Comprehensive Economic Development Strategy

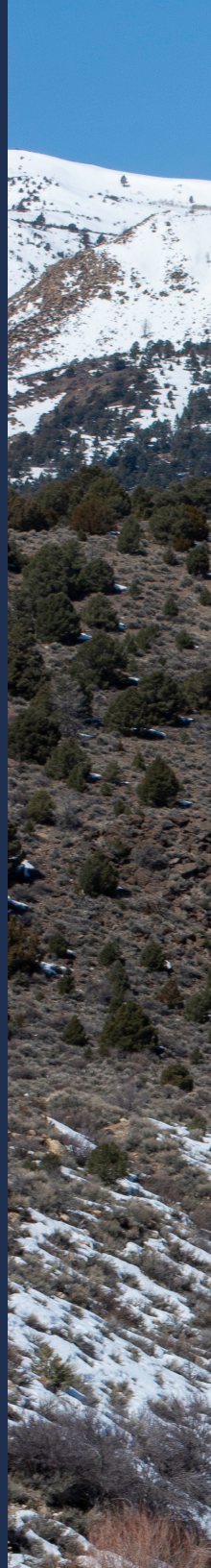
Walker River Corridor, Nevada

Lyon County

Northern Nevada Development Authority

Beacon Economics

Table of Contents



Executive Summary

CEDS Overview

- Working on behalf of Lyon County, Beacon Economics developed the following economic planning framework, known as a Comprehensive Economic Development Strategy (CEDS), for the Walker River Corridor (WRC) region of Northwestern Nevada.
- This study utilizes quantitative as well as qualitative methods to analyze the current state of the local economy.
- Input from stakeholders forms a key component of this report's recommendations which aim to revitalize local industry, housing, and civic life.
- The Walker River Corridor must address two pressing issues: low labor market participation and an undersupply of housing.
- To boost labor market participation the region needs to:
    - o Develop production capacity outside of manufacturing, agriculture, and public administration. Production opportunities are identified in in food manufacturing, logistics, and tourism
    - o Effectively target skilled workers who are culturally aligned with the region, including those who are WRC natives but currently reside in other parts of the country
- To solve problems arising from an undersupply of rental housing the region needs to:
    - o Explore the feasibility of more multi-family development
    - o Conduct design review of non-traditional housing concepts
    - o Apply for stimulus funds for which the region is qualified
    - o Establish regional-level governance with engagement from local, county, and tribal officials as well as the private and nonprofit sectors

Chapter Overview

- Chapter 1 describes the current state of the Walker River Corridor regional economy using an analysis of existing national databases such as the American Community Survey (ACS). Our findings indicate that labor force participation, educational attainment, and broadband connectivity are lower in this region compared to the state and national average.
- Chapter 2 identifies the Strengths, Weaknesses, Opportunities, and Threats (SWOT) of the region through interviews with government (federal and local), nonprofit organizations, business owners and managers, educators, and tribal groups administered between March and May of 2021. Interviewees often mentioned housing as a key challenge in addition to demographics, education, and broadband connectivity.
- Chapter 3 outlines five major strategic outcomes and fifteen more tractable strategic objectives that will improve prosperity while addressing existing challenges in the Walker River Corridor.

This strategic framework should help planners and policymakers create the conditions necessary to revitalize the region.

Introduction

Spanning Lyon County, NV and Mineral County, NV, the Walker River is a river in western Nevada. It flows from the Sierra Nevada mountains in California into Walker Lake in Mineral County. The Walker River Corridor is one of six economic districts that comprise Nevada's Sierra Region, where the Northern Nevada Development Authority (NNDA) directs its economic development efforts.

In late 2020, Lyon County commissioned Beacon Economics to design a Comprehensive Economic Development Strategy (CEDS) for the Walker River Corridor. This report is the final version of that document. It reflects seven months of consultation and collaboration between Beacon Economics, Lyon County, the NNDA, leaders in Lyon and Mineral Counties, and community members. It is intended to provide a framework for economic development activities over the next five years that will focus planning efforts and provide clear benchmarks for success.

About Lyon County

Lyon County is a county is northwestern Nevada. It is one of the nine original counties founded in 1861 and is currently the state's third largest county in population behind Clark County and Washoe County. Yerington, which is part of the Walker River Corridor in this study, is the County seat. However, Fernley (not part of the Walker River Corridor) is the largest city in Lyon County. The County population was 51,980 according to the 2010 Decennial Census, and has grown to 57,510 in 2019. According to the U.S. Census Bureau, the County has a total area of 2,024 square miles (5,240 km²), of which 2,001 square miles (5,180 km²) is land and 23 square miles (60 km²) (1.1%) is water. The Walker River occupies southern Lyon County.

Lyon County is situated in an ideal business location, about one to two hours from Reno and Carson City, Nevada. The Northern California marketplace is only a couple of hours away via railroad or interstate highway. Lyon County also provides a business-friendly environment; the County has low property taxes and no state income tax. In addition, Lyon County has three growing industrial parks in Dayton, Fernley, and Yerington. The Fernley industrial park, now known as Victory Logistics District, has recently broken ground and will include full-service rail switching and transload facilities.

About Mineral County

Named after the heavily mineralized surrounding area, Mineral County is located southeast of and adjacent to Lyon County. It is the fourth least populated county in Nevada. There are no incorporated cities in Mineral County. Hawthorne, is the County seat. The County population was 4,772 according to the 2010 Decennial Census but has declined to 4,505 in 2019. According to the U.S. Census Bureau, the County has a total area of 3,813 square miles (9,880 km²), of which 3,753 square miles (9,720 km²) is land and 60 square miles (160 km²) (1.6%) is water. The Walker River occupies western Mineral County.

WHAT IS A COMPREHENSIVE ECONOMIC DEVELOPMENT STRATEGY (CEDS)?

Formally, a CEDS is a planning document that qualifies jurisidictions for funding offered by the U.S. Economic Development Administration (EDA). The Walker River Corridor conducted its CEDS process following 13 CFR §303.6. This CEDS was developed with broad-based participation from agricultural workers, tourism and hospitality professionals, educators, small-business owners, nonprofit representatives, and community partners. One of the main goals of the document is to determine needs in the regional economy. The CEDS accounts for and, where appropriate, incorporates or leverages other regional planning efforts, including the use of federal funds, private sector resources, and state support that can advance a region's CEDS goals and objectives. The CEDS should be a useful tool for regional economic development decision-making.

CEDS researchers analyze regional conditions, opportunities, and global economic conditions to generate a region-specific, strategy-driven plan for economic prosperity. The CEDS must be updated every five years to maintain its relevance in relation to changing economic condition's. Annual assessments of progress and plans for the coming year also are required. The EDA requires that the following components be incorporated into the document in some form: [1]

- **Background Summary:** The summary of the region uses current, relevant data to describe local economic conditions.
- **SWOT Analysis:** This analysis of Strengths, Weaknesses, Opportunities and Threats (SWOT) provides insights into a region's capabilities, capacity, and aspirations.
- **Strategic Direction/Action Plan:** The strategic direction and associated action plan outline priorities, objectives, and specific activities to be implemented over a set period.
- **Evaluation Framework**: The evaluation framework gauges progress on the implementation of the overall CEDS.
- **Economic Resilience:** In the context of economic development, resilience means the ability to recover quickly from a shock, withstand it, and avoid the shock.

[1] Definitions are provided by the U.S. Economic Development Agency. For detail, see https://www.eda.gov/ceds/

The success of a CEDS hinges on the implementation of specific recommendations. The planning of the CEDS initiated the building of support among partner agencies and will continue throughout the five-year period. Note that not all proposed action items in the CEDS will apply to every local community in the Walker River Corridor.

This document is the culmination of extensive data collection and targeted community engagement across various sectors and pertains to the communities in the Walker River Corridor. In addition, this CEDS is pertinent to all represented jurisdictions because each has a vested interest in improving the region's governance, planning, communication, and engagement. Beacon Economics was the primary researcher. Beacon, Lyon County and representatives from the Northern Nevada Development Authority met biweekly to monitor ongoing research and plan future research and consultation.

CEDS: Funding Outcomes

A CEDS document is a requirement for a region to receive designation as an Economic Development District (EDD) by the Economic Development Administration (EDA). Meeting these requirements allows eligibility for EDA implementation funding from programs such as Public Works and Economic Adjustment Assistance (EAA).

Public Works Program

Public works funding is used to revitalize, expand, and upgrade the infrastructure of a region. The program aims to attract new businesses, increase capacity, diversify the local economy, and generate long-term investment through the acquisition/development of land and infrastructure needed to facilitate industrial growth.

Economic Adjustment Assistance Program

The EAA provides technical planning/assistance and public works and infrastructure assistance to regions that are economically distressed from industrial decline, natural disasters, military base closures, environmental changes, and regulatory changes.

CEDS DEVELOPMENT PROCESS

Planning for the Walker River Corridor CEDS is made possible by a Community Development Block Grant that was secured by Lyon County through the U.S. Department of Housing and Urban Development and the Nevada Office of Economic Development. The team at Beacon Economics met biweekly with a liaison from Lyon County and a liaison from the NNDA to plan, discuss, and develop the CEDS.

Key information for the CEDS was drawn from an array of sectoral interests across many professional organizations in the Walker River Corridor and areas immediately outside the Walker River Corridor.

CEDS Key Informants and Stakeholder Interview Participants

Name	Industry	Affiliation
Allen Biaggi	Nonprofit, Mining	Head of Environmental Affairs, Nevada Mining Association
Malieka Bordigioni	Higher Education	Research Manager, University of Nevada – Reno
Michael Brazier	Nonprofit, Housing	CEO and President, United Way of Northern Nevada
Ken Collum	Public Administration (Federal)	District Manager, Carson City District, NV, Bureau of Land Management
Jack Desai	Business, Tourism & Hospitality	Manager, Hawthorne Best Inn
Patrick Donnelly	Higher Education	Nevada State Director, Center for Biological Diversity
Staci Emm	Higher Education	Professor, University of Nevada - Reno (Mineral County)
Tyre Gray	Nonprofit, Mining	President, Nevada Mining Association
Catherine "Cassie" Hall	Public Administration (Local)	Commissioner, Seat A, Mineral County
Patty Herzog	Nonprofit, Economic Development	Director, Rural Economic and Community Development
Wendy Madson	Nonprofit, Healthcare & Social Assistance	Director, Healthy Communities Coalition of Lyon and Storey Counties
Elveda Martinez	Tribal Representative	Water Resources Coordinator, Walker River Paiute Tribe
Mike O'Carroll	Nonprofit, Conservation	Interim Executive Director, Walker Basin Conservancy
Jeff Page	Public Administration (Local)	County Manager, Lyon County
Amy Pennington	Nonprofit, Conservation	Community Engagement Manager, Walker Basin Conservancy
Bob Potts	Nonprofit, Economic Development	Deputy Director, Nevada Governor's Office of Economic Development
Rob Pyzel	Public Administration (Local)	Planner, Lyon County
Dick Roberson	Business, Real Estate	Real Estate Agent, Roberson Realty
Sean Rowe	Public Administration (Local)	District Attorney, County of Mineral
Robert Switzer	Public Administration (Local)	City Manager, City of Yerington

Community Meeting Participants

Name	Affiliation
Jerry Bryant	General Sales Manager, Wild West Chevrolet, City of Yerington
Matt Cunningham	Exploration Manager, Hudbay Minerals
Timothy M. Dyhr	Vice President - External & Governmental Relations, Nevada Copper Corp
John J. Garry	Mayor, City of Yerington
Amy Gladding	Human Resources and Operations Manager, Walker Basin Conservancy
Catherine "Cassie" Hall	Commissioner, Seat A, Mineral County
Daphne Hooper	City Manager, City of Fernley
Erin Lopez	Assistant to County Manager, County of Lyon
Elveda Martinez	Water Resources Coordinator, Walker River Paiute Tribe
Amy Miller	Business Support Specialist, Northern Nevada Development Authority
Crystal Miller	Real Estate Agent, Las Vegas Real Estate
Jen Nalder	Regional Manager at Kudrna Inc, Anytime Fitness
Mike O'Carroll	Interim Executive Director, Walker Basin Conservancy
Lynn O'Mara	Director of Communications, Northern Nevada Development Authority
Jeff Page	County Manager, County of Lyon
Dick Roberson	Real Estate Agent, Roberson Realty
Sean Rowe	District Attorney, County of Mineral
John Snyder	Information Technology Manager, Snyder Livestock Company, Inc.
Robert Switzer	City Manager, City of Yerington
Amber Torres	Chairman, Walker River Paiute Tribe
Don Vetter	Economic Recovery Coordinator, Western Nevada Development District
Steven Ward	General Manager, Yerington Inn
Leslie Williams	Finance Director, Walker River Paiute Tribe

Committee/community meetings began in April 2021 and continued until June. At each meeting, members offered perspectives and opinions on the current and future state of the CEDS document. This included oral and written input ranging from general feedback and direction to line-item edits on document drafts. All interviews, focus groups, and meetings were held virtually due to COVID-19 public health mandates, with the exception of the community meeting that took place on June 10, 2021. Guided by initial findings, these consultations gathered input on regional assets, and local assets with a regional impact, to help identify factors to further the region's economic position.

Finally, the CEDS Committee/community sent out business surveys to local business owners and managers.

STRUCTURE OF THE WALKER RIVER CORRIDOR CEDS

This document guides the Walker River Corridor's public agencies and departments, tribal groups, businesses, nonprofit organizations, and local communities in understanding the economic landscape (e.g historical trends, competitive advantages, chronic challenges, and most recently the impact of COVID-19) in order to inform future growth and development. The following areas are addressed across seven chapters:

- Part 1: Summary of Economic Conditions
- Part 2: SWOT Analysis
- Part 3: Strategic Framework & Action Plan
- Appendix A: Infrastructure Inventory
- Appendix B: Targeted Industry Snapshot: Mining
- Appendix C: Maps

Chapter 1: SUMMARY OF ECONOMIC CONDITIONS

This summary of economic conditions seeks to assess the performance of the Walker River Corridor economy along key dimensions, including population dynamics, labor force activities, industrial composition, and infrastructure. The analysis includes static 'snapshots' of how the corridor performs across key variables and a discussion of recent trends over the past five years, while taking into consideration the effects of the ongoing pandemic. The main objective of this study is to generate a reliable understanding of the region's economic profile.

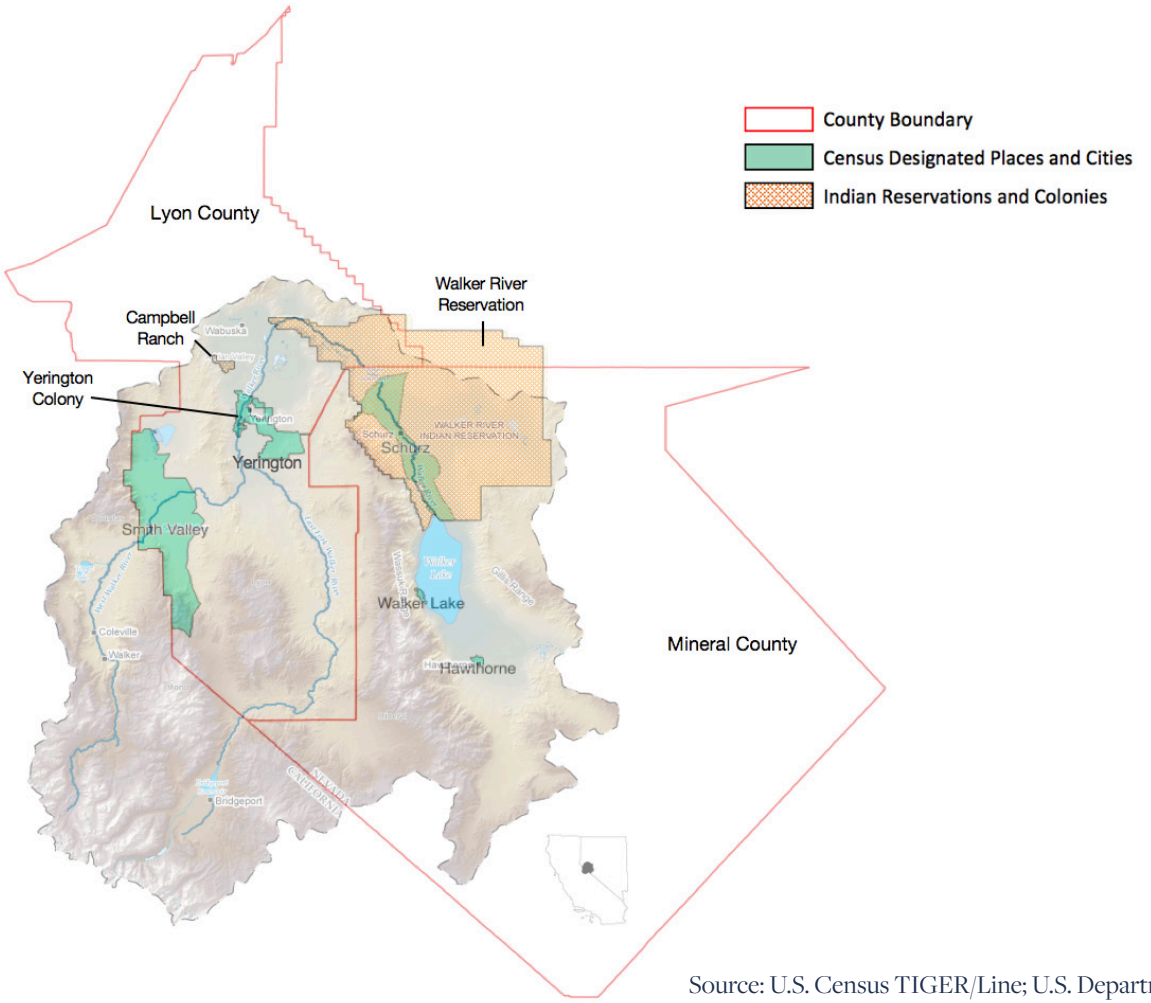
Unless otherwise noted, this analysis is mainly conducted using data from the U.S. Census Bureau's American Community Survey. The American Community Survey (ACS) is an annual demographic survey that randomly samples 3.5 million Americans. It solicits information on people, workers, and housing. The survey, which consisted of 44 topics in the 2020 version,[2] is more substantial than the decennial census. The ACS is the most respected source for granular data on communities due to its large size, geographic coverage, and response rate. More than 95% of those surveyed usually complete the questionnaire.

[2] A copy of the American Community Survey can be viewed here: https://www2.census.gov/programs-surveys/acs/methodology/questionnaires/2020/quest20.pdf

MAPPING THE WALKER RIVER CORRIDOR

The Walker River Corridor spans Lyon County and Mineral County. Figure 2 illustrates the area contained in the region.

Figure 1.1:
Corridor Boundaries and Cities



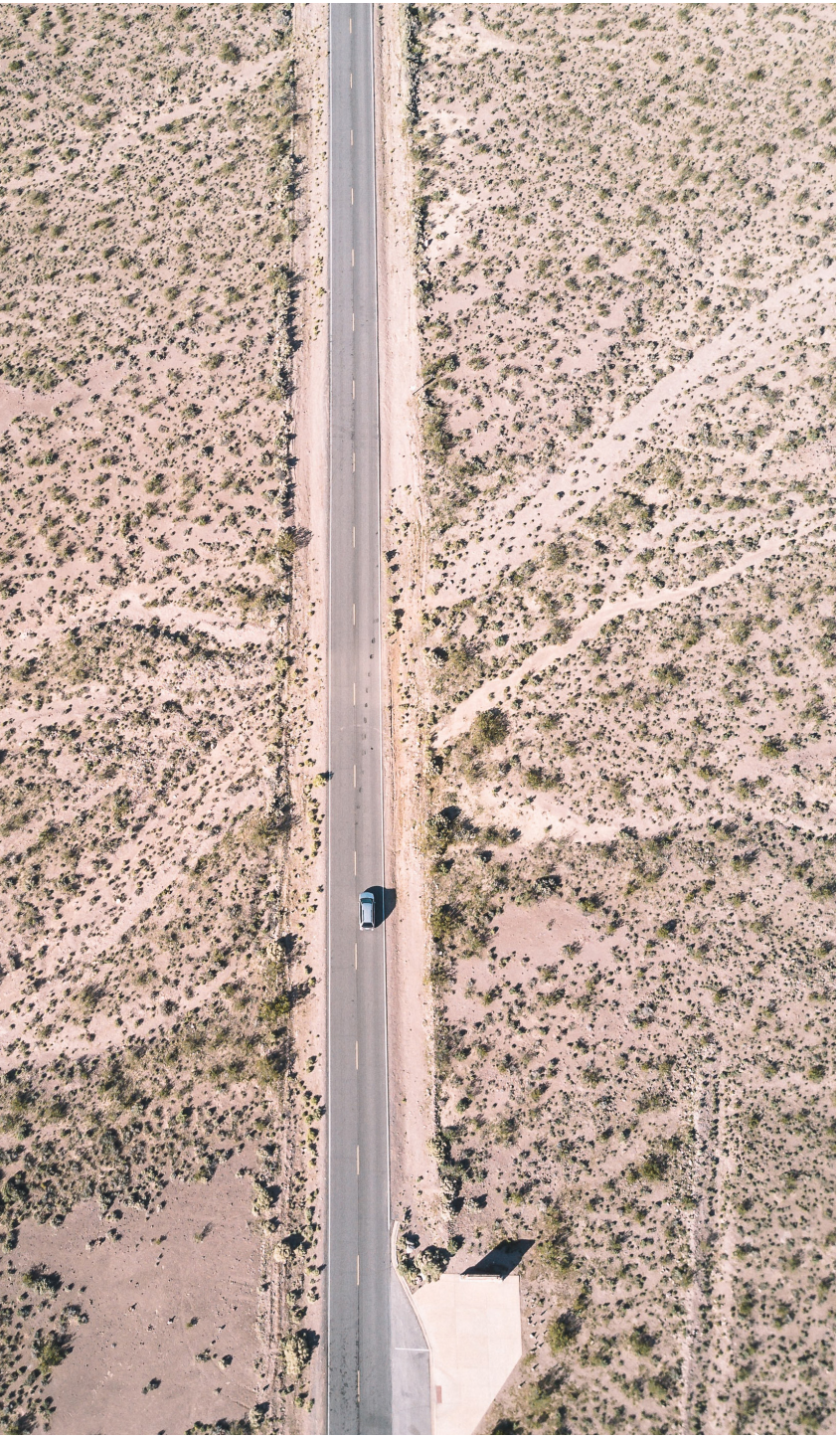
Source: U.S. Census TIGER/Line; U.S. Department of the Interior

The map also shows boundaries for Census Designated Places (CDPs) and American Indian Reservations (AIRs). These are functional geographic units to which Census Data can be aggregated. They can be thought of as the literal communities referred to by the American Community Survey. CDPs tend to coincide with municipal boundaries but they will also extend beyond these to capture suburban and exurban areas.

Our economic estimates are based on data CDP and AIR data. Averages for the corridor are calculated using population-weighted data from each of the following areas

- **Lyon County:** City of Yerington and Smith Valley (CDPs), Campbell Ranch, and Yerington Colony (AIRs). Yerington Colony lies completely within the boundary of the City of Yerington
- **Mineral County:** Schurz, Walker Lake, and Hawthorne (CDPs). Where applicable, this study will also analyze the Walker River Reservation, which entirely encompasses Schurz CDP. Note that part of the Walker River Reservation lies in Lyon County and Churchill County.

A limited population of the Walker River Corridor lives outside of CDPs and AIRs. Census data is not released for the areas outside of those indicated on the map. Fortunately, the non-surveyed population is not large enough to meaningfully alter our estimates. In addition, we oversample' the uncounted areas in the remaining phases of our research.



ECONOMIC PROFILES

Here, we describe the economy of the Walker River Corridor in static terms, based on ACS estimates from 2014 through 2019 and in terms of the five-year trend. These estimates reflect the most recent data on the regional economy from the US Census Bureau. It is important to note this data does not include the Covid-19 pandemic period.

Population and Population Growth

Population is a key economic indicator because it describes the scale of economic activity that is necessary to support a region. Larger areas need more jobs and firms, smaller ones need fewer. Similarly, growing regions need to ensure that income, wages, and tax proceeds respond to population changes. Figure 1.2 shows Walker River Corridor population levels in 2019 and changes between 2014 and 2019.

Just over 9,000 people reside in the Walker River Corridor. The Walker River Corridor represents a relatively large share of the Mineral County population and a small share of Lyon's. Schurz CDP, Walker Lake CDP, and Hawthorne CDP command 90% of the county's population. Meanwhile, the City of Yerington and Smith Valley CDP make up just 9% of Lyon County's population. 15% of the combined populations of both counties live in the area.

Figure 1.2:
Population and Population Growth 2019-2014

Region	2019	2014	5-Year Change	5-Year Pct. Change
Campbell Ranch	485	493	-8	1.6%
Smith Valley CDP	1,627	1,339	288	21.5%
City of Yerington	3,137	3,030	107	3.5%
Yerington Colony	243	229	-14	-5.8%
Hawthorne CDP	2,686	3,272	-586	-17.9%
Walker Lake CDP	310	327	-17	-5.2%
Walker River Reservation	1,165	812	353	43.5%
Schurz CDP	1,026	728	298	40.9%
Walker River Corridor	**9,410**	**9,273**	**137**	+**1.5**%
County & State Level Population for Comparison:				
Lyon County	54,380	51,579	2,801	+5.4%
Mineral County	4,460	4,627	-167	-3.6%
Nevada State	2,972,382	2,761,584	210,798	+3.5%

Source: American Community Survey 5-Year Estimates

Note: Data for the Native American Tribal areas are denoted in italics

The Lyon and Mineral County sides of the Walker River Corridor have seen different growth patterns. The population grew in Campbell Ranch, Smith Valley CDP, and the City of Yerington (Lyon County's side of the Corridor). On the other hand, Hawthorne CDP's population declined substantially from 2014 to 2019, which offset the population growth in the Walker River Reservation (Mineral County's side of the Corridor). Overall, the Corridor's population declined 6% on Mineral County's side. Different population dynamics underscore the degree to which different economic processes may be operating in the area. This is a consistent theme of the present analysis.

Age Structure

Figure 1.3 shows basic information related to the age of the population. The Walker River Corridor is older than the state at-large with 29% of its residents age 65 or older, twice as high as for the state as a whole (15%). The working-age cohort of 18- to 64-year-olds comprises less than half of the corridor's population (48%), which is much less than for the state as a whole (62%). The proportion of residents who are children under 18 years old is about the same as statewide (22% versus 23%).

Figure 1.3:
Population by Age Cohort

Region	Under 18	Age 18-64	65 and Older	Median Age	Age Dependency Ratio
Campbell Ranch	25%	60%	14%	29.8	66%
Smith Valley CDP	19%	42%	38%	59.9	136%
City of Yerington	27%	47%	26%	41.7	113%
Yerington Colony	38%	56%	6%	29.4	78%
Hawthorne CDP	16%	49%	35%	55.8	105%
Walker Lake CDP	14%	38%	47%	64.1	161%
Walker River Reservation	29%	57%	13%	29.8	75%
Schurz CDP	30%	56%	14%	30.3	78%
Walker River Corridor	**22%**	**48%**	**29%**		107%
State of Nevada	23%	62%	15%	38.0	62%

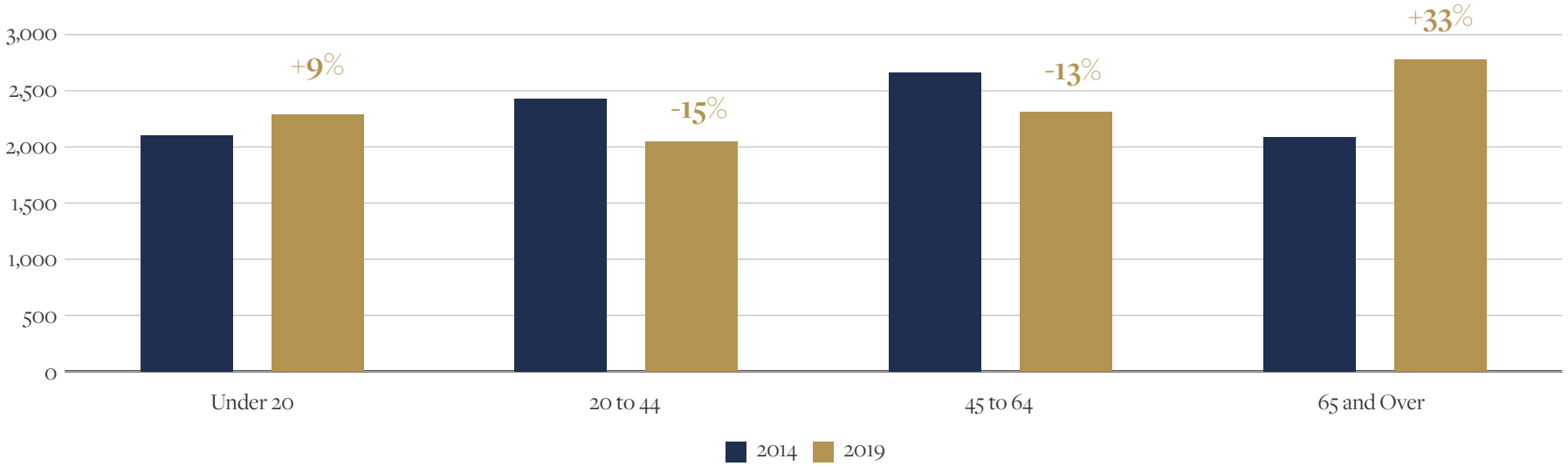
Source: American Community Survey 5-Year Estimates

Note: Data for the Native American Tribal areas are denoted in italics

The median age is lower in the three Native American Tribal areas than in non-tribal areas of the Corridor (Smith Valley CDP, the City of Yerington excluding Yerington Colony, Hawthorne CDP, and Walker River CDP). Age dependency ratios, which divide the non-working age population by the working-age population, are also significantly lower in the three Native American Tribal Areas compared to the state average of 62%.

Nonetheless, the Walker River Corridor as a whole has a significantly higher age dependency ratio (107%) than Nevada as a whole (62%). A high dependency ratio tends to inhibit economic growth due to decreases in aggregate savings rate and investment rate because people of non-working age tend to be out of the workforce and thus not saving by definition. [3]

Figure 1.4:
Population Age Distribution, 2014 vs. 2019



Source: American Community Survey 5-Year Estimates

Figure 1.4 shows how the age distribution changed between 2014 and 2019. Seniors are the fastest rising group by age. In addition, the working-age population (ages 20 to 64) declined between 2014 and 2019. As a result, the age-dependency ratio increased from 76% in 2014 to 107% in 2019. From 2014 to 2019, the senior population jumped by more than 50% in two of the three largest sub-regions: Smith Valley CDP (+75%) and Hawthorne CDP (+56%).

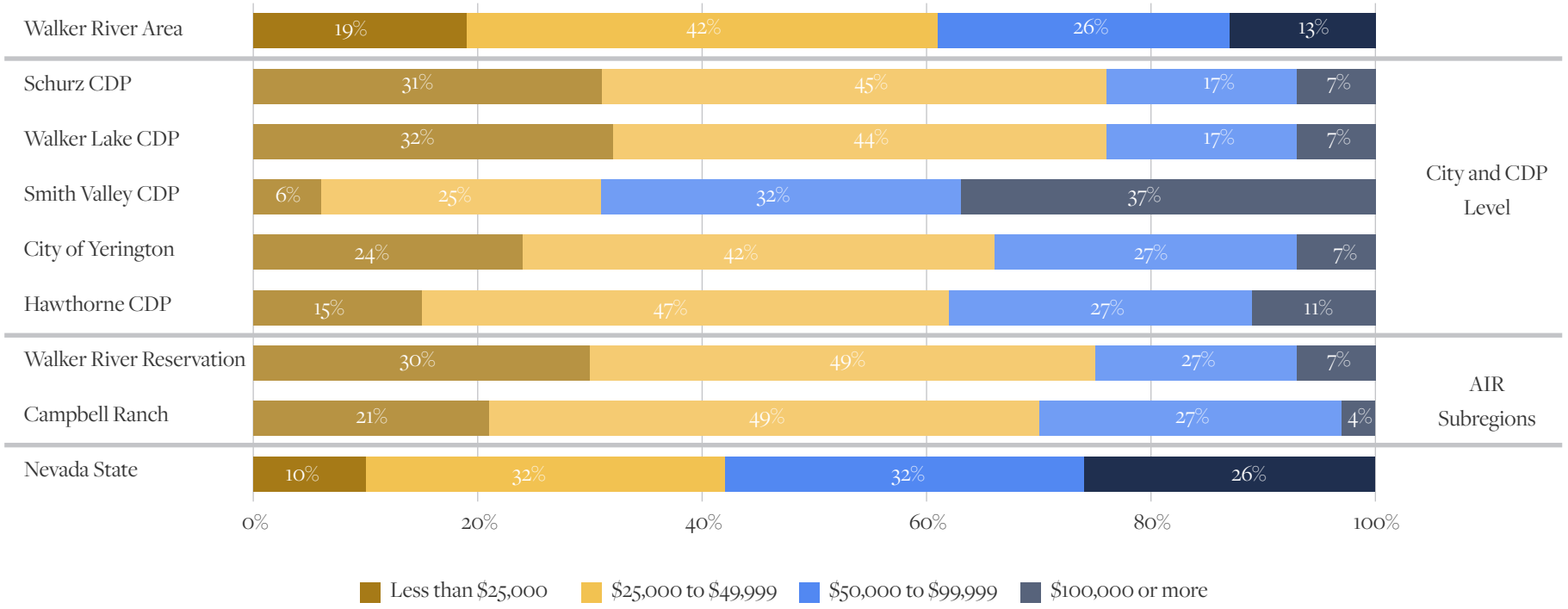
The region's demographic changes suggest that its economic challenges might be further intensifying. A declining working-age population is a signal of stagnating economic opportunities, and provides evidence that prime age workers may be relocating to growing areas like Reno, Carson City, and Fernley. The growing senior population is itself a challenge as it tends to be associated with more demand for healthcare services.

[3] Santacreu, A. M. (September 2, 2016). "Long-Run Economic Effects of Changes in the Age Dependency Ratio." Economic Research, Federal Reserve Bank of St. Louis. Retrieved from: https://doi.org/10.20955/es.2016.17

Household Income

Direct evidence of economic prosperity comes via household income data. Income is a composite category that includes wage, retirement, and investment income. Figure 1.5 shows income distribution across income groups for the region at large and its statistical areas. We see that 61% of households in the Walker River Corridor are in the bottom two income groups, earning less than $50,000 per annum. This indicates that the region is less developed on average than statewide, where only 42% of households earn less than $50,000 per annum.

Figure 1.5:
Average Household Income by Income Group

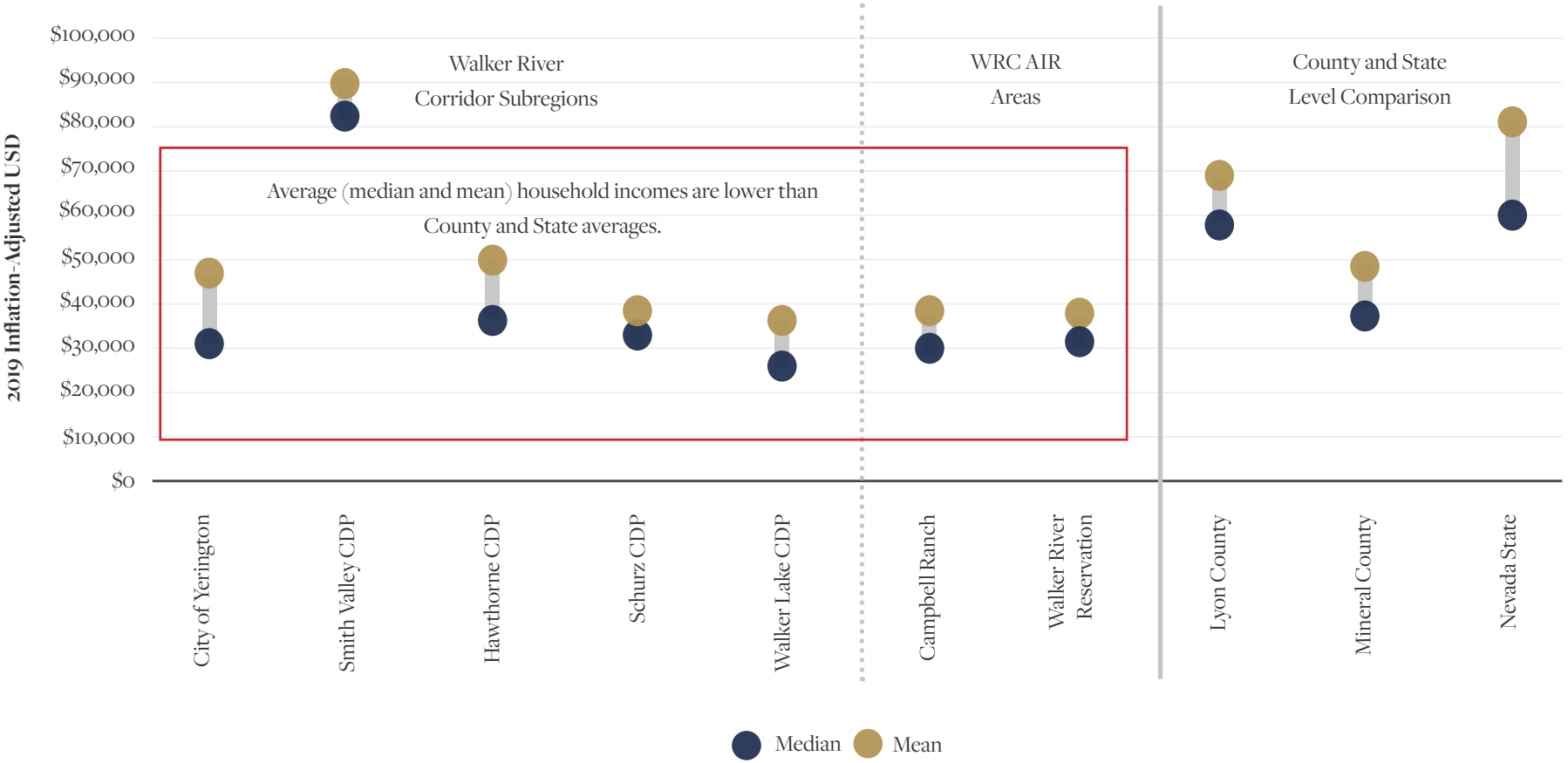


Source: American Community Survey 5-Year Estimates

Note: Yerington Colony is not reported due to the small sample size.

Among the Walker River Corridor sub-areas, we see that only Smith Valley has a higher percentage of households in the top two income groups than does the state of Nevada. Smith Valley also has the fewest households in the bottom income group. Schurz and the Walker River Reservation has the lowest proportion of higher-income households, with only 24% of households making over $50,000 in these two areas The differences between Smith Valley and the rest of the region are clearest in Figure 1.6, which plots the median and mean income levels for each area. Only Smith Valley's values are comparable to the state average.

Figure 1.6:
Mean and Median Household Income, 2019

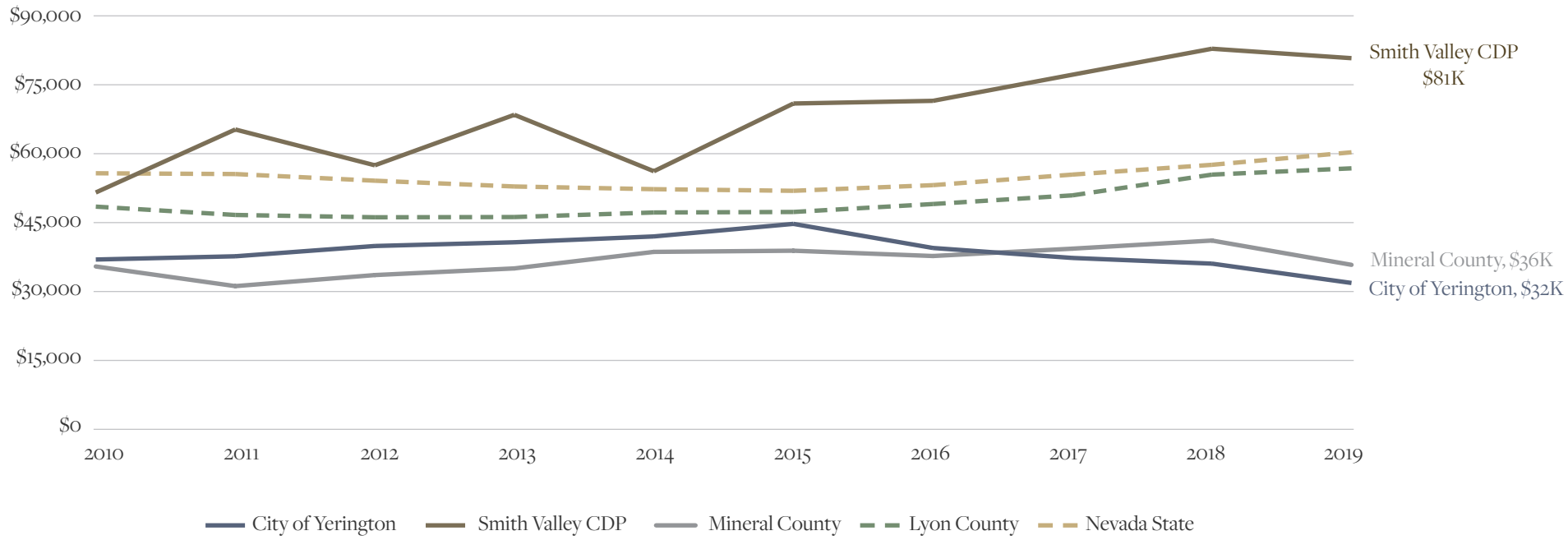


Source: American Community Survey 5-Year Estimates

Note: Yerington Colony is not reported due to the small sample size.

Median household income trended in a negative direction toward the end of the 2010s (Figure 1.7). Smith Valley, Mineral County, and the City of Yerington all saw income declines between 2018 and 2019, while Lyon and Nevada saw increases. Income data from the pandemic periods is not yet available at this geographic level.

Figure 1.7:
Median Household Income, 2010-2019



Source: American Community Survey 5-Year Estimates
Note: Since Mineral County's side of the Walker River Corridor's population represents about 90% of the county's population, median household income is presented at the county level instead of at sub-region level, which minimizes data volatility.

Educational Attainment

Educational attainment is understood by economists to represent 'human capital'. Generally, workers with more educational attainment possess economically valuable skills that generate higher wages. Figure 8 decomposes educational attainment into three categories: High School Degrees or less, some post-secondary experience, and a bachelor's degree or above. This analysis only considers workers in the labor force who are 25 or older.

Figure 1.8:
Average Educational Attainment by Group

Region	Less Than HS & Grad	Some College & AS/AA Degree	Bachelor's Degree or Above
Campbell Ranch	67.2%	26.1%	6.6%
Smith Valley CDP	26.4%	50.4%	23.3%
City of Yerington	45.7%	37.6%	16.7%
Yerington Colony	65.0%	33.3%	1.7%
Hawthorne CDP	44.3%	36.7%	19.1%
Walker Lake CDP	31.1%	58.0%	10.9%
Walker River Reservation	54.6%	39.7%	5.7%
Schurz CDP	53.6%	40.6%	5.8%
Walker River Corridor	42.9%	40.1%	16.9%
State of Nevada	41.4%	33.9%	24.7%

Source: American Community Survey 5-Year Estimates
Note: Data for the Native American Tribal areas are denoted in italics

Walker River Corridor workers are as likely to have post-secondary experience as the average Nevadan but less likely to have a bachelor's degree or beyond. Smith Valley CDP, which has significantly higher median household income than the rest of the Corridor also stands out for having higher educational attainment than the rest of the Corridor.

In addition, within the Corridor, educational attainment tends to be lower in the tribal areas than in the non-tribal areas. Less than 7% have a bachelor's degree or above in the tribal areas, or less than twice that of the Corridor average of 16.9%. Meanwhile, 3 out of 5 residents age 25 and older in the tribal areas have no more than a high school diploma compared to 2 out of 5 residents in the non-tribal areas, a difference of 20 percentage points. These patterns highlight the connection between educational attainment, income, and economic development in general.

Employment

Figure 1.9 shows labor market fundamentals. Less than half (45.5%) of the roughly 8,000 Walker River Corridor residents who are 16 or older are either in jobs or actively looking. Economists refer to this as the Labor Force Participation Rate (LFPR). The corridor's LFPR significantly trails the state average both among the working-age population (63.7%) and the 'prime' working age (20-64 year olds) cohort (77.7%). Low rates, particularly among workers who are not of retirement age, suggest a lack of local labor market opportunities in the Corridor when compared to the state. Within the Walker River Corridor, we see the lowest prime participation rates in Walker Lake and the Yerington Colony. The prime rate for Hawthorne is closest to the state average at 73.9 percent.

Figure 1.9:
Key Employment Statistics

Region	Population Age 16 and Older	LFPR (Age 16+)	LFPR (Age 20-64)	Unemployment Rate
Campbell Ranch	421	53.0%	69.1%	27.4%
Smith Valley CDP	1,383	42.7%	66.8%	3.0%
City of Yerington	2,486	43.9%	64.0%	11.8%
Yerington Colony	154	46.1%	56.3%	16.9%
Hawthorne CDP	2,335	47.2%	73.9%	8.2%
Walker Lake CDP	266	31.2%	47.3%	10.8%
Walker River Reservation	847	50.8%	65.9%	22.1%
Schurz CDP	740	49.1%	63.4%	20.9%
Walker River Corridor	**7,738**	**45.5%**	**67.4%**	**11.4%**
State of Nevada	2,366,398	63.7%	77.7%	6.2%

Source: American Community Survey 5-Year Estimates
Note: Data for the Native American Tribal areas are denoted in italics

The Walker River Corridor has a higher share of people working for the government than does Nevada or Lyon County as a whole (Figure 1.10). Most of these workers are local government employees (employed as teachers, protective services workers, etc.) rather than state or federal government employees. Only 56.3% of people are employed by private establishments in the Walker River Corridor compared to 79.6% in Nevada and 76.8% in the entirety of Lyon County. This relatively small share of private sector employment is another indication that the local economy could provide more job opportunities to its residents.

Figure 1.10:
Employment by Establishment Type

Class of Worker	Walker River Corridor	Lyon County	Mineral County	State of Nevada
Private for Profit	**53.0**%	73.2%	48.0%	76.1%
Private Nonprofit	**3.3**%	3.6%	2.5%	3.5%
Government	**34.5**%	16.2%	41.7%	11.7%
Self-Employed	**9.2**%	7.1%	7.8%	8.6%
Incorporated	**3.7**%	2.0%	3.5%	3.1%
Not Incorporated	**5.6**%	5.1%	3.4%	5.5%
Total	**100.0**%	100.0%	100.0%	100.0%

Source: American Community Survey 5-Year Estimates

Industry Profile

Figures 1.11 and 1.12 detail the kinds of employment opportunities available in the region in terms of industry and occupation. Educational Services, and Health Care and Social Assistance and Public Administration are the largest industry sectors in the Walker River Corridor, employing 20% and 17% of the workers, respectively. Both industries shed employment from 2014 to 2019 Arts, Entertainment, and Recreation, and Accommodation and Food Services is another major industry sector in the Corridor, employing 13% of the workers.

Figure 1.11:
Employment by Industry, 2014 vs. 2019

Industry	2019	2014	Abs. Change	Pct. Change
Educational Services, and Health Care and Social Assistance	612	736	-124	-17%
Public Administration	515	608	-93	-15%
Wholesale & Retail Trades	480	153	327	214%
Arts, Entertainment, and Recreation, and Accommodation and Food Services	416	473	-57	-12%
Professional, Scientific, and Management, and Administrative and Waste Management Services	208	278	-70	-25%
Agriculture, Forestry, Fishing and Hunting, and Mining	202	205	-3	-1%
Construction	185	302	-117	-39%
Other Services, Except Public Administration	167	107	60	56%
Information, Finance, Insurance, and Real Estate	159	175	-16	-9%
Transportation and Warehousing, and Utilities	91	125	-34	-27%
Manufacturing	85	177	-92	-52%
Total	**3,120**	**3,339**	**-219**	-7%

Source: American Community Survey 5-Year Estimates

Figure 1.12:
Employment by Occupational Group, 2014 vs. 2019

Industry	2019	2014	Abs. Change	Pct. Change
Management, Business, Science, and Arts	846	754	92	12%
Sales and Office	730	523	207	40%
Service	674	1,135	-461	-41%
Production, Transportation, and Material Moving	573	411	162	39%
Natural Resources, Construction, and Maintenance	297	516	-219	-42%
Total	3,120	3,339	-219	-7%

Source: American Community Survey 5-Year Estimates

Service occupations used to be the largest occupational group in the Walker River Corridor, but employment has declined greatly from 2014 to 2019. On the other hand, employment in Sales and Office occupations and Production, Transportation, and Materials Moving (Logistics) occupations have increased. Beacon's subsequent analysis will seek to determine whether growing job sectors represent opportunities for further investment and workforce development.

Location Quotient

Location quotient (LQ) analysis is used to classify a region's industry sectors as export industries (industries that market their output outside the region in which they are located; LQ > 1) or import industries (industries where a large portion of the demand for goods and services is satisfied by producers outside the region; LQ < 1).

Figure 1.13:
Industry Sector Location Quotient, Walker River Corridor, 2019 vs. 2014

Industry	2019	2014
Educational Services, and Health Care and Social Assistance	0.84	0.96
Public Administration	3.67	3.91
Wholesale & Retail Trades	1.15	0.32
Arts, Entertainment, and Recreation, and Accommodation and Food Services	1.38	1.44
Professional, Scientific, and Management, and Administrative and Waste Management Services	0.56	0.75
Agriculture, Forestry, Fishing and Hunting, and Mining	3.76	3.07
Construction	0.85	1.44
Other Services, Except Public Administration	1.12	0.65
Information, Finance, Insurance, and Real Estate	0.61	0.60
Transportation and Warehousing, and Utilities	0.52	0.76
Manufacturing	0.27	0.52
Total	**1.00**	**1.00**

Source: American Community Survey 5-Year Estimates; Calculations by Beacon Economics

The local economy is highly dependent upon Agriculture, Forestry, Fishing and Hunting, and Mining industries (LQ = 3.76 in 2019). Yerington and its surrounding areas have a very strong agricultural industry sector with anchor firms such as Peri & Sons. Both Lyon and Mineral counties also have strong mining presences. Since 2014, these industries have become even more over-represented and have become even stronger net exporter industry sectors.

Public Administration is another strong net exporter industry sector (LQ = 3.67 in 2019). This is a natural result given that the county seats of both Lyon County and Mineral County (Yerington and Hawthorne, respectively) are part of the Walker River Corridor, where most of the local and regional government positions are located.

Arts, Entertainment, and Recreation, and Accommodation and Food Services is also a relatively strong net exporter (LQ = 1.38 in 2019), owing to the fact that there are many outdoor attractions and activities within the Walker River Corridor.

Location Quotient analysis can be used to target new industries or businesses for the community and formulate economic development strategies, which are discussed in detail in the Strategic Framework section of this report.

Shift Share Analysis

Similar to the Location Quotient analysis, Shift Share Analysis is an economic development analytical tool used to determine a region's competitiveness and changing employment patterns in the industrial marketplace. There are three components to changes in employment: National component, industrial mix component and competitive share component. The national component measures how much change is due to overall national trend and the industrial mix component measures how much change is due to the corresponding national counterparts for each industry. From a regional economic development perspective, the competitive share component is what informs the region of its competitive advantages and weaknesses.

Figure 1.14:
Shift Share Analysis, Walker River Corridor, 2014-2019

Industry	National Component	Industrial Mix	Competitive Share	Total
Educational Services, and Health Care and Social Assistance	53	9	-186	-124
Public Administration	44	-23	-114	-93
Wholesale & Retail Trades	11	-10	326	327
Arts, Entertainment, and Recreation, and Accommodation and Food Services	34	-8	-83	-57
Professional, Scientific, and Management, and Administrative and Waste Management Services	20	19	-109	-70
Agriculture, Forestry, Fishing and Hunting, and Mining	15	-31	13	-3
Construction	22	35	-174	-117
Other Services, Except Public Administration	8	-3	56	60
Information, Finance, Insurance, and Real Estate	13	-7	-22	-16
Transportation and Warehousing, and Utilities	9	18	-61	-34
Manufacturing	13	-6	-98	-92
Total	**242**	**-8**	**-453**	**-219**

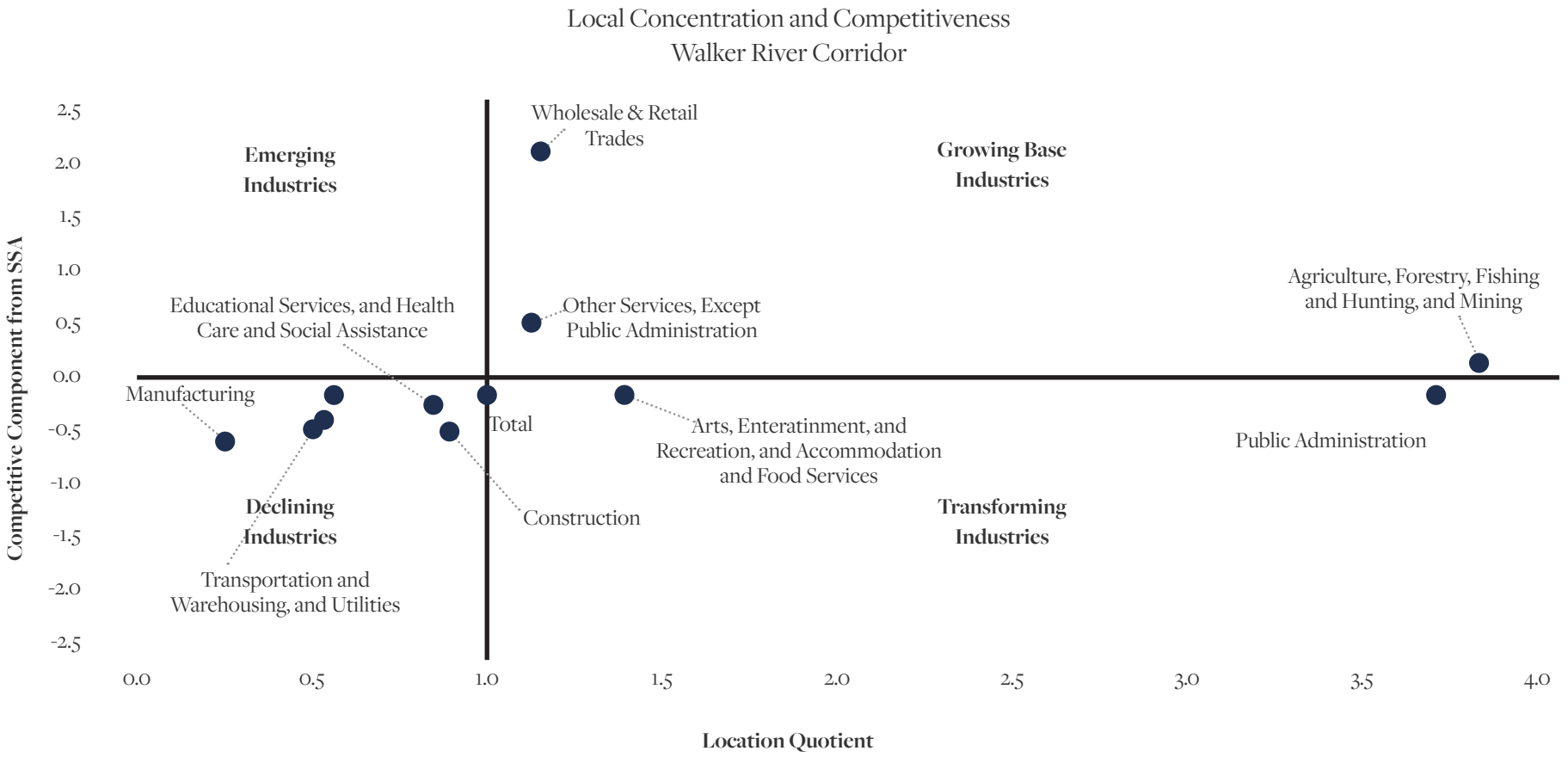
Source: American Community Survey 5-Year Estimates; Calculations by Beacon Economics

In the Walker River Corridor, total employment for Agriculture, Forestry, Fishing and Hunting, and Mining declined by only three jobs from 2014 to 2019. If employment in the region changed at the same pace as the overall national rate, the region would have added 15 jobs for this industry sector instead (national component), since there are more people employed in 2019 than in 2014 nationwide. However, because the Agriculture, Forestry, Fishing and Hunting, and Mining industry sector has been shrinking nationwide (industrial mix component), employment in this industry sector would have shrunk by 31 jobs in the Walker River Corridor. However, the competitive share for the Walker River Corridor's Agriculture, Forestry, Fishing and Hunting, and Mining sector was an increase of 13 jobs. This implies the Walker River Corridor had a competitive advantage over other regions in the nation for Agriculture, Forestry, Fishing and Hunting, and Mining employment.

On the other hand, the Walker River Corridor had a competitive disadvantage for its Arts, Entertainment, and Recreation, and Accommodation and Food Services employment, contracting by 83 jobs. Overall, employment growth in the Walker River Corridor contracted by 219 jobs between 2014 and 2019, with a competitive disadvantage (-453 jobs) during the five-year period.

The Location Quotient Analysis and Shift Share Analysis together inform which industries are transforming, growing, declining, or emerging in the Walker River Corridor relative to a reference economy. Businesses in an industry with a high local concentration (location quotient greater than 1) are considered to be part of an existing regional economic industry cluster.

Figure 1.15:
Growing Base, Transforming, Emerging, and Declining Industry Sectors in the Walker River Corridor



A competitive share (CS) greater than 0, and a location quotient (LQ) greater than 1, indicates a certain industry is growing due to a high local concentration (a net exporter) and a competitive advantage. Industries with these characteristics in the Walker River Corridor are (1) Agriculture, Forestry, Fishing and Hunting, (2) Mining, (3) Wholesale & Retail Trades and (4) Other Services, Except Public Administration.

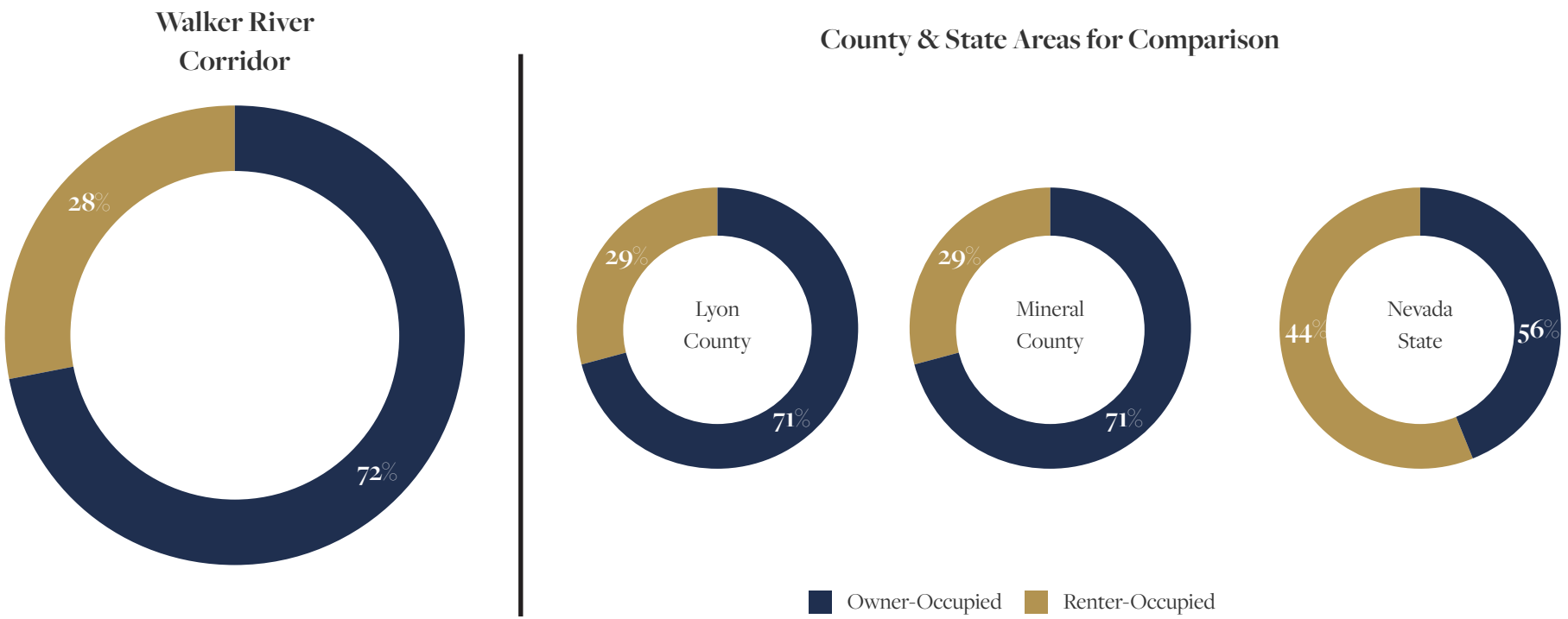
There are a few net exporter industry sectors with competitive disadvantages in the Walker River Corridor; these are known as transforming industries. While the local Walker River Corridor economy has a high concentration of these industry sectors, these may be undergoing unique challenges and need to innovate to remain competitive. These industry sectors are: Public Administration and Arts, Entertainment, and Recreation, and Accommodation and Food Services.

An emerging industry has a low local concentration but a competitive advantage. Such industry has a potential to grow into an established regional economic industry cluster. But there are no industry sectors that are classified as emerging in the Walker River Corridor.

Housing

Housing plays an important role in economic development because: (1) the share of household spending on housing tends to indicate the overall standard of living and (2) adequate housing supply is necessary to generate new jobs.

Figure 1.16:
Average Housing Tenure: Walker River Corridor and Containing Areas



Source: American Community Survey 5-Year Estimates; Calculations by Beacon Economics

Figure 1.16 shows tenure in the corridor and beyond, describing the type of housing market that prevails in the area. A higher percentage of housing units is owner-occupied in the Walker River Corridor than statewide (72% vs. 56%), which means the homeownership rate is higher in the Walker River Corridor. This is not surprising given that rural areas tend to have higher rates of homeownership. Housing tenure in the Walker River Corridor nearly matches the rates in Lyon and Mineral counties.

In the Walker River Corridor, non-tribal areas generally have a higher percentage of owner-occupied housing units than tribal areas (Figure 1.17). Within non-tribal areas, Smith Valley CDP has the highest percentage of occupied units that are owner-occupied (91%) while the City of Yerington (66%) has the lowest rate, which is similar to the overall rate in tribal areas.

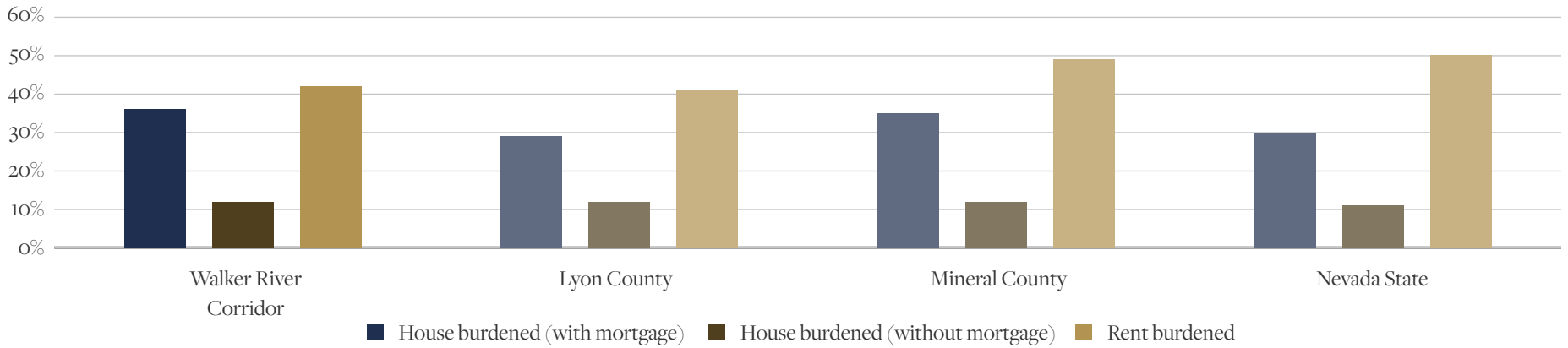
Figure 1.18 shows how many households are "burdened" by their housing payments. In general, households that spend more than 30% of monthly income on rent or mortgage payments are considered burdened. The chief concern with burdened households is that they struggle to cover basic non-housing expenses. The Walker River Corridor has a higher percentage of owner households that are house burdened but a lower percentage of burdened renter households compared to statewide. Given that most households own their properties, we can conclude that housing burden is more of a problem in the Corridor than in the state generally.

Figure 1.17:
Housing Tenure Within the Walker River Corridor

Region	Owner Occupied	Renter Occupied
Walker River Corridor	72%	28%
Non-Tribal Areas	73%	27%
Tribal Areas	66%	34%

Source: American Community Survey 5-Year Estimates
Note: Non-Tribal Areas refer to Hawthorne CDP, Smith Valley CDP, Walker Lake CDP, and the City of Yerington (excluding Yerington Colony). Tribal Areas refer to Campbell Ranch, Walker River Reservation (which includes Schurz CDP), and Yerington Colony.

Figure 1.18:
Percentage of House and Rent Burdened Households, 2019



Source: American Community Survey 5-Year Estimates

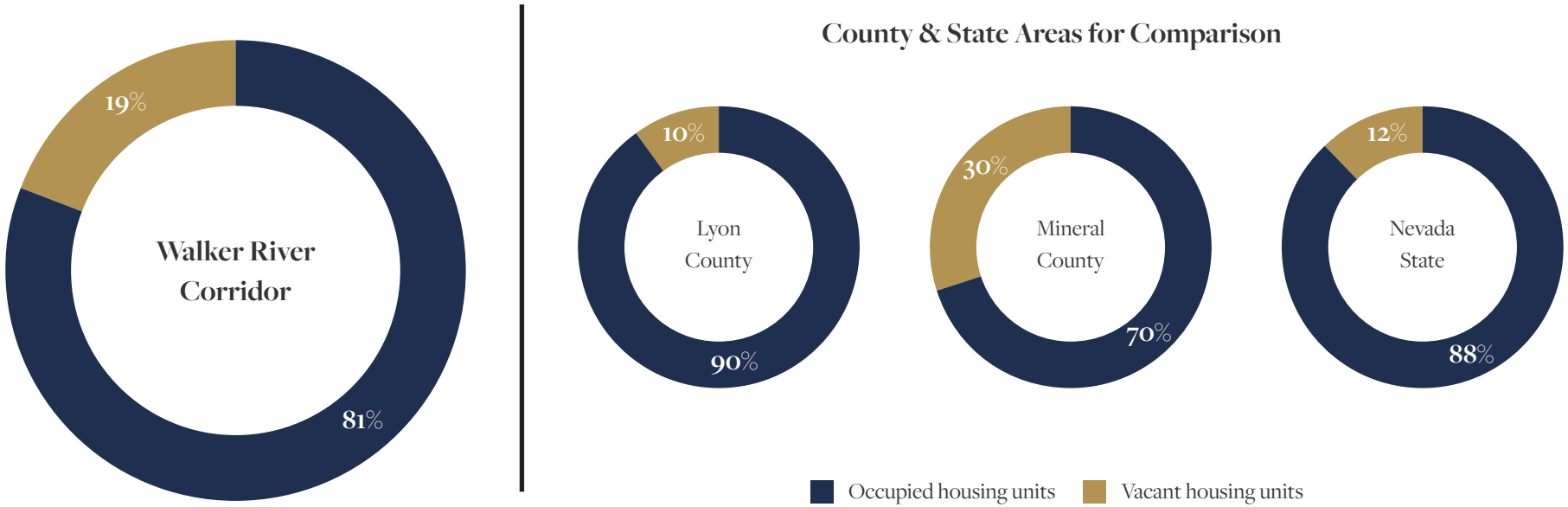
Figure 1.19:
Median Monthly Housing Costs, 2019

Region	With Mortgage	No Mortgage	Rent
Walker River Corridor			
Non-Tribal Areas	$920 - $1,809	$207 - $532	$318 - $658
Tribal Areas	$331 - $600	$196 - $243	$315 - $425
Lyon County	$1,283	$370	$1,033
Mineral County	$909	$278	$610
Nevada State	$1,524	$426	$1,107

Per Figure 1.19, Median housing costs are lower in the Walker River Corridor than statewide and the average housing costs are lower within the tribal areas of the Walker River Corridor. Housing costs and income are generally positively correlated; the Corridor has lower incomes and housing costs than statewide. Within the Corridor, housing costs are the highest in Smith Valley CDP, where median household income is also the highest.

Source: American Community Survey 5-Year Estimates
Note: Non-Tribal Areas refer to Hawthorne CDP, Smith Valley CDP, Walker Lake CDP, and the City of Yerington (excluding Yerington Colony). Tribal Areas refer to Campbell Ranch, Walker River Reservation (which includes Schurz CDP), and Yerington Colony.

Figure 1.20:
Average Vacancy: Walker River Corridor and Containing Areas



Source: American Community Survey 5-Year Estimates

Figure 1.20 suggests that area rent burden is not related to the stock of housing, as it is elsewhere in the state. There is a higher percentage of vacant housing stock in the Walker River Corridor than statewide. Mineral County has a significantly higher percentage vacancy rate than Lyon County at-large. One in three units is vacant in Walker River Lake CDP and three in ten units are vacant in Hawthorne. The percentage of vacant housing is also higher in the non-tribal areas of the Walker River Corridor (20% composite average) than in the tribal areas of the Corridor (10% composite average). The percentage of housing units that are vacant is particularly low in Campbell Ranch (1%), indicating a possible housing shortage.

Unlike elsewhere in Nevada, where many units are vacant for rent or for seasonal and recreation reasons, the majority of the vacant housing stocks in the Walker River Corridor are empty for reasons classified as "other vacant" by the U.S. Census. These are units where no one resides and where the owner:[4]

- Is making repairs or renovations;
- Does not want to rent or sell;
- Is using the unit for storage; or
- Is elderly and living in a nursing home or with family members.

Additional reasons are that the unit is being held for settlement of an estate or that the unit is being foreclosed. While foreclosed properties may be classified as "other vacant," they may also appear in any of the vacant or occupied categories.

The data presented above and interviews with key informants reveal that housing is a significant challenge in the Walker River Corridor. Moving forward, successful economic development of the Walker River Corridor hinges on overcoming the challenges on housing.

[4] Kresin, M. (February 2013). Other Vacant Housing Units: 2000, 2005, and 2010. United States Census Bureau. Report no. H121/13-1. Retrieved from: https://www.census.gov/library/publications/2013/demo/h121_13-01.html

Summary of Findings

Two main themes emerge from the granular survey data of the local economy. First, these are the common challenges.

The region faces a common set of challenges around demographics and labor force attachment. The area's population does tend to be older than the state average, a fact that suggests less labor force participation. However, the Walker River Corridor labor force participation is also lower among 18–64-year-old workers, and private sector opportunities appear to be relatively scarce. The lack of opportunities appears to be related to lower area educational attainment. A sustainable economic strategy should identify ways to expand the economic base to support its senior and housing-burdened population.

Second, cities in the region do not face entirely similar economic circumstances. For example, Smith Valley tends to have an economic profile similar to the state overall, while Schurz and the tribal areas have lower socioeconomic statuses even compared to both the state and the regional average. Any strategy for the Walker River Corridor must take into account the region's internal diversity.

Chapter 2: STRENGTHS, WEAKNESSES, OPPORTUNITIES AND THREATS (SWOT) ANALYSIS

The CEDS committee used a Strengths, Weaknesses, Opportunities and Threats (SWOT) analysis to identify the factors that are likely to shape the success of the Walker River Corridor region in the context of its internal and external environment. Responses from stakeholder interviews form the basis of the SWOT analysis. Beacon Economics interviewed key informants, leaders and experts from the government (federal and local), nonprofit organizations, business owners and managers, educators, and tribal groups. The interviews were conducted between March 2021 and May 2021.

The CEDS committee selected the following major areas of focus. A few areas, such as housing, received significantly more mentions than other areas; these areas are emphasized below.

Major Areas of Focus:

BUSINESS/INDUSTRY:

Agriculture, Manufacturing, Mining, Natural Resources, Hospitality and Tourism, and cost of doing business.

GOVERNANCE:

Sense of belonging to a community, presence or absence of community resources and services, relationship between local government agencies, tribal communities, business communities, and other communities.

INFRASTRUCTURE:

Energy, water supply, broadband, communications, roadways, railroad network.

HOUSING:

Availability and quality of housing.

QUALITY OF LIFE:

Natural resources, natural and outdoor amenities, cost of living, outdoor and recreation activities.

WORKFORCE:

Workforce development, recruitment, training, talent retention.

A SWOT analysis is an inventory of "**S**trengths", "**W**eaknesses", "**O**pportunities" and "**T**hreats". It is an intermediate step between an analysis of regional conditions and the identification of strategies. Regional planning should seek to maintain strengths, limit weaknesses, seize opportunities, and guard against threats.

The interviewees also mentioned the following areas:

Demographics

Education

Healthcare & Hospitals

Location

Strengths

Business/ Industry

- Agricultural specialization in Lyon County
- Mining specialization in Mineral County

Housing

- Low development and permit fees
- Supply of serviced lots

Governance

- Collaborative attitude among cities and counties
- Leaders tend to hold multiple positions

Quality of Life

- Ample recreational activities
- Wide open spaces
- Attractive rivers and lakes

Infrastructure

- Highway and Railroad access
- Hawthorne Army Depot
- 2 Airports

Workforce Development

- Trainable jobs in mining industry
- UNR rural development programs

Weaknesses

Business/ Industry

- Weak supplier linkages
- Reliance on commodity prices
- Smaller export base
- Extreme drought

Workforce Development

- No community college
- Low labor force participation
- High degree of commuting

Housing

- Low housing supply
- Reliance on outside construction and development

Governance

- Vocal 'no growth' minority
- Small planning workforce
- Small development budget
- Weaker tribal/nontribal relationships

Quality of Life

- Lack of 'Saturday afternoon' amenities
- Low grocery competition

Infrastructure

- Mediocre broadband speeds
- Gaps in broadband service
- Reliance on distant hospitals

Opportunities

Business/ Industry

- Historic demand for green energy
- Mining/manufacturing linkages with Washoe County
- Supportive national energy policy
- Tourism and retirement

Housing

- Mining industry support for new housing
- State and federal housing programs

Governance

- Walker River CEDS
- New generation of county leadership
- Appetite for smart growth

Quality of Life

- Renewed enthusiasm for social life
- National main street programs

Infrastructure

- Intermodal Container Transfer Facility and other rail plans
- Federal Infrastructure Bill

Workforce Development

- Increased social acceptance of distance learning
- New community college relationship

Threats

Business/ Industry

- Long permitting and review processes on federal lands
- Global commodity supply uncertainty
- Climate change brings more drought
- Water rights litigation

Housing

- Deteriorating housing stock
- Lumber price inflation
- Skepticism of alternative housing concepts

Governance

- New perspectives among new residents
- Governance challenges for growing communities

Quality of Life

- Declining water levels
- Restart costs for pre-pandemic activities
- Declining lodge membership
- I-95 Hawthorne Bypass

Infrastructure

- Lack of state income tax
- Falling school enrollment

Workforce Development

- 'Brain drain' to Reno, Las Vegas and California
- Crowding out of labor market by mining and agriculture

In generating this analysis Beacon Economics has relied on administrative statistics, key informant interviews and the business survey. Input from across these sources has mainly emphasized six categories: (1) Business/Industry, (2) Governance, (3) Housing, (4) Quality of Life, (5) Infrastructure, and (6) Workforce Development. A SWOT analysis within each of these areas is presented below.

Business/Industry (Regional Economy)

S

The regional economy is strongest in **mining** and **agriculture**. Its specialization in these areas is evident in the employment location quotients (LQs), indicators that reflect the ratio of current employment in a sector to what would be expected in an average area of a similar size. Mineral County's natural resource, mining, and agriculture LQ is 2.0—suggesting twice as much employment in these areas as in an average American region of its size. Lyon County's score of 2.58[5] is driven by the mining and agriculture concentrations in both Smith Valley and Mason Valley. Lyon County's metal mining industry appears to be on the upswing thanks to recent activity at the Pumpkin Hollow copper site.

W

The main weakness of the region's primary sector industries is related to **weak supplier linkages**. Current activities tend to focus on the extraction of metals and commodities, with less emphasis placed on value-adding services earlier or later in the supply chain. Farms and mines tend to rely on upstream services from outside the region (e.g., surveying, agricultural R&D, legal and accounting), and similarly there are limited value-adding services downstream (e.g., food manufacturing and metals processing). This industrial organization leads to an over-reliance on a few mines and farming companies, and increases exposure to their risks. In general, specialization in primary sectors makes regions more vulnerable to changing **commodity prices** or environmental conditions like **drought**. Northwestern Nevada currently faces "Extreme Drought" based on estimates from the U.S. Drought Monitor.[6] The region is also generally reliant on public sector employment at County, and Federal government facilities. This means that the **export base** of the economy is smaller.

[5] Based on 5-year American Community Survey Data

[6] U.S. Drought Monitor. National Drought Mitigation Center, University of Nebraska-Lincoln. Data as of June 8, 2021. Retrieved from: https://droughtmonitor.unl.edu/

O

The region can benefit from developments outside of its borders. As an example, increased national **demand for green energy** is a boon for **Washoe County's** electric vehicle (EV) complex. The average electric vehicle requires more than twice the amount of copper than the average internal combustion vehicle, and copper is a necessary component in electric vehicle charging stations.[7] Copper from the Walker River Corridor can be easily accessed and deployed by current and future Nevada EV manufacturers. More **mining/manufacturing linkages** may lead to the thicker supplier networks and more value-adding activity in the Walker River Corridor itself. Supportive **national energy policy** may reinforce these activities even further. There is increasing recognition[8][9] that the United States can support its climate change goals (i.e., less reliance on fossil fuels) and its national security priorities (i.e., less reliance on foreign sources of energy) by supporting domestic extraction of copper, lithium, cobalt and other resources. These developments would be a boon to mining and manufacturing in the US in general, and Northern Nevada in particular.

Key informant interviews have flagged industrial opportunities outside of mining, especially related to **tourism and retirement**. The attraction of residents and retirees may positively contribute to the local tax base and lead to a degree of economic diversification. Whether these activities are a net positive will mostly depend on the average demographic profile of retirees, and the capacity of tourism and hospitality to absorb increased demand.

T

An oft repeated threat to development in the region is the **permitting and land use** process for the use of federal lands. Existing and potential users of land managed by the Bureau of Land Management report long and uncertain approval processes. BLM officials themselves confirm this, blaming resource constraints. Regulatory bottlenecks threaten the ability for private firms to capitalize on encouraging national and international developments.

Changes in the supply of minerals around the world represent a more global threat. For instance, even if Walker River Corridor copper mining is viable at a certain time, the discovery of new supply elsewhere may lead to a decline in local demand even if overall demand rises.

Agricultural activity is constantly threatened by drought. Technological advances and the transition to more efficient crops like onions from less efficient crops like alfalfa can only go so far in shielding agriculture from this risk. The Environmental Protection Agency attributes ongoing drought conditions to ongoing **climate change**,[10] suggesting that the drought threat is likely to persist. Drought is also a threat to the region's waterways, especially the Walker River and the Walker Lake. Increased tourism around these amenities will somewhat depend on water levels here.

[7] Lynch, J. (May 5, 2021). "Copper's Role in Growing Electric Vehicle Production." CME Group, Paid Editorial posted on Reuters.com. Retrieved from: https://www.reuters.com/article/sponsored/copper-electric-vehicle

[8] Goldwyn, D. L. and A. Clabough (March 6, 2021). A new energy strategy for the Western Hemisphere. Atlantic Council. Retrieved from: https://www.atlanticcouncil.org/in-depth-research-reports/report/a-new-energy-strategy-for-the-western-hemisphere/

[9] Hook, L. and H. Sanderson (February 3, 2021). "How the race for renewable energy is reshaping global politics." The Financial Times. Retrieved from: https://www.ft.com/content/a37d0ddf-8fb1-4b47-9fba-7ebde29fc510

[10] Author Unknown. "Climate Change Indicators: Drought." U.S. Environmental Protection Agency. Accessed on June 11, 2021. Retrieved from: https://www.epa.gov/climate-indicators/climate-change-indicators-drought

Housing

S

The Walker River Corridor enjoys several advantages with respect to the development of housing. **Development and permit fees** should not be a significant barrier to new construction because they tend to be lower than in more urban areas of the state. Moreover, county officials and tribal leaders have pointed to the availability of **serviced lots** across the region that could immediately accommodate new construction. In general, the supply of land is not a constraint on housing.

W

Despite these advantages, there is widespread agreement that the region faces a housing crisis, rooted in the low **supply of available housing units**. This housing shortage is particularly acute in the rental market. The rental occupancy rate is over 99% in Lyon County according to Nevada Rural Housing Authority's most recent Needs Assessments[11] and appears to have gotten more dire in the last year with increased mining activity. Interviewees report that a high percentage of housing units are not at market-ready quality, meaning that the effective supply of housing units is lower than official estimates suggest.

As is the case for other industries, the Walker River Corridor does not have a developed real estate industry. **Construction and development** rely on firms from outside of the area, increasing the costs of development on a per-unit basis. The breakeven point for development in the Walker River Corridor is higher than it would be with local suppliers and developers.

[11] Available at https://nevadaruralhousingstudies.org/

O

Some relief for renters and homeowners is coming in the form of recent **federal** relief. 2021's American Recue Plan Act sets aside $100 million for rural and $750 million dollar for Native American- focused housing aid. While such money is intended as a lifeline for pandemic-related housing insecurity, it effectively doubles as support for communities afflicted by structural housing stress. Primarily, these funds ensure that housing-insecure residents can maintain access to their homes, and that local lenders and property owners are protected.

State programs delivered through the Nevada Rural Housing Authority (NRHA) provide ongoing support. These include down payment assistance, the administration of the Coronavirus Aid, Relief, and Economic Security (CARES) Act and Section 8 programs, and the full development of multifamily developments. The NRHA's development capacity allows for the Walker River Corridor to receive some benefits available to local real estate developers.

T

Community informants have named **deteriorating housing stock** as a threat. There is fear that the proportion of low-quality housing units is increasing over time, especially in tribal areas. Prevailing cost pressures, particularly with respect to **building materials like lumber** were another concern. Escalating costs will only increase the breakeven point for new housing construction. There is also some concern about community attitudes toward new housing. Several respondents have suggested that community opposition was a threat to multifamily housing, or to the development of less expensive, **alternative housing solutions** such as small-lot or modular housing.

Governance

S

Interviews with local leadership have revealed a spirit of **cooperative governance.** Officials report healthy working relationships with counterparts in other jurisdictions or governance levels. When describing the nature of regional economic development challenges in the area, they did not tend to blame leaders elsewhere. A positive (or what one official calls a "can-do") governing spirit can possibly be attributed to an overlapping leadership structure, whereby officials tend to work in **multiple leadership positions** simultaneously or to work for multiple local organizations over the course of their careers. This regular circulation of local leadership minimizes the degree of inter-organizational rivalry.

W

Tribal leadership did report that **tribal/nontribal relationships** could be improved. While much of this dynamic may be rooted in history going back to before the founding of the state, our interviews with tribal leaders made clear that tribes often feel neglected with respect to important economic development decisions.

Across the Walker River Corridor there is a concern that economic development is constrained by a lack of resources. The region's **professional planning workforce** is very small, meaning that land use planning and other basic functions can take much longer than they do in larger counties. In addition, **budgetary support for economic development** is sparse for both staff and/or development-enhancing projects.

A weaker economic development tradition was named as a barrier to new initiatives. Mostly, economic development in the region has tended to occur outside of intentional planning processes. The region did not acquire its current economic base as the result of prior planning. Leaders report that a vocal minority of **'no-growth'** residents make it hard to generate momentum.

O

Officials emphasize that there is a widespread **appetite for 'smart growth'** among a clear majority of residents, especially more labor force opportunities for young workers and families. They voiced strong support for this goal. Lyon and Mineral **County leadership is relatively new**, a fact that may be related to their own pro-development attitude. The present **Comprehensive Economic Development Strategy** is itself an indication that the region is embracing a pro-growth paradigm.

T

Growth itself may be the biggest threat to the region's current governance paradigm. A more varied economy will make it harder to achieve consensus on regional economic challenges. A larger government may make it harder to maintain the overlapping governance and 'can-do' ethic that are currently the strengths of this region. **Growing communities** also face challenges—most notably pressures on the labor and property markets. New residents tend to bring **new perspectives** including new priorities and governance expectations.

Quality of Life

S

There was unanimous agreement that the region's natural amenities are a major source of strength. At the community meetings, **recreational opportunities** were mentioned more than anything else as a source of strength. Several interviewees emphasized the **'wide open'** nature of outdoor activities. Residents can ride, or hike or stargaze at an almost unlimited number of sites not confined to areas that have been set aside for these purposes. **The Walker River and Walker Lake** were singled out as especially attractive areas and as symbols of a regional way of life.

W

There was less satisfaction with the amount and diversity of establishment amenities. Some community members pointed to the lack of **'Saturday- Afternoon'** recreation opportunities to relax that do not involve drinking or gambling. Some community members were frustrated with the number of retail options, especially of the 'big box' variety. Some have to commute to Fernley or California to access goods that are only available in large formate stores Others complained about **higher prices for groceries,** which they blamed on a lack of competition.

O

The post-pandemic period is seen as a time of **renewed enthusiasm for social life.** Officials are hopeful that residents are more eager to interact and participate in recreation activities outside of their homes. The resumption of normal life in urban Nevada and California will mean a return of music festivals, fairs, and professional races to the region. Two officials mentioned the national **main street programs** (for example Main Street America[12]) as opportunities of jumpstarting civic life.

T

There was concern about **declining water levels**, especially at Walker Lake. The region has not been able to maintain all its boating and fishing activities in the face of drought. Some residents are fearful that some **recreational programs will not restart** from their Covid-19 suspensions. Well before the pandemic, membership at **fraternal lodges** and other community organizations appeared to be on the decline in the Walker River Corridor and rural communities in general.[13] Some officials link this to decline associationism in general, or what sociologist Robert Putnam calls social capital.[14] Main street life in Hawthorne continues to be threatened by the **I-95 Bypass** which has dramatically lowered the exposure of businesses to highway travel.

[12] Main Street America is a program of the National Main Street Center with the mission to revitalize older and historic commercial districts to build vibrant neighborhoods and thriving economies. The program's website is: https://www.mainstreet.org/about-us

[13] Hinck, J. (May 25, 2018). "Understanding the Decline in Participation in Fraternal Organizations: A Mixed Methods Approach." University of San Diego, Dissertations. 109. Retrieved from: https://digital.sandiego.edu/cgi/viewcontent.cgi?article=1110&context=dissertations

[14] Putnum, R. D. (2015). "Bowling Alone: America's Declining Social Capital." The City Reader, 6th ed. Retrieved from: https://www.taylorfrancis.com/chapters/edit/10.4324/9781315748504-30/bowling-alone-america-declining-social-capital-robert-putnam

Infrastructure (For more see Infrastructure Inventory on page 59)

S

The Walker River Corridor is well-served by transportation infrastructure, especially rail and highway. **Federal Highway 95** serves as the main highway for the area and another source of regional identity. There are ongoing plans to extend **Federal Interstate-11** along portions of this US-95, connecting the region to a larger inter-continent corridor.[15]

In addition to being a current source of jobs, the **Army Depot in Hawthorne** is home to extensive unused bunker infrastructure. 67% of the roughly 600,000-foot facility is currently available.[16] The region is served by **two airports** in Hawthorne and Yerington.

W

There was widespread dissatisfaction with the quality of broadband infrastructure. Nearly 50% of business survey respondents either said that **internet speeds** only meet basic needs or do not at all meet needs. Residents have remarked on **gaps in cell phone service**, particularly between settlements or on tribal lands. Medical infrastructure was deemed sufficient for basic services, but some community members expressed concern about access to **advanced hospital services**.

[15] Information on the I-11 & Intermountain West Corridor study can be found here: http://i11study.com/IWC-Study/index.asp

[16] Cruz, L. (June 25, 2019). "Hawthorne Army Depot: Providing Lethality That Wins." U.S. Army. Retrieved from: https://www.army.mil/article/223519/hawthorne_army_depot_providing_lethality_that_wins

O

All infrastructure provides some degree of future opportunity, but local officials also highlighted two specific infrastructure plans. The State Department of Transportation's **2021 Rail Plan**[17] specifies upgrades to rail infrastructure, especially the "Mina Branch" which connects Hawthorne to the transcontinental overland route. A potential intermodal transit facility at Fernley would greatly increase access from the Walker River Corridor's mining and agricultural industries to the Port of Oakland. The current study unfolded as federal lawmakers considered an **infrastructure appropriations bill** that promises as much as $2 Trillion in spending.[18] Local officials hope that some of this money will find its way into the region's areas of need—especially broadband and housing.

T

Local leaders worry about the fiscal sustainability of infrastructure. Some cited the **lack of a state income tax** as a long-term threat to infrastructure. Similarly, there is concern about **declining school enrollments** in some areas, and the effects of these on the ability to retain school services even at their current levels.

[17] Individual chapters for the 2021 Nevada State Rail Plan can be retrieved here: https://www.dot.nv.gov/mobility/rail-planning/state-rail-plan/-fsiteid-1

[18] The White House (March 31, 2021). FACT SHEET: The American Jobs Plan. Retrieved from: https://www.whitehouse.gov/briefing-room/statements-releases/2021/03/31/fact-sheet-the-american-jobs-plan/

Workforce Development

S

Workforce development encompasses all aspects of labor market training, attraction, and retention. The Walker River Corridor's mining base is seen as a desirable platform for workforce development because they provide **trainable job opportunities** to workers without much labor market experience or with few credentials. Workforce development officials also report positive partnerships between **University of Nevada at Reno** and the region, including the Rural Education Initiative—a program that funds student teaching in rural communities,[19] and UNR's Center for Economic Development, which conducts labor market analysis in Lyon and Mineral Counties and the tribal communities.

W

The Walker River Corridor must leverage its partnerships with Post-Secondary Institutions elsewhere because it **does not have its own college or university**. Community members lament that promising college-age residents must leave the area to get a post-secondary degree. As the economic analysis makes clear, **labor force participation** in the region is much lower than in the state at large, even among prime age workers, suggesting that the Walker River Corridor is not making use of its current human capital. Many residents who do participate in the labor force, end up **commuting to Reno, Carson City or even California** to work.

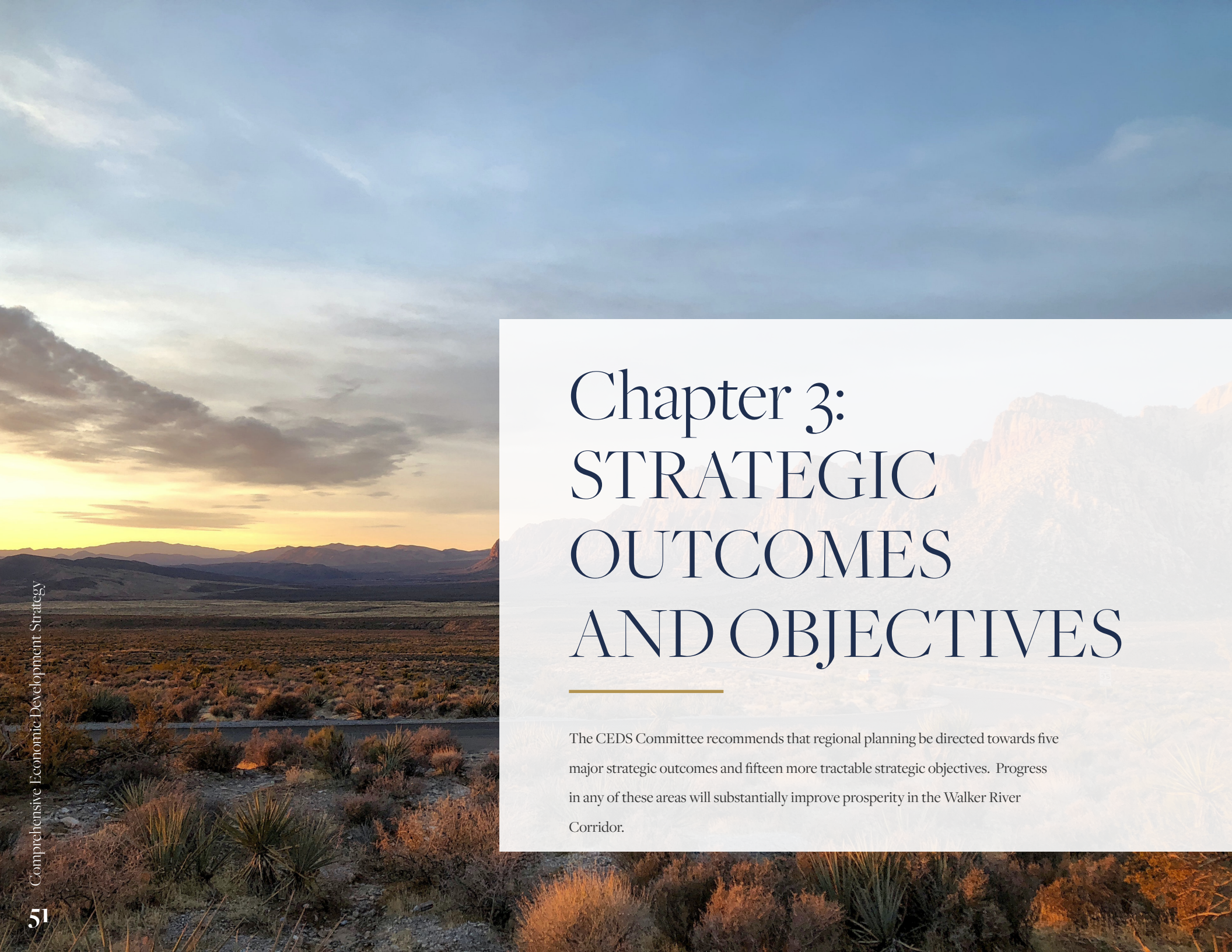
[19] UNR's Rural Education Initiative program website is available at: https://www.unr.edu/education/centers-and-student-resources/initiatives/rural-education

O

Rural communities like the Walker River Corridor stand to benefit the most from new opportunities in remote learning. In the post-pandemic period, **distance learning** is less likely to be seen as inferior to traditional education formats, and the region might be able to make the most of distance learning products like massive open online courses (MOOCS). Previously, the Mineral and Lyon County portions of the region have fallen into different community college service areas. Under a **new arrangement**, the entire Walker River Corridor will be in the Western Nevada College planning area. This will improve the viability of workforce development on a region-wide basis.

T

Residents, officials, and businesses alike are concerned about an ongoing **brain drain** from to Reno, Las Vegas, and California. The limited number of professional opportunities in the region make it hard for the Walker River Corridor natives to return home once they get their degree. While the current mining and agricultural base is a much-needed source of private sector jobs, some officials do worry that these sectors, particularly mining will **crowd out** new sectors in the labor market. When commodity prices are high, the mining industry tends to outcompete other sectors for skilled labor.



Chapter 3: STRATEGIC OUTCOMES AND OBJECTIVES

The CEDS Committee recommends that regional planning be directed towards five major strategic outcomes and fifteen more tractable strategic objectives. Progress in any of these areas will substantially improve prosperity in the Walker River Corridor.

The, principles and goals detailed below set the framework for the Walker River Corridor's development over the next five years. The associated actions aim to bolster further strategic planning, increase administrative capacity, facilitate technical assistance, foster community revitalization, and encourage community advocacy. As the region pivots toward a new economic development infrastructure, this strategic framework will help planners and policymakers create the conditions for revitalization of the region.

1) Expand Effective Housing Supply

- Increase supply of available units.
- Reinvest in existing housing stock.
- Identify flexible housing solutions.

2) Kickstart Economic Development

- Win federal recovery and infrastructure money.
- Attract a second anchor for Mineral County.
- Support State Rail Plan.

3) Diversify the Economic Base

- Recruit a light manufacturing anchor to Lyon County.
- Stimulate producer services.
- Foster agriculture/manufacturing linkages.

4) Create a Regional Governance System

- Convene a regional planning council.
- Develop regional data sources and tools.
- Establish region-wide workforce development.

5) Attract and Retain Talent

- Encourage expansion of broadband and 5G infrastructure.
- Launch a retail planning process.
- Study and re-recruit emigrants.

EXPAND EFFECTIVE HOUSING SUPPLY

Regional planners should aim to increase the number of market-quality homes in the Walker River Corridor. Housing policy is economic development policy. Without sufficient supply, the region will be unable to seize its current opportunities, attract new investment, or recruit families. More housing access means that fewer lower-income and fixed-income families are burdened by rent and mortgage payments.

Strategic Objectives:

- **Increase supply of available units:** More housing supply is most fundamentally about bringing new homes to market. The region should support the construction of new private and public housing, targeting these efforts in submarkets where housing is most scarce.
- **Reinvest in existing housing stock:** A significant share of current housing units is not in market-ready condition. Therefore, the effective supply of housing would increase through maintenance and repairs of existing units.
- **Identify flexible housing solutions:** Cyclical industries like mining and seasonal industries like agriculture create demand for mobile and non-traditional housing options. Officials should study alternatives to traditional housing and support concepts that alleviate short-term supply problems.

Potential Action Items:

- Sponsor a sub-market study to identify market segments facing the greatest need.
- Conduct design review of non-traditional housing concepts.
- Engage with Nevada Rural Housing Authority to discuss the feasibility of multi-family development.
- Advocate for reforms that would allow for a portion of impact fees to be set aside for housing development.

Evaluation Criteria:

Component	Indicator
Housing Supply	Available Housing Units Number of Housing Transactions
Housing Quality	Average Housing Unit Age
Housing Innovations	Changes to Land Use Regulations

KICKSTART ECONOMIC DEVELOPMENT

The region should entertain all available opportunities that would expand the size of the local economy and raise labor market participation. The next five years appear ripe for catalytic economic development due to new mining activities, expanded federal spending across the country and in Nevada, and a local economy that was relatively resilient during the Covid-19 pandemic. Local leaders should seek to seize these opportunities, putting the regions's available workforce and developable land into use.

Strategic Objectives:

- **Win federal recovery and infrastructure money:** 2021 has been a banner year for federal support of local communities. The 1.9 trillion dollar American Rescue Plan Act follows the 2.3 trillion dollar Coronavirus Aid, Relief, and Economic Security Act and is expected to precede an infrastructure plan of at least 1 trillion dollars. Infrastructure funds will be particularly useful in development efforts by supporting fiscally significant projects with long-term impacts. Regional leadership needs to lobby for these funds from higher levels of government.
- **Attract a second anchor for Mineral County:** The Hawthorne Army Depot is Mineral County's only major outside employer, employing 200 direct and contract workers. However, the area also has large development sites on the base itself and in nearby Babbitt. The County should seek a tenant at either or both sites that would employ even more workers, drawing as much as possible from the local workforce.
- **Support State Rail Plan:** The Nevada Department of Transportation's 2021 Rail Plan is a well-researched and detailed economic planning document with a strong degree of local and state wide support. New plans should be as closely aligned to the Rail Plan as possible.

Potential Action Items:

- Apply for stimulus funds for which the region is qualified.
- Commission a new highest and best use study of Babbitt and Schweer Properties to replace the 1998 UNR study.
- Create an externally-facing website touting investment in the region.

Evaluation Criteria:

Component	Indicator
Labor Force Engagement	Labor force participation rate Ratio of full-time to part-time workers
Mineral County Anchor	Investor site visits to Mineral County
State Rail Plan	Participation in DOT railroad planning

DIVERSIFY THE ECONOMIC BASE

In the medium and long-term, planning should seek to vary the type of economic activity in the region. Mining is part of the area's economic heritage and should be maintained, but it is also a volatile industry. The region should embrace opportunities in sectors that are not reliant on commodity prices. Economic resilience means having multiple sources of new jobs and investment. Manufacturing and logistics are prime sectors because they share more workers with mining. Tourism is another attractive target because it takes advantage of the region's impressive natural assets. Economic diversity also means not relying exclusively on one or two anchor firms. The region would benefit from one or a few additional large employers and a supportive ecosystem of small and medium-sized firms.

Strategic Objectives:

- **Recruit a light manufacturing anchor to South Lyon County:** The addition of a light manufacturing operation near Yerington would greatly improve economic diversity. Such a firm might serve the expanding Reno and Carson City metropolitan regions or take advantage of expanding rail opportunities.
- **Stimulate producer services:** Economically dynamic regions tend to have strong producer services for their anchor firms. These increase the economic benefit of a given industry and make the region more attractive to new anchors. Planning and development should prioritize Business-to-Business type services in mining and agriculture including surveying, engineering, financing, accounting, and construction.
- **Foster agriculture/manufacturing linkages:** The region's strong agricultural sector can support the development of activities in food processing and manufacturing. The emergence of a small food manufacturing sector might in turn lead to opportunities in other manufacturing sectors.

Potential Action Items:

- Hire a site selection consultant to promote south Lyon County to manufacturing firms.
- Launch a lending program for small producer services firms.
- Study food manufacturing and processing linkages with current agricultural operations.

Evaluation Criteria:

Component	Indicator
Manufacturing Anchor and Linkages	Site visits from manufacturing firms Manufacturing Employment Growth
Producer Service Growth	Growth in the number of producer services establishments

CREATE A REGIONAL GOVERNANCE SYSTEM

The Walker River Corridor does not yet have a regional organizational structure to support its planning. The region's multi-jurisdictional composition presents coordination challenges. As a result, the establishment of regional governance structures in the next year would greatly improve the ability to pursue development goals. To be most effective, the regional governance structure would require participation by representatives from both Counties, both tribal areas, The Bureau of Land Management, The Department of Defense, local industry, the non-profit sector, and education/workforce development.

Strategic Objectives:

- **Convene a Regional Planning Council:** A permanent regional council would oversee regional planning activities. It would meet regularly to discuss and direct ongoing planning efforts including master planning and the commissioning of technical reports.
- **Develop regional data sources and tools:** County and tribal officials would contribute local data on economic conditions and assets to a shared data repository that would inform region-wide planning and provide prospective investors with region-wide intelligence.
- **Establish region-wide workforce development:** Workforce development activities should be coordinated across each jurisdiction, with an eye to strengthening the region-wide labor force. Educational programming should consider broader economic development objectives including economic diversification and intra-industry linkages.

Potential Action Items:

- Formally incorporate a Regional Planning Council.
- Contract with a software service provider to create an internal regional data repository and a public data dashboard.
- Partner with Western Nevada College to create a hybrid satellite campus in the Walker River Corridor, which would support remote and limited face-to-face educational programing. Such an operation would require dramatically fewer resources than a traditional satellite campus.
- Convene a rural planning clinic in Walker River Corridor that would invite geography, planning, and public policy students from Nevada and California universities to conduct 9-12 month projects in collaboration with local officials.

Evaluation Criteria:

Component	Indicator
Regional Planning Council	Participation from every relevant jurisdiction community including attendance at meetings
Regional Data Tools	Region-based economic statistics for key economic and human development areas
Region-Wide Workforce Development	Training and workforce development programs targeting the Walker River Corridor

ATTRACT AND RETAIN TALENT

The Walker River Corridor needs a strong working-age workforce to thrive. Prime age workers ensure that new establishments and operations are staffed and are net contributors to the local health and educational infrastructure. The post-pandemic period provides more opportunities to attract talent, especially remote workers. The region can make the most of these opportunities, without sacrificing its traditional values and way of life.

Strategic Objectives:

- **Encourage expansion of broadband and 5G infrastructure:** Connectivity is currently limited in the most remote areas of the Walker River Corridor and can generally be improved everywhere. The region can greatly improve its ability to attract remote workers by improving this infrastructure.
- **Launch a retail planning process:** Residents currently must travel outside of the region for many retail opportunities and face limited competition for groceries. In addition, there is a strong appetite for more 'main street' type activities in Yerington and Hawthorne, including family recreation. A retail planning process would research the minimum requirements for new retail operations, identify possible sites, and interface with retail developers.
- **Study and re-recruit emigrants:** Traditionally, the region has tended to be a net-exporter of skilled workers to metropolitan areas before Nevada and California. Local leadership should survey these 'expatriates' to understand how they might be re-recruited to the area, or otherwise involved in the development process.

Potential Action Items:

- Apply for new federal government broadband infrastructure tranches.
- Discuss retail site selection with major 'big box' retailers.
- Commission a Main Street revitalization plan for Yerington and Hawthorne.
- Identify and survey expatriates from the region.
- Investigate opportunities for festivals and other community events.

Evaluation Criteria:

Component	Indicator
Broadband Infrastructure	Internet speed survey Broadband access percentage (County-level data)
Retail Planning	Retail establishment growth
Skilled Migration	Share of working age residents Average educational attainment

APPENDIX

Appexdix A: INFRASTRUCTURE INVENTORY AND ANALYSIS

This section provides a detailed infrastructure inventory and analysis, which is needed to accurately understand the limitations of existing infrastructure.

Transportation Infrastructure

The development and continuous improvement of transportation infrastructure involve transportation plans by transportation planning organizations. The following table presents a list of proposed and upcoming development plans and the regions covered.

Figure A.1:
Regional Transportation Planning in Nevada

Proposed and Upcoming Development Plans	Regions Covered
Proposed High-Speed Rail (North-South Linkage)	Northern/Southern Nevada
Nevada State Rail Plan 2021[20]	Statewide
2050 Regional Transportation Plan	Carson City, Douglas County, and Lyon County
Nevada Department of Transportation Inter-County and Regional Transit Plan	Washoe County, Storey County, Carson City, Lyon County, and Churchill County

Note that Mineral County is not part of the 2050 Regional Transportation Plan nor the Nevada Department of Transportation Inter-County and Regional Transit Plan, despite its relatively more important roles (compared to Lyon County) in trucking route (I-95) and railroad freight (Hawthorne/Mina Branch Line).

[20] The Nevada State Rail Plan can be viewed here: https://www.dot.nv.gov/mobility/rail-planning/state-rail-plan

Highways and Roadways

There are a few state highways and state routes that run alongside the Walker River Corridor. U.S. Highway 95 (Veterans Memorial Highway) passes through Hawthorne CDP in Mineral County, and continues northwest just west of the Walker Lake through Walker Lake CDP and the Walker Lake State Recreation Area. The highway then continues northbound on just west of the Mineral County's side of the Walker River through Schurz CDP in the Walker River Indian Reservation. U.S. Highway 95 then bifurcates into two routes: The main route continues northward towards Fallon (which is outside of the Walker River Corridor and the scope of this report), while a secondary branch (U.S. Highway 95 Alternate) continues westward toward Lyon County. U.S. Highway 95 Alternate lies south of the northern portion of the Walker River and the Mason Valley Wildlife Management Area.

In Lyon County, U.S. Highway 95 Alternate continues westward to the City of Yerington, then turns northward at the western border of the City of Yerington toward the City of Fernley and U.S. Highway 50. At Yerington, U.S. Highway 95 Alternate turns into two routes and continue southward: (1) Main Street, which then turns to State Route 208 through the center of Yerington; and (2) State Route 339 at the western border of Yerington. The two state routes merge together at West Walker River, continuing westward toward Smith Valley. There are no highways nor state routes alongside or perpendicular to the East Walker River.

Figure A.2:
Major Highways and Roadways in Walker River Corridor

Source: U.S. Census Bureau TIGER/Lines

Road Condition and Level of Service

The relatively heavy presence of mining and agricultural activities in the Walker River Corridor region underscores the importance of the region's freight infrastructure. It is therefore important for the Walker River Corridor region's roadways and state highways to be sufficiently maintained in order to maintain and increase economic efficiency, productivity, and competitiveness. Nevada Department of Transportation (NDOT) is responsible for maintaining and improving the condition of the entire state-maintained roadway network. The roadway network is classified into five separate road prioritization categories based on heavy truck equivalent single axle loads (ESALs), average daily traffic (ADT), and federal guidelines for highway classification descriptions.

Figure A.3:
Road Prioritization Categories of Roadways in Walker River Corridor

Roadway	County	Category	Description
US Highway 95	Mineral	2	ESAL > 540 or ADT > 10,000
US Highway 95 Alt	Mineral	4	405 ≥ ESAL > 270 or 400 < ADT ≤ 1,600
US Highway 95 Alt	Lyon	3	540 ≥ ESAL > 405 or 1,600 < ADT ≤ 10,000
State Route 208	Lyon	4	405 ≥ ESAL > 270 or 400 < ADT ≤ 1,600
State Route 338	Lyon	4	405 ≥ ESAL > 270 or 400 < ADT ≤ 1,600
State Route 339	Lyon	3	540 ≥ ESAL > 405 or 1,600 < ADT ≤ 10,000

Source: Nevada Department of Transportation

Although the Walker River Corridor is a very rural area, there are medium to somewhat heavy uses of U.S. Highway 95 followed by U.S. Highway 95 Alternate and State Route 339, which connect to Fernley, Reno, and Carson City, by vehicles and heavy trucks. In 2014, the average daily truck traffic on U.S. Highway 95 was 501 to 1,500 trucks, which is comparable to the Boulder Highway (Nevada State Route 582), which stretches from Henderson to Las Vegas and Nevada State Route 146, which connects Interstate 15 and Interstate 215 to the south of Las Vegas. Most of the traffic came from combination trucks.

The road conditions of the above major roadways in the Walker River Corridor have been mostly decent. There have been no rehabilitation projects performed for the roadways within the Walker River Corridor in recent fiscal years.[21] The roadway network is divided into five road prioritization categories. The pavement in each category is rated and quantified using the Present Serviceability Index (PSI).[22] In the Walker River Corridor, most of the roadways are deemed to be in fair to very good condition except for a small stretch of State Route 339 near the City of Yerington, which is rated mediocre. By comparison, 10% of the roadways statewide are deemed to be in poor or very poor condition.

Increased economic activity and population growth have increased traffic congestion in Northern Nevada, calling for the Inter-County and Regional Transit Plan. In addition, many traffic problems on rural two-lane highways result from the lack of passing opportunities due to limited sight distance and heavy oncoming traffic volumes.[23] NDOT has identified locations to add passing lanes, truck climbing lanes and turn lanes on rural routes in Churchill, Elko, Lyon, Mineral, and Nye counties. [24]

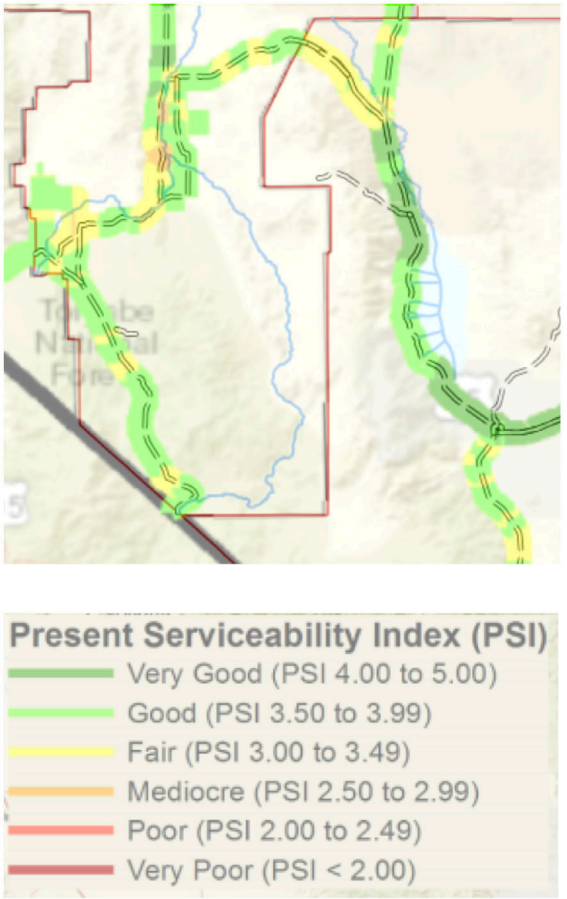
[21] See Tables 4 and 5 of the 2021 Nevada State Highway Preservation Report. Retrieved from: https://www.dot.nv.gov/Home/ShowDocument?id=15950

[22] The PSI pavement condition rating system uses a value that is calculated using pavement roughness measurements and mathematical formulas that quantify pavement distresses such as cracking, raveling, rutting, and potholes. These measurements and formulas are combined and standardized into an objective rating scale numbered from zero (worst condition) to five (best condition).

[23] 2020 Annual Report. Nevada Department of Transportation. Retrieved from: https://www.dot.nv.gov/home/showpublisheddocument?id=18892

[24] Ibid.

Figure A.4:
Present Serviceability Index of Roadway Network in the Walker River Corridor



Source: 2021 Nevada State Highway Preservation Report, Nevada Department of Transportation

Truck Freight

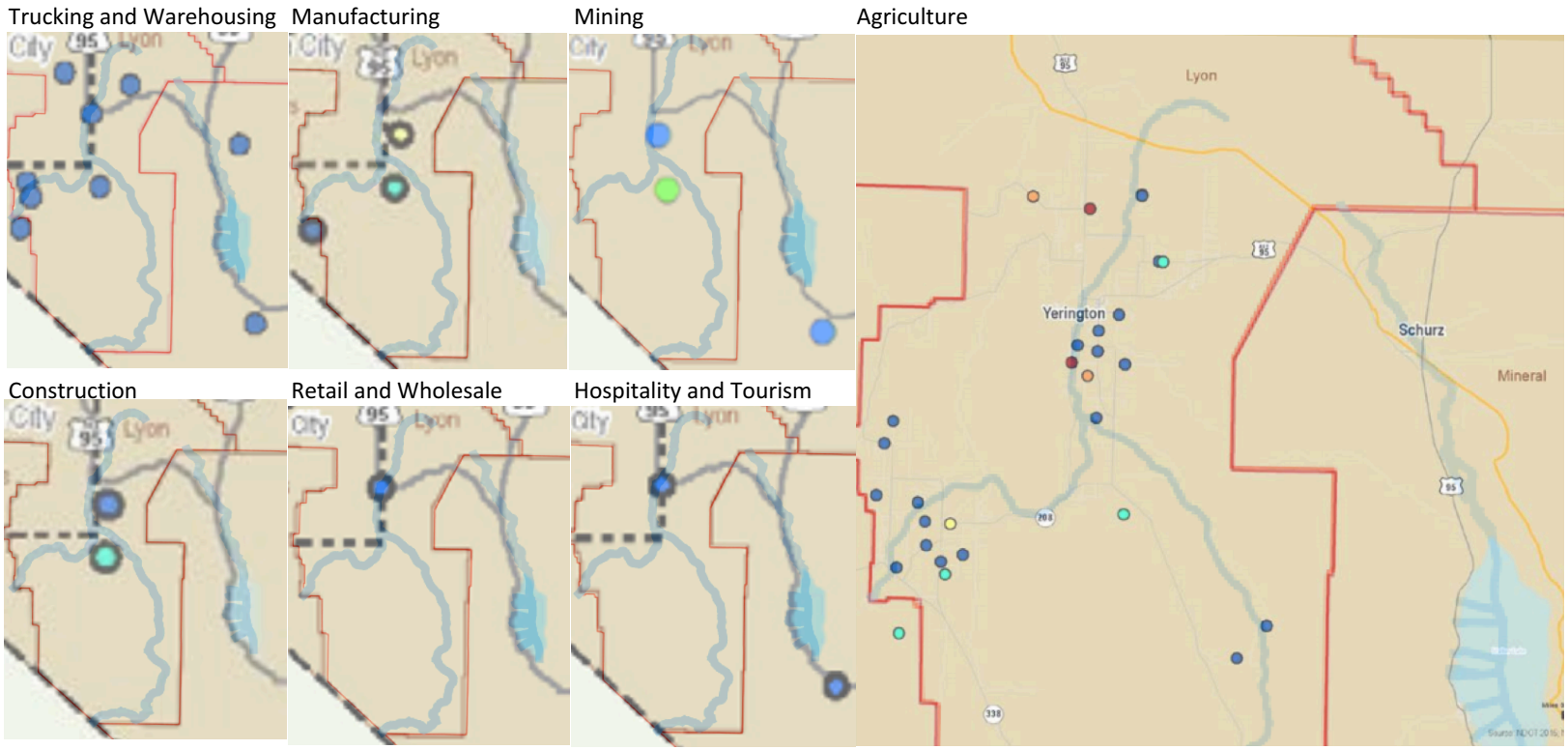
Recently, NDOT developed the Nevada State Freight Plan (2017), which provides a strategic framework for freight mobility and economic competitiveness. The state freight plan identifies U.S. Highway 95 and U.S. Highway 95 Alternate as Critical Multistate Freight Corridors. Several major industry sectors such as agriculture and mining in the Walker River Corridor are highly dependent on the region's freight infrastructure for the region to strengthen and diversity its economy.

Based on the industry analysis performed in an earlier section of this report, the three industry sectors in the Walker River Corridor with the highest level of linkages with truck freight activities are trucking and warehousing, agriculture, and mining. Each industry sector generates different levels of truck trips:

- Trucking and Warehousing: Generates the highest proportion of truck trips per employee and are a major indicator of where shipments are generated and received. In the WRC, there are more facilities in Lyon County's side than Mineral County's, but all facilities are small, employing fewer than 10 employees each. The lack of large-scale facilities means trucking and warehousing may not have the greatest need for freight infrastructure in the WRC.
- Agriculture: Produces a much smaller proportion of truck trips per employee than manufacturing and logistics. Agriculture facilities tend to be more widespread throughout the region. The state freight plan identifies Lyon County as having the highest concentration of agriculture facilities in the state. In the WRC, most facilities are located in Yerington and Smith Valley.
- Mining: Generates a larger proportion of truck trips per employee than agriculture due to the mass of materials. But similar to agriculture, the industry sector is widespread and tend to be in less urbanized areas. Most freight needs occur on the Mineral County's side of the WRC.

The state freight plan has identified freight dependent industry sectors statewide; the portions relevant to the Walker River Corridor are reproduced below.

Figure A.5:
Major Freight-Dependent Employment Centers in Walker River Corridor by Industry Sector



Source: Appendix 2, Nevada State Freight Plan

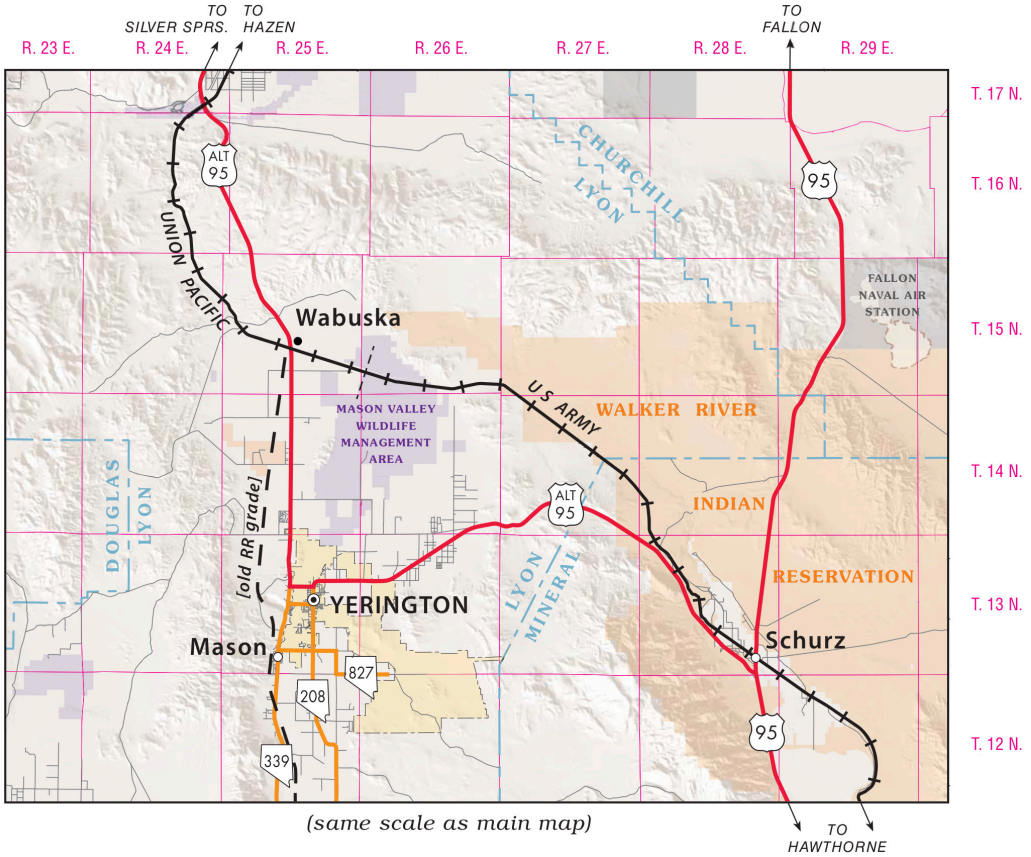
Rail

Rail freight originating and terminating in Nevada is predominantly bulk commodities. Rail is an integral part of the Walker River Corridor: The region is highly dependent on its rail networks to transport its agricultural and mining products.

In the Walker River Corridor, the Mina Branch Area of the Hawthorne/Mina Line is one of the main rail lines featured in the 2021 Nevada State Rail Plan. The Union Pacific Railroad (UPRR) owns and operates the Mina Branch, which connects to the Overland Route main line in Hazen and extends 43 miles south to Fort Churchill near Wabuska. The line is single-tracked and track warrant controlled. The line formerly went all the way to Mina in south Mineral County but now ends at the Hawthorne Army Depot in Hawthorne just south of Walker Lake.

The Hawthorne/Mina Line passes through the Eastern portion of the Walker River Corridor, through Hawthorne CDP and Schurz CDP in Mineral County, and the Mason Valley Wildlife Management Area in Lyon County. The line does not reach Yerington; instead, it continues northbound toward Silver Spring. Currently, there is no rail infrastructure servicing the western portion of the Walker River Corridor. There existed an old rail line that ran through the Western portion of the Walker River Corridor, but it had been discontinued.

Figure A.6:
Mina Branch Area –
2020 Nevada State Rail Plan



Source: Nevada Department of Transportation

UPRR sold the last 54 miles to the U.S. Army, and it wishes the Army to subcontract with an independent rail operator for those 54 miles so that UP would only traverse 43 miles south from Hazen in Churchill County (north of the Walker River Corridor). The Army has agreed in principle to work with Top Rail Solutions of Pittsburg, Kansas to do this, but an interchange between UP and Top Rail remains to be agreed upon and funded. [25]

The rail infrastructure in the Walker River Corridor is a key part of the region's economic development strategies. There are prospects for empty rail car storage on a portion of the 252 miles of in-service sidetracks inside the Army Depot. There are also good prospects for Top Rail to operate a transloading site inside the Army Depot to handle bulk materials for mining and energy supplies. With the strong mining activities in the Walker River Corridor, especially copper, the Nevada State Rail Plan has outlined the following strategies for the Mina Branch Line:

- Explore opportunities to serve copper mines, molybdenum mines, and cattle lots in the Yerington area with a short branch line diverging south from the Union Pacific at Wabuska
- Collaborate with Union Pacific and the U.S. Army on an economical, near-term approach to constructing interchange trackage between UP and Top Rail at Fort Churchill
- Publicize and facilitate car storage and rail/truck transloading at the Hawthorne Army Depot
- Promote collaboration among mining and energy operations that would be better served by having the Mina Branch reconstructed back through Luning to Mina for rail/truck transloading there
- Eventually continue the process of reconstructing an active rail line in steps to Blair Junction and Goldfield Junction, to include stubs directly into nearby mine

[25] Nevada State Rail Plan – 2021.

Fernley Integrated Multimodal Cargo Transfer Facility

The rail infrastructure within the Walker River Corridor may have additional impacts on the region's economic development through its linkages with the rail networks in other regions. Recently, the state studied the feasibility of an Integrated Multimodal Cargo Transfer Facility (IMCTF) in Fernley, NV (located in north Lyon County) to maximize the economic benefits of freight rail utilization. The IMCTF will be able to capture the regional demand for mining and manufactured freight as well as containers by reinstituting commercial service on the Mina Branch to Hawthorne. This would also stimulate rail activity that can utilize new logistics services in Fernley area.

Currently, truck freight accounts for 90% of all current freight flows in the Fernley/Hazen/Fallon/Silver Springs/Innovation Park Region[26] and 77% in Northwestern Nevada.[27] Securing rail freight services could address the over-dependence on trucking freight. In addition, there are environmental benefits of converting truck freight to rail freight through conversion of through farm and food products traffic and conversion of clay, concrete, glass, stone and non-metallic minerals.[28] This is important as environmental degradation is a significant threat to the Walker River Corridor's ongoing economic development efforts.[29] Finally, shippers could save substantially – 19% per the feasibility study – on their shipping costs by utilizing a Fernley IMCTF.

[26] Ibid.

[27] Hooper, R. C. Fernley Multimodal Freight Facility Feasibility Study Presentation. Presentation by Northern Nevada Development Authority at the 2021 NV State Rail Summit. February 16, 2021. Retrieved from: https://www.dot.nv.gov/home/showpublisheddocument/18914/637491754659270000

[28] Nevada Department of Transportation. 2021 Nevada State Rail Plan Recommendations Presentation. Retrieved from: https://www.dot.nv.gov/home/showpublisheddocument/18924/637491754686630000

[29] This is discussed in greater details in this report's SWOT Analysis section.

Upcoming Project List for the Mina Branch Area

Nevada Department of Transportation has several projects for the Mina Branch Area. Many of these projects would have direct positive economic impacts for the Walker River Corridor, displayed in the following tables.

Figure A.7:
Mina Branch Area Project List Within the Walker River Corridor

Project Name	County	Short Description	Contracted Description	Commodities
Cattle Feed Project	Lyon	Transloading on Mina Branch	Transload	various cattle feeds
Ann Mason Project	Lyon	Connect to Mina Branch	Rail Connection	copper & molybdenum ores
Pumpkin Hollow	Lyon	Connect to Mina Branch	Rail Connection	copper ores, I/B fuel, lime, etc
Hawthorne Army Depot Car Storage	Mineral	Build interchange with UP	Interchange with UPRR	car storage, transloading bulk
Gold Resources- Isabella Pearl Mine	Mineral	Transloading site at Hawthorne	Transload	ammonium nitrogen, lime, diesel
Extend Mina Branch, Hawthorne to Mina	Mineral	Build on abandoned ROW on BLM	Rail Connection	N/A

Source: 2021 Nevada State Rail Plan

Public Transportation

Public transport infrastructure is fragmented or nonexistent in rural Nevada counties, which is a familiar story through rural America. In Lyon County, the Lyon County Human Services provides limited public transportation services to and from senior centers for participation in activities, meals, personal errands, and shopping. In other words, there is no public transportation provided for commuting purposes or as an alternative to driving for the general population.

Mineral County currently has no public transportation services. Mineral County also falls outside of the 2050 Regional Transportation Plan and the Nevada Department of Transportation Regional Transit Plan. However, there are plans to expand the railroad infrastructure to include passenger rail, which can be a good choice for residents who commute elsewhere such as Reno for work.

Airports

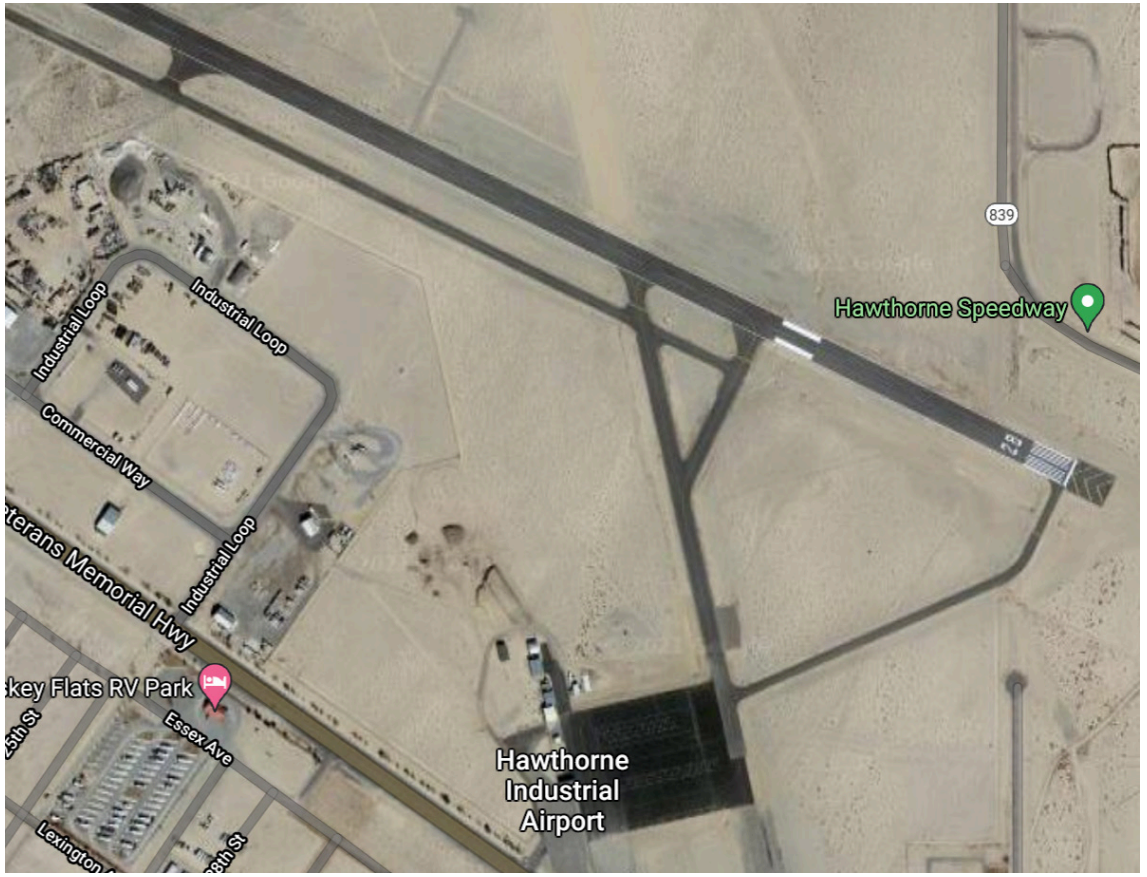
There are two regional airports within the Walker River Corridor: Hawthorne Industrial Airport (FAA Identifier: KHTH) and Yerington Municipal Airport (FAA Identifier: O43), and both airports are located one mile north of Hawthorne and Yerington, respectively.

Hawthorne Industrial Airport averages 38 flights per day and is primarily used for transient general aviation (70% of aircraft operations) and local generation aviation (20% of aircraft operations).[30][31] There are also some activities for the military and air-taxi (5% each). There are two runways – Runway 10/28 and Runway 15/33 - and the surface conditions are both rated as good. [32]

Yerington Municipal Airport averages 70 flights per day and is primarily used for local generation aviation (54% of aircraft operations), followed by transient general aviation (33% of aircraft operations).[33] There is one runway (Runway 2/20), which is rated as excellent for its surface condition. [34]

Figure A.8:
Aerial Satellite Images of the Municipal Airports in the Walker River Corridor

Hawthorne Industrial Airport and Runway 10/28



Source: Google Maps Satellite Imagery

[30] Retrieved from AirNav information for KHTH: http://www.airnav.com/airport/KHTH

[31] General aviation refers to nonscheduled flights that are not operated by commercial airlines or by the military. Compared to commercial aviation, it is easier to obtain a license to fly general aviation aircraft and the safety standards are not quite as high.

[32] Aeronautical Information Services, U.S. Federal Aviation Administration. Data as of May 20, 2021. Retrieved from: https://nfdc.faa.gov/nfdcApps/services/ajv5/airportDisplay.jsp?airportId=hth

[33] Retrieved from AirNav information for O43: http://www.airnav.com/airport/O43

[34] Aeronautical Information Services, U.S. Federal Aviation Administration. Data as of May 20, 2021. Retrieved from: https://nfdc.faa.gov/nfdcApps/services/ajv5/airportDisplay.jsp?airportId=O43

Figure A.9:

Aerial Satellite Images of the Municipal Airports in the Walker River Corridor

Yerington Municipal Airport and Runway 2/20

Source: Google Maps Satellite Imagery

Neither airport is for commercial aviation purposes, which means there are currently no transportation linkages between the airports and the region's freight rail and trucking network. Nonetheless, both airports are important assets to the Walker River Corridor and may play an important role in the region's economic development. Regional airports can be important points of access to remote locations and parts of country with limited or lengthy ground access. In addition, regional airports may allow easy access for personal jets and convenient landing (due to the less stringent required than commercial airports), which may help attract and retain businesses also have significant economic impact on the surrounding region. Finally, if ongoing economic development efforts in the Walker River Corridor generates traffic, then the two airports may act as a catalyst for local investment. [35]

[35] Button, K. J., Doh, S., and Yuan, J. (2010). The role of small airports in economic development. Journal of Airport Management, vol. 4, no. 2. Retrieved from: https://www.researchgate.net/publication/251864448_The_role_of_small_airports_in_economic_development

Hawthorne Army Depot (HWAD)

Hawthorne U.S. Army Ammunition Depot (HWAD), located directly south of Walker Lake in Mineral County and adjacent to Hawthorne CDP, is a U.S. Army ammunition storage depot. HWAD stores conventional munitions, demilitarizes and disposes of unserviceable, obsolete and surplus munitions; and maintains serviceability through inspection and renovation to ensure munitions readiness.[36] It is the largest facility of its kind in the world, covering about 226 square miles with 414 administrative and storage buildings, and 2,094 magazines providing an explosive storage capacity of 7,685,000 square feet. HWAD, along with the U.S. Naval Air Station Fallon in the City of Fallon (located not far outside of the study area of this report), have traditionally been key assets central to the region's and the state's defense industry.

Citing redundancy and excess from the Industrial Base issues, the Department of Defense recommended closing HWAD in its 2005 Base Realignment and Closure (BRAC) Recommendations.[37] Despite being next to the I-95 and not far from Hawthorne Industrial Airport, the report also cited infrastructure problems that severely limited the ability to offload. HWAD is still operation as of the writing of this report, despite the recommendation to close. Presently, HWAD has tremendous training capacity and its unique Afghanistan-like terrain and strategic location enable Warfighters to perform a multitude of training opportunities.[38]

Currently, although HWAD is still government-owned, it is run by independent contractors. There is a government staff of 25 Department of Army civilians and one Soldier to provide contract oversight and reliability of munitions stockpile.[39] The shift from being operated by civilian and military personnel to being run by contractors led to significant changes in the nearby community. Babbitt, formerly a town located immediately northwest of Hawthorne, was once a community that mainly housed facilities for workers of HWAD; it is now almost completely vacant with only a few structures remaining. Furthermore, HWAD stores reserve munitions that can be used the first 30 days of any major conflict for the US, which means the depot is normally minimally staffed unless there is a major conflict. As of June 2019, under half (43%) of the storage space are occupied. These observations suggest that HWAD has not generated much employment relative to its size.

[36] United States Army Joint Munitions Command. Retrieved from: https://www.jmc.army.mil/Installations.aspx?id=Hawthorne

[37] See page 662 of the 2005 BRAC Recommendations Report: https://www.acq.osd.mil/brac/docs/DoD-BRAC-2005-Report-to-Commission.pdf

[38] Cruz, L. (June 25, 2019). "Hawthorne Army Depot: Providing Lethality That Wins." U.S. Army. Retrieved from: https://www.army.mil/article/223519/hawthorne_army_depot_providing_lethality_that_wins

[39] It is not clearly known how many contractors are presently on site, as contractor statistics are considered proprietary and therefore are not available.

Figure A.10:
Hawthorne U.S. Army Ammunition Depot and its proximity to Hawthorne CDP via I-95

Source: Google Maps Satellite Imagery

There have been ongoing discussions on redeveloping HWAD. Since many bunkers are not used as storage for reserve munitions, these bunkers have the potential to be repurposed for general storage and warehousing use. With interstate highway and railroad access, HWAD's location would be ideal for manufacturing and storage in Nevada, while serving possible customers in California.

However, there are notable challenges to development. HWAD conducts weekly Explosive Detonations at various times every Monday through Thursday from 9:00 AM to 3:00 PM, which generates loud noises.[40] This could be potential deterrent for businesses looking to set up manufacturing facilities. In addition, there are environmental, health and safety risks, which requires environmental restoration costs, as noted in the 2005 BRAC Recommendations. However, there has been ongoing initiatives for environmental cleanup, including a recent effort to clean up 14 acres for Fiscal Year 2019 to 2025 pending Unexploded Ordinance (UXO) clearance.[41]In addition, the Defense Environmental Restoration Program has awarded at least $66 million since 2020 to address legacy contamination issues with $90 million planned through 2025. [42]

Figure A.11:
Satellite Aerial Image of Former Town of Babbitt

Source: Google Maps Satellite Imagery

[40] Based on announcements at the Hawthorne Army Depot Facebook page: https://www.facebook.com/HawthorneArmyDepot/

[41] LTC Scott Bishop. Hawthorne Army Depot. "World's Largest Ammunition Depot" Presentation. May 2018. Retrieved from: https://www.leg.state.nv.us/App/InterimCommittee/REL/Document/12306

[42] Ibid.

Utilities Infrastructure

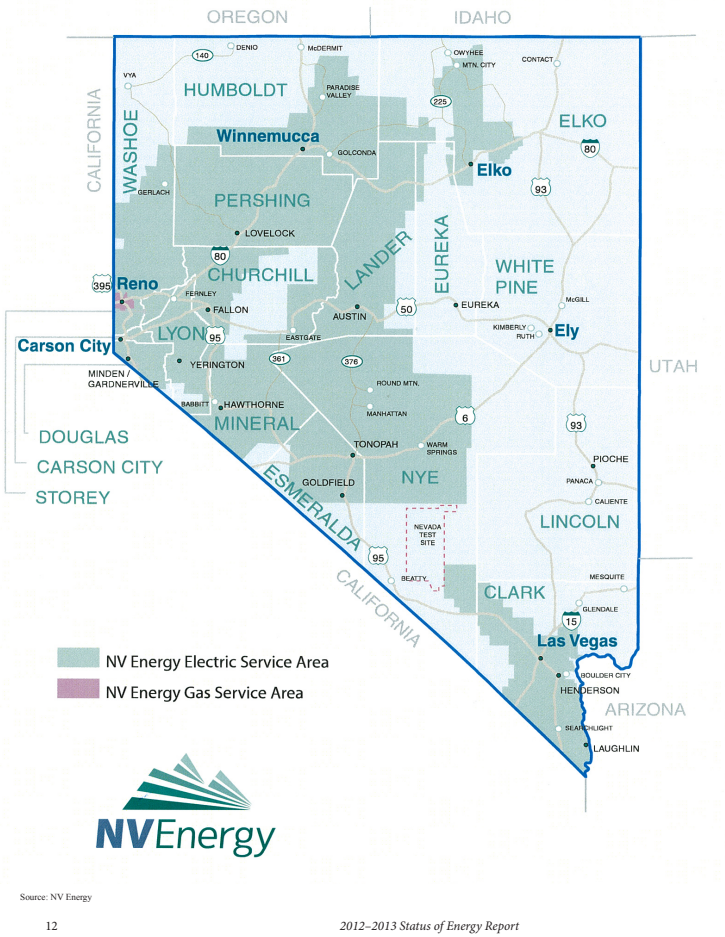
Similar to rural America, the lack of utilities infrastructure is a continuous challenge in the Walker River Corridor. Two investor-owned utility companies, Southwest Gas and Sierra Pacific Power Company (d/b/a NV Energy), provide natural gas covering most of the state. For electricity, NV Energy and Nevada Rural Electric Utility are the main service providers.[43] Lyon County and Mineral County are both under the jurisdiction of NV Energy.

Natural Gas

There exists a large gap in rural America where natural gas does not reach. Similarly, a lack of natural gas infrastructure is present in the Walker River Corridor, which is considered a rural area by all standards.[44] Particularly, there is no natural gas pipeline serving Mineral County (which is more rural than Lyon County). The lack of infrastructure means rural households tend to experience higher energy burdens, or the percentage of household income spent on energy bills.

The following are maps of NV Energy Electric & Gas Service Areas and Southwest Gas Transmission Pipeline that are submitted and filed to Public Utilities Commission Nevada (PUCN). The Walker River Corridor is covered by NV Energy for electricity, but not for natural gas; NV Energy only provides natural gas services in Reno, NV. The Southwest Gas transmission pipeline (for natural gas) only services Yerington and nearby areas but not the Mineral County's portion of the Walker River Corridor.

Figure A.12:
NV Energy Electric & Gas Service Areas

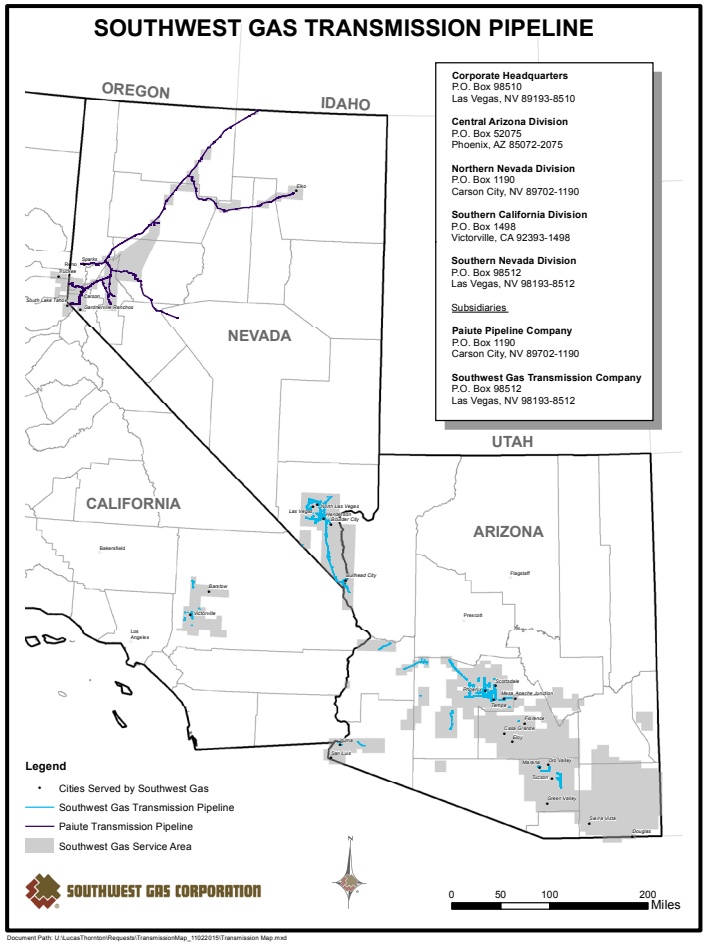


Source: NV Energy; Public Utilities Commission Nevada

[43] More information can be found at the Public Utilities Commission Nevada's website: https://puc.nv.gov/Utilities/Utility_Service_Area_Maps/

[44] The Walker River Corridor is considered rural by the following definitions: Census Places, Census Urban Areas, Office of Management and Budget, Economic Research Service Rural-Urban Commuting Areas, and U.S. Department of Agriculture Business and Industry Loan Program. These definitions can be viewed here: https://www.ers.usda.gov/webdocs/DataFiles/53180/25583_NV.pdf?v=0

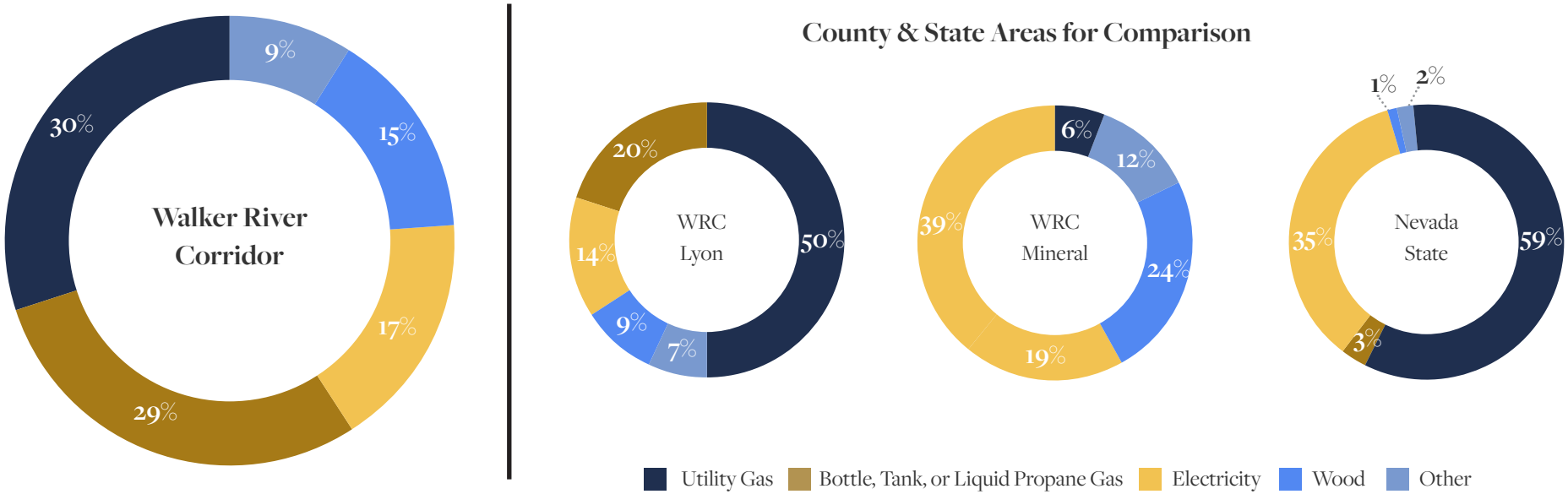
Figure A.13:
Southwest Gas Transmission Pipeline



Source: Southwest Gas, Public Utilities Commission Nevada

In the Walker River Corridor, utility natural gas (30%) and bottled, tank, or liquid propane gas (29%) are the most common heating fuel sources. Yet, the share of households that uses natural gas as the primary heating fuel is considerably lower than statewide, where 59% of the households use natural gas as the primary heating fuel. Electricity as a heating fuel is also far less popular in the Walker River Corridor (17%) than statewide (35%).

Figure A:14:
Heating Fuel Sources



Source: American Community Survey 5-Year Estimates

A large disparity exists within the Walker River Corridor. While utility natural gas is the primary heating fuel for half of the households in Lyon County's side of the Walker River Corridor, this is true for only 6% of the households in Mineral County's side of the Corridor because of the lack of utility natural gas infrastructure in Mineral County. In fact, utility natural gas is less common than wood, electricity, and bottled, tank, or liquid propane. In Mineral County, residents purchase propane gas from companies such as AmeriGas Propane, Valley Propane Service, and Suburban Propane. However, all else equal, it is costlier to fuel a home with propane than with natural gas.

To illustrate the difference in residential energy bills, the Home Energy Saver calculator[45] is used to compute yearly energy costs in the following end uses: Heating, cooling, hot water, large appliances, small appliances, and lighting. The following chart illustrates the cost differentials for a home built in 1985 in the City of Yerington (representing Lyon County) and an identical home built in Hawthorne CDP (representing Mineral County). The calculation assumes default settings; the only input differences are the options for water heater fuel (Natural Gas vs. Propane) and heating equipment type (Central Gas Furnace vs. Propane Furnace). The results are for a household with one person age 6 to 13, one person age 14 to 64, and one person age 65 or above.

Figure A.15:
Yearly Energy Costs, Natural Gas vs. Liquid Propane, for an Existing Home in Yerington, NV and Hawthorne, NV

	City of Yerington, NV		Hawthorne CDP, NV	
End Use	**Natural Gas**	**Liquid Propane**	**Natural Gas**	**Liquid Propane**
Heating	$1,518	$3,717	$1,651	$4,056
Cooling	$0	$0	$0	$0
Hot Water	$188	$454	$188	$454
Large Appliances	$282	$345	$282	$345
Small Appliances	$150	$150	$150	$150
Lighting	$168	$168	$168	$168
Whole House	$2,306	$4,834	$2,439	$5,173
Median Household Income (2019)	$31,795	$31,795	$36,993	$36,993
Energy Costs as Percentage of Income	**7%**	**15%**	**7%**	**14%**

Source: Home Energy Saving, Lawrence Berkeley National Laboratory; American Community Survey 5-Year Estimates

[45] The HES computes a home's energy use based on models and data developed at the U.S. Department of Energy's Lawrence Berkeley National Laboratory. More information can be found here: https://hes.lbl.gov/consumer/about

For a standard 1,800 square feet house build in 1985 in the City of Yerington, the annual energy costs using liquid propane is $4,834, or slightly more than twice as much as using natural gas ($2,306). Using the exact same parameters, the modeled results for Hawthorne, NV are almost the same; yielding an annual energy costs of $5,173 with liquid propane and $2,439 with natural gas. The additional energy cost due to the lack of availability of natural gas poses greater financial challenges to the residents in Mineral County's side of the Walker River Corridor, where household incomes are generally lower than residents in Lyon County's side of the Corridor. This means all else equal, a household in Mineral County can be expected to spend a higher percentage of income on heating fuel than an identical household in Lyon County. However, since liquid propane is far more common in Mineral County, an average household in Mineral County can be expected to spend an even higher percentage of income on heating fuel than its peer in Lyon County. Based on the data on median household income discussed in the Economic Profiles section, a household earning the median income with the above energy costs can expect to spend 7% of income on energy if using natural gas and 14%-15% if using liquid propane.

In addition to monetary costs, there are additional costs associated with a lack of natural gas infrastructure. The greenhouse gas (GHG) emissions generated from fueling a residential unit with propane gas is higher than using natural gas. Using the same parameters, the following table shows the estimated annual GHG emissions for an existing home in Yerington, NV and Hawthorne CDP, NV.

Figure A.16:
Yearly Emissions (Pounds of CO2), Natural Gas vs. Liquid Propane, for an Existing Home in Yerington, NV and Hawthorne, NV

	City of Yerington, NV		Hawthorne CDP, NV	
End Use	**Natural Gas**	**Liquid Propane**	**Natural Gas**	**Liquid Propane**
Heating	14,070	17,481	15,322	19,059
Cooling	0	0	0	0
Hot Water	1,788	2,094	1,788	2,094
Large Appliances	2,228	2,308	2,228	2,308
Small Appliances	1,057	1,057	1,057	1,057
Lighting	1,184	1,184	1,184	1,184
Whole House	**20,327**	**24,124**	**21,579**	**25,702**

Source: Home Energy Saving, Lawrence Berkeley National Laboratory

For a model residential unit in the City of Yerington, the GHG emission generated from using liquid propane amounts to 24,124 pounds of CO_2 per year, or 18.7% higher than an identical one using natural gas. Similarly, in Hawthorne CDP, the same unit is estimated to generate 25,702 pounds of CO_2 per year using liquid propane, or 19.1% higher than using natural gas.

There had have numerous studies demonstrating the negative relationship between GHG emissions and health, including lower life expectancy. In the case of Walker River Corridor, the residents have lower life expectancy, on average, compared to statewide. Lyon County and Mineral County have lower average life expectancy than statewide. Of the 16 counties in Nevada, [46] Lyon and Mineral County have the fifth and third lowest average life expectancy, respectively.

There are other health and health care related challenges that the Walker River Corridor currently faces. The description, assessment, and discussion of these challenges are detailed in the Health Care subsection of this report.

Figure A.17:
Life Expectancy (2016-2018) by County

County	Life Expectancy
Lyon	76.7
Mineral	75.1
Comparisons:	
Clark (Las Vegas MSA)	78.8
Washoe (part of Reno MSA)	78.3
Nevada Statewide	78.5

Source: National Vital Statistics System, National Center for Health Statistics

[46] There are 17 counties in Nevada, but there is no data for Esmeralda County due to missing data, which is due to Esmeralda's very small population.

Challenges

The lack of robust utility infrastructure in the Walker River Corridor has led to a higher energy burden, which is an impediment to economic development. Elevated energy burdens have also been correlated with negative health outcomes. [47] In addition, the lack of developed infrastructure deprives residents from having the choice for cleaner fuel; the resulting higher GHG emissions has further adverse health outcomes. Improving energy efficiency would be the most common ways to reduce long term energy burden. However, upgrading to more energy efficiency appliances and improving home energy efficiency carry high upfront costs that are simply financially infeasible for most households.

Region wide, improving broadband access not only expands economic opportunities in the Walker River Corridor but also allows energy efficiency technologies to be co-delivered through local utilities or energy and internet service providers, which can leverage broadband expansions by jointly promoting broadband and energy efficiency technologies such as smart thermostats. [48] An assessment of broadband and associated challenges in the Walker River Corridor is discussed in further details in this report.

Broadband

Figure A.18:
Broadband Connectivity in the Sierra Nevada Region

Region	% of Pop. With Fixed 25/3 Mbps	% of Pop. With Mobile 5/1 Mbps	% of Pop. With Fixed & Mobile	Pop. Density
Lyon County	82.3%	99.9%	82.3%	28.7
Mineral County	71.5%	98.0%	71.5%	1.2
Storey County	69.1%	100.0%	69.1%	15.7
Douglas County	96.5%	100.0%	96.5%	68.9
Carson City	99.5%	100.0%	99.5%	386.5
State-Level for Comparison:				
Nevada State	**97.1**%	**99.9**%	**97.1**%	**28.1**%

Source: Federal Communications Commission

[47] Ross, L., A. Drehobl, and B. Stickles (July 2018). The High Cost of Energy in Rural America: Household Energy Burdens and Opportunities for Energy Efficiency. American Council for an Energy-Efficient Economy. Retrieved from: https://www.aceee.org/sites/default/files/publications/researchreports/u1806.pdf

[48] Ibid.

Unequal broadband access and a "digital divide" are issues in the Walker River Corridor. The WRC has less broadband connectivity than regional neighbors Douglas County, Carson City, as well as the Nevada State average. Mineral County (71.5%) has less connectivity than Lyon County (82.3%).

Average broadband speeds in Yerington, Smith and Hawthorne are 18.24 Mbps, [49] 13.52 Mbps[50] and 30.02 Mbps, [51] respectively. Average broadband speeds in the Walker River corridor are significantly below--83.7%, 87.9% and 73.2% below, respectively--the Nevada State average speeds of 111.86 Mbps. Currently, there are roughly 11,600 people in the Walker River corridor without a fixed 25/3 Mbps broadband connection. The FCC defines broadband as a minimum speed of 25 Mbps download and 3 Mbps upload. In terms of connectivity (measured by number of ISPs per block), Hawthorne (13th most connected), Yerington (18th most connected), and Wellington (27th most connected) are well-connected but Smith (76th most connected) and Schurz (78th most connected) are faring poorly.

The region has several providers offering the minimum broadband benchmark speeds of 25 Mbps, but few providers offer competitive pricing with speeds of 100 Mbps and above in the more rural areas. For example, in Mineral County a 35 Mbps plan costs $0.47 per Mbps. Conversely, In Reno, a plan with a 93 Mbps average speed costs $0.42 per Mbps. Furthermore, broadband benchmark speeds of 25 Mbps are not adequate in the post-COVID-19 environment in which multiple family members are using a single connection for work, school, health services, and leisure. Fast, reliable internet access is needed by residents to use telehealth services, by small businesses for daily operations, and students learning in an online environment. Access to telehealth services is compounded for those living in rural areas without internet access. Telehealth can be a lifeline for those in rural regions. But those most in need of telehealth live in areas with reduced broadband capacity or access to transit.

[49] Internet Access in Yerington, NV is based on information from BroadbandNow provided for Zip Code 89447, accessed on May 25, 2021, from https://broadbandnow.com/Nevada/Yerington?zip=89447

[50] Internet Access in Smith, NV is based on information from BroadbandNow provided for Zip Code 89430, accessed on May 25, 2021, from https://broadbandnow.com/Nevada/Smith?zip=89430

[51] Internet Access in Hawthorne, NV is based on information from BroadbandNow provided for Zip Code 89415, accessed on May 25, 2021, from https://broadbandnow.com/Nevada/Hawthorne?zip=89415

Water

In Lyon County, water is provided by the Lyon County Water and Sewer Service Utilities Department among other providers in the region. The utility department provides water service to Mound House and Dayton. Lyon County Utilities also provide service to other utility providers in Yerington (Crystal Clear Water – The City of Yerington), Smith Valley (Smith Valley Water System), and Wellington (Dressler Park Water System). [52] The City of Yerington providers water to both City of Yerington Residents and those in the Mason Valley region. [53] In Mineral County water is provided by Mineral County- Hawthorne utilities as well as Walker Lake Gid and Hawthorne Army Depot among others.

The water used in these systems is sourced from groundwater wells except for the Hawthorne Army Depot which uses surface water as the primary water source. The Mound House and Dayton region are serviced by over twenty wells, eleven storage tanks, and six pressure boosting stations. [54] The City of Yerington operates four water wells, five water storage tanks, and three pressure boosting stations. [55] The Smith Valley region is serviced by one well and one storage tank. The Mason Valley region is serviced by two irrigation wells and one pressure boosting station. [56] The Mineral County Hawthorne Utility system operates eight groundwater wells (five via Hawthorne Utility and three via Mina Luning Water System.

Figure A.19:
Primary Water Systems of the Walker River Corridor

Lyon County Water System	City	People Served	Mineral County Water Systems	City	People Served
Fernley Public Works	Fernley	18,000	Hawthorne Utilities	Hawthorne	2,900
Dayton Valley Water System	Dayton	14,168	Mina Luning Water System	Hawthorne	300
City of Yerington	Yerington	3,300	Walker Lake Gid	Hawthorne	300
Silver Springs Mutual Water Company	Stateline	3,070	Hawthorne Army Depot	Hawthorne	300
Stagecoach Gid	Stagecoach	1,411			
Weed Heights Development	Yerington	340			

Source: Environmental Working Group

[52] Lyon County Nevada – Water. Accessed March 5th, 2021, from https://www.lyon-county.org/117/Water

[53] City of Yerington. (2020, June 6th). 2019 Consumer Confidence Report. Accessed March 5th, 2021, from https://yeringtonnet.files.wordpress.com/2020/08/2019-consumer-confidence-report.pdf

[54] Lyon County Nevada – Water Source. Accessed March 5th, 2021, from https://www.lyon-county.org/118/Water-Source

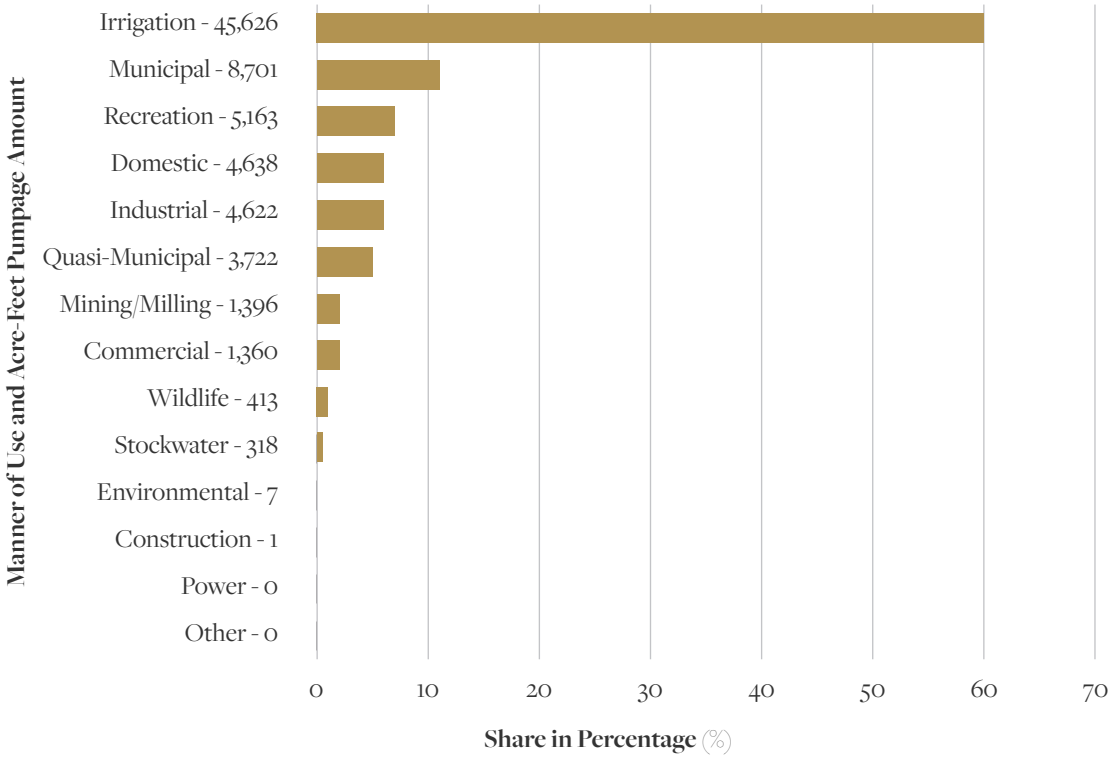
[55] City of Yerington. (2020, June 6th). 2019 Consumer Confidence Report. Accessed March 5th, 2021, from https://yeringtonnet.files.wordpress.com/2020/08/2019-consumer-confidence-report.pdf

[56] Lyon County Nevada – Water Source. Accessed March 5th, 2021, from https://www.lyon-county.org/118/Water-Source

The Walker River Corridor is primarily serviced by ten main water system providers who deliver water services to those in the Walker River service area. [57] All water systems utility systems referenced in table x comply with federal health-based drinking water standards. However, although all primary providers comply, some residents may obtain their water supply outside of these primary water systems. Furthermore, the legal limits for tap water contaminants have not been updated in several years. Because of this some groups argue that despite meeting EPA (Environmental Protection Agency) compliance, there may still be harmful contaminants in the water system under the current compliance criteria. [58] [59]

Figure A.20 illustrates the amount of groundwater pumpage and manner of use for the most recent data year (2017). Over half (60%) of the groundwater sourced in the WRC is used for irrigation. 11% of the water sourced is used for municipal use which refers to water used for public demands such as fire protection, schools, homes, and other public buildings. The remaining 29% of water sourced is used for domestic, wildlife/ environmental, and commercial/industrial use, etc.

Figure A.20:
Walker River Corridor Groundwater Pumpage



Source: State of Nevada, Department of Conservation and Natural Resources

[57] There are more than ten water system providers in the region, however, outside of the main water suppliers, other water systems are primarily related to public buildings such as schools and private businesses. A more comprehensive list of water systems in the region may be accessed at https://ndep.nv.gov/uploads/documents/ACR_2019.pdf

[58] Introducing EWG Standards – Benchmarks to Protect Public Health. (2017, July 26). Accessed March 5th, 2021, from https://www.ewg.org/research/introducing-ewg-standards-benchmarks-protect-public-health

[59] Schaider, L. A., Swetschinski, L., Campbell C., and Rudel, R. (2019). Environmental justice and drinking water quality: are there socioeconomic disparities in nitrate levels in U.S. drinking water? Environmental Health, 18, Article Number 3.

Figure A.21:
Groundwater Pumpage (acre-feet) in the Walker River Corridor 2013 – 2017

Manner of Use	Walker River Corridor 2017	WRC 2013-2017 % Change	Lyon County 2017	Lyon County 2013-2017 % Change	Mineral County 2017	Mineral County 2013-2017 Change
Mining	1,396	-72.2	268	24.1	1,128	-77
Industrial/Construction	4,623	-37.7	4,551	-37.9	72	-23
Power	0	0	0	0	0	0
Environmental	7	16.7	0	0	7	17
Irrigation	45,626	-73.1	39,306	-76.1	6,320	28
Stockwater	318	-44.6	254	-19.9	64	-75
Municipal	8,701	-35.3	7,625	5.4	1,076	-83
Quasi-Municipal	3,722	-2.5	1,831	-5.5	1,891	0
Domestic	4,638	-3.6	4,542	-3.9	96	9
Recreation/Wildlife	5,576	18.5	5,272	19.8	304	0
Commercial	1,360	-42.4	1,325	2.7	35	-97
Other	0	-100	0	0	0	-100
Total	**75,967**	**-64.2**	**64974**	**-66.2**	**10,993**	-46

Source: State of Nevada Department of Conservation and Natural Resources

Figure A.21 illustrates the change in groundwater pumpage over five years (2013-2017). Much like the State of Nevada, overall groundwater pumpage declined in the WRC by roughly 64% over five years. Over the same period trends in water usage also changed significantly. There was an increase in water pumpage for environmental, recreation, and wildlife purposes; Conversely, during the same period all other water use categories declined. The greatest declines in water pumpage came primarily from industry such as Irrigation, Mining, Stockwater, [60] Commercial, and Industrial/Construction. Considering the water needs for key local industries such as mining and irrigation, the prospect of future water scarcity and droughts can hamper and put limits on economic growth and development in the region.

[60] Stockwater refers to water used for livestock.

Drought and Water Scarcity

Water drought and shortages remain an issue in Nevada and indeed the Walker River corridor. Water in Nevada comes from two primary sources: surface water (Colorado River - Lake Mead, and Walker River, etc.) and groundwater. 70% of the state's water supply comes from surface water and the remaining 30% is sourced from groundwater. [61] Although groundwater and surface water are seen as two separate water sources, they are a single resource, as surface water systems are connected to groundwater systems. As they can be seen as a single resource, any depletion of surface water also threatens the groundwater supply. [62] Understanding the interrelation between groundwater and surface water will be key in sustainable water resource management.

Periods of drought in the region have put constraints on the water supply. The State of Nevada projects water demand to increase by 85% by 2065 which will hamper the region's already limited water supply. [63] Population in the Walker River corridor is projected to increase by 18% by 2038. The majority of the increase comes from Lyon County with an increase of 19% (10,555), with Mineral County accounting for a 1% increase (50). [64] The biggest threat to the region's water supply are periods of drought and consumptive usage stemming from increased water demands.

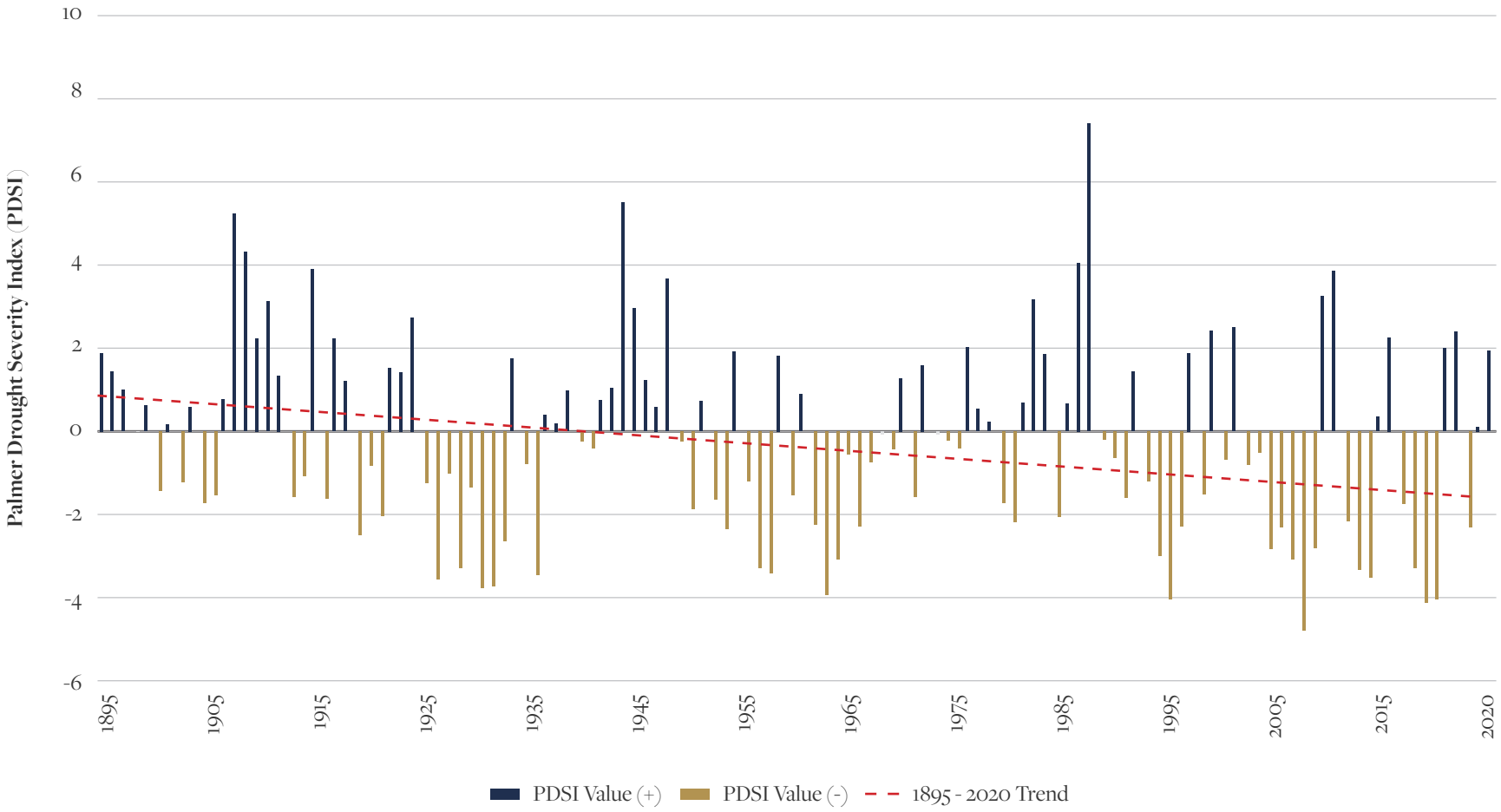
[61] Stockwater refers to water used for livestock.
Environmental Protection Agency. (2017, February). Saving Water in Nevada. Accessed March 8th, 2021, from https://www.epa.gov/sites/production/files/2017-02/documents/ws-ourwater-nevada-state-fact-sheet.pdf

[62] U.S. Geological Survey. (2015, February 8th). Overview of Nevada groundwater systems and evolution of groundwater investigations. Accessed March 8th, from https://www.leg.state.nv.us/interim/78th2015/committee/statcom/lcwater/other/8-february-2016/04agendaviiiallendernvgwoverview.pdf?rewrote=1

[63] Environmental Protection Agency. (2017, February). Saving Water in Nevada. Accessed March 8th, 2021, from https://www.epa.gov/sites/production/files/2017-02/documents/ws-ourwater-nevada-state-fact-sheet.pdf

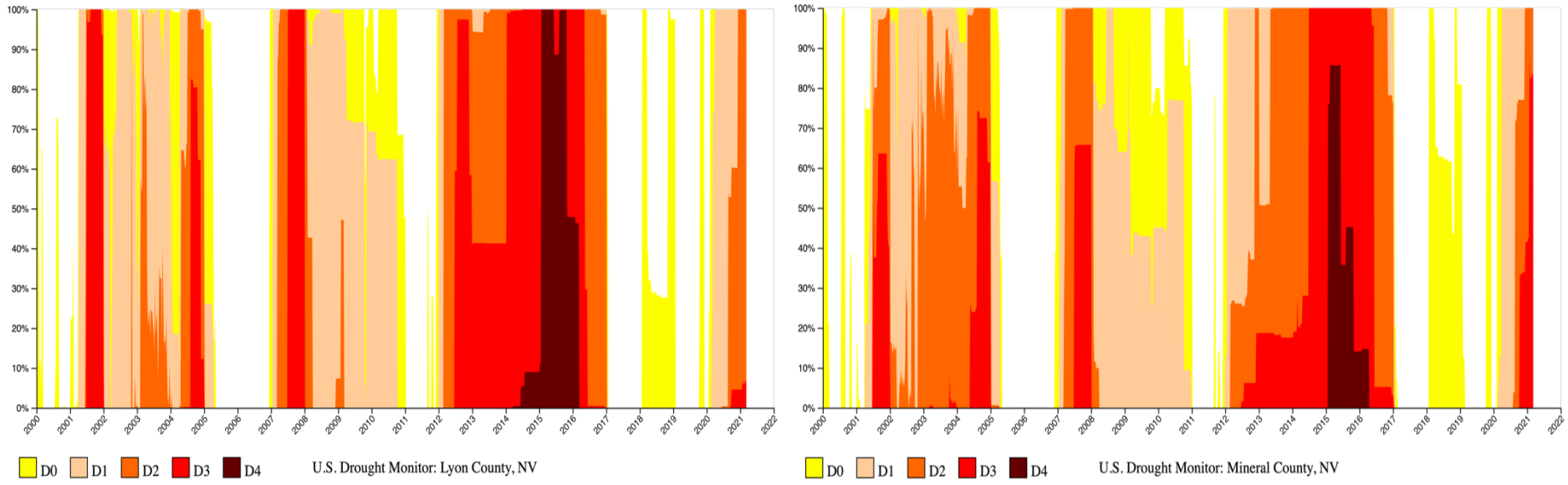
[64] These population projections are baseline estimates. Population projections based on the success of the Tesla Gigafactory and Pumpkin Hollow Mine project show a greater projected increase. Under this scenario, population in the Walker River corridor is projected to increase by 21% by 2038. The majority of the increase comes from Lyon County with an increase of 22% (12,376), with Mineral County accounting for a 1% increase (62).

Figure A.22:
Drought Conditions in Nevada



Source: National Oceanic and Atmospheric Administration

Figure A.23:
Historical Drought in the Walker River Corridor (Mineral & Lyon County) [65]



Source: National Integrated Drought Information System

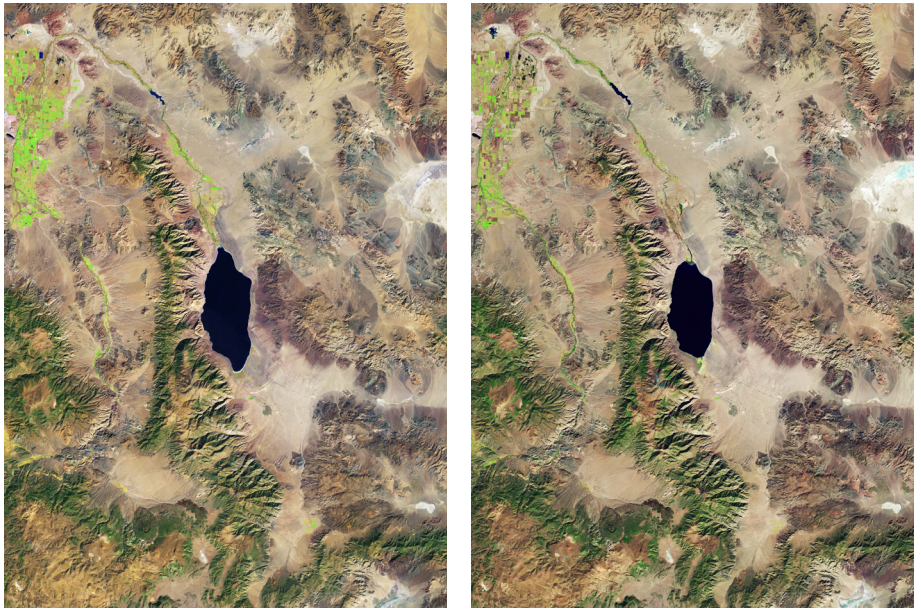
Figures A.22 shows the recent trends of drought conditions for the State of Nevada from 1895 - 2020. The palmer index conditions on drought have shown periods of variation since 1895. The early 1900s, 1950s, and late 1990s onwards show considerable periods of drought. However, the 1940s and late 1970s were relatively wet. Meanwhile, Figure A.23 shows more recent data for the Walker River corridor; the region shows a period of severe to exceptional drought from 2012 to 2017. From the end of 2020 to early 2021 the region experienced more severe drought than 2017 to early 2020. A challenge for the region is that the Walker River Corridor is susceptible to cycles of drought.

[65] Figure A.23 illustrates periods of drought and precipitation in the State of Nevada. Positive values above the normal base value of 0 represent wetter than average conditions and negative values below the base value represent drier than average conditions. For instance, -2 is moderate drought, -3 is severe drought, and -4 is extreme drought.

Figure A.24:
Map of the Walker River Basin

Source: Open-Source Image

Figure A.25:
Walker River, 1988 – 2017



1988 **2017**

Source: NASA Earth Observatory

An important source of water for the Walker River Corridor comes from the Walker River basin which gets its streamflow from the snowmelt of the Sierra Nevada mountains. The majority of the water sourced from the Walker River is used for agriculture; in the Walker River Corridor 60% of all groundwater sourced is used for Agriculture. The demand for water for industrial uses, population increase, as well as environmental factors have caused Walker River to decline 160 feet between 1882 and 2010. [66]

Since the late 1880s, the Walker River has lost roughly 90% of its volume. The loss of water comes from diversion and environmental factors; this has caused an increase in dissolved solids (primarily salt) in the river which has contributed to the loss of biodiversity in the region as fish and other wildlife are severely impacted.[67] The degradation of the Walker River Lake poses a threat to the river's ecosystem as well as biodiversity in the region. A significant challenge will be managing water resources during periods of drought and population increase. As the population increases, further demand for industrial use and agricultural products will put pressure on the regions already stained water resources especially during periods of drought.

[66] U.S. Geological Survey. USGS Research in the Walker River Basin. Accessed on March 10th, 2021, from https://nevada.usgs.gov/walker/.

[67] NASA Earth Observatory: https://earthobservatory.nasa.gov/images/91921/disappearing-walker-lake

Ongoing Infrastructure Projects in the Walker River Corridor

The City of Yerington:

1. United States Department of Agriculture - Water & Sewer Project (Both City of Yerington and Yerington Colony)
2. Federal Aviation Administration - Airport Master Plan
3. NV Energy ChargePoint - Electric Charging Stations
4. Farr West Engineering Rate Study
5. Lyon County School District Kiss and Drop Project
6. Nevada Department of Transportation SF208 and Pearl Street Beacon Lights

Yerington Paiute Tribe:

1. Road maintenance on Taboosi way (recently completed)
2. Campbell Ranch water line extension
3. Sewage pumping relocation
4. Fiber optic line extension

Walker River Paiute Tribe

1. Roads – ongoing maintenance and repairs
2. Existing rail lines currently in us by the US Army
3. Fiber connectivity to the administration and other tribal buildings
4. Wireless internet connectivity
5. Water system infrastructure
    a. Water looping project to improve water pressure issues and expand capacity in the community
    b. Addition of water tank to increase the number of homes to be serviced in the community
    c. Installation of water meters
    d. Expansion of arsenic plant
6. Waste Water System
    a. Addition and expansion of sewer lagoons
7. Evaluation of transportation program to assist with employment, healthcare and other needs.

Smith Valley

1. Upgrade to Electrical Utility Service line from Nation Valley into Smith Valley
2. New substation included in Smith Valley

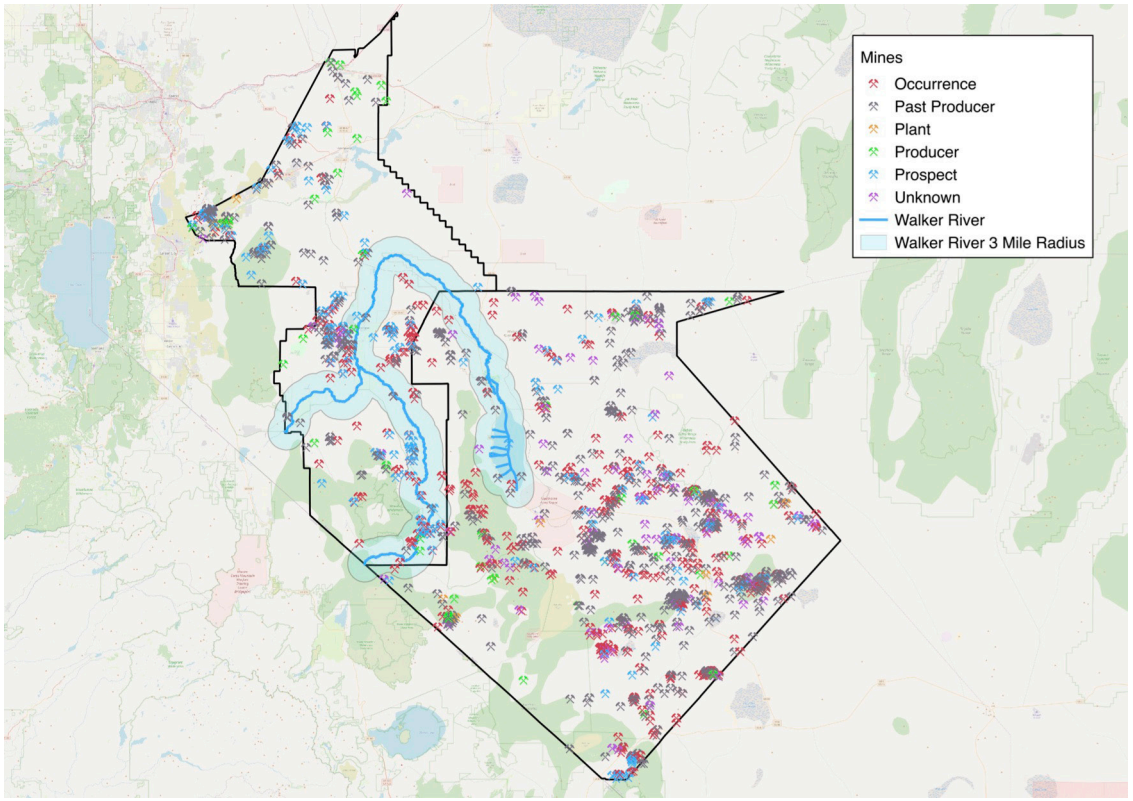
Mineral County

1. New Storage Water Tanks

APPENDIX B: TARGETED INDUSTRY PROFILE: MINING

The Economic Conditions section of this report has identified mining as one of the targeted industry sectors that has both a high local concentration and competitive advantage. This subsection discusses the Walker River Corridor's mining assets in greater details. The following discussion is more broadly at the county level instead of confined within the immediate area within the Walker River, given that the economic, environmental, and regulatory impacts of mining are often regional and global instead of local.

Figure B.1:
Historical Mining in the Walker River Corridor



Source: Mineral Resources Data System (MRDS)

The historical mining data from the MRDS database details all of the past and current mining activity up until 2011. Considering the long-life cycle of some mines, the database is a useful tool for understanding important mining locales of the region from a historical perspective. The following table summarizes the historical mine types within the Walker River Corridor.

The types of mines are split into different mine types such as occurrence, past producer, plant, producer, prospect, and unknown: [68]

- Occurrence: A mine that has been identified, however, no production has begun.
- Past Producer: A formally operating mine that has since been closed.
- Plant: A processing facility that deals in smelting and refining, etc.
- Producer: A mine that is currently in production.
- Prospect: A site has gone beyond occurrence and site work has begun such as grade and tonnage; at this stage, the mine is not in full production.
- Unknown: A site in which the development status is not known.

Figure B.2:
Historical Mine Types in the Walker River Corridor

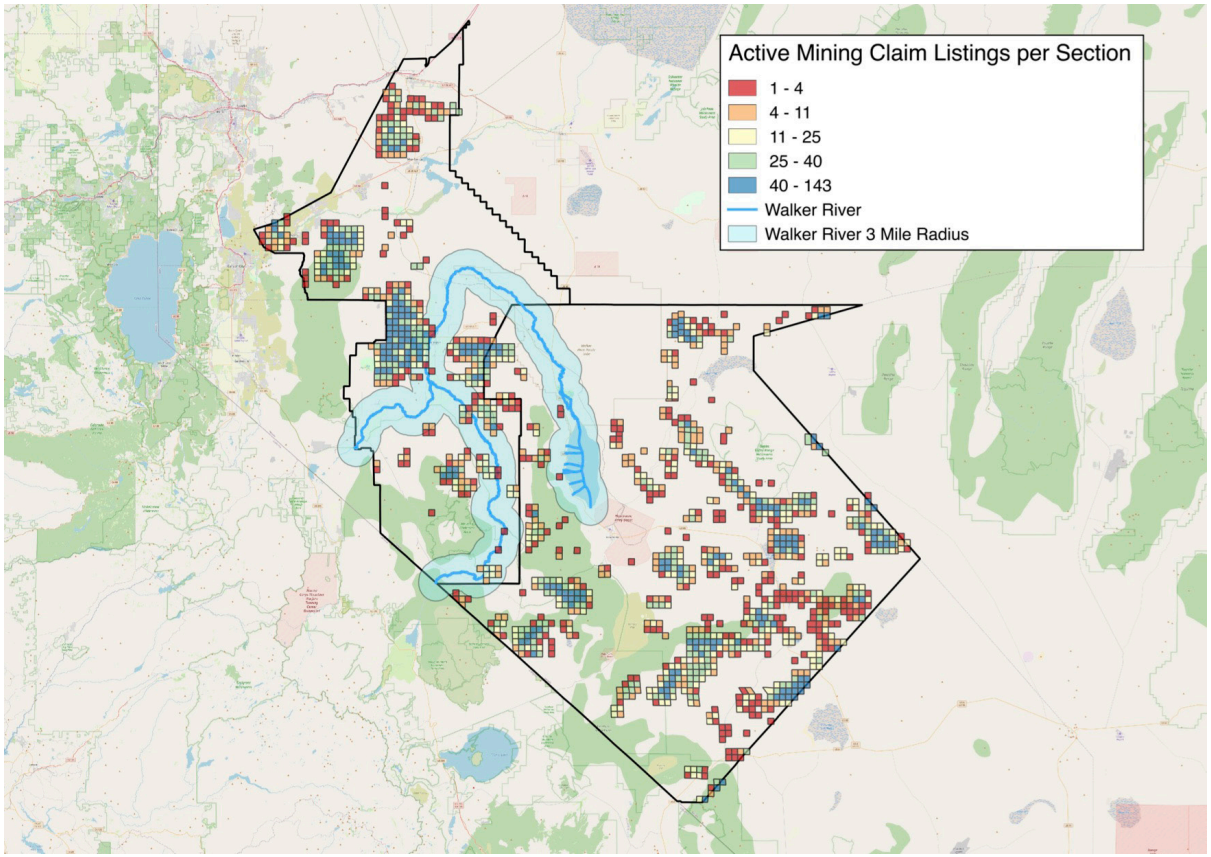
Mine Type	Number
Occurrence	433
Past Producer	762
Plant	17
Produce	60
Prospect	170
Unknown	93

Source: Mineral Resources Data System (MRDS)

As of December 2020, there are 60 producer mines currently in operation. There are potentially 603 mines in the pipeline (433 occurrences and 170 prospects). About half of the mines in Lyon County and Mineral County are past producers or closed mines. However, advances in mining technology have prolonged the useful life of mines. The ability to reinvent, find and use technology in order to find different deposits within a mine have allowed the mining industry to push the useful life of a mine significantly longer. Advances in mining technology has also enabled miners to recover smaller amounts of minerals. These factors imply a potential transformation of the mining industry from a boom-and-bust cycle into a more traditional type of industry.

[68]Schweitzer, P. N. Mineral Resources Data System, U.S. Geological Survey, U.S. Department of Interior. Last updated December 30, 2020. Retrieved from: https://mrdata.usgs.gov/metadata/mrds.faq.html

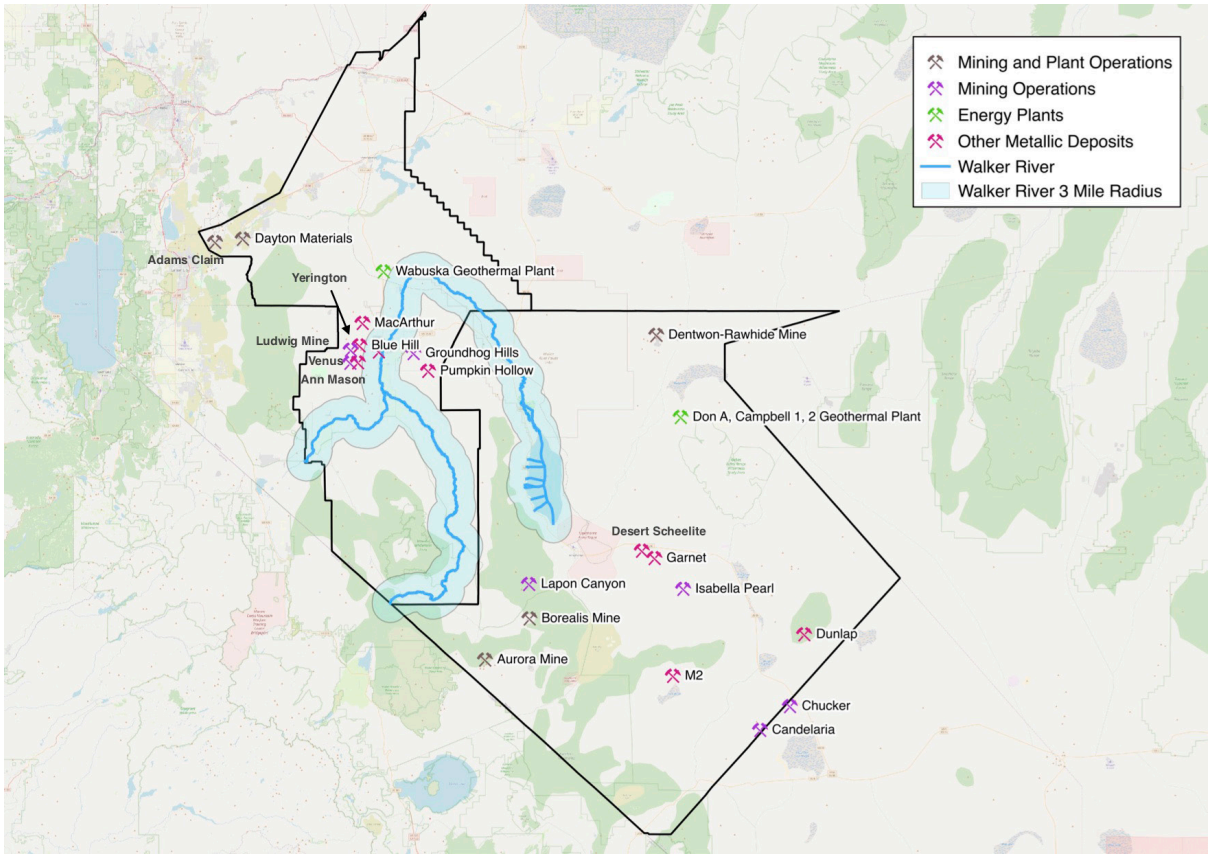
Figure B.3:
Active Mining Claim Listings Data – 2020



Source: Nevada Division of Minerals

The map of active mining claims listing illustrates the number of mining claims in the region. Mining claims are a good barometer for discerning mining activity outside of the larger-scale mining operations. A mining claim grants the holder rights to prospect, explore, develop, and extract resources from a parcel of land. As of December 2020, there are 25,702 active mining claims in Lyon County and Mineral County, which accounts for 12.3% of all active mining claims in the State of Nevada. Of these 25,702 claims, 1,663 claims lie within 3 miles of the Walker River. The mining claim sites mirror somewhat the location and density of mining activity of the historical mining sites in the region.

Figure B.4:
Active Mining Claim Listings Data – 2020



Source: The Nevada Mineral Industry 2019, Major Mines of Nevada 2019, & Nevada Division of Minerals

There are 27 major mines and energy plants in Lyon County and Mineral County, of which eight of them are located near Yerington alone. Most of the major mines near the Walker River have mining operations or metallic deposits while the sites farther away from the Walker River have mining and plant operations. There are also two geothermal energy plants (one in each county). Traditionally, by gross proceeds, gold and geothermal are the major operations in Mineral County and clay, geothermal, gypsum and limestone are the major operations in Lyon County. [69]However, copper and lithium mining has become increasingly more prominent in the region.

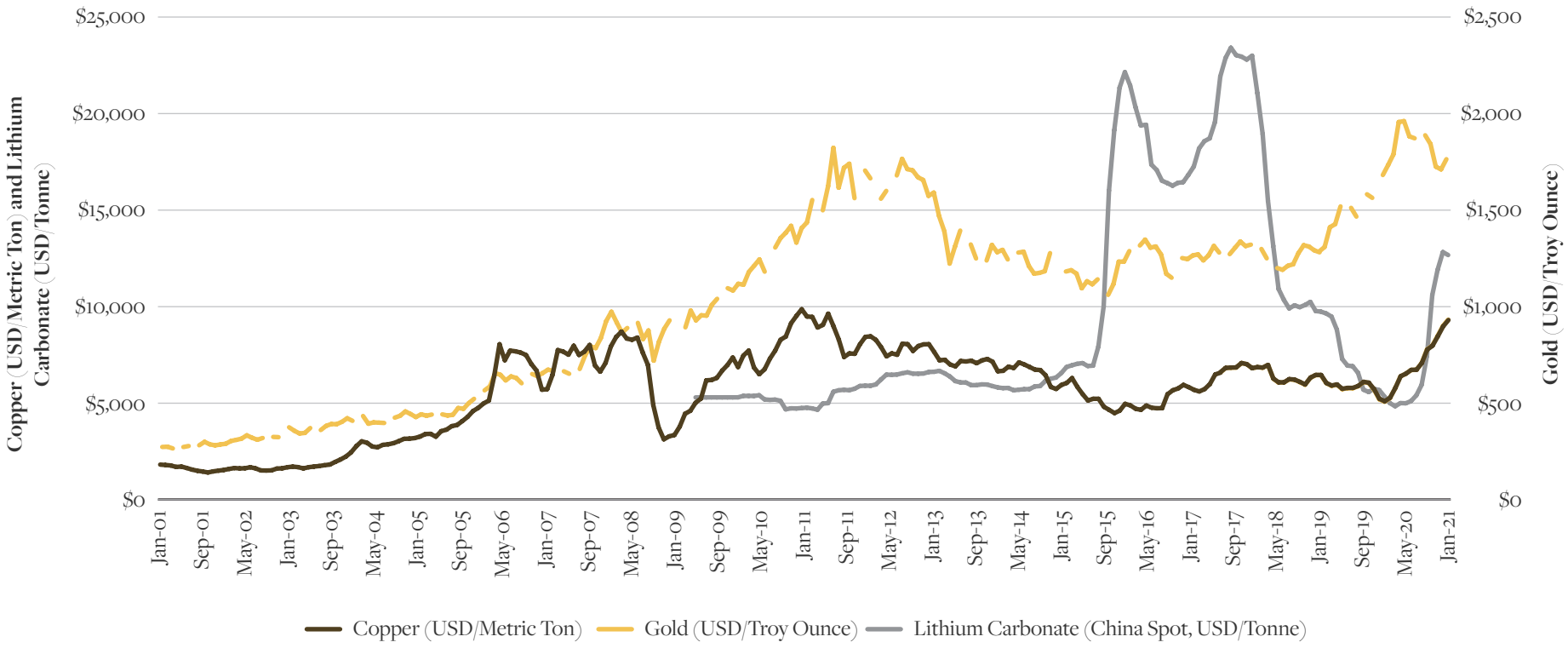
The outlook for the mining industry sector in the Walker River Corridor is bright. However, there are commodity price, environmental and regulatory challenges that the industry faces. These challenges are at global, regional and local scales. The rest of this section discusses some of the main challenges.

[69] Aguero, J. "2019, Mining Through Uncertainty." Applied Analysis report for Nevada Mining Association. Retrieved from: https://www.nevadamining.org/wp-content/uploads/NvMA-Annual-Convention-Presentation-2019-Jeremy-Aguero-Report.pdf

Volatile Commodity Prices

The mining industry is often the beginning of a supply chain. The COVID-19 pandemic has caused tremendous disruptions to the global supply chain of many commodities. When refining and smelting plants are shut down, there are no facilities to process the minerals and ores, and the supply chain breaks down. The constricted supply chain and pent-up demand could lead to extremely volatile commodity prices.

Figure B.5:
Prices of Selected Major Commodities Mined in the Walker River Corridor



Source: International Monetary Fund, Retrieved from St. Louis Fed (FRED); Yahoo! Finance; Trading Economics and Investing.com

In the Walker River Corridor, copper[70] and gold[71] are the major commodities in mining. With the imminent urge to electrify global transportation, lithium (lithium carbonate[72]) has gained significant importance and will remain important. As of April 2021, the price of copper (+84%) and lithium carbonate (+139%) surged greatly year-over-year.

Particularly, lithium carbonate traded close to a near 3-year high of $12,667 per tonne, buoyed by rising global demand for EVs, while supplies remained tight. Most economic recovery plans put forward by global leaders bet heavily on the EV industry to transform the transportation sector. In the U.S., President Biden pledged to build half a million charging stations. [73] The supply-and-demand balance for lithium fell into deficit in 2020 and it is expected to continue in 2021 due to lack of investment in mines after prices declined following the boom until 2018.

Environmental Challenges

The environmental impacts of mining can occur at local, regional, and global scales through direct and indirect mining practices. Impacts can result in erosion, sinkholes, loss of biodiversity, or the contamination of soil, groundwater, and surface water by the chemicals emitted from mining processes.

Near Yerington, there are still on-going environmental cleanup efforts at the Anaconda copper mine, which closed in 1978. The Anaconda Copper Mine site was transferred to the Nevada Division of Environmental Protection (NDEP) in 2018 to oversee investigations and cleanup work along with Atlantic Richfield Company, which purchased the Anaconda operation in 1977.[74] Although the site has been closed for decades, contamination lies silently in the heaps and in a toxic groundwater plume that, over time, has snaked below homes and toward the Yerington Paiute Tribe's reservation.[75] Only recently in 2013 did the residents finally win a class-action settlement of $19.5 million. Plans for cleanup bounced back and forth, with work only ramping up in the last two years. [76]

[70] Value represents the benchmark prices which are representative of the global market. They are determined by the largest exporter of a given commodity. Prices are period averages in nominal U.S. dollars.

[71] Value represents COMEX delayed price at adjusted close (adjusted for both dividends and splits) in Troy Ounce.

[72] Lithium Carbonate prices are displayed in Chinese Yuan as China Spot 99.5% cif. Prices have been converted based on historical exchange rate.

[73] Outside of the U.S., European governments offer subsidies to electric-car buyers and sales of alternatively powered cars account now for a third of new passenger cars. China has invested at least $60 billion to support the EV industry and it's pushing an ambitious plan to transition to all-electric or hybrid cars by 2035.

[74] Environmental Protection Agency's page on Anaconda Copper Mine: https://cumulis.epa.gov/supercpad/SiteProfiles/index.cfm?fuseaction=second.Stayup&id=0902959#Stayup

[75] Rothberg, D. "What Anaconda Left Behind." The Nevada Independent. Published September 22, 2019. Last updated September 24, 2019. Retrieved from: https://thenevadaindependent.com/article/what-anaconda-left-behind-a-complicated-past

[76] Alonzo, A. "Nevada Deferral of Anaconda Superfund Site Speeds up Lyon County Mine's Cleanup Progress." Reno Gazette Journal. Published April 20, 2021. Retrieved from: https://www.rgj.com/story/news/2021/04/20/nevada-deferral-anaconda-superfund-site-speeds-cleanup-progress/7229508002/

Anaconda is an example illustrating the long-term environmental consequences of mining. IT also had adverse social impacts on the quality of life on the residents, who risked drinking from water not safe for consumption. With technological advances, mining can be more environmentally conscious.

Lithium mining is becoming increasingly important, but lithium mining faces one major challenge: Tiehm's buckwheat, a rare and pale-yellow wildflower that only grows in lithium and boron rich soil in a few of Nevada lithium mining sites. Tiehm's buckwheat is considered "critically imperiled" (Rank G1; at very high risk of extinction or elimination due to very restricted range, very few populations or occurrences, very steep declines, very severe threats, or other factors.)[77] A recent ruling issued in April 2021 mandates that the U.S. Fish and Wildlife Service must decide whether or not to protect Tiehm's buckwheat under the Endangered Species Act. The litigation came to light after almost half of Tiehm's buckwheat population was lost in 2020.

It is not possible to simply moving the Tiehm's buckwheat someplace else away from the lithium mines. Ioneer's proposed Rhyolite Ridge lithium mine in nearby Esmeralda County would destroy as much as 60% of the global population of Tiehm's buckwheat during phase one and up to 90% in phase two.[78] So far, Nevada Center for Biological Diversity (the claimant) has proposed to designate the area of critical environmental concern and to put a one-mile buffer around the habitat.[79] Although the Rhyolite Ridge lithium mine occurs outside of the Walker River Corridor, there could be indirect impacts on lithium mining that occur within or near the Corridor as well as potential disruption to the supply chain.

[77] Based on Global (G) Conservation Status Ranks. Definitions of conservation status ranks can be viewed here: https://help.natureserve.org/biotics/content/record_management/Element_Files/Element_Tracking/ETRACK_Definitions_of_Heritage_Conservation_Status_Ranks.htm

[78] Donnelly, P. "Legal Victory Compels Federal Government to Decide on Tiehm's Buckwheat Protections." Nevada Center for Biological Diversity. Published April 21, 2021. Retrieved from: https://biologicaldiversity.org/w/news/press-releases/legal-victory-compels-federal-government-to-decide-on-tiehms-buckwheat-protections-2021-04-21/

[79] Earls, M. "U.S. Lithium Production Hinges on a Mine-or-Wildflower Decision." Bloomberg Law. Published May 3, 2021. Retrieved from: https://news.bloomberglaw.com/us-law-week/u-s-lithium-production-hinges-on-a-mine-or-wildflower-decision?utm_source=rss&utm_medium=LWNW&utm_campaign=00000179-1eb6-d909-a5fb-9eb7311600001

Regulatory Challenges

The mining industry in Walker River Corridor face unique and multi-faceted regulatory challenges. In addition to industry-related regulations, the region is also often required to cooperate with stakeholders such Walker River Paiute Tribe, Yerington Paiute Tribe and the Bureau of Land Management (BLM).

For the Anaconda Mine near Yerington, the EPA handed control of the site over to the NDEP in 2018. However, the site has the potential to impact Tribal lands (Yerington Paiute Tribe) and NDEP does not have jurisdiction over tribal land. The EPA remains involved by working directly with the tribe on issues that affect them.[80] On the other hand, locals feel that the EPA's decision has sidelined tribes and residents who fear they'll never have clean water.[81] Cleanup efforts had been stalling for several years as the site was repeatedly proposed, listed, and removed from the EPA's federal Superfund list, a perpetually underfunded compilation of highly polluted national sites.[82]

The majority of the land in the Walker River Corridor is under BLM jurisdiction. For the Anaconda site, it oversees federal land that comprises almost half of the near-3,500-acre site. The BLM had independently tested uranium levels at the site, which irritated other federal agencies and ultimately led to the wrongful termination suit of Earle Dixon,[83] who was hired by the BLM to test uranium levels at the site.[84]The Anaconda site is just one of many examples of regulatory challenges.

[80] Environmental Protection Agency's page on Anaconda Copper Mine: https://cumulis.epa.gov/supercpad/SiteProfiles/index.cfm?fuseaction=second.Stayup&id=0902959#Stayup

[81] Stern, M. "EPA Struck Secretive Deal Over Toxic Site Leaving $13 Million in BP's Pocket." National Audubon Society. Published January 15, 2019. Retrieved from: https://www.audubon.org/news/epa-struck-secretive-deal-over-toxic-site-leaving-13-million-bps-pocket

[82] Alonzo, A. "Nevada Deferral of Anaconda Superfund Site Speeds up Lyon County Mine's Cleanup Progress." Reno Gazette Journal. Published April 20, 2021. Retrieved from: https://www.rgj.com/story/news/2021/04/20/nevada-deferral-anaconda-superfund-site-speeds-cleanup-progress/7229508002/

[83] The decision of the lawsuit, Dixon v. United States Department of Interior, Bureau of Land Management, can be reviewed here: https://nas-national-prod.s3.amazonaws.com/dixonruling.pdf

[84] Stern, M. "EPA Struck Secretive Deal Over Toxic Site Leaving $13 Million in BP's Pocket." National Audubon Society. Published January 15, 2019. Retrieved from: https://www.audubon.org/news/epa-struck-secretive-deal-over-toxic-site-leaving-13-million-bps-pocket

As mentioned, a unique challenge that is unique to the Walker River Corridor is the very different mix of land ownership, which often results in extremely long review and permitting processes (Environmental Assessments and Environmental Impact Statements). For example, Borealis mine took 10 years and 10 million dollars in permitting to get open while Isabella Pearl also took several years to obtain all permits needed to commence operation.[85] The long review and permitting processes as well as delays cost communities opportunities as investors are unwilling to invest in projects that are convoluted and intensive, both in time and money.

The cumbersome processes pose threats to the Walker River Corridor in terms of employment and workforce development caused by the long lead times to receive mining permit approval for Environmental Assessments and Environmental Impact Statements. Given that any prospective projects will involve many stakeholders—residents, tribal groups, environmental advocates, local government, and the BLM at the very least—increasing and improving cooperation between each stakeholder may help streamline the processes. For example, the mining firm designates a staff member for each prospective mine with a review team combining representatives from these stakeholders who meet on a regular basis to review and approve the permits.

[85] Hartman, S. AGENDA ITEM IV A-LANDS. Mineral County Economic Development Authority. May 18, 2018. Retrieved from: https://www.leg.state.nv.us/App/InterimCommittee/REL/Document/12301

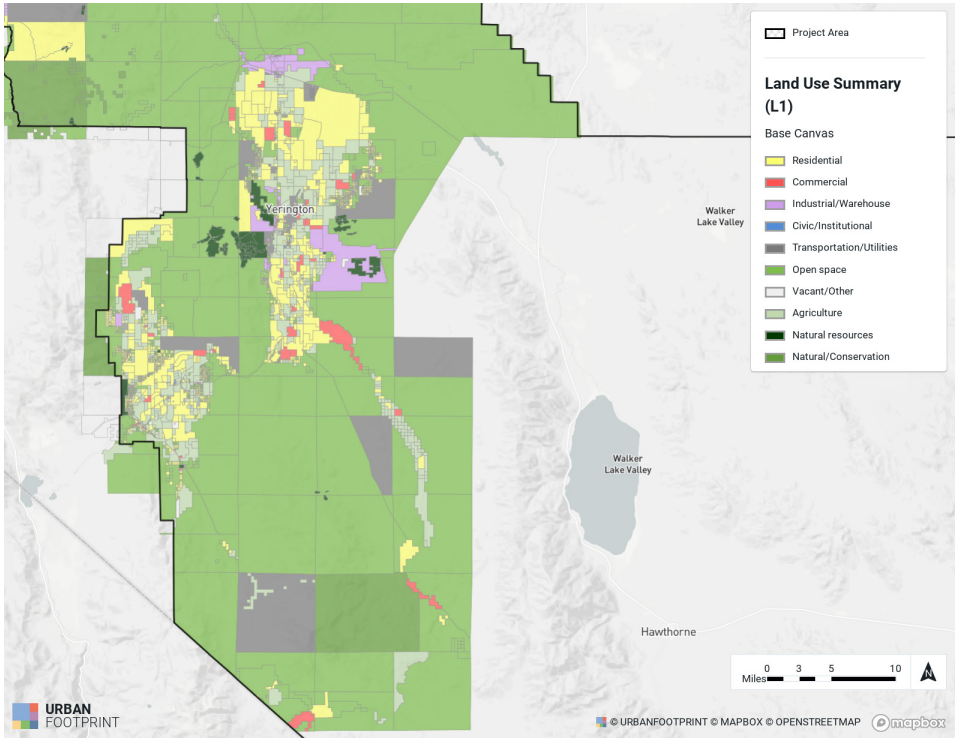
APPENDIX C: MAPS

Land Use and Zoning

This section discusses land use and zoning in Lyon County's portion of the Walker River Corridor—City of Yerington, Yerington Colony, Smith Valley, Lyon County's portion of Walker River Paiute Tribe, and the rest of the county area near the Walker River—with greater context to the entire Lyon County when necessary. Unfortunately, Mineral County's website is not always up to date; discussions on Mineral County will draw primarily from previous literature.

Lyon County's masterplan was last updated in 2010. The Lyon County Planning Department has developed land use maps for public use. The City of Yerington commenced an update to the 2010 master plan in 2020.

Figure C.1:
Walker River Corridor (Lyon County's Portion) General Land Use Map[86]

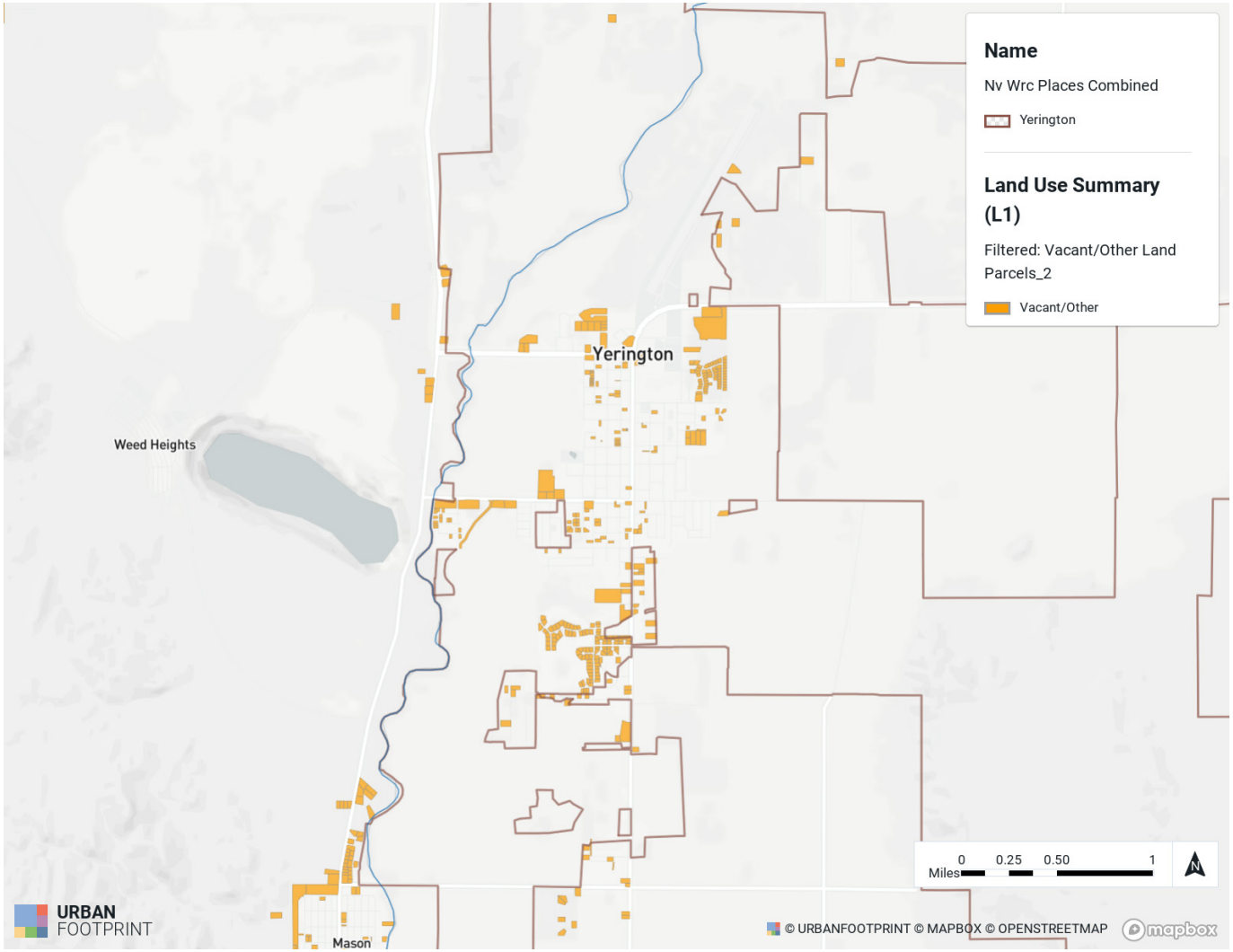


Source: UrbanFootprint

[86] There is no land use data available for Mineral County.

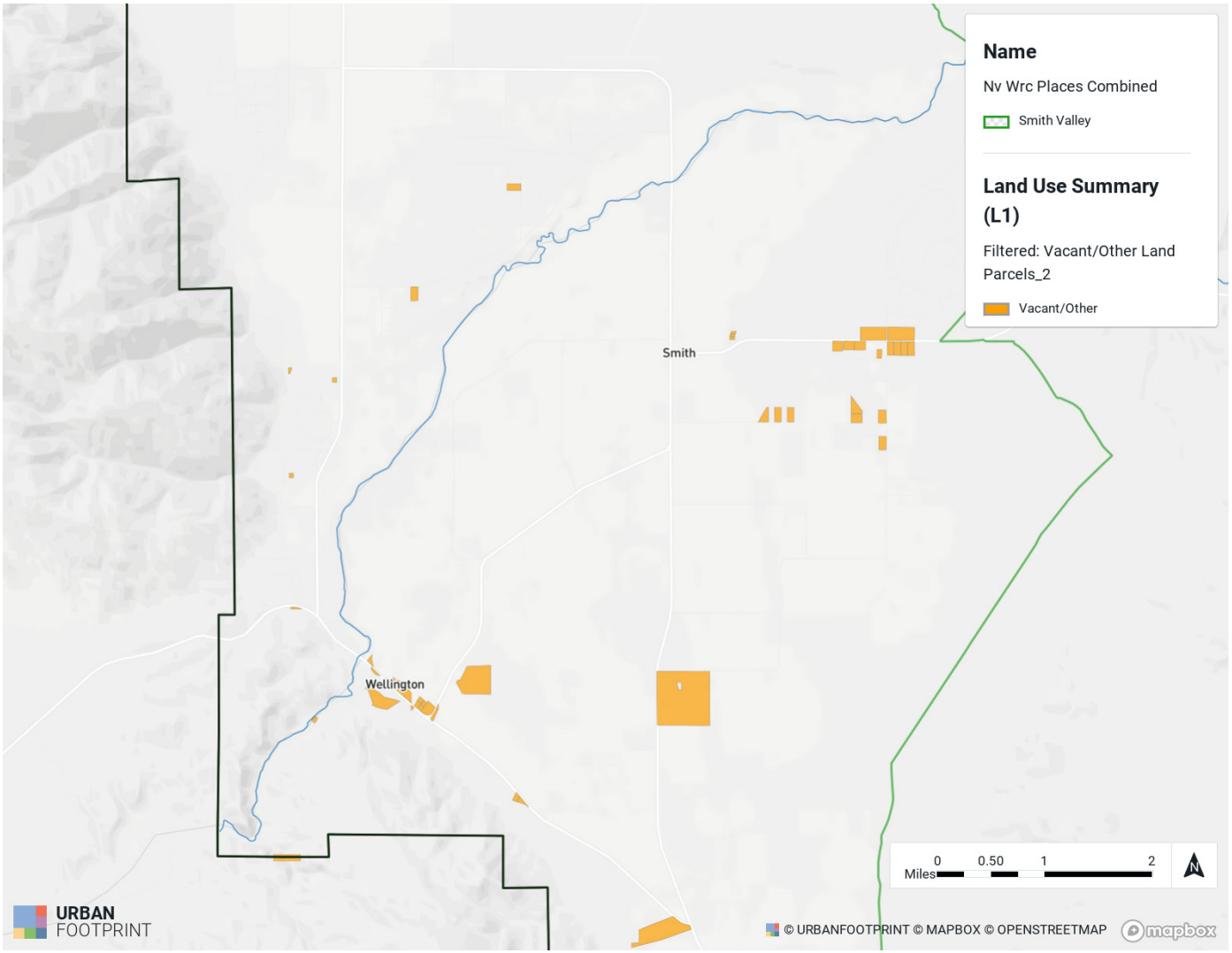
There are a number of vacant parcels in the city center areas of both Yerington and Hawthorne. Given that housing shortage is a major concern that the Walker River Corridor faces, a separate study that determines the feasibility of repurposing these vacant lands for housing or other uses might be needed. The following maps display parcels that are vacant or not assigned a specific land use in Yerington and Smith Valley.

Figure C.2:
Vacant/Other Land Parcels in Yerington



Source: UrbanFootprint

Figure C.3:
Vacant/Other Land Parcels in Smith Valley



Source: UrbanFootprint

Lyon County

For the study area—City of Yerington, Smith Valley, Walker River Reservation, and the rest of the Walker River Corridor (within a 3-mile radius)—open space (which includes public land) makes up the majority of the land use (69%), followed by residential (9%) and agriculture (8%). Industrial and Commercial uses make up just 2% and 1%, respectively. Walker River Reservation is entirely open space and has a mountainous terrain.

Figure C.4:
Walker River Corridor Top Level Land Use Summary

Walker River Reservation (Lyon County)	Square Miles	Percentage
Agriculture	85.5	8%
Civic Institutional	0.2	0%
Commercial	15.0	1%
Industrial	22.6	2%
Natural Conservation	53.1	5%
Natural Resources	10.6	1%
Open Space	779.4	69%
Other	15.6	1%
Residential	103.2	9%
Transportation Utilities	40.7	4%
Land Use Total	**1125.8**	**100%**

Source: UrbanFootprint; Calculations by Beacon Economics

The 2010 Lyon County master plan is drafted with the "Community Core Concept" in mind, which emphasized more growth and development around existing community core areas but less growth in the remote unincorporated areas. The Community Core Concept also promotes alternative development and conservation approaches for areas of environmental significance or hazardous features.

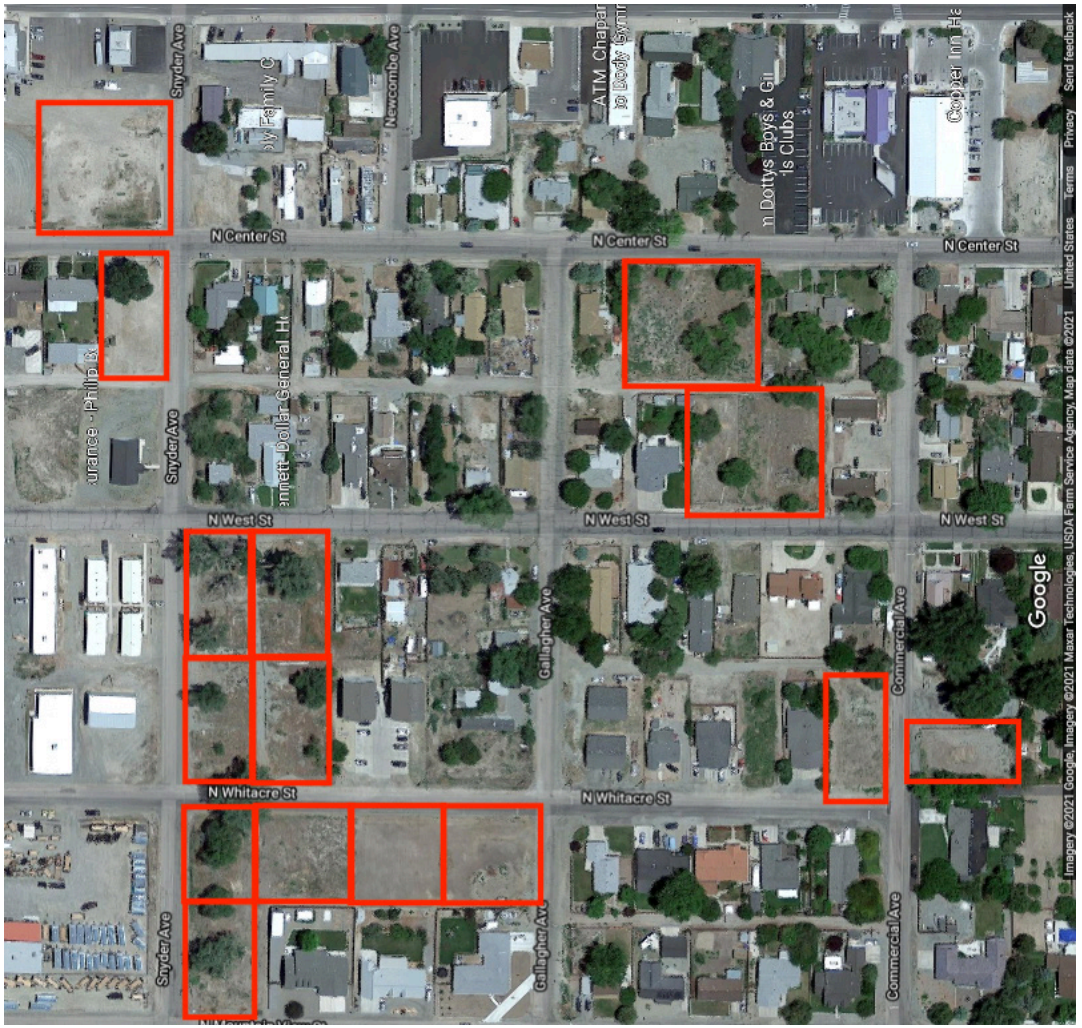
City of Yerington and Yerington Colony (Yerington Area)

Within the city, the major land zoned for **industrial** uses are situated at and near the airport and northwest area (where Yerington Production Services is located). There are also a smattering of smaller parcels zoned for industrial uses in the center of the city.

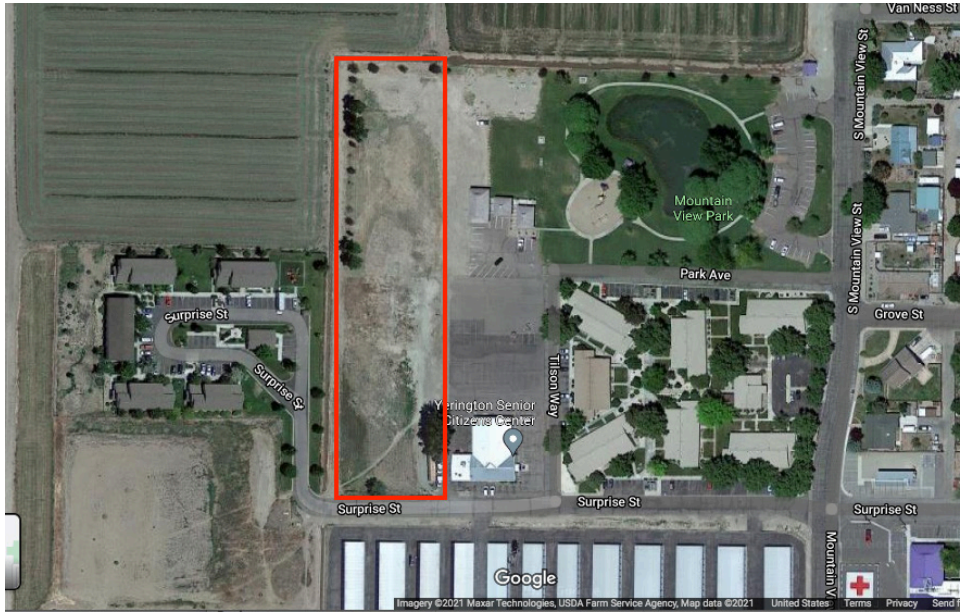
Limited **commercial** areas (C-1 zoning) are primarily located along Goldfield Avenue west of N. Main Street, where Raley's (one of the few supermarkets in the Walker River Corridor) is located and along Main Street. The easternmost area of Pearl Street is also zoned for light commercial but is right outside of the city boundary. General commercial areas (C-2 zoning) are mostly located along Main Street.

The 2007 City of Yerington master plan specifically calls for developing lower density zoning districts as a goal in order to prevent overcrowding and main current quality of life. The vast majority of the land is zoned for single-family **residential**. A small amount of multi-family zoned land mostly concentrated along the West Street corridor (a), the westernmost portion of Surprise Avenue (b), the easternmost portion of Broadway Avenue (c), and the two blocks of areas between Snyder Avenue, West Street, Gallagher Avenue, Mountain View Street (d), and north of the east end of Pearl Street (e). Many of these areas zoned for multi-family housing currently have single-family homes sitting on top of or are vacant. The following are Google Map aerial screenshots; vacant land parcels are boxed in red.

Figure C.5(a)-(e):
Google Map Satellite Aerial View of Vacant Land in Yerington



(a) West Street corridor and (d) areas between Snyder Avenue, West Street, Gallagher Avenue, and Mountain View Street



(b) The westernmost portion of Surprise Avenue

(c) The easternmost portion of Broadway Avenue

(e) North of the east end of Pearl Street

Given that housing shortage is a major concern in the Walker River Corridor including Yerington, these areas are underdeveloped and have the potential to bring more housing into the area.

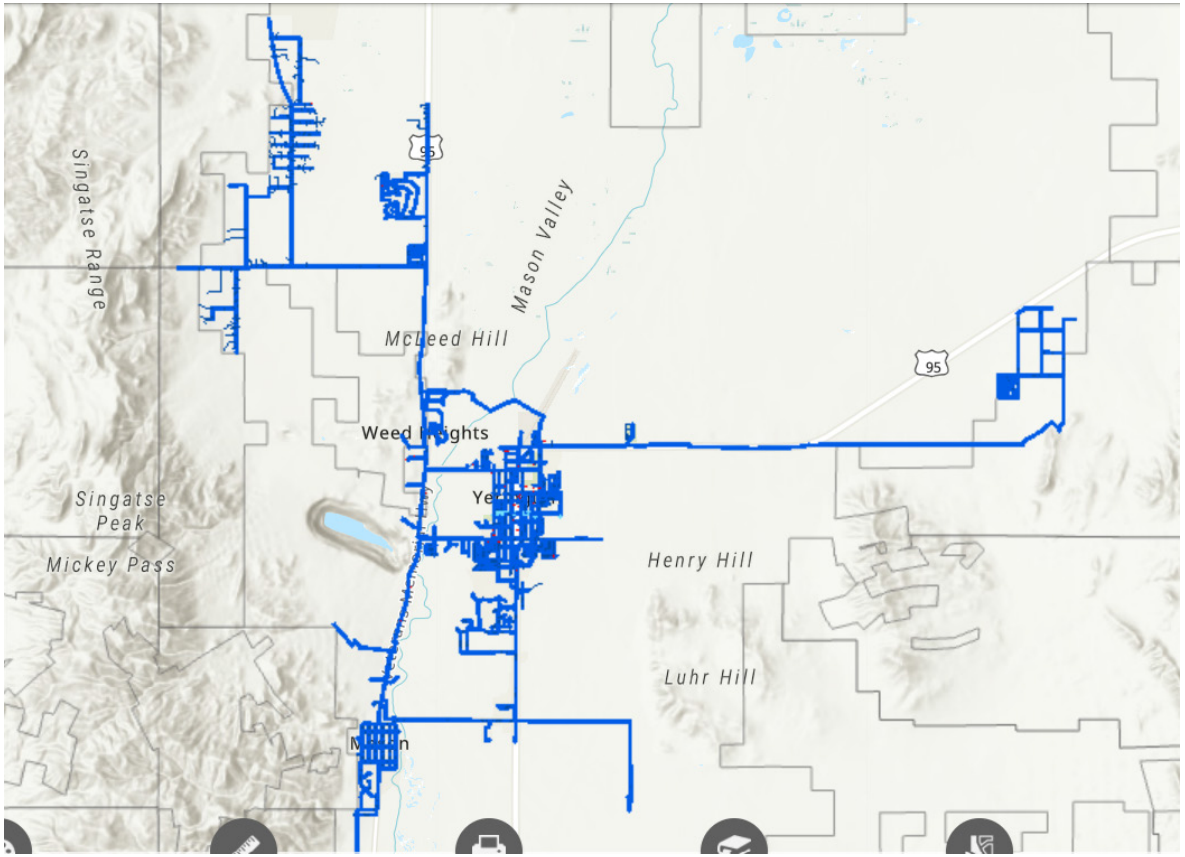
Mason Valley

Mason Valley is a rural farm and ranch community. In addition to the City of Yerington and Yerington Colony, Mason Valley also encompasses Mason, Nordyke, and Weed Heights. Note that Mason Valley is not a census-designated place.

Excluding open space, agriculture is the major land use in Mason Valley, followed by low-density single-family residential. Most of the land zoned for industrial uses in the Walker River Corridor is located in Mason Valley, including the north (Wabuska), southeastern, and the west (Weed Heights near Anaconda Mines).

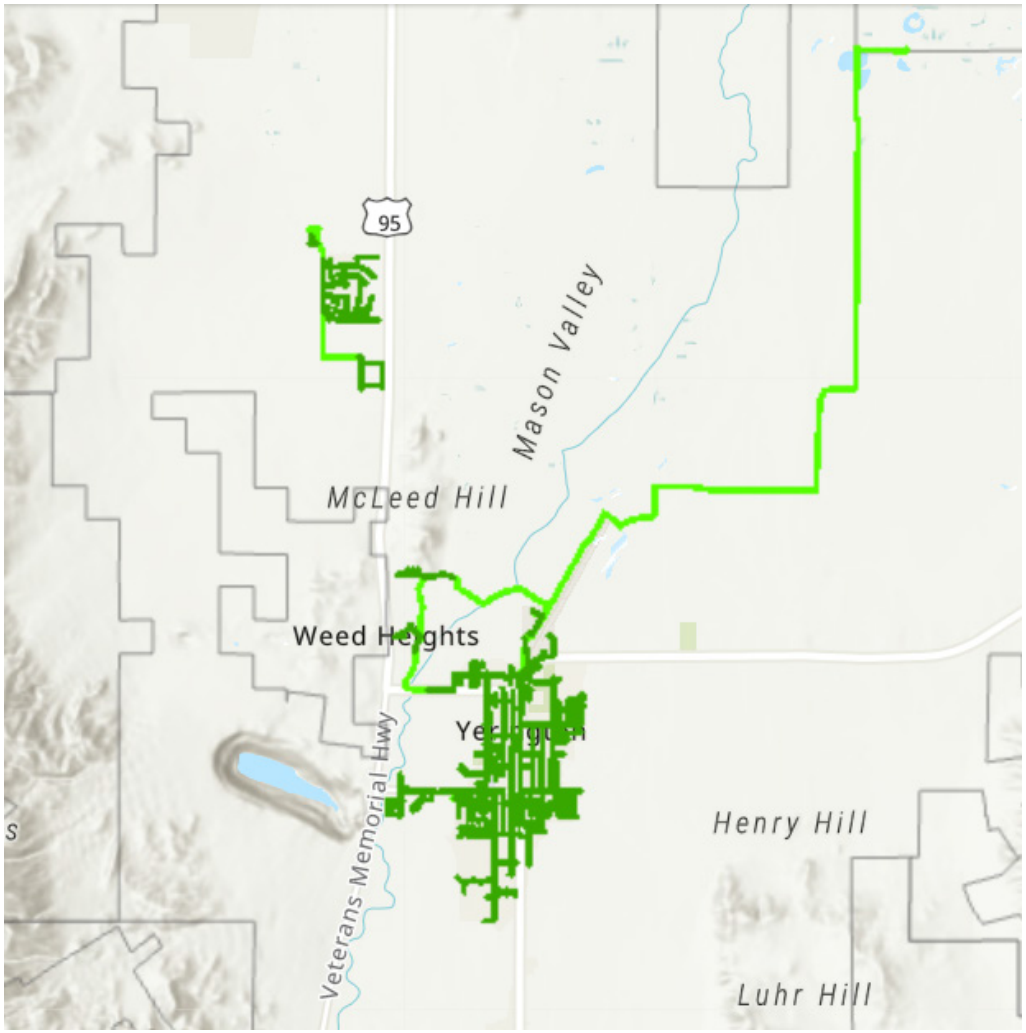
The following maps are the water service lines and sewer lines of Yerington and Mason Valley.

Figure C.6:
Map of Water Service Lines: City of Yerington and Mason Valley



Source: Courtesy of Rob Pyzel (Planner, Lyon County Planning Department)

Figure C.7:
Map of Sewer Lines: City of Yerington and Mason Valley



Source: Courtesy of Rob Pyzel (Planner, Lyon County Planning Department)

Smith Valley

Smith Valley is also a rural farm and ranch community, located southwest of Mason Valley. The Alkali Lake State Wildlife Management Area lies at the northern part of Smith Valley.

Similar to Mason Valley, excluding open space, agriculture is the major land use in Smith Valley, followed by low-density single-family residential. There is a small amount of land zoned for commercial uses: East (near Walker River Resort), Southwest (the intersection of Hwy 208 and the western leg of the Walke River), and the Hwy 208 and Hwy 824 intersection (there is a post office).

There are no domestic water or sewer infrastructure available in Smith Valley. Furthermore, Lyon County does not have nor maintain a list of parcels within this portion of Lyon County with available water or sewer lines within the required connection distance.

Mineral County

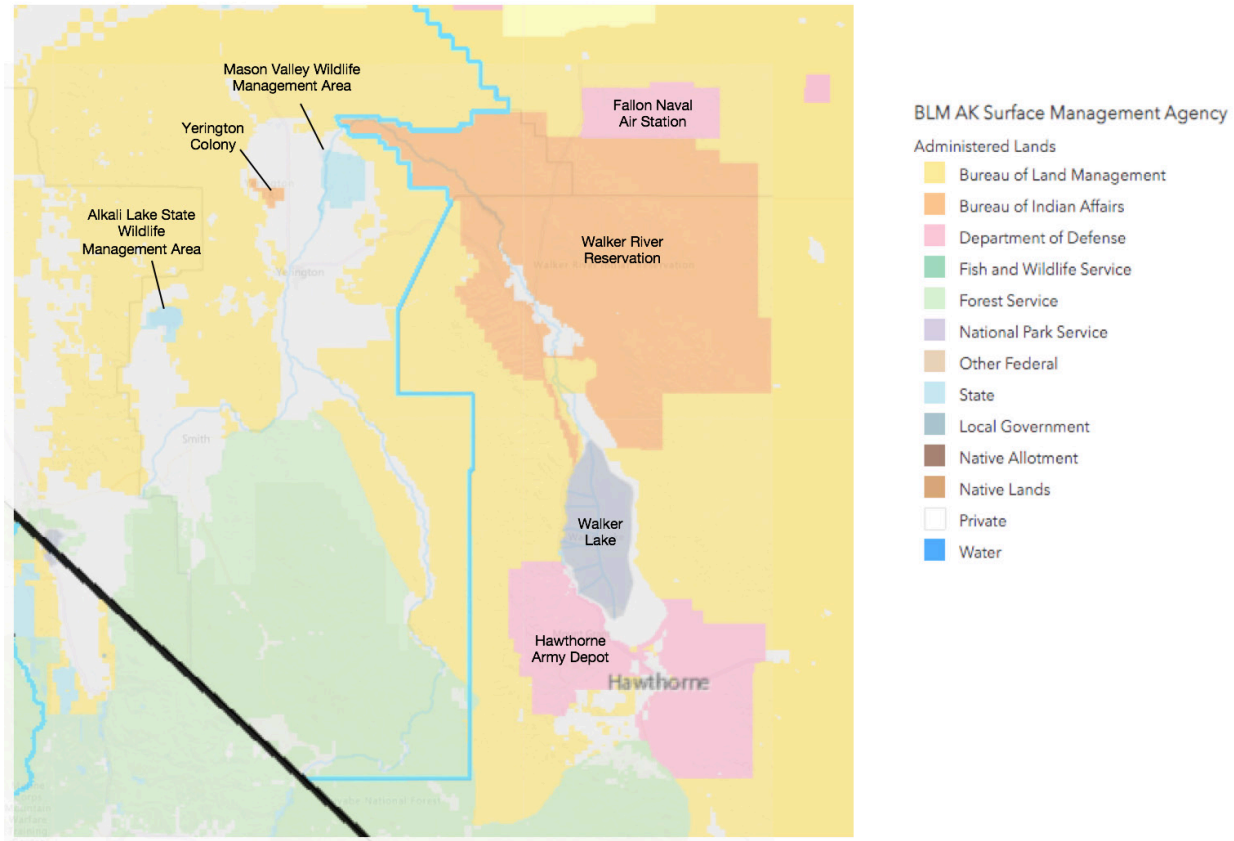
Most residents living within the Walker River Corridor in Mineral County live in Hawthorne CDP, which is just south of Walker Lake. Residential is the major land use in Hawthorne. There are some parcels for commercial uses; most of them are along 5th Street and E Street. Babbitt, immediately to the northwest of Hawthorne, is a mostly deserted ghost town with only a few establishments. Both Hawthorne and nearby Babbitt are almost entirely surrounded by the Hawthorne Army Depot.

Federal, State and Tribal Jurisdiction

Most of the land in the Walker River Corridor are under the jurisdiction of the Bureau of Land Management (BLM) followed by the Forest Service (south portion of study area) and the Department of Defense (Hawthorne Army Depot). Fallon Naval Air Station, which is just outside of the Walker River Corridor, is also under the jurisdiction of the Department of Defense. Finally, Walker River Paiute Tribe and Yerington Paiute Tribe own Walker River Reservation and Yerington Colony, respectively, which are under the jurisdiction of Bureau of Indian Affairs.

Most private land are in Mason Valley, Smith Valley, and Hawthorne. Babbitt is under Department of Defense jurisdiction according to the BLM National Data.

Figure C.8:
Map of Administered Land in the Walker River Corridor

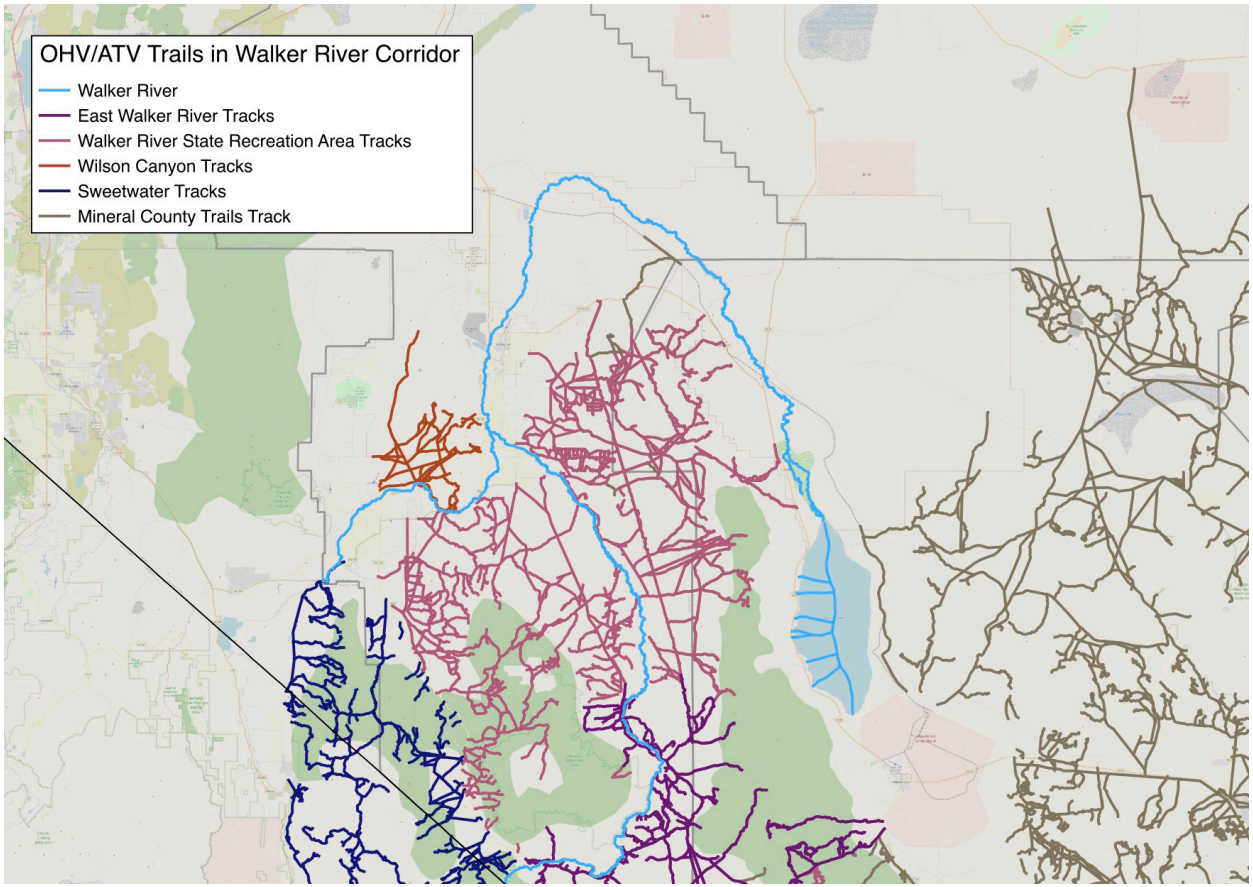


Source: Bureau of Land Management National Data

Off Road Routes: Off Highway Vehicles (OHV) and All-Terrain Vehicles (ATV) Map

Outdoor activities are attractive qualities of the Walker River Corridor. A popular outdoor activity in the region involves road-tripping in off-road routes. The region has ample routes for off highway vehicles (OHV) and all-terrain vehicles (ATV). In the Walker River Corridor, there are five main OHV/ATV trails:[87] Mineral County Trails (near Hawthorne and Walker Lake along Mt. Grant), Walker River State Recreation Area (south/southeast of Mason Valley and east of Smith Valley), Wilson Canyon (west of Mason Valley and northeast of Smith Valley), Sweetwater Mountains (south of Smith Valley), and East Walker River.

Figure C.9:
Map of OHV and ATV Trails in Walker River Corridor



Source: The Nevada Off-Highway Vehicles Program

[87] More information can be found at Nevada Off-Highway Vehicles Program: https://ohv.nv.gov/trails

Health Clinics and Hospitals

Healthcare is generally underserved in rural America; the Walker River Corridor is no exception. Furthermore, aging has been identified as one of the key demographic trends in the Walker River Corridor. Demand for healthcare services would likely increase as the population ages.

Lyon County

2016-2018 county level data[88] indicates that the majority emergency department (ED) visits (85%) and inpatient hospitalizations (98%) generated by residents of Lyon County occur outside of the county. Carson City (40% for ED visits and 43% for inpatient hospitalization) and Washoe County (34% and 51%, respectively) accounted for most of the visits outside of Lyon County.

Mineral County

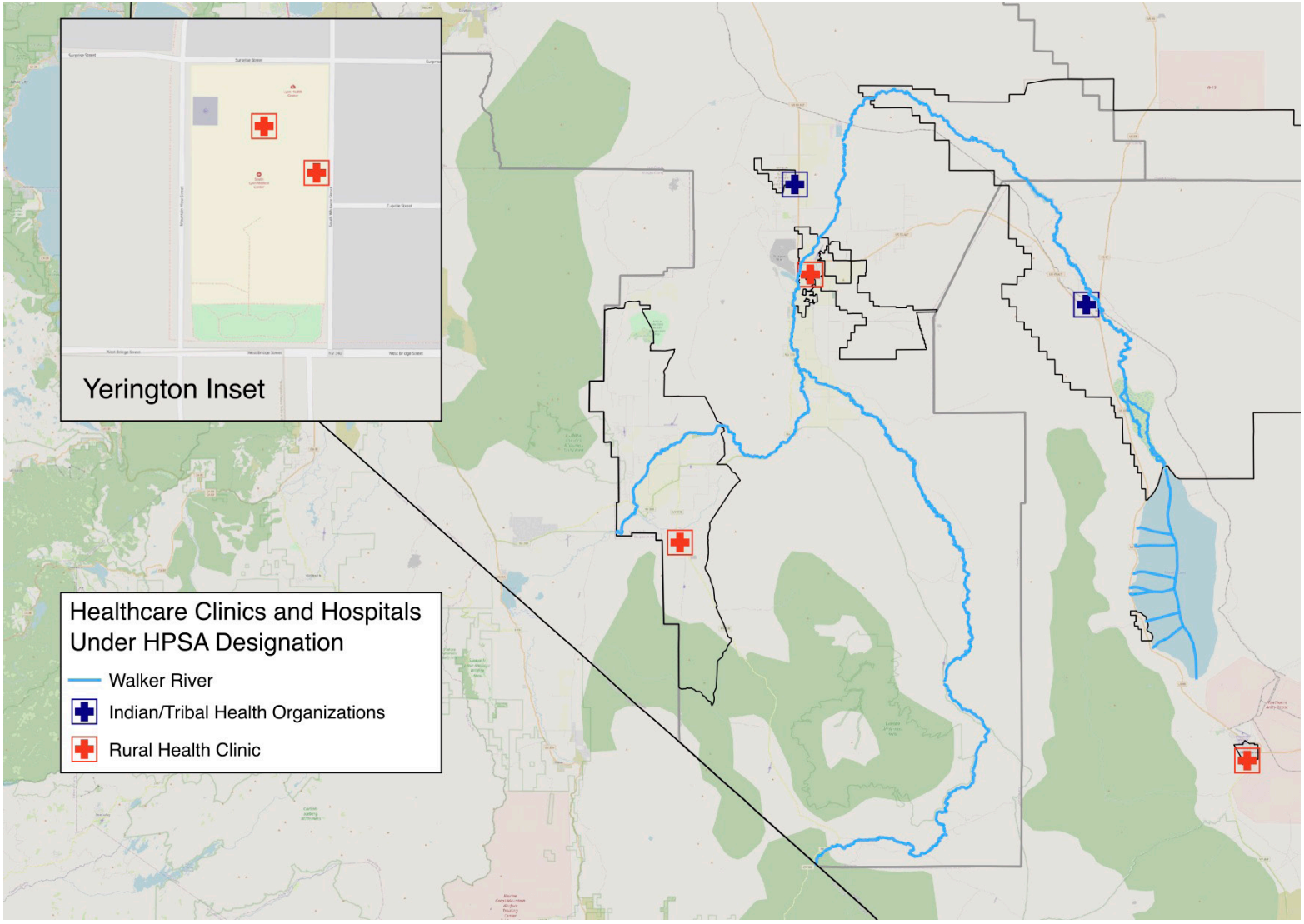
Compared to Lyon County, significantly lower percentages of ED visits (32%) and inpatient hospitalizations (59%) generated by residents of Mineral County occur outside of the county. For ED visits, Churchill County (56%) received the highest share of visits by Mineral County residents, followed by Washoe County (23%) and Lyon County (15%). For inpatient hospitalization, most out of county visits occur in Washoe County (62%), followed by Churchill County (20%) and Carson City (16%).

Health Professional Shortage Areas

Health Professional Shortage Areas (HPSAs) are designated by Health Resources Services Administration (HRSA) as having shortages of primary care, dental care, or mental health providers. There are two types of designation in the Walker River Corridor: Rural Health Clinic and Indian Health Service, Tribal Health, and Urban Indian Health Organizations.

[88] https://dhhs.nv.gov/uploadedFiles/dhhsnvgov/content/Programs/Grants/NV_SHNA_FINAL.pdf

Figure C.10:
Health Professional Shortage Areas in Walker River Corridor



Source: Health Resources & Services Administration; Department of Health & Human Services

The following table summarizes the HPSA scores for primary care, dental health and mental health for the sites in the Walker River Corridor.[89] Compared to Nevada State average scores, these sites all scored higher, except for South Lyon Physicians Clinic and South Lyon Medical Center in dental health, and Mount Grant Medical Building and Walker River Tribal Health Clinic in mental health. A higher HPSA score imply a greater shortage.

Figure C.11:
HPSA Scores of Designated Health Clinics and Hospitals in Walker River Corridor

HPSA Site Name	Designation Type	County	Primary Care HPSA Score	Dental Health HPSA Score	Mental Health HPSA Score
South Lyon Physicians Clinic	Rural Health Clinic	Lyon	17	16	18
South Lyon Medical Center-Barnett Clinic	Rural Health Clinic	Lyon	17	16	18
Mount Grant Medical Building	Rural Health Clinic	Mineral	16	18	14
Smith Valley Physicians Clinic	Rural Health Clinic	Lyon	17	18	19
Yerington Tribal Health Center	Indian Health Service, Tribal Health, and Urban Indian Health Organizations	Lyon	17	22	16
Walker River Tribal Health Clinic	Indian Health Service, Tribal Health, and Urban Indian Health Organizations	Mineral	17	19	13
		Nevada State Average	14.81	16.36	15.98

Source: Health Resources & Services Administration; Department of Health & Human Services

[89] HPSA scores range from 0 to 25 for primary care and mental health and 0 to 26 for dental health. HPSA scoring criteria can be found here: https://bhw.hrsa.gov/workforce-shortage-areas/shortage-designation/scoring

Project Team

Report Authors

Patrick Adler
Hoyu Chong
Brady Allardice
James McKeever

Key Advisors

Erin Lopez, Lyon County
Amy Miller, Northern Nevada Development Authority

With Contributions by

Cory Bard
Adam Fowler
Lachlan Roach
Victoria Pink Bond

Design and Layout

Jessica Hernandez and Mark Schneider