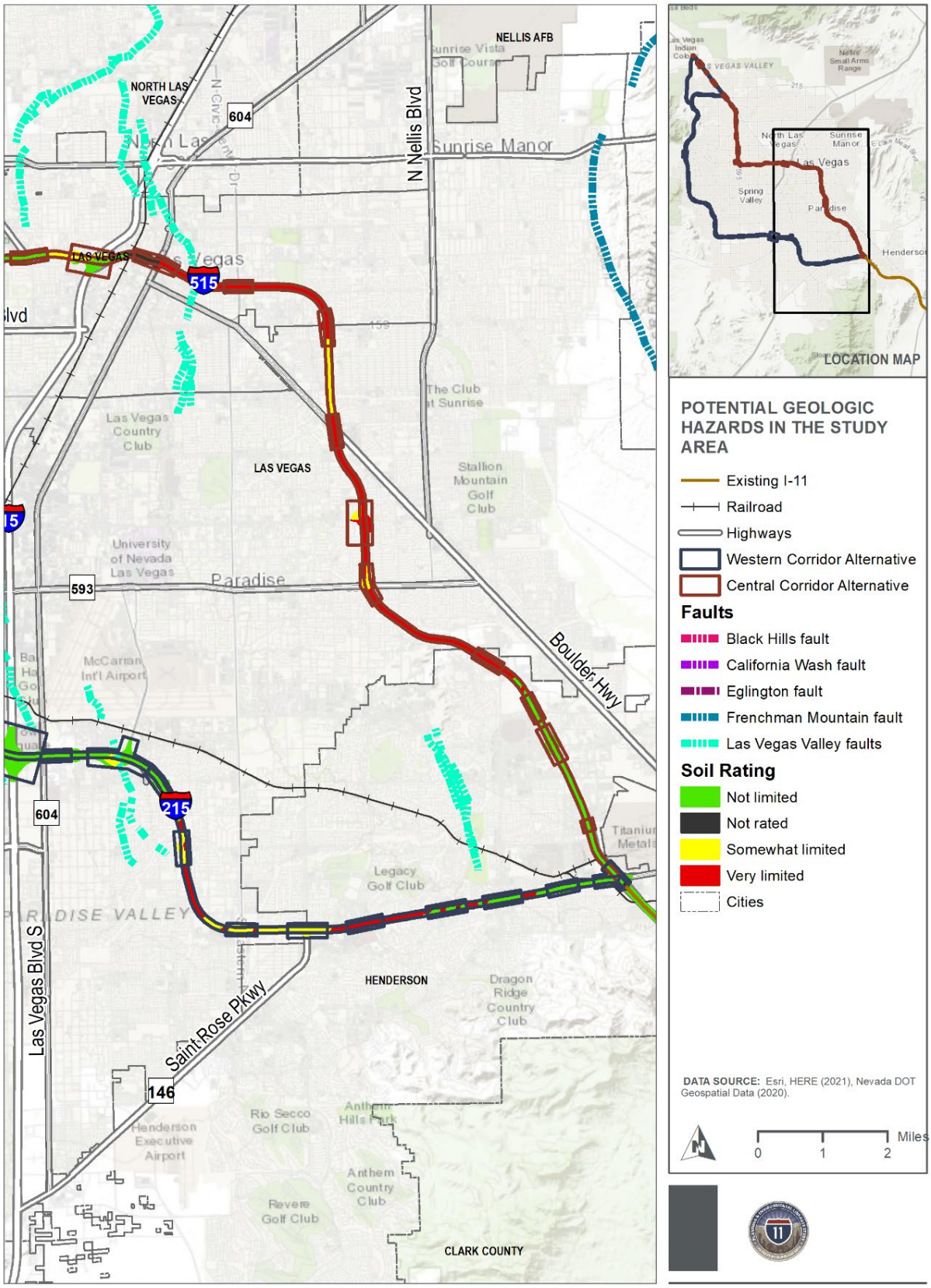


Figure 5-4. Potential Geologic Hazards in the Study Area – Sheet 2



5.6 HAZARDOUS MATERIALS

STAKEHOLDERS INVOLVED IN HAZARDOUS MATERIALS

- Nevada Division of Environmental Protection
- State of Nevada Emergency Response Commission
- Cities
- Clark County
- Private landowners

5.6.1 What Are the Applicable Laws, Regulations, and Guidance Documents?

The major applicable laws for hazardous materials include:

- ***Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA):*** provides federal authority for the identification, investigation, and cleanup of sites throughout the US that are contaminated with hazardous substances (as specifically designated within the Act)
- ***Resource Conservation and Recovery Act of 1976 (RCRA):*** establishes a framework for the management of both solid and hazardous waste.

Other applicable laws, regulations, and guidance documents for hazardous materials include:

- ASTM Standard E 1527 or E 1528
- 40 CFR Part 312 “Standards and Practices for All Appropriate Inquires”
- Hazardous Waste Sites Affecting Highway Project Development. FHWA Interim Guidance, August 1988
- Supplemental Hazardous Waste Guidance, FHWA, January 1997
- Guidance for Performing Preliminary Assessments Under CERCLA, USEPA, September 1991

5.6.2 What Data Sources Are Used to Identify Resources?

Hazardous materials pertain to substances or materials that the EPA has determined to be capable of posing an unreasonable risk to health, safety, or property. An Area/Corridor Report conducted by Environmental Data Resources, Inc. was generated for both the Western and Central Corridor Alternatives to search available environmental records, including federal and state environmental resources. There were no windshield surveys, property owner interviews, or soil testing conducted as a part of this PEL study.

5.6.3 What Are the Resources under Consideration?

The records search included a 1-mile radius from the centerlines of the Western and Central Corridor Alternatives. Database listings within a 0.25-mile radius were examined based on potential to impact the Study Area. Table 5-6 shows the types of facilities included in the database search and the number of these types of facilities within 0.25 mile of each alternative. The total number of hazardous sites is generally the same for both corridor alternatives, with 596 hazardous materials database listings located within a 0.25-mile radius of the Central Corridor Alternative and 573 listings located within a 0.25 mile radius of the Western Corridor Alternative.

Figure 5-6 and Figure 5-7 show the hazardous materials database listings within 1 mile of the Central and Western Corridor Alternatives.

Table 5-6. Hazardous Materials Listings in the Study Area

Central Corridor Alternative Hazardous Materials Database Listings	Number within 0.25 Mile	Western Corridor Alternative Hazardous Materials Database Listings	Number within 0.25 Mile
Abandoned Mines	1	Abandoned Mines	10
Aboveground Storage Tank (AST)	4	AST	1
*Brownfields	1	ECHO	11
Enforcement and Compliance History Information (ECHO)	2	*EDR Exclusive Historical Auto Stations	15
*EDR Exclusive Historical Auto Stations	65	*EDR Exclusive Historical Cleaners	10
*EDR Exclusive Historical Cleaners	27	*ERNS	4
*Emergency Response Notification System (ERNS)	1	FINDS	131
Facility Index System/Facility Registry System (FINDS)	92	Federal Insecticide, Fungicide, & Rodenticide Act and Toxic Substances Control Act Tracking System	1
*Hazardous Materials Information Reporting System (HMIRS)	1	Indian Reservations	1
Indian Reservations	1	*LUST	1
*Leaking Underground Storage Tank (LUST)	25	MINES Mineral Resources Data System	1
National Pollutant Discharge Elimination System (NPDES): Permitted Wastewater Facility Listing	29	NPDES): Permitted Wastewater Facility Listing	185
RCRA Non-Generators/No Longer Regulated	28	RCRA Non-Generators/No Longer Regulated	14
RCRA Large Quantity Generators	5	RCRA Large Quantity Generators	3
RCRA Small Quantity Generators	19	RCRA Small Quantity Generators	16
RCRA Very Small Quantity Generators	19	RCRA Very Small Quantity Generators	19
*RGA HWS: Recovered Government Archive State Hazardous Waste Facilities List	11	*RGA HWS	5
*RGA LUST: Recovered Government Archive Leaking Underground Storage Tank	13	*RGA LUST	1
*Superfund Enterprise Management System (SEMS)	1	*SEMS	2
*SEMS-ARCHIVE	2	*SEMS-ARCHIVE	1
*State Hazardous Waste Site (SHWS): Corrective action sites	97	*SHWS: Corrective action sites	46
Solid Waste Recycling in California (SWRCY) Listing	26	Section Seven Tracking Systems (SSTS)	1
Aerometric Information Retrieval System (US AIRS)	1	SWRCY	24
*US Brownfields	14	US MINES	19
US MINES: Mines Master Index File	3	UST	51
Underground Storage Tank (UST)	108		
Total:	596	Total:	573

** Indicates higher risk sites based on previous releases or contamination onsite.*

Source: EDR 2021a; EDR 2021b

5.6.4 What Special Considerations Should Be Incorporated in the Impact Assessment?

None.

Figure 5-5. Hazardous Materials within 1-mile of the Corridor Alternatives – Sheet 1

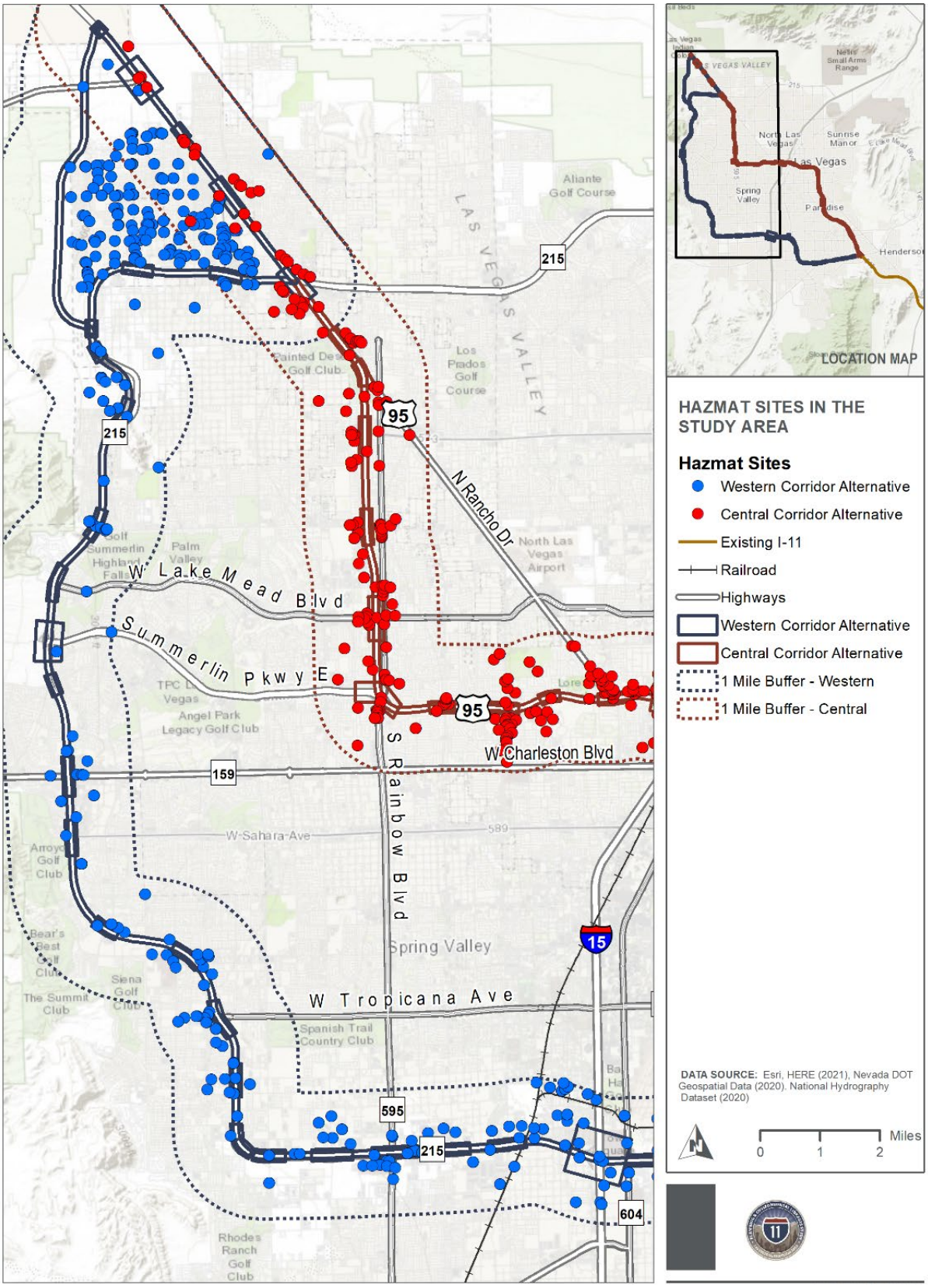
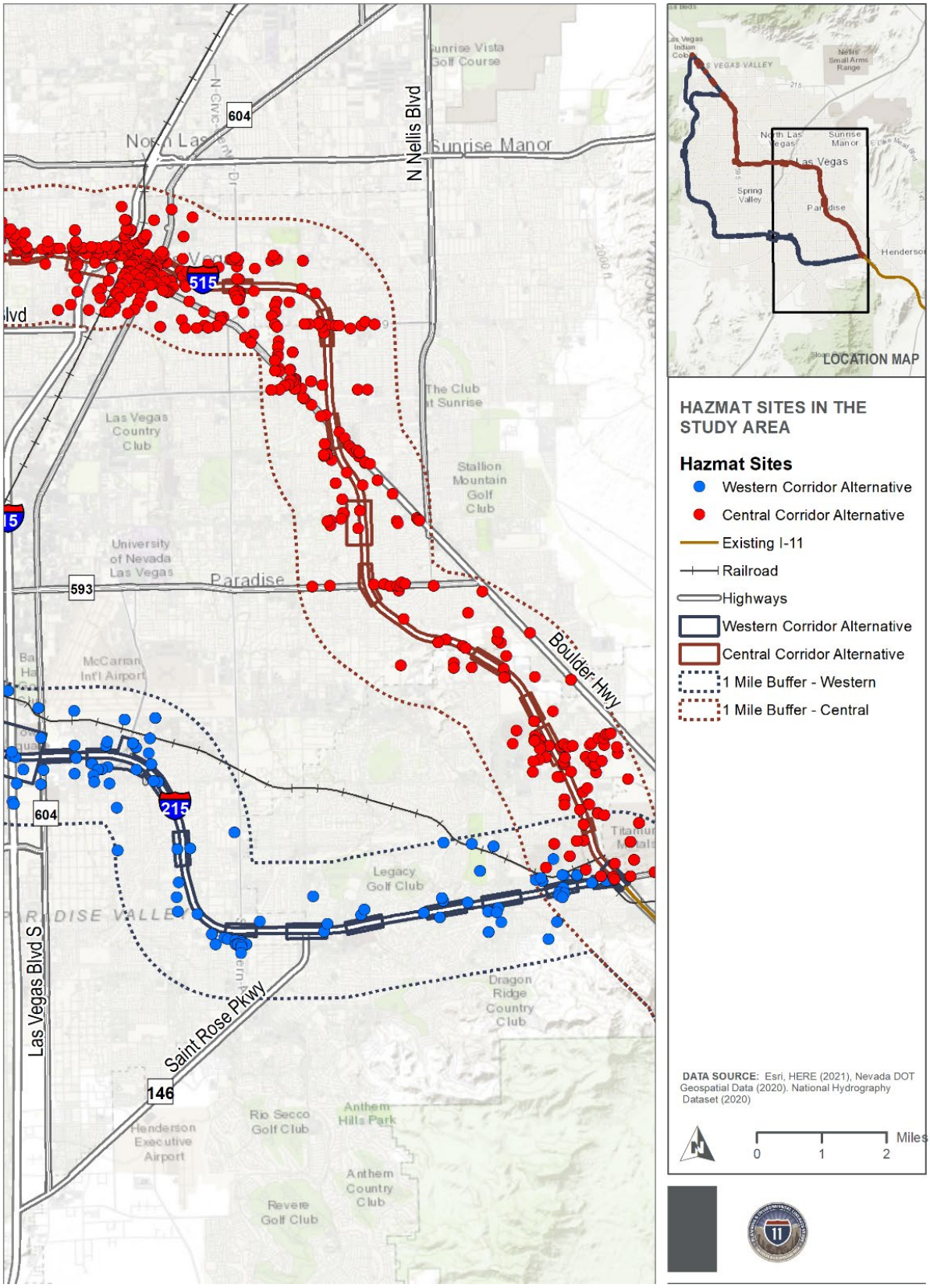


Figure 5-6. Hazardous Materials within 1-mile of the Corridor Alternatives – Sheet 2



5.7 BIOLOGICAL RESOURCES

5.7.1 What Are the Applicable Laws, Regulations, and Guidance Documents?

The following laws, Executive Orders, and other guidance documents relate to biological resources:

- ***Endangered Species Act (ESA) of 1973, as amended (16 United States Code (U.S.C.) § 1531 et seq.)***: Provides for the listing and protection of species designated as threatened or endangered. Under Section 7 of that Act, federal agencies are required to consult with USFWS to ensure their actions do not jeopardize the continued existence of threatened or endangered species or result in the adverse modification of any designated critical habitats upon which those species depend.
- ***The Migratory Bird Treaty Act (MBTA) of 1918, as amended (16 U.S.C. §§ 703–712)***: Implemented to ensure the sustainability of populations of all protected species of birds based on Conventions between the United States and four neighboring countries. Specific provisions of the statute include establishment of a federal prohibition, unless permitted by prior authorization from the USFWS, to: *pursue, hunt, take, capture, kill, attempt to take, capture or kill, possess, offer for sale, sell, offer to purchase, purchase, deliver for shipment, ship, cause to be shipped, deliver for transportation, transport, cause to be transported, carry, or cause to be carried by any means whatever, receive for shipment, transportation or carriage, or export, at any time, or in any manner, any migratory bird, included in the terms of this Convention … for the protection of migratory birds … or any part, nest, or egg of any such bird (16 U.S.C. § 703–712).*
- ***Executive Order 13186 – Responsibilities of Federal Agencies to Protect Migratory Birds***: Directs departments and agencies to take certain steps to further implement the MBTA.
- ***The Bald and Golden Eagle Protection Act (BAGEPA) (16 U.S.C. §§*** 668–668c): Requires issuance of a take permit from the USFWS if it is determined an activity would disturb a bald (Haliaeetus leucocephalus) or golden (Aquila chrysaetos) eagle through any action that causes or is likely to cause 1) injury, 2) a decrease in productivity by substantially interfering with normal breeding, feeding, or sheltering behavior, or 3) nest abandonment by substantially interfering with normal breeding, feeding, or sheltering behavior. Issuance of an eagle take permit requires offsetting mitigation measures and can take a year or longer to obtain.
- ***Nevada Revised Statutes (NRS) 527.260–300 and Nevada Administrative Code (NAC) 527***: Provide a program for the conservation, protection, restoration, and propagation of selected species of flora and for the perpetuation of the habitats of such species and provides a list of species declared by the State Forester Firewarden to be threatened with extinction. Removal or destruction of a Nevada fully protected species requires a special permit for removal or destruction.
- ***The NAC Chapter 503***: Identifies species of wildlife that are classified by the Board of Wildlife Commissioners as protected, sensitive, endangered, or threatened. State protection is provided for these species in addition to any federal protections such as those provided under the MBTA, ESA, and BAGEPA.
- ***NRS 527.060–527.120***: Requires notification to the Division of Forestry and the applicable registration and permit for the removal or possession of cacti or yucca from state land. On federal lands under BLM jurisdiction, permits and tags are required for removal of cactus or yucca.

STAKEHOLDERS INVOLVED IN BIOLOGICAL RESOURCES

- FHWA
- U.S. Fish and Wildlife Service (USFWS)
- Bureau of Land Management (BLM)
- Nevada Department of Wildlife (NDOW)
- Nevada Division of Forestry

- ***BLM Manual Section 6840***: manages sensitive species and their habitats to minimize or eliminate threats affecting the status of the species or to improve the condition of the species' habitat on BLM-administered lands.
- ***Executive Order 13112 Invasive Species and Executive Order 13751 Safeguarding the Nation from the Impacts of Invasive Species***: Address prevention and control of invasive species and provide for their control to minimize the economic, ecological, and human health impacts that invasive species cause. EO 13751 amended EO 13112 to incorporate considerations for the impacts of climate change, technological innovation, and other emerging priorities.
- ***Nevada Revised Statutes 555.130 et seq. and Nevada Administrative Code Chapter 555***: In Nevada, noxious weeds are regulated under the Nevada Revised Statutes (NRS) Chapter 555 and Nevada Administrative Code (NAC) Chapter 555. The Nevada Department of Agriculture publishes and updates the state's list of Noxious Weeds. NRS 555.150 requires every landowner or land occupant to control noxious weeds. Accordingly, "[e]very railroad, canal, ditch or water company, and every person owning, controlling, or occupying lands in this State, and every county, incorporated city or district having the supervision and control over streets, alleys, lanes, rights-of-way, or other lands, shall control all weeds declared and designated as noxious as provided in NRS 555.130 in any manner specified by and whenever required by the State Quarantine Officer."

5.7.2 What Data Sources Are Used to Identify Resources?

A preliminary review of biological resources within and near the proposed I-11 corridor Alternatives was conducted using existing natural resource data, web-based geospatial data and environmental review tools, and aerial imagery from the following sources:

- USFWS Information for Planning and Consultation (IPaC) project planning tool (USFWS 2021)
- Eastern Mojave Data Viewer Interactive Map (Eastern Mojave Conservation Collaborative 2020)
- Nevada Threatened and Endangered Flora Habitat Models (Nevada Division of Forestry 2021)
- Southwest Regional Gap Analysis Project (SWReGAP) (U.S. Geological Survey 2005)
- BLM Nevada Sensitive Species List (BLM 2017)
- Clark County Multiple Species Habitat Conservation Plan/EIS (MSHCP) (Clark County 2000)
- Nevada Noxious Weed List by Category (Nevada Department of Agriculture 2021)
- EDDMapS: Invasive Species Mapping data (EDDMapS 2021)

5.7.3 What Are the Resources under Consideration?

Existing Conditions

The corridor alternatives fall within the Mojave Basin and Range ecoregion, typified by undeveloped grasslands and shrublands; however, Las Vegas is the is the major urban center within the region and has permanently altered ecological features and processes. Figure 5-8 and Figure 5-9 show the existing land cover across the study area. In undeveloped portions of the region, vegetation is dominated by creosote bush (Larrea tridentata)-white bursage (Ambrosia dumosa) desert scrub. This land cover classification is typified by a sparse to moderately dense layer of plants adapted to conditions with very little moisture.

Figure 5-7. Land Cover in the Study Area - Sheet 1

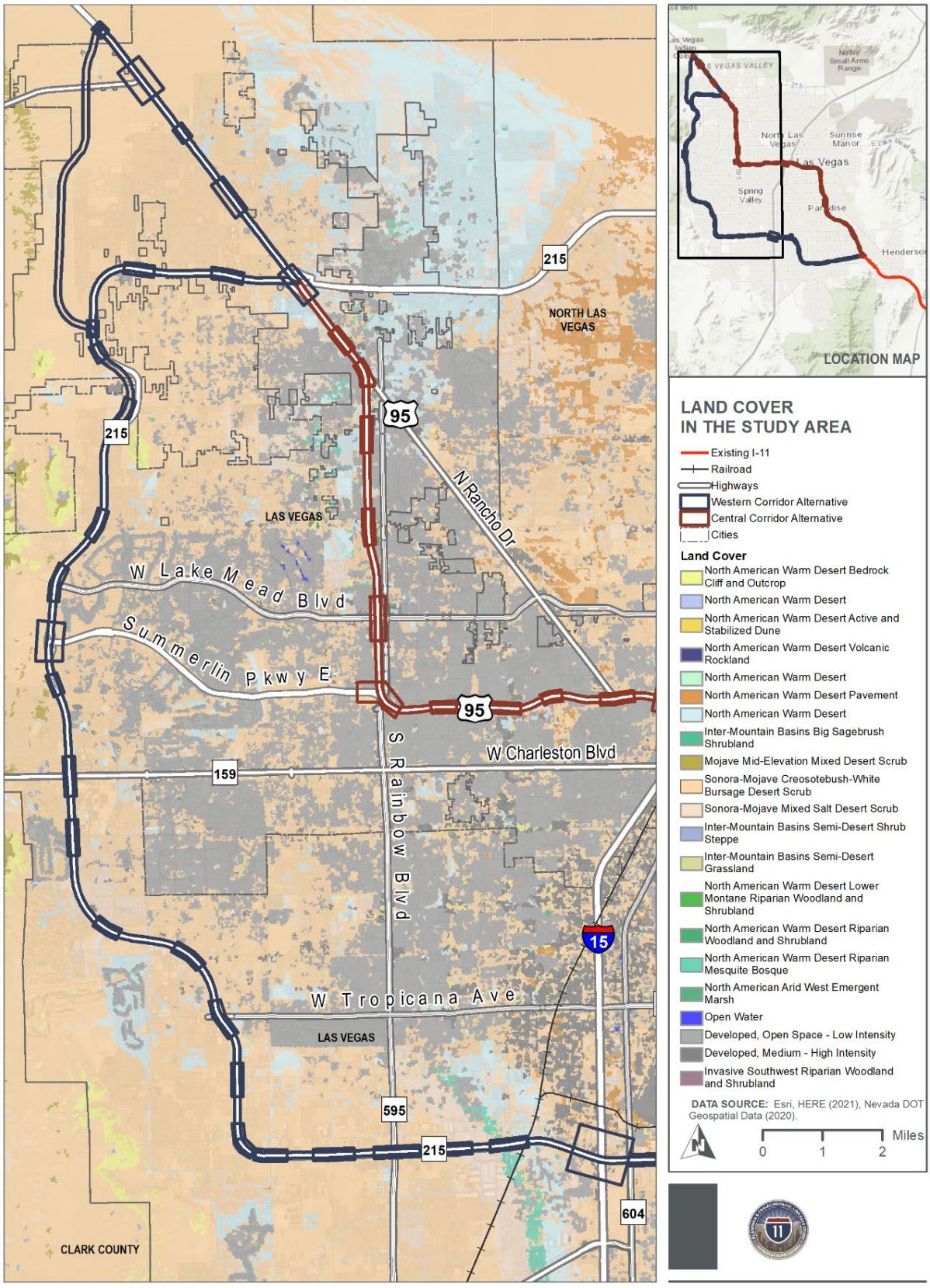
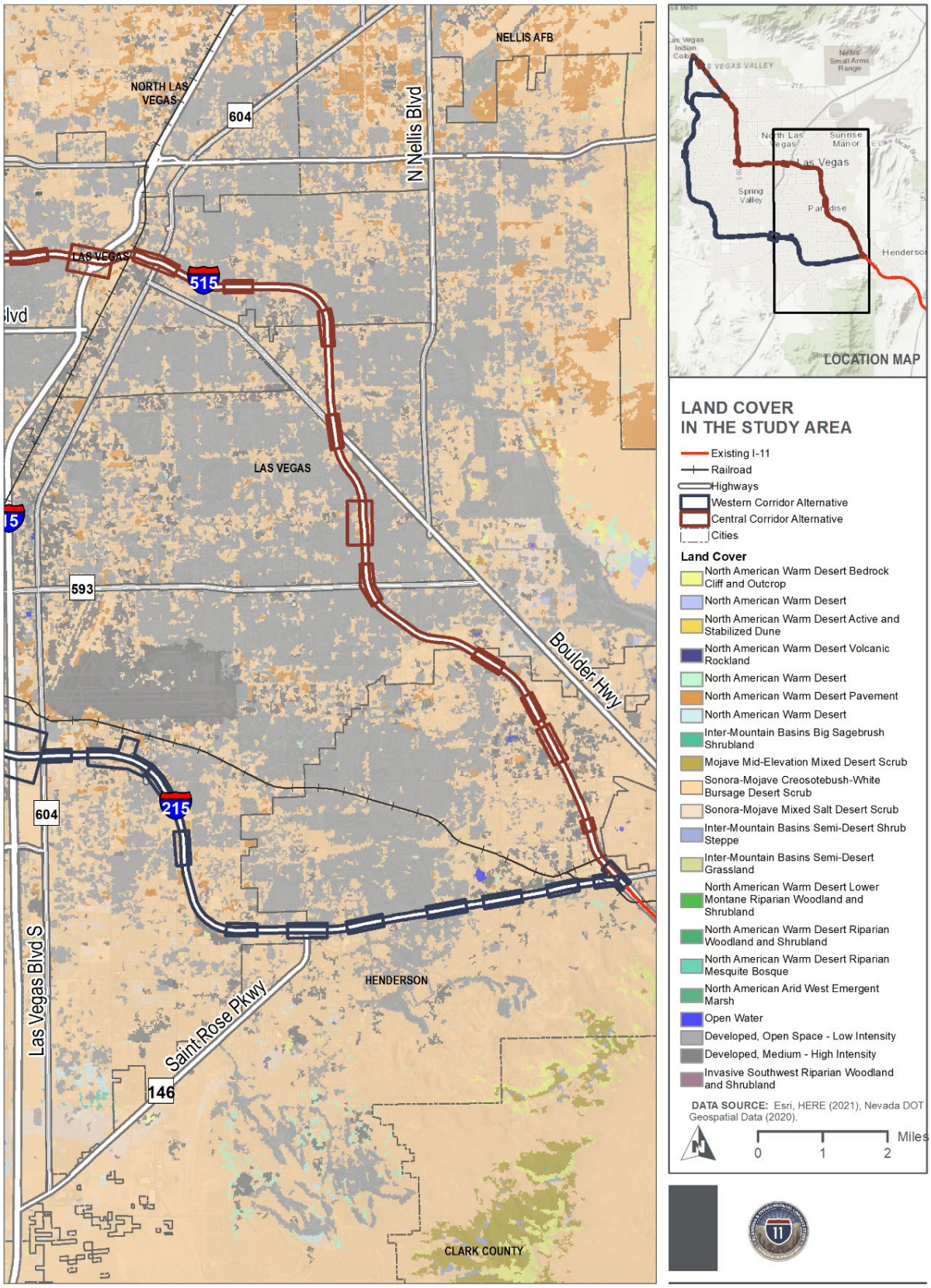


Figure 5-8. Land Cover in the Study Area - Sheet 2



Federally Listed Species

A preliminary project report generated using the USFWS IPaC project planning tool indicates four federally listed species occur or could occur within the proposed Central and Western Corridor Alternatives (Table 5-7). There are no proposed or designated critical habitats within the corridors; however, east of the proposed project on the existing I-11 roadway corridor, there is designated critical habitat at Lake Mead and downstream of Lake Mead on the Colorado River for the razorback sucker (Xyrauchen texanus) and bonytail chub (Gila elegans), respectively (Figure 5-12).

Table 5-7. Federally Listed Species with Potential for Occurrence in the Study Area

Common Name	Scientific Name	Habitat	Status
Southwestern willow flycatcher	Empidonax trailii extimus	Dense riparian habitats dominated by native cottonwoods and willows or by nonnative tamarisk	Endangered
Yuma Ridgway's rail	Rallus obsoletus yumanensis	Fresh and brackish marsh habitat with dense vegetation next to the water's edge	Endangered
Mojave desert tortoise	Gopherus agassizii	Alluvial fans and bajadas in various types of Mojave desert scrub	Threatened
Pahrump poolfish	Empetrichthys latos	Isolated spring systems and pools in southern Nevada	Endangered

Source: U.S. Fish and Wildlife Service, July 8, 2021, IPaC Official Species List, Consultation Code: 08ENVS00-2021-SLI-0149

In the Mojave Desert of southern Nevada, desert tortoises occupy a wide range of habitats; however, habitat for the desert tortoise in urban freeway areas has been destroyed or severely degraded and desert tortoises are absent or very rare in areas adjacent to those roads. There have been sightings of desert tortoises near US 95 in the northwestern portion of the study area and on the proposed Western Corridor Alternative east of the Decatur Boulevard interchange. There is one documented desert tortoise culvert crossing at milepost 87 on I-515; however, that area is now fully developed and any habitat that previously existed has since been destroyed. The highest quality remaining habitat within the study area is within the footprint of the Sheep Mountain Parkway option; however, most of the habitat in that area has been eliminated by the construction of nearly four miles of flood control facilities.

Special Status Species

The BLM Nevada Sensitive Species List and NAC lists of protected, endangered, threatened, and sensitive wildlife and fully protected species of flora identify potential habitat for three critically endangered plans along the corridor alternatives: Las Vegas bearpoppy, white bearpoppy, and threecorner milkvetch (Figure 5-10 and Figure 5-11). The Central Corridor Alternative would intersect the largest amount of modeled habitat for the Las Vegas bearpoppy and white bearpoppy; however, little to no potential habitat remains in those areas due to extensive development and urbanization. The greatest potential for both Las Vegas bearpoppy and white bearpoppy exists in the overlapping portion of the Central and Western Corridor Alternatives in the southeastern segment of the proposed I-11 corridor, as well as in a very small area west of the proposed Sheep Mountain Parkway Option. Potential habitat modeled for the threecorner milkvetch along the Western Corridor Alternative is unlikely to be affected because any potential habitat has been eliminated through existing development in that area.

Figure 5-9. Special Status Species Habitats in the Study Area – Sheet 1

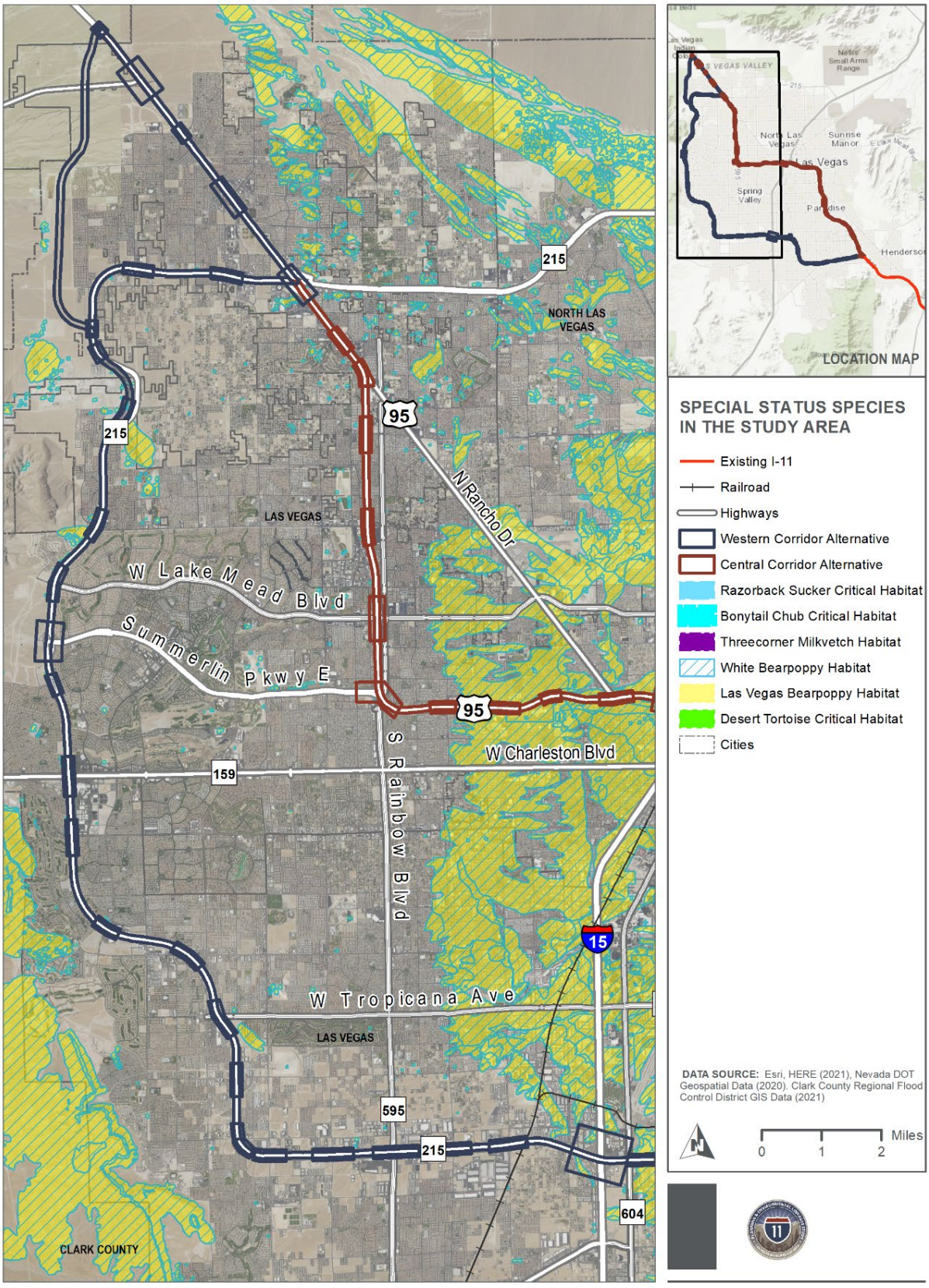
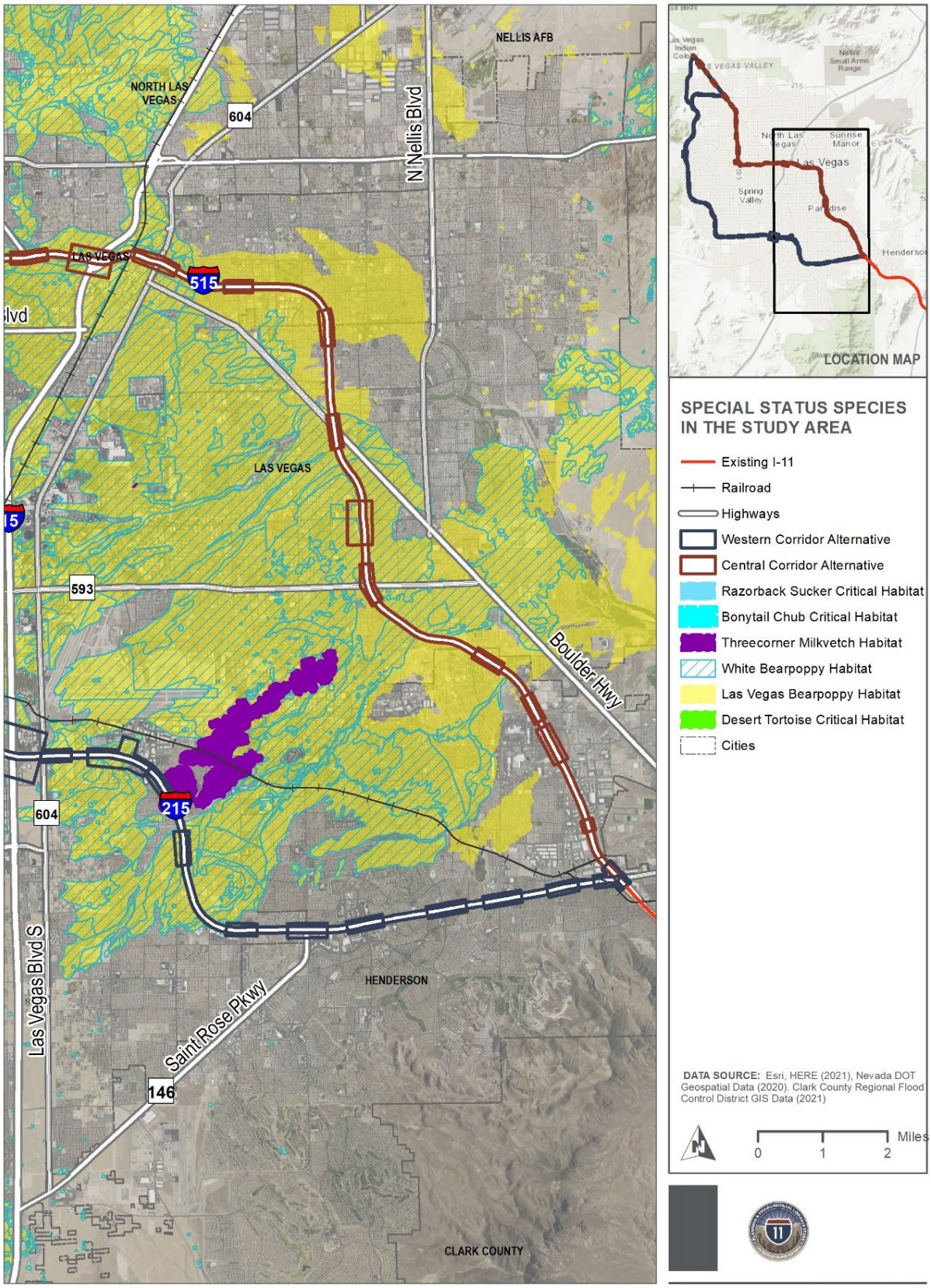


Figure 5-10. Special Status Species Habitats in the Study Area – Sheet 2



Noxious Weeds

Invasive plant species likely occur within most, if not all, plant communities across the Las Vegas Valley. Little existing location data for noxious weeds in the region are publicly available; however, documented infestation points obtained from EDDMapS indicate Sahara mustard occurs within the footprints of both the Central and Western Corridor Alternatives, and African rue, green fountaingrass, and silverleaf nightshade occur within the one mile of the existing roadway corridors.

5.7.4 What Special Considerations Should Be Incorporated in the Impact Assessment?

Due to the potential for the presence of protected biological resources, and for compliance with Section 7 of the ESA, surveys are recommended during the NEPA environmental review process to support further assessment of the proposed project's potential impacts on flora, fauna, and habitat in areas the selected alternative is proposed in the study area.

5.8 WATER RESOURCES

5.8.1 What Are the Applicable Laws, Regulations, and Guidance Documents?

The following laws, Executive Orders, and other guidance documents relate to water resources:

- ***Executive Order 11988 – Floodplains Management (May 24, 1977):*** Requires that floodplain encroachments avoid adverse impacts and minimize development of floodplains where there is a practicable alternative.
- ***Section 14 of the Rivers and Harbors Act of 1899, as amended and codified at 33 U.S. Code § 408 (Section 408)***: Requires permission to modify, alter, or occupy any existing USACE constructed public works project, including dams, basins, levees, channels, navigational channels, and any other local flood protection works constructed by USACE.
- ***The Clean Water Act (CWA) of 1972 (33 USC 1251 et seq.)***: The primary federal statute governing discharge of pollutants into waters of the United States (WOTUS), which, in Nevada, include traditional navigable watercourses (TNW), their perennial and intermittent tributaries, and adjacent wetlands.
    - ***Section 303(d)*** of the CWA requires states, territories, and authorized Tribes to evaluate all available water quality-related data and information to develop a list of waters that do not meet established water quality standards (impaired) and those that currently meet water quality standards but may exceed it in the next reporting cycle (threatened). States must then develop a total maximum daily load for every pollutant/waterbody combination on the list.

STAKEHOLDERS INVOLVED IN WATER RESOURCES

- Federal Emergency Management Agency (FEMA)
- Clark County Regional Flood Control District (CCRFCD)
- U.S. Army Corps of Engineers (USACE)
- Nevada Division of Environmental Protection (NDEP)
    - Bureau of Water Pollution Control (BWPC)
    - Bureau of Water Quality Planning (BWQP)
- Nevada Division of Water Resources (NDWR)
- U.S. Fish and Wildlife Service (USFWS)

  - ***Section 401*** of the CWA requires that any applicant seeking to obtain a federal license or permit (i.e., Section 404 permit) for activities that may result in a discharge of dredged or fill material into WOTUS first obtain a Section 401 water quality certification from the state or tribal authority for the location in which the discharge may or will originate.
  - ***Section 404*** of the CWA regulates the discharge of dredged or fill material into WOTUS, including wetlands, through a permitting program implemented by the USACE. For USACE to issue a Section 404 permit, a Section 401 certification is required.
  - ***Section 402*** of the CWA regulates sources of pollutants that could infiltrate surface WOTUS through the National Pollutant Discharge Elimination System (NPDES) permitting program. The EPA has granted NDEP authority to issue NPDES permits on non-Tribal lands in Nevada.
- ***Nevada Water Pollution Control Law (Nevada Revised Statutes [NRS] 445A.300 to 445A.730)***: Under NRS § 445A.415, waters of the state are defined as "all waters situated wholly or partly within or bordering upon this State, including but not limited to:
  1. All streams, lakes, ponds, impounding reservoirs, marshes, water courses, waterways, wells, springs, irrigation systems and drainage systems; and
  2. All bodies or accumulations of water, surface and underground, natural or artificial."
- ***Fish and Wildlife Coordination Act (as amended, 16 U.S.C. §§ 661–666c)***: Requires federal agencies to consult with USFWS and state agencies for activities that affect, control, or modify waters of any stream or body of water so that adverse effects on fish and wildlife can be minimized. It requires that fish and wildlife resources receive equal consideration to other project features.
- ***Executive Order 11990 – Protection of Wetlands:*** Requires federal agencies or projects receiving federal funding to compensate for impacts on all wetlands, regardless of whether the wetland is determined a regulated WOTUS.
- ***Nevada Underground Water Act:*** Directs the State Engineer to oversee and manage the appropriation of groundwater through a permitting system. Discharges that have the potential to impact subsurface waters require a Water Pollution Control Permit as required by the Nevada Water Pollution Control Law.

5.8.2 What Data Sources Are Used to Identify Resources?

The following data and guidance documents were used to identify water resources in the study area:

- US Topo maps (U.S. Geological Survey 2018)
- National Hydrography Dataset (NHD) 1:24,000 (U.S. Geological Survey 2020)
- Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region (Version 2.0) (USACE 2008a)
- A Field Guide to the Identification of the Ordinary High Water Mark (OHWM) in the Arid West Region of the Western United States (USACE 2008b)
- USACE Regulatory Guidance Letter (No. 16-01) for Jurisdictional Determinations, dated October 2016 (USACE 2016)
- U.S. Environmental Protection Agency's (EPA) WATERS GeoViewer (EPA 2021)
- U.S. Fish and Wildlife Service's (USFWS) National Wetlands Inventory (NWI) database (USFWS 2021)
- FEMA Flood Insurance Rate Maps (FEMA 2006, 2011)
- U.S. Army Corps of Engineers Geospatial Open Data (USACE 2020)
- Nevada Water Quality Integrated Report Web Map (NDEP 2020)

5.8.3 What Are the Resources under Consideration?

Floodplains

In the Las Vegas metropolitan area, there are numerous flood control detention basins, levees, channels, and other structures that help mitigate the impacts of flooding that cross or are adjacent to the corridor alternatives (Figure 5-12 and Figure 5-13). These flood control facilities have reduced flood hazard risks within the Las Vegas Valley. For the Sheep Mountain option, there are three detention basins immediately east of the corridor and any potential impacts on the basins should be evaluated with CCRFCD.

The FEMA Flood Insurance Rate Map Panels indicate that both the Western and Central Corridor Alternatives primarily reside in FEMA Zone X, which is an area of minimal flood hazard. There are sections of both corridor alternatives that reside in FEMA Zone AO, which is an area with a 1% annual change of shallow flooding; there is a section of the Central Corridor Alternative in FEMA Zone AE, which is an area within a 100-year floodplain.

In the effort to continue to protect Clark County residents from the impacts of flooding, CCRFCD manages a program of improvement projects, including some projects under the jurisdiction of the USACE. Figure 5-14 and Figure 5-15 identify the locations of the planned flood control facilities, including channels, culverts, and detention basins, proposed by CCRFCD and USACE.

Surface Water and Wetlands

As shown in Figure 5-16 and Figure 5-17, both corridors intersect numerous named and unnamed drainages. Major drainages that bisect the Central Corridor Alternative include Pittman Wash, Duck Creek, Flamingo Wash, and Vegas Creek; a number of unnamed tributaries of those drainages also intersect the Central Corridor Alternative. The Western Corridor Alternative bisects Pittman Wash, Duck Creek, Tropicana Wash, Flamingo Wash, and several unnamed drainages. Both corridor alternatives and options intersect a number of minor ephemeral drainages; however, the Western Corridor Alternative crosses the largest number of drainages and could therefore have a greater impact. There is one major spring – Grapevine Springs – mapped within the Central Corridor Alternative footprint between Russell Road and Tropicana Avenue at the intersection with Mountain Vista Street.

The USFWS NWI indicates there are approximately 36 acres of nonriverine wetlands within a 500-foot buffer zone surrounding the proposed Corridor Alternatives: about 35 acres of freshwater ponds and 1.4 acres of freshwater forested/shrub wetlands (Figure 5-18 and Figure 5-19). NWI data also identified about 296.5 acres of riverine wetlands within a 500-foot buffer zone surrounding the proposed Corridor Alternatives: about 273 acres of intermittent or ephemeral streams and 23.2 acres of perennial streams. Based on NWI data, the Western Corridor Alternative would bisect significantly more ephemeral drainages than the Central Corridor Alternative, including at the proposed Sheep Mountain Parkway option. At this time, a field verification of the NWI data and aquatic resources delineation have not been completed, and no jurisdictional determinations have been made by USACE as to whether a potential wetland is jurisdictional and thus federally regulated within the study area.

Figure 5-11. Flood Zones and Flood Control Structures in the Study Area – Sheet 1

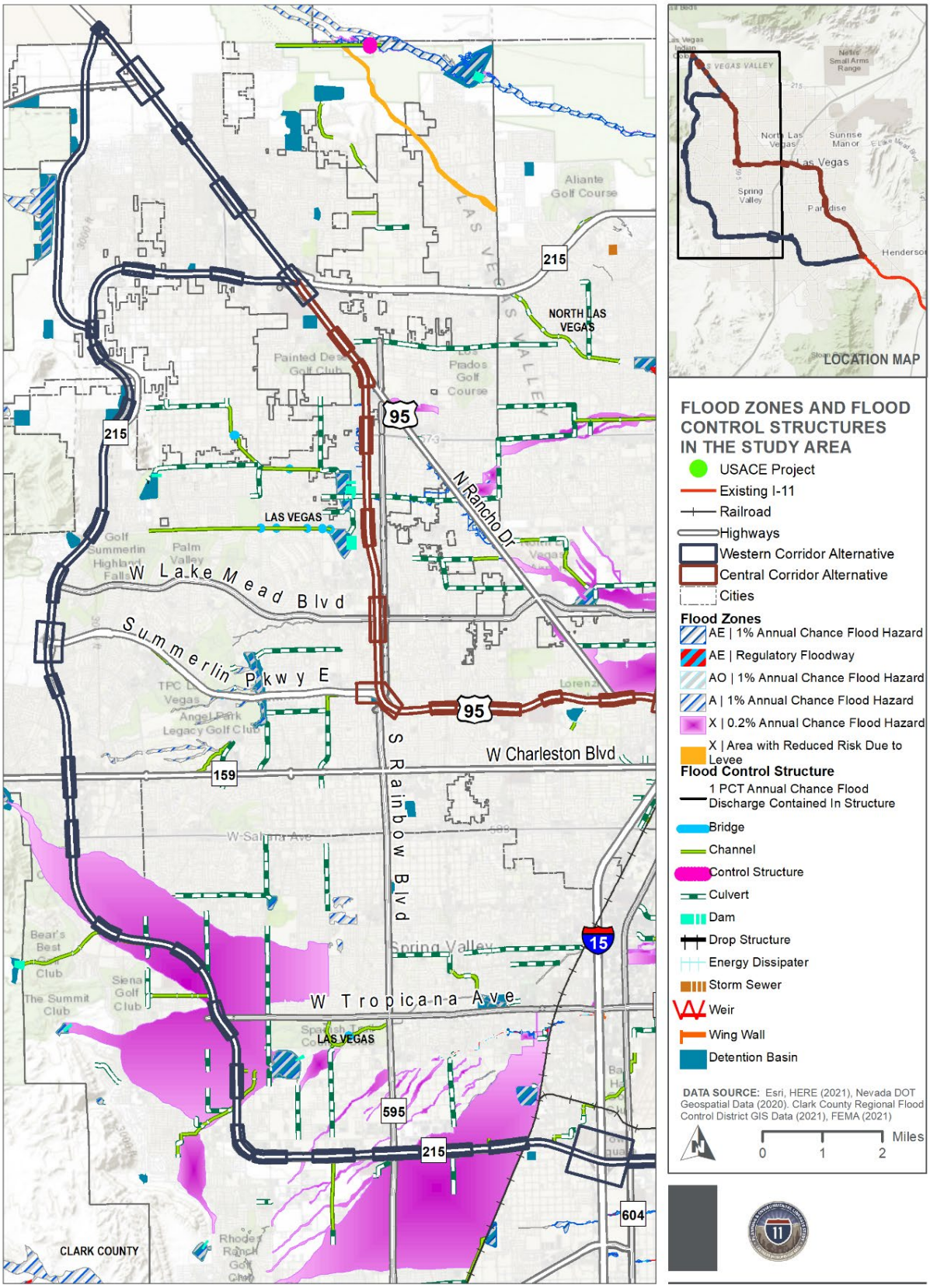


Figure 5-12. Flood Zones and Flood Control Structures in the Study Area – Sheet 2

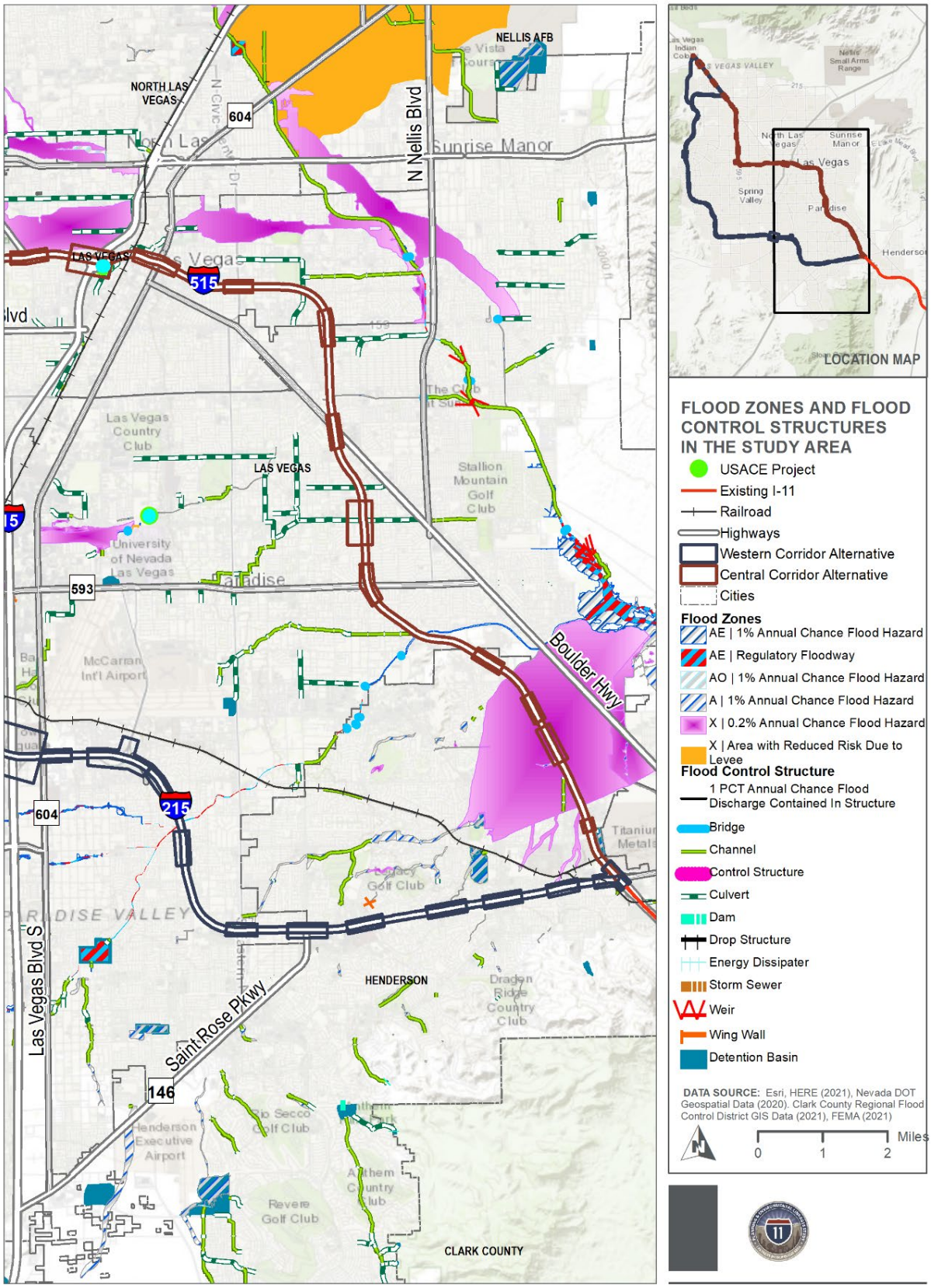


Figure 5-13. CCRFCD and USACE Planned Flood Control Facilities – Sheet 1

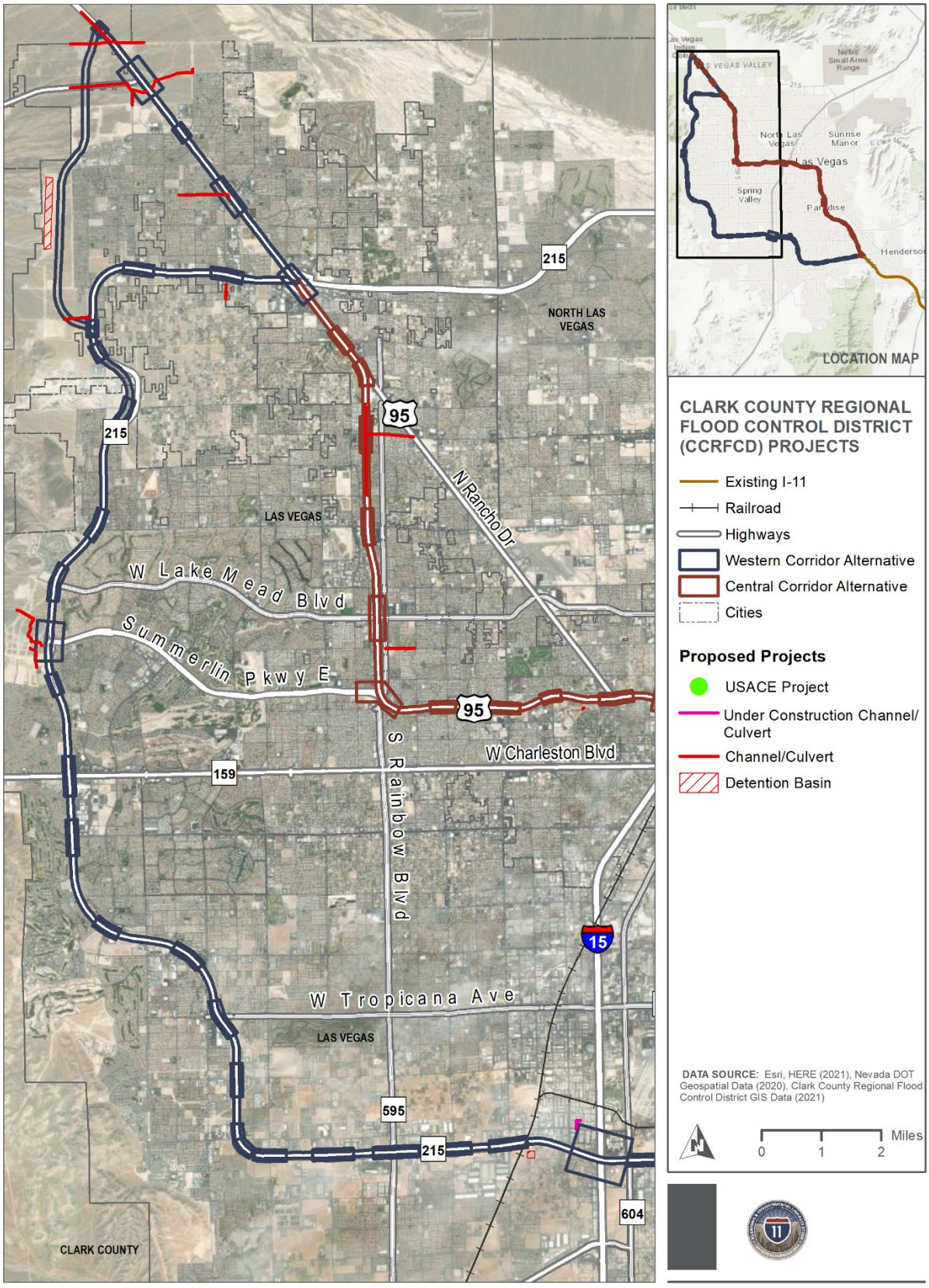


Figure 5-14. CCRFCD and USACE Planned Flood Control Facilities – Sheet 2

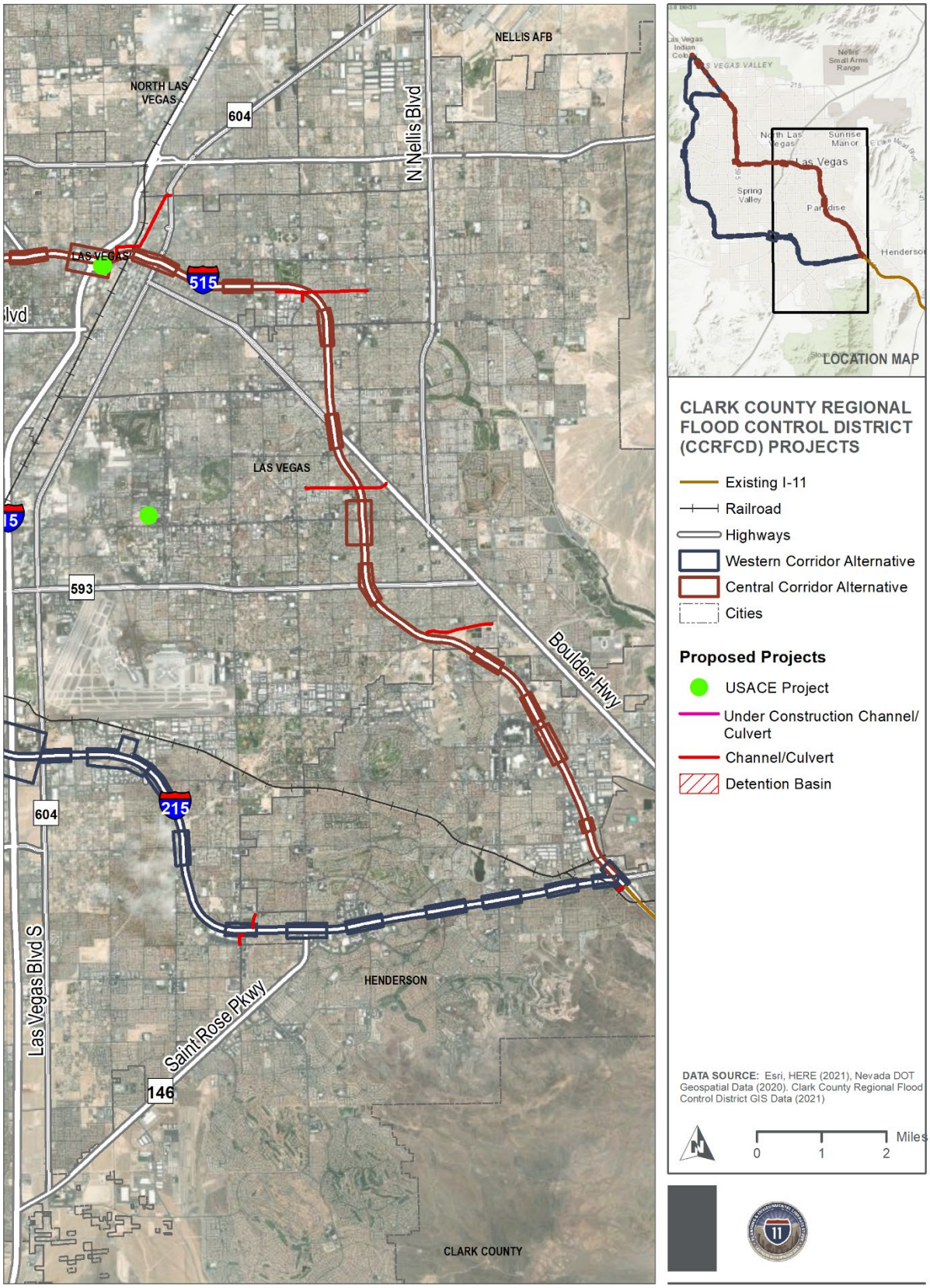


Figure 5-15. Surface Water Resources in the Study Area – Sheet 1

Figure 5-16. Surface Water Resources in the Study Area – Sheet 2

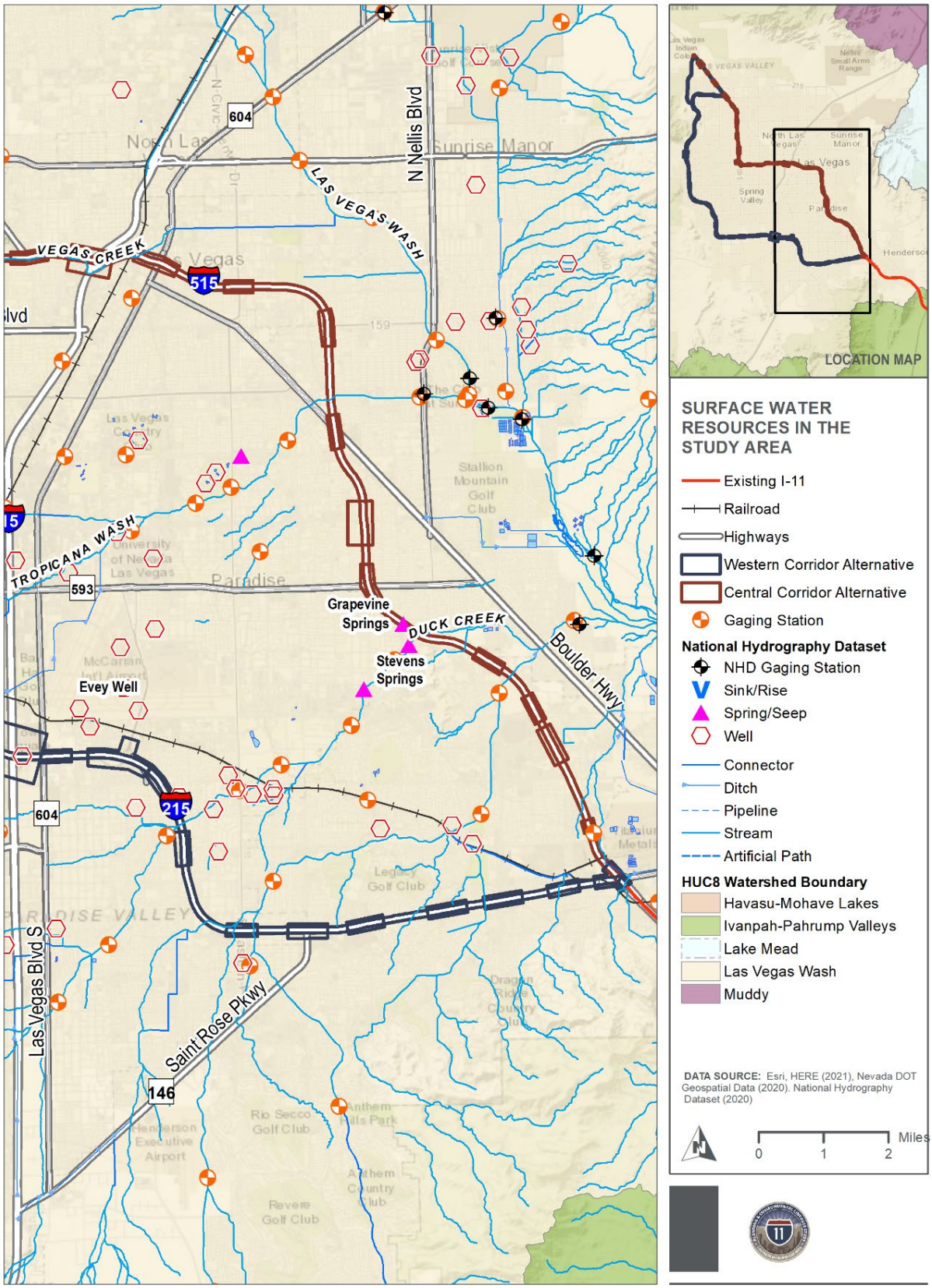


Figure 5-17. Wetlands in the Study Area – Sheet 1

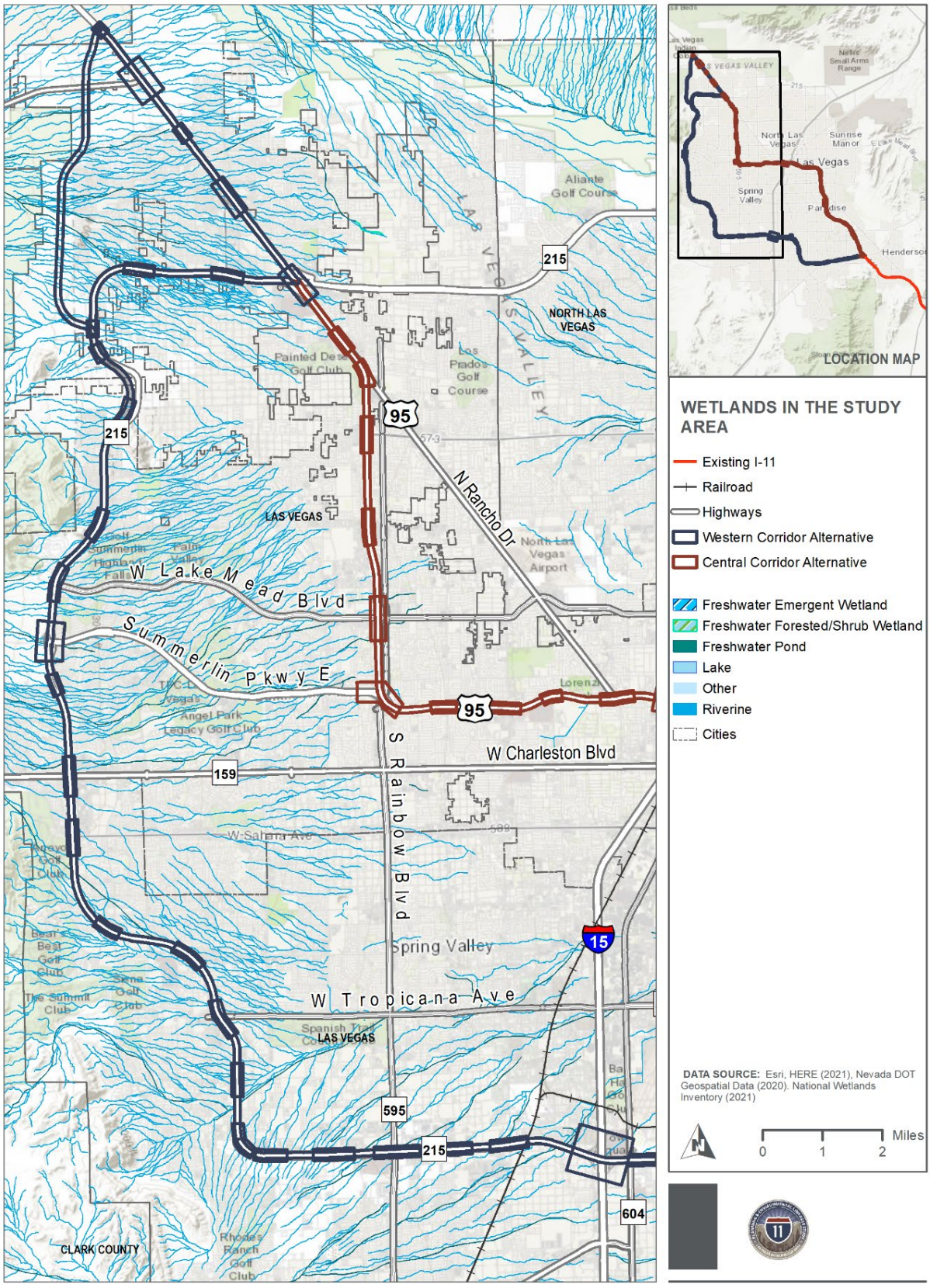
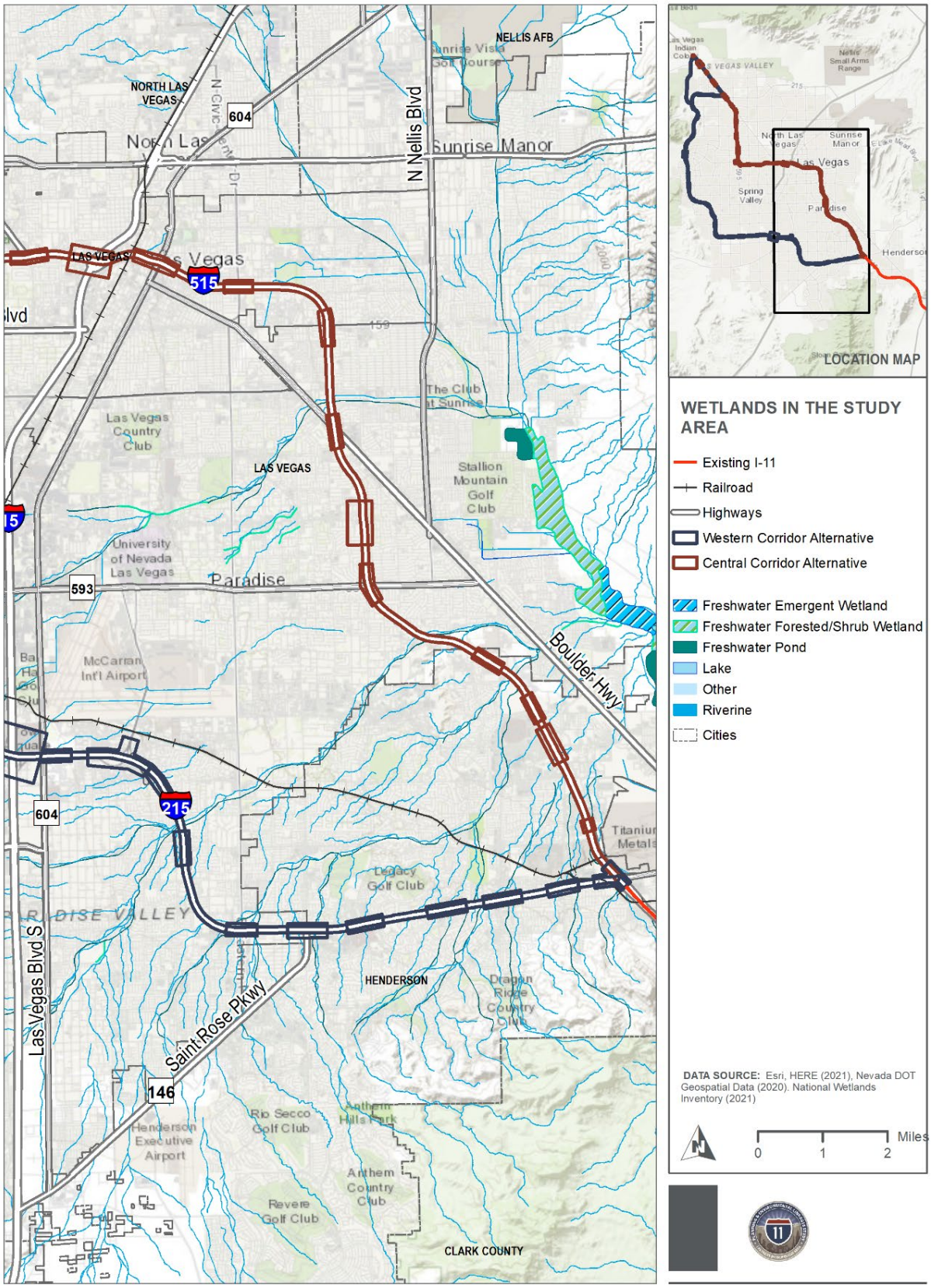


Figure 5-18. Wetlands in the Study Area – Sheet 2



Surface Water Quality

Stormwater runoff from the existing roadway system in the study area is ultimately conveyed into the Las Vegas Wash – a primary tributary of Lake Mead – by a complex network of stormwater management facilities including drop inlets, channels, pipes, and basins; in areas not served by storm drains or washes, stormwater may ultimately percolate into the ground. All named major drainages within the study area (Pittman Wash, Duck Creek, Tropicana Wash, Flamingo Wash, and Las Vegas Creek) have been assessed for impairment, and Pittman Wash, Duck Creek, Flamingo Wash, and Las Vegas Creek are listed as impaired on the state's 303(d) list.

NDOT has identified 25 transportation related water quality pollutants as potentially affecting surface water quality in Nevada: sediment, total dissolved solids, total suspended solids, turbidity, nitrate, nitrite, total nitrogen, ortho-phosphorus, total phosphorus, cadmium, chromium, copper, lead, iron, nickel, manganese, zinc, herbicides, *Escherichia coli*, fecal coliform, oil, grease, polycyclic aromatic hydrocarbons, total petroleum hydrocarbons, and temperature (NDOT 2021). In addition, stormwater discharge contributions to impairments for NPDES permitting reviews in the Las Vegas Valley identified trash and toxins as the main stressors representing contaminant inflow to the Las Vegas Wash and general study area. Other stressors include stormwater (both NPDES-regulated and unregulated), wastewater (NPDES-regulated), illicit discharges, and shallow groundwater.

Groundwater

The mountain ranges surrounding the Las Vegas Valley are comprised of indurated rocks that impede the movement of groundwater from the basin. As a result, three major aquifer zones underlie the Las Vegas Valley from about 300 feet to 1,500 feet below the surface. These zones comprise a principal aquifer confined by an approximately 200-foot aquitard comprised of clay and fine-grained sediments. The aquitard separates and protects the principal aquifer from a shallow groundwater system within 50 feet of the surface that is often contaminated with pesticides, fertilizers, and other toxic pollutants.

On average, about 10 percent of the Las Vegas Valley's water supply is sourced from groundwater. However, in the summer months, as much as 25 percent of the valley's water supply is sourced from groundwater. There are over 6,000 wells within the Las Vegas Valley, few of which are within the immediate footprint of the proposed Corridor Alternatives (Figure 4-8.2). The Central Corridor Alternative is near several wells between North Rancho Drive and North Valley View Boulevard. The Western Corridor Alternative would pass wells near along Duck Creek, at the I-15/I-215 interchange, and south of Decatur Boulevard near the railroad tracks.

5.8.4 What Special Considerations Should Be Incorporated in the Impact Assessment?

Consideration of the CWA for potential impacts on WOTUS and the Rivers and Harbors Act (Section 408) for impacts on civil works projects will be important in the future environmental and design phases of project development. To determine whether WOTUS occur in the

recommended I-11 corridor, an aquatic resources delineation would be necessary to determine the boundaries of federally regulated surface waters. Any discharge of fill and/or pollutants into a WOTUS would require acquisition of all necessary permits, including a Section 404 permit from USACE and Section 401 water quality certification from NDEP BWQP. Coordination with USACE and CCRFCD to evaluation potential impacts on USACE civil works projects should also be incorporated into the impact assessment.