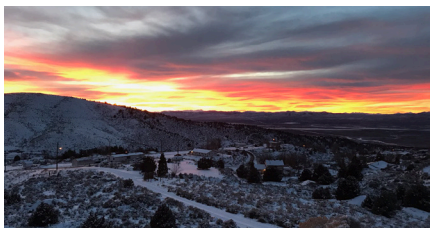


Lander County
MASTER PLAN

Final Draft
May 2022

Table of Contents

2. CONSERVATION & NATURAL RESOURCES

5. PUBLIC FACILITIES, SERVICES & RECREATION

Acknowledgements

Board of County Commissioners
District 1 - Bryan Sparks
District 2 - Art Clark III
District 3 - Patsy A. Waits
District 4 - Wallace (Jr.) Thomas
District 5 - Kathleen V. Ancho

Planning Commission
John Williams
Louis Lani
Monte Price
Colt Nelson
Steven Stienmetz

Office of the County Manager
Bartolo “Bert” Ramos, County Manager

Planning/Building Department
Colt Nelson, Building Official
Jessica Walker, Planning Coordinator

Assessor’s Office
Lura Duvall, Assessor

Consultant Team
Wood Rodgers, Inc.
UNR - Center for Economic Development

EXECUTIVE SUMMARY

Executive Summary

Pursuant to Nevada Revised Statute (NRS) 278, the Lander County Master Plan with the accompanying tables, diagrams, figures, and charts is the County's comprehensive long-term plan for growth and development.

Special Note: This Master Plan was prepared while Lander County and the nation were in the midst of the COVID-19 pandemic, and constraints were imposed on the process as a result. The potential changes that our country will experience remain uncertain. As such, county officials should be encouraged to reexamine changing data and behavior and to support revisions in the Master Plan as warranted.

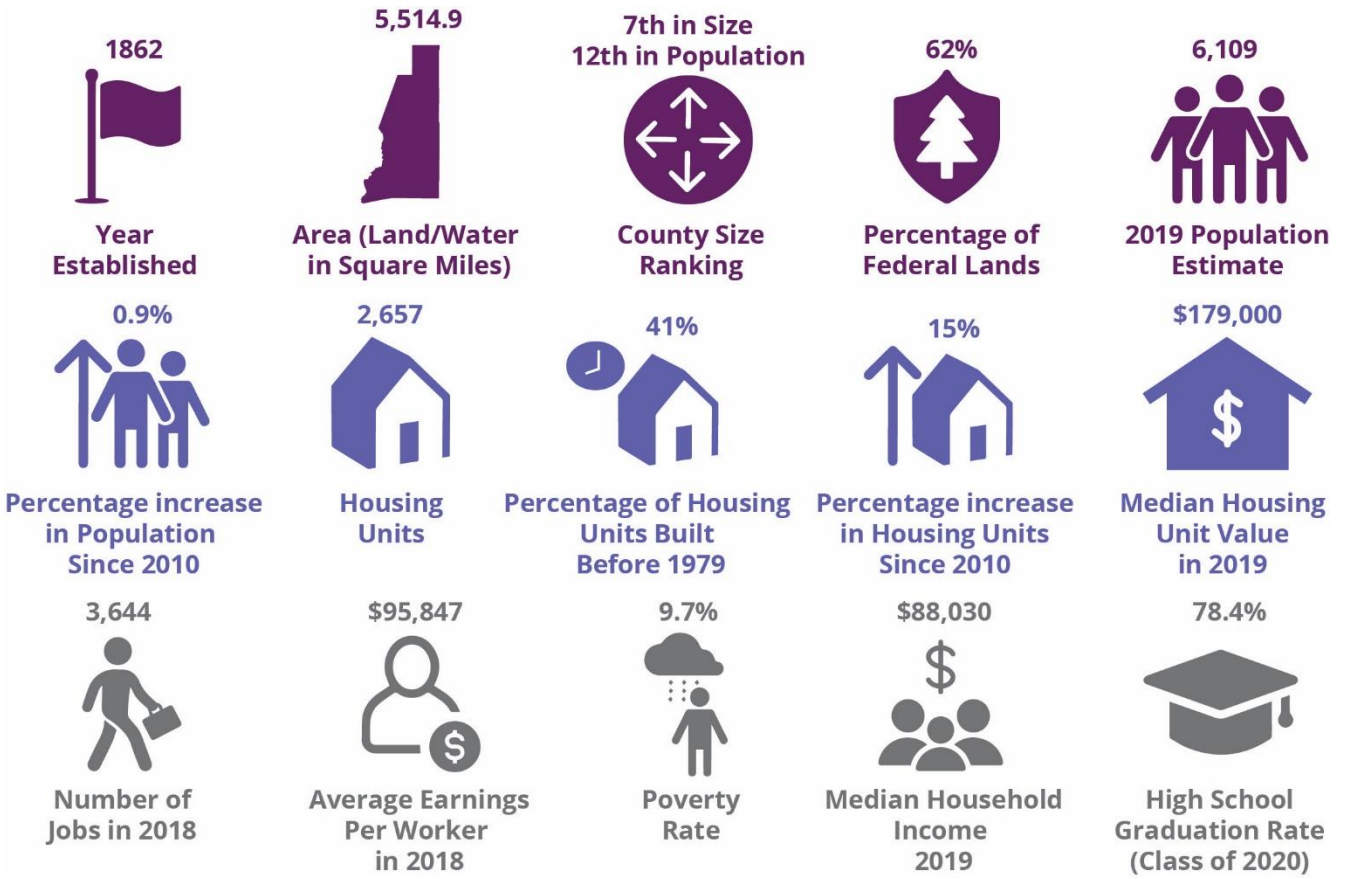


Figure 1: Lander County at a Glance
Sources: American Community Survey 5-Year Estimates, years between 2013 and 2019, Tables S2201, DP03, DP05;
Nevada Economic Assessment Project-Socioeconomic Baseline Report (2021);
Nevada State Demographer (2021);
University Center for Economic Development, College of Business, University of Nevada, Reno (2021)

Geography

Lander County is located in central Nevada, an arid desert landscape characterized by dramatic basins and ranges. Elevation in the county ranges between 11,473 feet at Bunker Hill in the Toiyabe Range to 4,510 feet at Battle Mountain in the northwest corner of the county. Portions of Lander County are among the most arid areas in the United States, with an average of 12.3 inches of precipitation at Battle Mountain. Most of the vegetation in the area is desert shrubland, generally consisting of sagebrush with some pinyon pine and juniper woodland areas near mountain ranges. Although water is generally scarce in this climate, several surface water features exist, including the Humboldt River, Reese River, Rock Creek, and Groves Lake. Rich mineral deposits of gold, silver, and other minerals lie within Lander County, generating the largest continuous industry in the County.

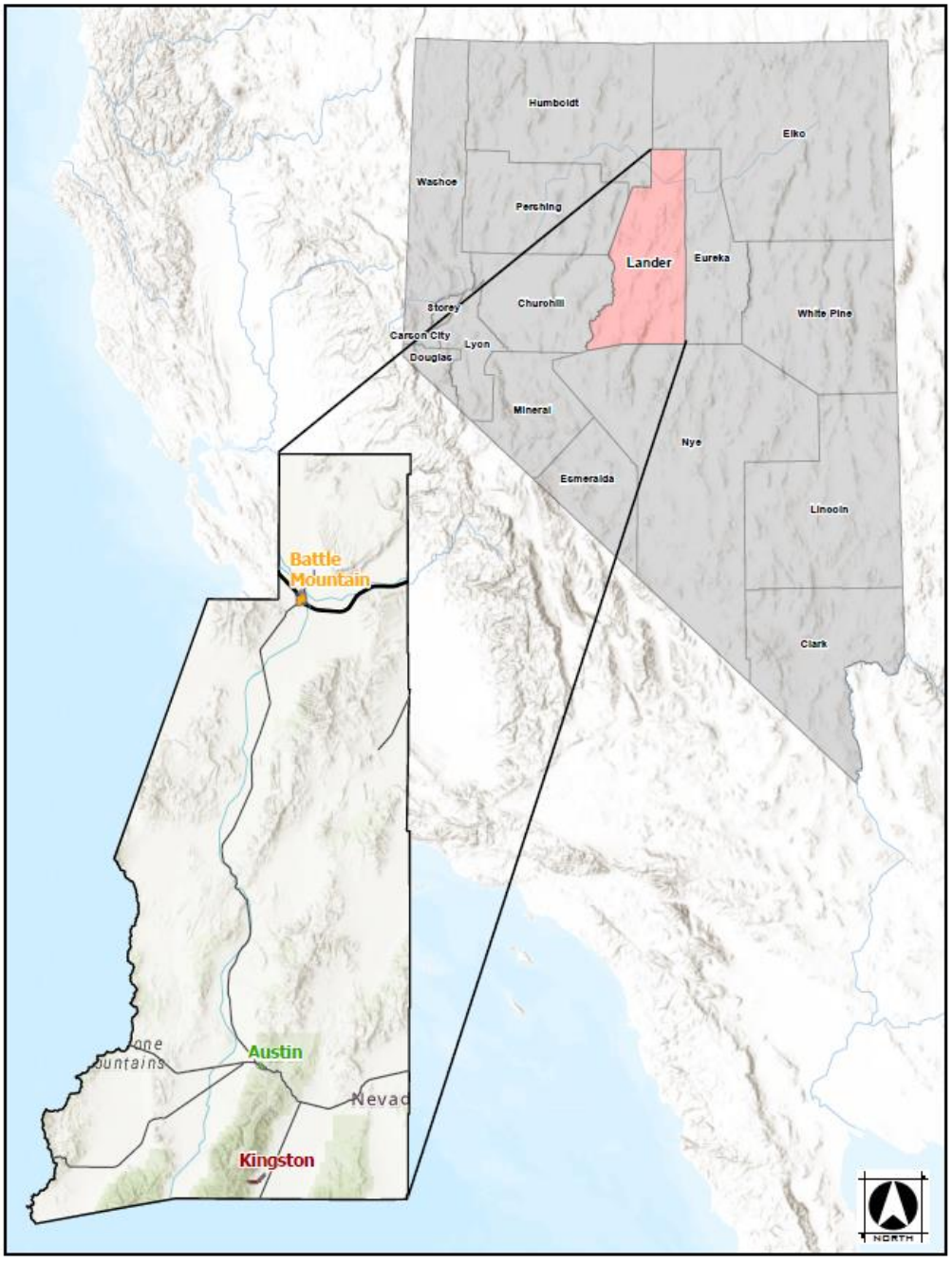


Figure 2: Vicinity Map of Lander County

Recreational opportunities abound, primarily on publicly owned lands that compose over half the County, and include hiking, mountain biking, fishing, hunting, wildlife viewing, and a wide variety of other outdoor activities.

History

Historic Lander County Courthouse, Austin, Nevada
Source: Ken Lund, 2007 (Licensed by CC BY-SA 2.0)

Known as the "mother of counties," Lander County has retained mining, agriculture, truck transportation, and government service industries.

View of Austin, Nevada | Source: Austinnv.com, date unknown

Lander County, formed in 1862, has been known as the "mother of counties," spawning three other counties from its original lands: Elko, Eureka, and White Pine.[1] However, the history of human occupation in this area extends back thousands of years as the ancestral lands of the Newe, also known as the Western Shoshone. The Battle Mountain region was the boundary between the Shoshone and the Northern Paiute Tribes and provided an important area for rabbit and antelope drives for the indigenous population.[2] Rich archaeological evidence and oral histories of the indigenous population reflect the lengthy and continued occupancy of the area by the Shoshone and their ancestors. Currently, tribal lands encompass 834 acres in Lander County, governed by the sovereign nation of the Te-Moak Tribe of the Western Shoshone.[3]

In the mid-to-late 19th century, a booming mining industry and the expansion of the railroad into Austin, Kingston, and Battle Mountain created a rich and vibrant mining community. The mining industry has continued into the modern day but has generally extended away from Austin and Kingston, with limited population and growth in these areas. Historical buildings and artifacts from this time remain on the landscape, including the Austin historical district that encompasses most of the town.

Over the decades, Lander County industry has surrounded mining, agriculture, truck transportation, and government services. Most of the population has shifted to Battle Mountain, which has resulted in some residential and commercial growth in the town.

[1] (Zapata 2021)
[2] (Te-Moak Tribe of Western Shoshone 2018)
[3] (Te-Moak Tribe of Western Shoshone 2018)

Government

Lander County is governed by a five-member elected Board of County Commissioners. Other elected officials include the District Attorney, Sheriff, Assessor, Recorder, Public Administrator, District Court Judges, Justices of the Peace, and Clerk. Lander County is the administrator of approximately 5,783 acres of land. In the fiscal year 2019-2020, total revenues were over $42.4 million, and total expenses were approximately $30.7 million.[4] In fiscal year 2019-2020, there were 461 local government employees in Lander County.[5]

Lander County Courthouse & Administration Building
Source: Eleventhjudicialdistrict.com, 2015

Emergency medical services are provided by the Battle Mountain Ambulance Department, the Austin Volunteer Ambulance Department, the Battle Mountain General Hospital, clinics in Battle Mountain and Austin, and Lander County Community Health Nurse. Emergency fire services are provided by the Battle Mountain, Austin, and Kingston Volunteer Fire Departments. The U.S. Forest Service (USFS) and the Bureau of Land Management (BLM) are the primary respondents to fires on federal lands. Water and wastewater services are provided by the Lander County Water and Sewer Districts 1 and 2 and the Kingston Water District.

Demographics

Table 1 - Population 2013-2019

Population	2013	2019	Net Change to 2019	% Change to 2019
Lander County Overall	6,343	6,109	-234 residents	-3.7%
Battle Mountain	3,657	3,391 (3,705)*	-266 residents (+48)*	-7.2% (+1.3%)
Austin	169	156 (167)*	-13 residents (-2)*	-7.7% (-1.1%)
Kingston	124	122 (194)*	-2 residents (+70)*	-1.6% (+156%)

Source: Nevada State Demographer - Final Governor's Certified Series of Population of Nevada's Counties and Incorporated Cities; Years 2013 and 2019

*Note: Population numbers represented in "(-)" represent data provided by the United States Census Bureau, 2020 Decennial Census, which became available after this document was prepared. As a result, population comparison facts utilize data provided from the State Demographer prior to the 2020 census.

Population data for Lander County varies between the Nevada State Demographer and the recent 2020 Census. The key take away is that the data provided by the 2020 census shows an increase in population within Battle Mountain and Kingston while Austin is showing a slight decline. Data should be monitored over the next few years as the State Demographer provides updates. The previous Master Plan predicted the following: a) an increase in population in northern Lander County, b) the total county population increasing to 7,540 by 2020, and c) the Battle Mountain population increasing to 3,730, the Austin population to 3,800, and the Kingston population to 450. This Master Plan update also revealed another important change: the aging of the community, both in demographics (Figure 1) and housing stock (Figure 7).

[4] (Hinton Burdick 2020, 8)
[5] (Borden, et al. 2021, 51)

Population Projections

Lander County's population is expected to grow slightly between 2019 and 2039. Figure 3 provides population projections for Lander County.

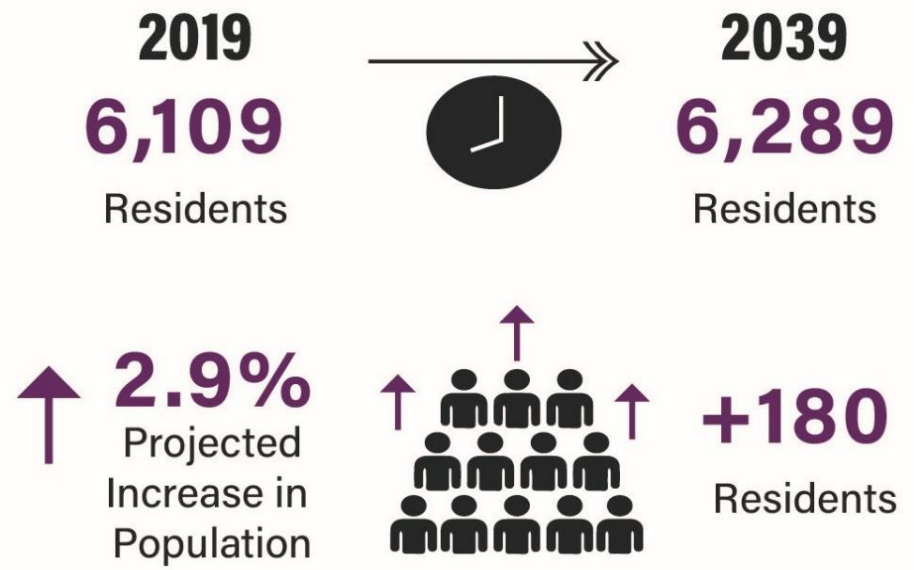


Figure 3: Population Projection Using U.S. Census Bureau Low International Migration Scenario
Source: Nevada County Population Projections 2020 to 2039 by Nevada State Demographer (2021), page 11

Although projections are developed by the Nevada State Demographer with the best available data, all projected numbers are estimates dependent on the conditions of Lander County and the nation. Notably, projections from the previous year estimated a loss in population in Lander County by 2038. The new projection model does not show this same loss in population. Due to the ongoing COVID-19 pandemic, the demographer developed several different growth scenarios using different variables (Figure 4). Generally, the trend shows a moderate increase in population in the mid-2020s, followed by a decline. A full overview of each model and projection is available in the Nevada County Population Projections 2020 to 2039 report by the Nevada State Demographer.

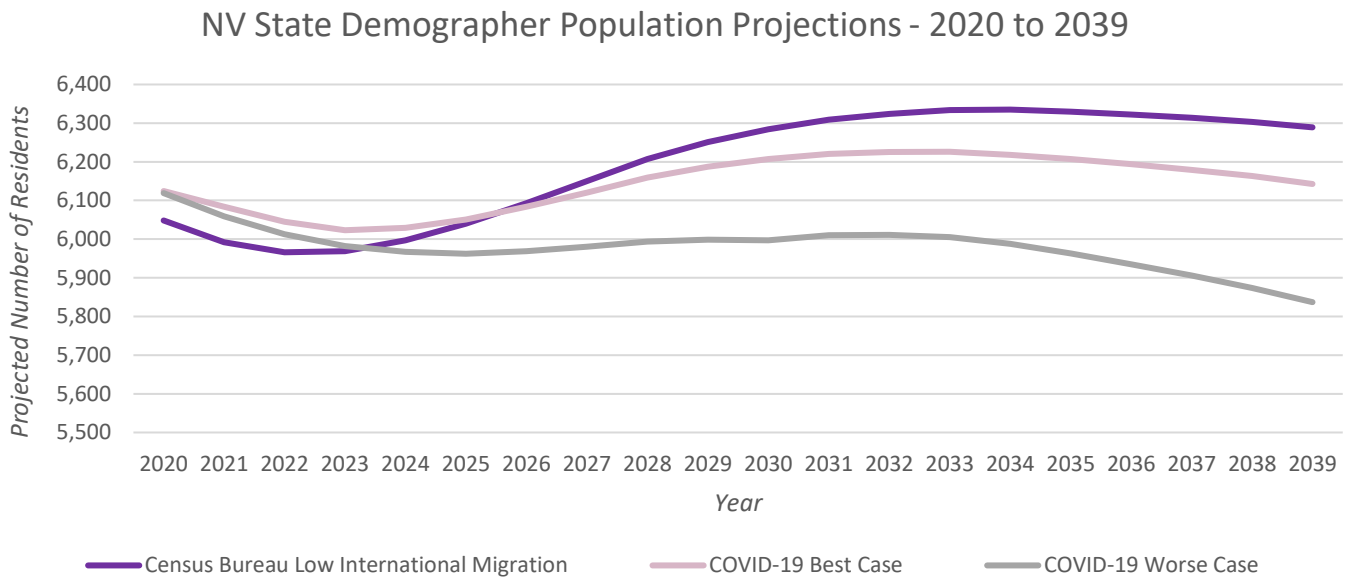


Figure 4: NV State Demographer Population Projections
Source: Nevada County Population Projections 2020 to 2039 by Nevada State Demographer (2021), pages 11 and 20

Many surrounding counties will also experience a shift in population, as detailed in Table 2.

Table 2 - Population Projections 2019 to 2039				
Population	**% Change**	**Net Change**	**2019**	**2039**
Lander County	2.9%	180 residents	6,109	6,289
Eureka County	-8.6%	-168 residents	1,955	1,787
Elko County	-0.8%	-428 residents	55,116	54,688
Humboldt County	6.7%	1,149 residents	17,079	18,228
Source: Nevada County Population Projections 2020 to 2039 by Nevada State Demographer (2021)				

Median Age

The median age of the population fluctuated between 2013 and 2019. Overall, Lander County has consistently matched the median state average for Nevada. However, the individual towns of Battle Mountain, Kingston, and Austin were generally above the state average. In particular, Kingston and Austin have a median age far exceeding other communities and the state average, although the median age has decreased over time, likely attributed to migration from the area or mortality. This rising median age is important, as aging populations typically require more public services or assistance (e.g., public transportation options, medical facilities). The Housing chapter of this Master Plan includes a discussion of possible ways to accommodate this population change.

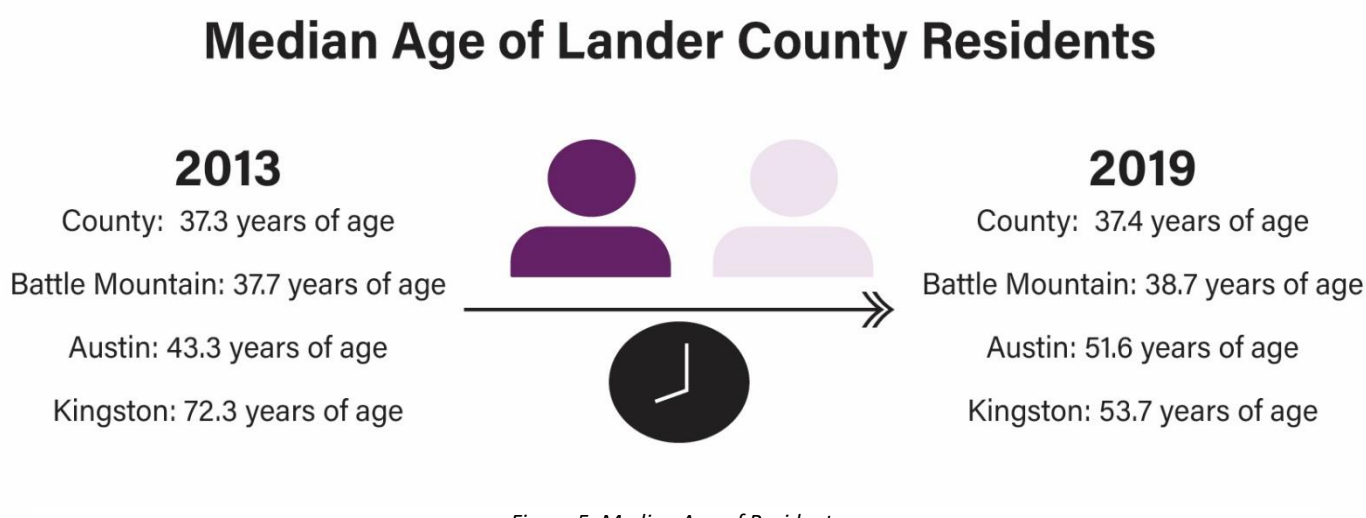


Figure 5: Median Age of Residents
Source: University Center for Economic Development, College of Business, University of Nevada, Reno (2021)

Housing

Approximately 2,657 housing units exist in Lander County.[6] A distribution of housing types is shown in Figure 6. Generally, the housing in Lander County is composed of Manufactured Homes and Single Family Residences, with <5% of housing composed of multiple units.[7] Few multi-family (medium to high density) housing options exist in Lander County.

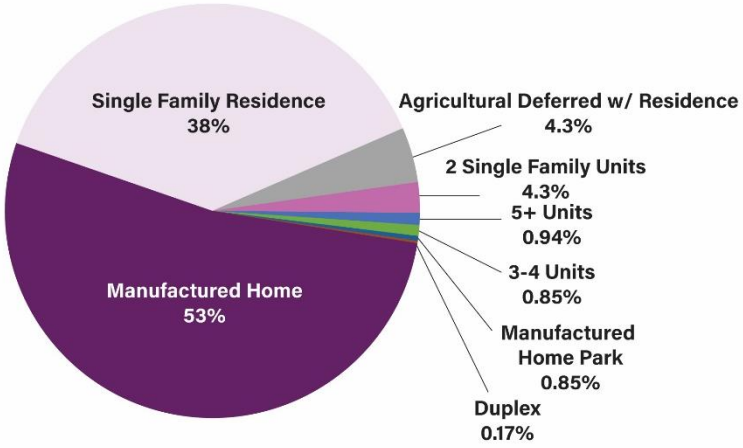


Figure 6: Composition of Residential Uses
Source: Lander County Assessor Parcel Data (2021)

Aging Housing Stock

Housing stock is aging in Lander County, with a substantially older housing stock in certain areas. Forty-one percent of housing in Lander County was built prior to 1979. Austin has the oldest housing stock, with approximately 93% of the housing built prior to 1979. Although older housing stock is not inherently negative, it creates issues since these houses approach the 50-year depreciation schedule in Nevada (Figure 7). Nevada law, NRS 361.227(1)(b), directs assessors to subtract depreciation at a set rate of 1.5% of the cost of replacement for each year of adjusted actual age of the improvement, up to a maximum of 50 years. Coupled with the aging population requiring more county resources, this condition will create issues with the long-term viability of the area if not mixed with newer housing to counteract the reduced tax base.

Household Characteristics

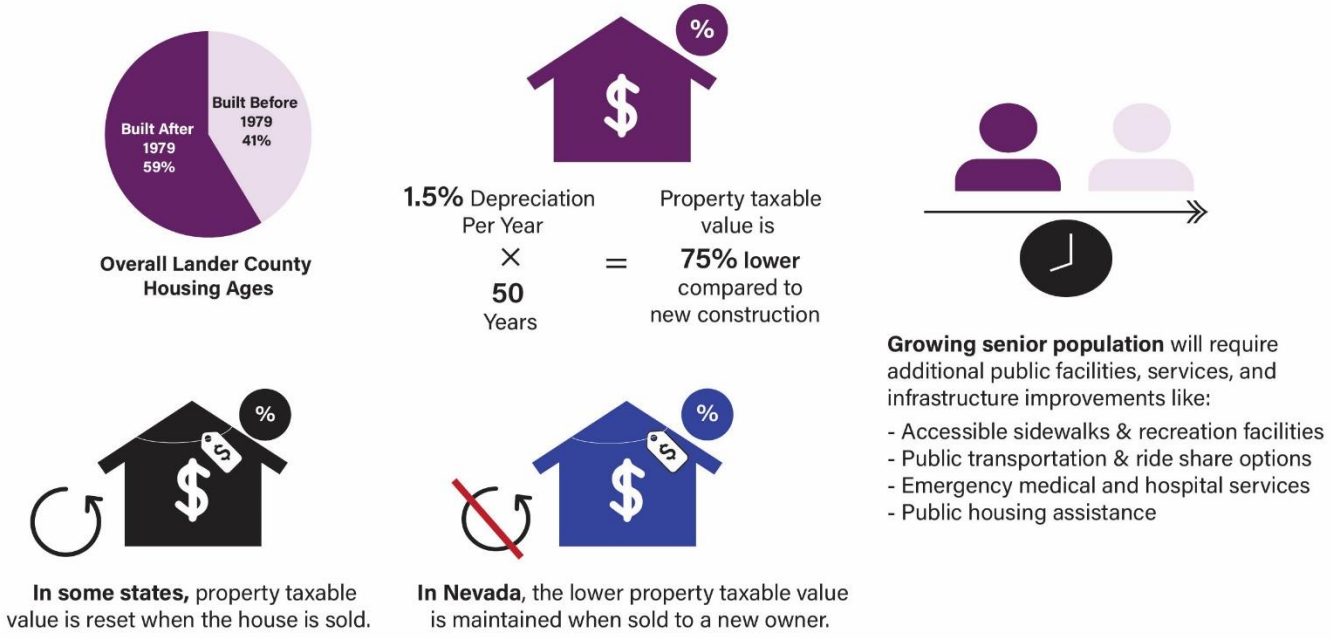


Figure 7: Tax Depreciation in Nevada and Connection to Aging Population

[6] (Steinmann 2020)
[7] (Lander County Assessor's Office 2021)

Between 2013 and 2019, the number of households increased from 2,010 to 2,198, an increase of 9.35%. Interestingly, household sizes decreased in the County overall and in Austin and Battle Mountain during this same time period. In Austin, there was a drop in average household size from 2.5 to 1.74 people per household. A large increase in total household was seen in Austin , although there also was a drop in population in these areas, possibly due to a shift in the type of individuals living in this area (i.e., families versus retirees or single workers). Median household income rose in the County overall but dropped slightly in Battle Mountain.

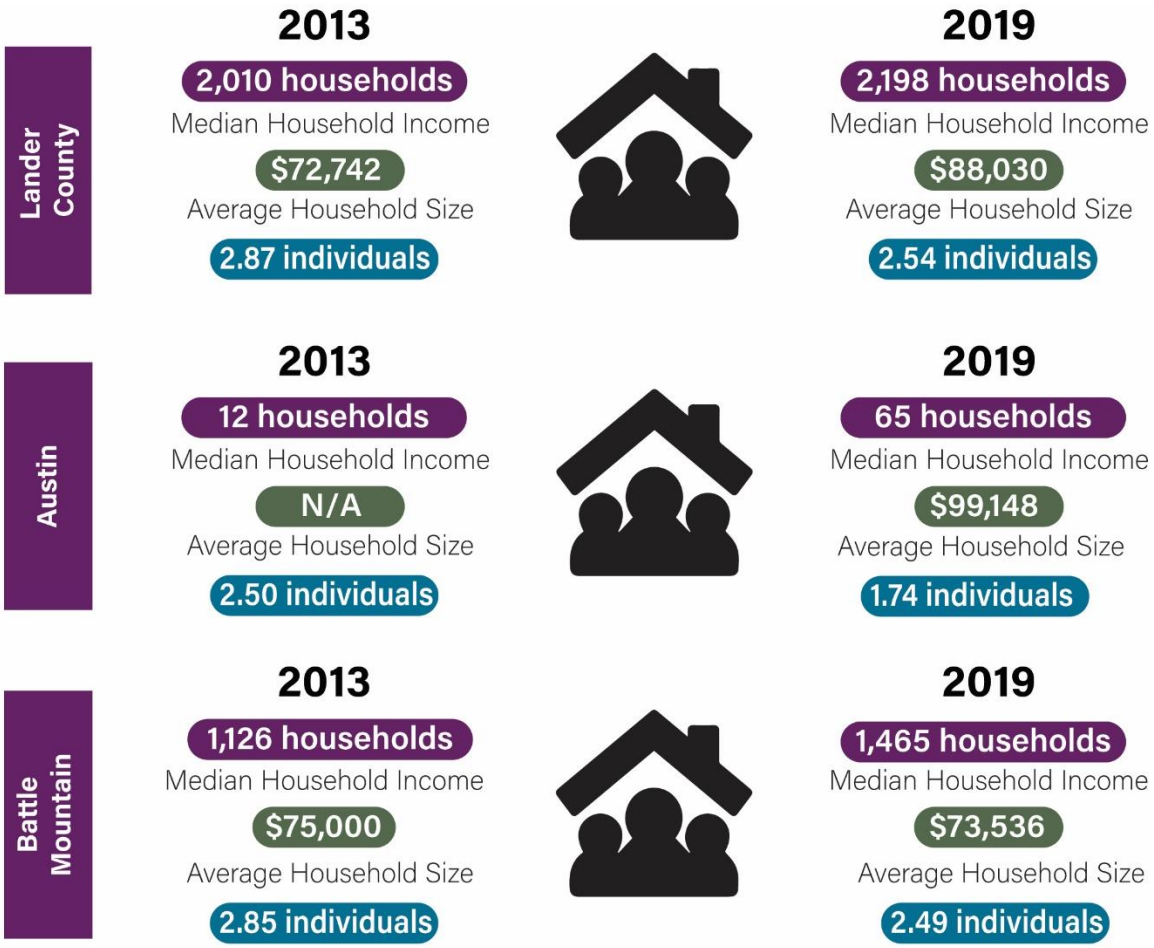


Figure 8: Household Statistics for Lander County, Austin, and Battle Mountain
Source: U.S. Census Bureau - American Community Survey Estimates 2013 and 2019, Tables S1101, S1901

Poverty Rates

The percentage of the population living below the poverty level is a measure used by the government to characterize the economic situation of an individual and a community. Lander County has a lower percentage of individuals living below the poverty line compared to surrounding counties and the state of Nevada (Table 3).

Poverty Rate

The poverty rate is the ratio of the number of people (in a given age group) whose income falls below the poverty line. The poverty line (or threshold) is determined by the U.S. Census Bureau each year and is dependent on household size.

(U.S. Census Bureau, 2019)

Table 3 - Median Household Income & Poverty Rates in Northeast Nevada (2019)					
	Lander	**Elko**	**Eureka**	**Humboldt**	**State**
Median Household Income[1]	$88,030	$74,801	$67,882	$66,009	$54,763
Unemployment Rate[2]	8.2%	4.7%	0%	3.4%	6.2%
Poverty Rate[1]	9.6%	9.1%	12.4%	10.6%	12.7%

Sources:
[1] University Center for Economic Development, College of Business, University of Nevada, Reno (2021)
[2] American Community Survey 5-Year Estimates, years between 2013 and 2019, Tables S2201, DP03

The percentage of individuals and households living below the poverty level remained well below the state average until 2018, when it spiked to 15.4% before declining to 9.7% in 2019 (Figure 9). Figure 10 combines the poverty rates and unemployment rates in the state and county. While the state unemployment and poverty rates have been steadily declining, Lander County has more variability. In several years, there is a visible increase in the percentage of individuals living below the poverty line and a higher unemployment rate. However, this is not a consistent trend. The Economic Development chapter discusses poverty rates in greater depth.

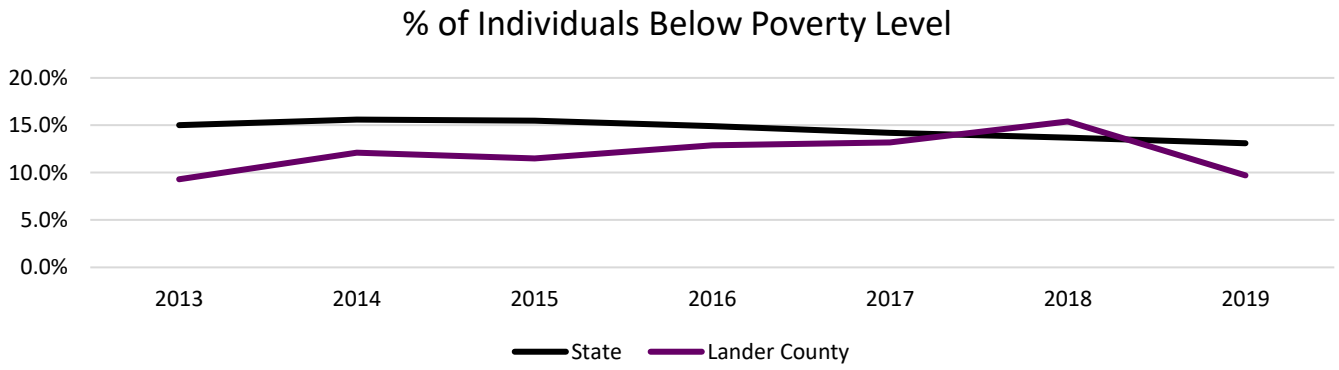
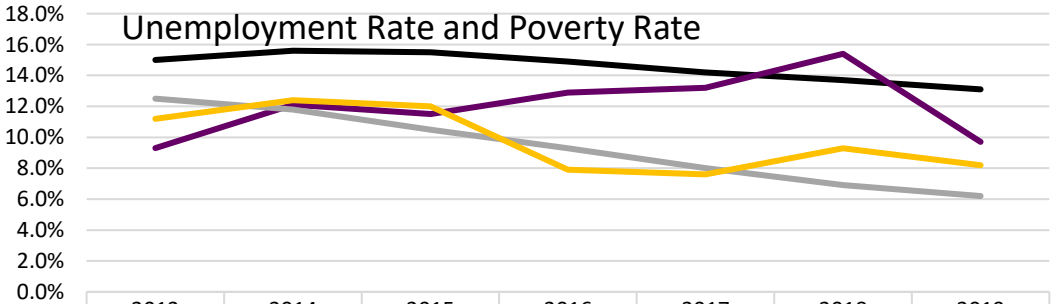


Figure 9: Poverty Rate Graph 2013-2019
Source: American Community Survey 5-Year Estimates, years between 2013 and 2019, Table S2201



	2013	2014	2015	2016	2017	2018	2019
State Poverty Rate	15.0%	15.6%	15.5%	14.9%	14.2%	13.7%	13.1%
County Poverty Rate	9.3%	12.1%	11.5%	12.9%	13.2%	15.4%	9.7%
State Unemployment	12.50%	11.8%	10.5%	9.3%	8.0%	6.9%	6.20%
County Unemployment	11.20%	12.4%	12.0%	7.9%	7.6%	9.3%	8.2%

Figure 10: Unemployment and Poverty Rates
Source: American Community Survey 5-Year Estimates, years between 2013 and 2019, Tables S2201, DP03

Housing Affordability

Although the percentage of cost-burdened households is below most other counties in Nevada (refer to Figure 11), housing affordability is an important component to consider when analyzing poverty levels and the need for social services and interventions in Lander County. Of note is the significant difference between cost-burdened renters versus homeowners, with an estimated 20.2% of renters in Lander County experiencing cost burden with few rental options (120 units). Nearby counties have relatively similar affordability statistics, although Lander County has the lowest number of cost-burdened renters compared to other counties. The median home value is generally in the middle, neither the most or least expensive.

Median House Value

$179,900

Owner-Occupied	Renter-Occupied
2,198 Total Units	**120** Total Units
1.2% Vacancy Rate	**17%** Vacancy Rate
9.1% Cost-Burdened (w/Mortgage)	**50.8%** Cost Burdened
12% Cost-Burdened (w/Mortgage)	

Figure 11: Lander County Housing Affordability

Table 4 - Rural County Affordability Statistics[1]

Renters	**Elko County**	**Eureka County**	**Humboldt County**	**Lander County**
Median Gross Rent	$952	N/A	$841	$842
Cost-Burdened %	22.3%	N/A	41.4%	50.8%
Homeowners	**Elko County**	**Eureka County**	**Humboldt County**	**Lander County**
Median Housing Value	$212,500	$120,100	$180,600	$179,900[2]
Cost-Burdened % (with mortgage)	16.8%	8.3%	17.6%	9.1%
Cost-Burdened % (without mortgage)	16.1%	3.2%	11.3%	12%

Sources:
[1] U.S. Census Bureau - American Community Survey Estimates 2019, Tables DP04, S1101, S2001
[2] University Center for Economic Development - College of Business, University of Nevada, Reno (2020)

Housing Projections[8]

Based on population projection and estimated job growth, 346 new housing units are needed to satisfy and meet future housing demand between 2020 and 2025. An estimated 270 new housing units built between 2020 and 2025 will be needed to satisfy future workforce housing demand over the next five to six years, and an estimated 76 new housing units built between 2020 and 2025 will be needed to satisfy future non-workforce housing demand over the next five to six years in Lander County.

346

Total number of new housing units needed in Lander County to satisfy and meet projected housing demand between 2020 and 2025.

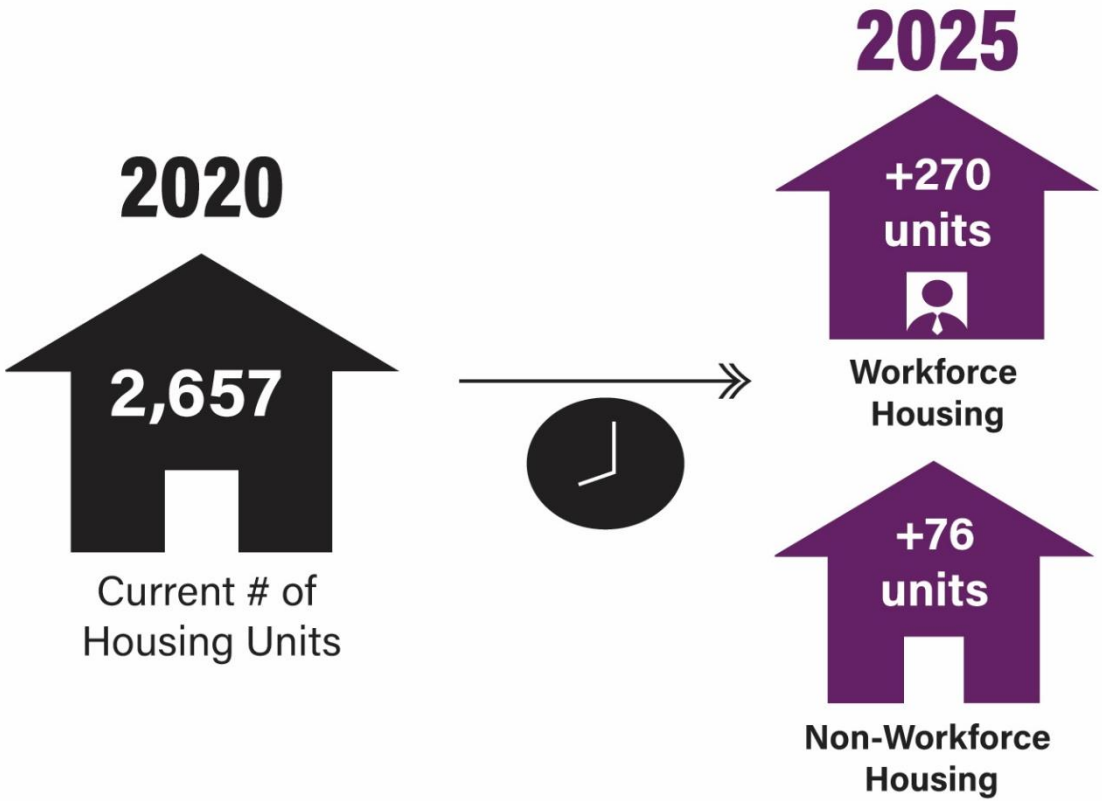


Figure 12: Current and Projected Housing Units
Source: University Center for Economic Development - College of Business, University of Nevada, Reno (2021)

[8] University Center for Economic Development - College of Business, University of Nevada, Reno (2021).

Land Use

The land use of Lander County maintains its historic rural and agricultural character, with the majority of parcels classified with the Master Plan category Rural, meaning that they have limited infrastructure and services available. The majority of land in the County is federally administered by the BLM. Figure 13 provides a breakdown of public versus private lands in the County.

Agricultural lands historically have been important to the area and continue to be important for the economy and livelihood of the County. One hundred seventeen farms, with a total of 329,373 acres of land, are classified as agricultural lands.[9] These lands are included in the Rural Master Plan category.

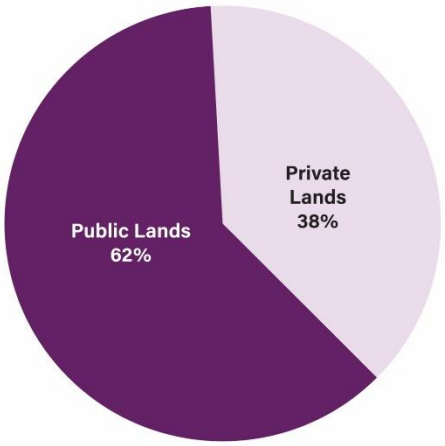


Figure 13: Public versus Private Lands
Source: Lander County Assessor Parcel Data (2021)

In the populated areas of Battle Mountain, Austin, and Kingston, there is a greater mixture of residential, commercial, and industrial uses. The Land Use chapter provides maps and tables breaking down the Master Plan categories for these areas. Figure 14 provides a breakdown of the percentage of parcels with each Master Plan category. Refer to the Land Use & Historic Preservation chapter for maps and other details.

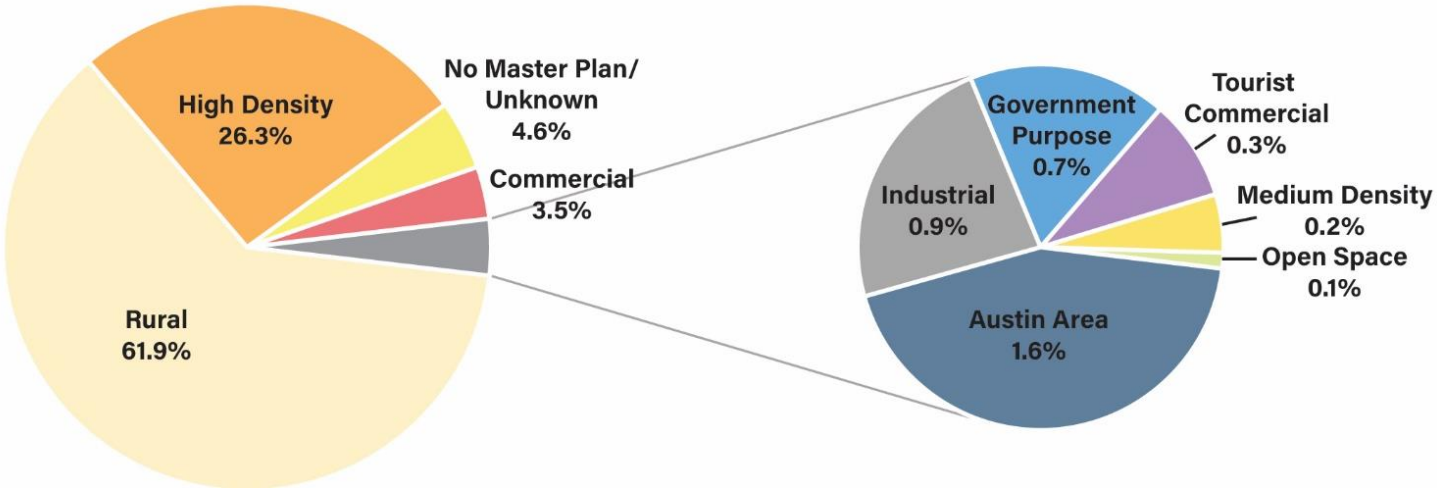


Figure 14: Master Plan Categories of Parcels
Source: Lander County Assessor Parcel Data (2021)

**Note: This graph depicts a percentage of Lander County parcels, not the percentage of acreage of all parcels. Tribal lands are excluded since these parcels are within a sovereign nation and outside of the jurisdiction of Lander County and this Master Plan.*

[9] (US Department of Agriculture 2012-2017)

Economy

Economic Sectors[10]

The top six industries that employ Lander County residents are in or near the County. A substantial amount of the workforce is employed by the various gold, silver, and other precious mineral mines in the area (Figure 15). Other important industries include government, truck transportation, agriculture, fishing, hunting and forestry. Geothermal is also a growing economic sector in Lander County, with several facilities operated by Ormat within county boundaries.

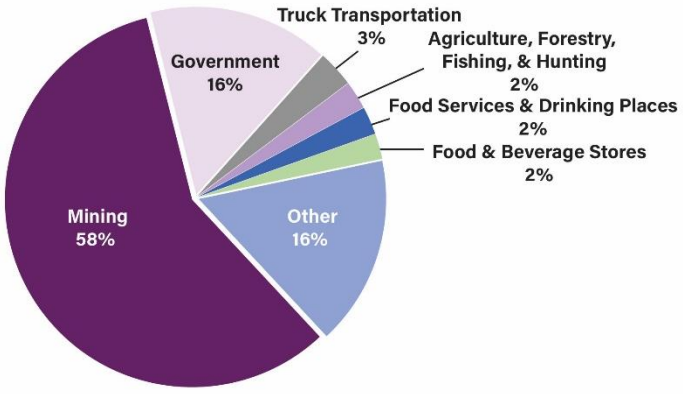


Figure 15: Top Industries in Lander County
Source: Nevada Economic Assessment Project - Socioeconomic Baseline Report (2021); industries lumped by Wood Rodgers, Inc. for graphics/analysis

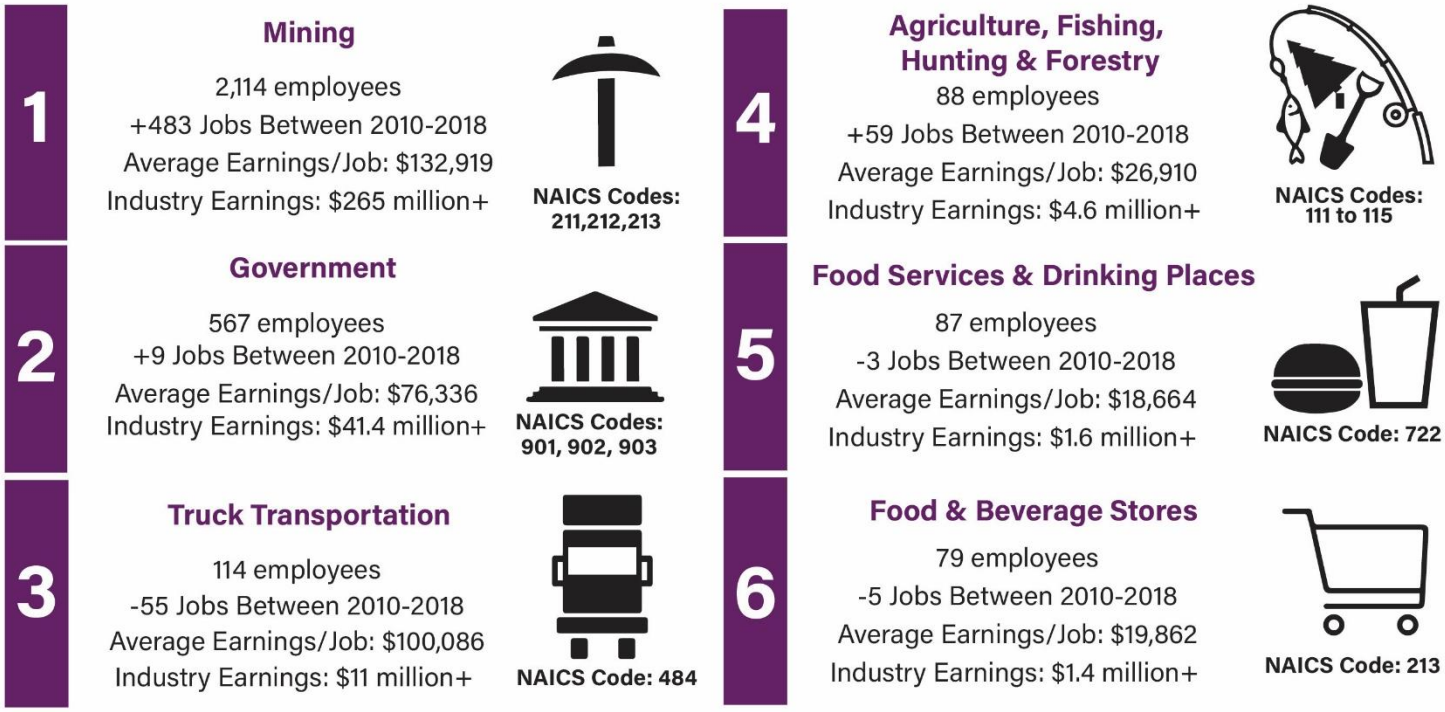


Figure 16: Facts on Top Six Industries in Lander County
Source: Nevada Economic Assessment Project - Socioeconomic Baseline Report (2021)
Industries lumped by Wood Rodgers, Inc. for graphics/analysis

Workforce[11]

[10] (Borden, et al. 2021)
[11] (Steinmann 2020) (University Center for Economic Development, College of Business, University of Nevada, Reno 2021)

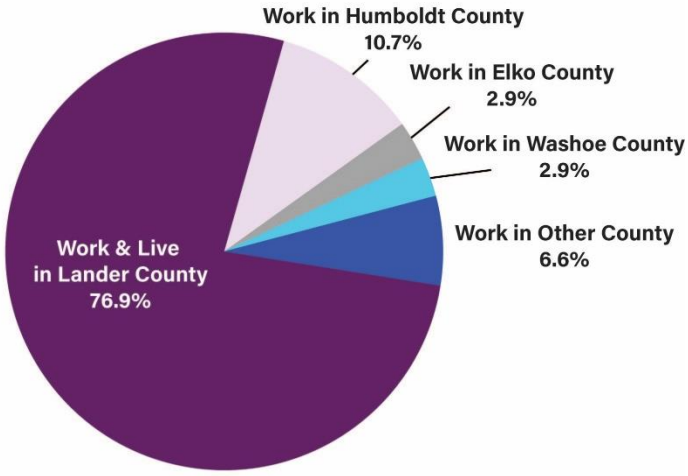


Figure 17: Commuting Patterns of Workforce
Source: University Center for Economic Development, College of Business, University of Nevada, Reno (2021)

The majority of residents living in Lander County also work in Lander County (Figure 17). The unemployment rate decreased from 11.2% to 8.2% between 2013 and 2019, although this rate varies from year to year. Median household income also increased substantially during this time period (Figure 18).

The number of employees decreased slightly in these years; however, a better picture of total employment in industries is available by looking at the overall economic sectors (refer to the Economic Sectors section and Economic Development chapter). The information in this section is centered on employees living in Lander County.

Figure 18: Workforce Statistics
Source: American Community Survey 2013 and 2019, Tables S1901, S1903

Movement of Workforce Throughout Northeastern Nevada

Lander County and northeastern Nevada are unique in the movement of employees. For example, a mine may employ or move a certain number of miners within different counties of northeastern Nevada from year to year depending on mining activities, generating widely different numbers of employees in each county. For this Master Plan update, it is important to note the differences between the total number of employees in certain sectors and the overall workforce population living in Lander County in 2019. In 2017, approximately 1,486 individuals were living outside the County and were employed inside, while 2,290 worked and lived in the County.[12]

Workforce Trend

Lander County has seen a trend toward a greater population working in Lander County but living elsewhere.

Schools

[12] (Borden, et al. 2021, 44)

Lander County has six schools, including three elementary schools, one middle school, one high school, and one K-12 school in Austin. Enrollment has fluctuated slightly between 2014 and 2019 but has remained fairly consistent.[13] No new schools are planned for the future.

Educational Attainment

Educational attainment refers to the highest level of education completed. A higher percentage of higher-end educational attainment helps indicate the type of available labor force in the area. Between 2010 and 2017, 31.9% to 39.2% of the population over the age of 25 had a high school degree or equivalent. This percentage has been rising steadily, and the percentage of this population without a high school diploma dropped from 25% to 16.8% between 2010 and 2017. Although fewer bachelor's degrees were obtained during this period, the number of individuals with associate's degrees and graduate or professional degrees doubled.

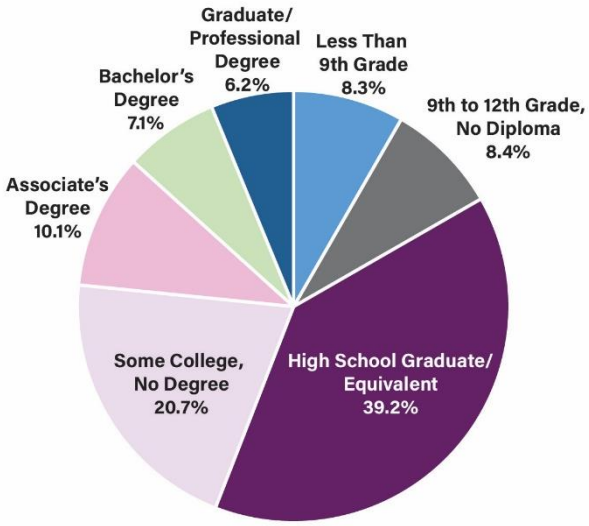


Figure 19: Educational Attainment of Population Over 25
Source: Nevada Economic Assessment Project, University of Nevada, Reno (2021)

Graduation Rates

Graduation rates varied between 2014 and 2019 but generally exceeded state graduation rates, with the exception of 2018 and 2019. The highest enrollment was between 2017 and 2018, coincidentally the year with the highest graduation rate. The first year that Lander County graduation rates fell below the state rate was 2019 to 2020. Graduation rates can influence the ability of residents to obtain employment or progress to higher education.

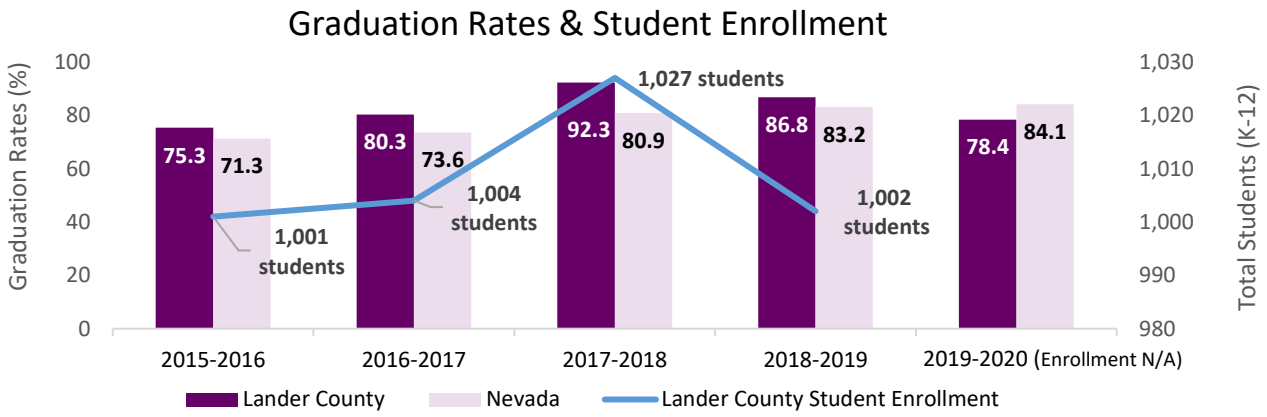


Figure 20: Graduation Rates and Student Enrollment
Source: Nevada Economic Assessment Project - Socioeconomic Baseline Report (2021), pages 23 and 30

Data Limitations

Throughout this Master Plan, most data provided to characterize the existing population and demographics were estimates provided by the U.S. Census Bureau or the Nevada State Demographer. Population projections were

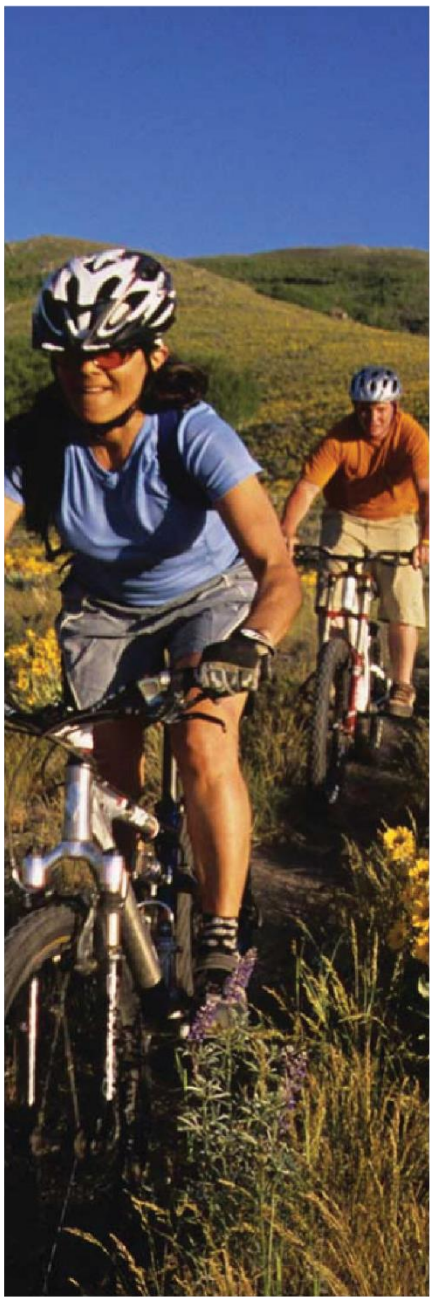
[13] (Nevada Department of Education 2014-2020)

determined by the Nevada State Demographer. Final figures may differ slightly from the recently completed 2020 census data, which will be completed and publicly available in mid-2021. Other census data, including the information in the Affordability section, also may differ compared to the 2021 census or may differ slightly from a more comprehensive affordable housing study if Lander County or another entity chooses to examine affordability more closely. In addition, census methods and sampling are regularly changed to follow advancements and best practices in surveying and therefore may contain slight differences when data is looked at historically.

Additionally, it is important to note the potential for undercounting in Lander County.[14] The U.S. Census Bureau strongly encourages households to return their 2020 census questionnaire online. However, between 2014 and 2019, approximately 15.6% of Lander County households did not have internet access or dial-up in their homes, with 19.8% using a cellular data plan only. Due to this low access to internet, there is the potential that the census questionnaire will not be returned in this format and will require a physical census to be mailed or in-person follow-up. The U.S. Census Bureau acknowledges that these areas are at risk of being undercounted. The deadline for self-response ended on October 15, 2020; at that time, the self-response rate of Lander County was 45.3% (the number of individuals who responded online, by phone, or by mail), a smaller rate than 2000 and 2010. There was a higher risk of undercounting in 2020 compared to the 2000 and 2010 census efforts, due to a number of factors, including a shorter window for follow-up for non-responses.

In sum, the best available data was used to arrive at the existing conditions and predictions of future populations and housing needs. However, as with any data, there are limitations to consider. Updates of the data in this Master Plan may be warranted as new information is available.

[14] (Census Hard to Count Maps 2020)



LAND USE

Land Use

The Land Use element addresses conditions and trends that influence growth in Lander County, analyzes the distribution and interrelationships of the various land use types, and contains policies and action plans that establish a development pattern for the next 20 years.

Goals

1. **Facilitate orderly development that is consistent with available resources and services in Lander County.**
2. **Minimize conflicts among land uses.**
3. **Provide adequate lands to support economic development and population growth.**
4. **Create a development pattern that is cost effective to serve with municipal services.**
5. **Create stable and compatible land uses among residential areas.**

Policies

LU.1 Ensure that future land uses are consistent with the adopted land use plans for Battle Mountain, Austin, and Kingston plans to the extent practical.

LU.2 Minimize conflicts between rural land uses and higher-density land uses. Medium- to high-density land uses generally should not be allowed adjacent to active farm and ranch operations and areas suitable for agricultural operations without approval of a Special Use Permit or similar entitlement process.

LU.3 Maintain irrigated agriculture on lands outside community areas of Battle Mountain, Kingston, and Austin. Cluster development that maintains the overall allowed density can be utilized to maintain the balance of lands in agricultural production.

LU.4 For lands proposed for development and in close proximity of municipal water and sewer services, evaluate requirements for service line extension to the site.

LU.5 Encourage tourist commercial and general commercial land uses along main transportation routes. General commercial (C-2) should not be allowed adjacent to residential neighborhoods without approval of a Special Use Permit or similar entitlement process.

LU.6 Lands located in remote areas without deeded access shall not be parceled or subdivided. Subdivision or parceling of lands where slopes are more than 15% are discouraged. Access to remote lands should meet the rural road standards and provide adequate drainage. New rural roads and drainage must be reviewed by the County Public Works Director.

LU.7 Prevent new residential subdivisions from locating directly adjacent to highway and railroad easements without adequate landscape buffering.

LU.8 No structure shall be erected, constructed, altered or maintained, and no tree shall be allowed to grow to a height in excess of the applicable height limit established by Federal Aviation Regulation (FAR) Part 77, "Objects Affecting Navigable Airspace," unless the Federal Aviation Administration (FAA) issues a determination of "No Hazard to Air Navigation" and Lander County determines that the structure does not place restrictions on airport operations or have the potential to limit future operations.

LU.9 Areas subject to land disposal provide a variety of development opportunities. Appropriate development includes:

- Residential development providing a variety of housing opportunities, including second home and vacation home opportunities
- Industrial development and tourist commercial development that provide employment opportunities for local residents
- General government and public uses

LU.10 Ensure that development of lands within critical flood zones and floodways do not negatively impact their hydrologic function. Critical flood zones include the Reese River near the confluence of the Humboldt River and lands in the Humboldt River Corridor. Lander County will consult appropriate flood maps to determine location of other critical flood zones and floodways in Lander County. Maintain low-density development within areas that are subject to floodways and flood zones.

LU.11 Ensure availability of lands, public services, and facilities to support development and job creation.

LU.12 For workforce and employer-sponsored housing associated with a business expansion or new operations in Lander County requiring at least 25 new residential structures, Lander County may allow the employer to establish temporary and short-term housing units under a special use permit or planned unit development. The development may include a variety of housing units to meet the unique needs of short-term or temporary workers and to adjust development standards to reflect the employer housing needs.

LU.13 Identify, recognize, and increase historic resources by encouraging and incentivizing the addition of properties to state and national registers.

LU.14 Foster a balance between new development and preservation of historic, archaeological, and cultural resources.

LU.15 Encourage design of development and community improvements complementary to the surrounding historic landscape, including adaptive reuse and integration of historic properties into new projects where possible and appropriate.

Current Conditions

The land patterns of Lander County are consistent with its rural history, with primarily large rural swaths of land and some concentrated areas of medium- and higher-density residential land uses as well as supportive industrial and commercial uses. Since the 2009 Master Plan, the county development patterns have been relatively consistent. The 2021 update of the Land Use Map provided a land use for the majority of parcels in Lander County, compared to the 2009 Master Plan that contained several blank areas. This mapping process created a substantial number of parcels with a Rural land use designation, primarily in areas farther from the towns of Battle Mountain, Austin, and Kingston. Refer to Figures 1-2 through 1-5 of this document for the updated 2021 Master Plan Land Use Maps.

Inventory of Land

Table 1-1 - Inventory of Land Uses			
Residential			
Master Plan Category	**# of Parcels**	**Acreage**	**% of # of Parcels**
Rural (R)	4,990	3,520,350	61.79%
Medium Density (MD)	15	87.99	0.19%
High Density (HD)	2,178	1413.17	26.97%
Austin Area	414	202.90	5.13%
Non-Residential			
Master Plan Category	**# of Parcels**	**Acreage**	**% of # of Parcels**
Commercial (C)	277	397.68	3.43%
Tourist Commercial (TC)	27	453.78	0.33%
Industrial (I)	83	3203.02	1.03%
Other			
Master Plan Category	**# of Parcels**	**Acreage**	**% of # of Parcels**
Open Space (OS)	31	190.87	0.38%
Government Purpose (GP)	59	3618.15	0.73%
Tribal (T)	2	836.67	0.02%
Total	**8,076**	**3,530,754.2**	**100%**

Master Plan Categories

The Land Use Element provides the vision for the future development pattern in Lander County. Land use groups were determined by analyzing the typical intensity, location, and distribution of land uses in Lander County. It is expected that these land use groups provide opportunities for growth that are desired in Lander County and will dominate throughout the scope of this plan. As part of this Master Plan, land use categories were reorganized to better fit the current land patterns and to provide more clarity moving forward. The reorganization was primarily related to better aligning density with zoning designations and renaming of land use categories to provide more clarity. New Master Plan land use categories are described in the following table.

RESIDENTIAL			
Master Plan Category	**Uses & Density**	**Characteristics & Development Guidelines**	**Equivalent Zoning Category**
RURAL (R)	**Primary Uses:** Generally remote lands with very low-density development (1 dwelling unit per 20 acres) for agriculture or mining and milling. Expected to remain relatively undeveloped or in agricultural use or mining and milling use. **Other Uses:** Remote but unique developments (e.g., outdoor recreational resorts, renewable energy facilities, agri-business, mining facilities). Watchmen's quarters or employee housing may be allowed only for agricultural uses. **Density:** 1 dwelling unit per 20 acres or more.	Intended to preserve agriculture, grazing, and/or open space areas. These lands also include mining and milling uses. These areas generally lack essential infrastructure and services for intensification, are larger swaths of land used for mining or agriculture, or have constraints such as steep slopes, flood zones, and other sensitive environmental areas. This designation identifies areas that may have one or more of the following characteristics: ▪ Within the 100-year floodplain identified on the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps (FIRM). ▪ Within a "potential wetland area" as identified by the U.S. Army Corps of Engineers. ▪ Within active mining areas or near active mine sites. ▪ Moderate slopes (between 15% and 30%) or steep slopes (30% or steeper) based on interpretation of the topographic information on the U.S. Geological Survey (USGS) maps for the County. ▪ In agricultural use or directly adjacent to agricultural areas. ▪ In a remote location that does not have public infrastructure adjacent to or near the site; public services are located significant distances from the proposed development and creates a financial burden on local government to serve. **Public service standards:**	A-3 (Farm and Ranch)

RESIDENTIAL			
Master Plan Category	**Uses & Density**	**Characteristics & Development Guidelines**	**Equivalent Zoning Category**
		Estimated water generation: Water right dedication is 2.0 acre- feet/dwelling unit/individual wells in a designated basin for newly created parcels. Development will be served by individual appropriate water right; dedication requirements apply. Estimated sewer generation: Development will be served by individual septic systems. **Design standards:** Conservation of natural terrain, groundwater recharge capabilities, scenic qualities, ranching and agricultural uses, and other natural surroundings is encouraged.	
RURAL RANCHETTES (RR)	**Primary uses:** Single family detached residential uses on parcels in semi-rural setting. **Secondary uses:** Livestock and agricultural. **Density:** 1 dwelling unit per 4.5 acres or more.	Single family detached residential uses on parcels in a semi-rural setting. Livestock and agricultural uses are common secondary uses. **Public service standards:** Estimated water generation: 2.0 acre-feet/dwelling unit/individual well. For lower density, 1.12 acre-feet/dwelling unit/connection with community water system for all others. Typically served by individual sewage disposal system unless public sewer services are available. **Design standards:** Rural setting with less developed infrastructure. Conservation of natural terrain, groundwater recharge capabilities, and scenic qualities is encouraged.	RR-4.5 (Rural Residential 4.5 acres)

Master Plan Category	Uses and Density	Characteristics and Development Guidelines	Equivalent Zoning Category
LOW DENSITY (LD)	**Primary Uses:** Single family detached residential uses. **Other Uses:** Limited livestock and agricultural uses. **Density:** 1 dwelling unit per 2.5 acres or more.	Single family detached residential uses on parcels in a semi-rural setting but closer to more populated areas. Limited livestock and agricultural uses are common secondary uses. **Public service standards:** Typically served by individual sewage disposal system unless public sewer services are available. Estimated water generation: 2.0 acre-feet/dwelling unit/individual well. For lower density, 1.12 acre-feet/dwelling unit/connection with community water system for all others. **Design standards:** Typical to see more developed infrastructure such as paved streets with rural standards such as no curb and gutter. Conservation of natural terrain, groundwater recharge capabilities, and scenic qualities is encouraged.	RR-2.5 (Rural Residential 2.5 acres)
MEDIUM DENSITY (MD)	**Primary Uses:** Single family detached homes. **Other Uses:** Public, semi-public facilities, parks, open space. **Density:** 1 unit per 2 acres to 2 units per acre.	Single family detached intended to be closer to population centers with access or future access to community water and wastewater systems. **Public service standards:** Developments less than 2 acres shall be served by municipal water/wastewater systems. Estimated water generation: 1.12 acre- feet/dwelling unit/connection with community water system. Estimated sewer generation: 325 gpd/dwelling unit. **Design standards:** Developed infrastructure is present and subject to specific design standards. Traditional and conventional interconnected development patterns are appropriate for this area.	R-4 (Single-Family Residential One acre) R-3 (Single-Family Residential One-half acre)

Master Plan Category	Uses and Density	Characteristics and Development Guidelines	Equivalent Zoning Category
HIGH DENSITY (HD)	**Primary Uses:** Single family detached and attached houses. **Other Uses:** Temporary or short-term housing options may be appropriate in certain areas. **Density:** 3 to 5 units per acre.	Intended to provide a mix of single family detached and attached housing product types near existing infrastructure and services. Previous Mixed Residential Commercial (MRC) zoning shall be limited to existing MRC zoned lands. Future zone changes to MRC shall not be allowed. **Public service standards:** Developments shall be served by municipal water/wastewater systems. Estimated water generation: 1.12 acre-feet/dwelling unit for single family; 1.0 acre- feet/dwelling unit for mobile home parks. Estimated sewer generation: 300 gpd/dwelling unit for higher-density residential development. **Design standards:** Higher density and redevelopment of vacant parcels is encouraged. Development should be compatible with existing neighbors. The character of existing residential areas should be maintained. Standards should minimize conflict that may occur due to the compact form of this land use, including minimum setbacks, building heights, landscaping, lighting, parking, and noise. Pedestrian needs are important. Higher-density residential areas may be appropriate for short-term or temporary employer-sponsored workforce housing opportunities. For workforce housing proposals, Lander County will evaluate the need for modified development standards.	R-1 (Single-Family Residential 6,000 square feet) R-2 (Single-Family Residential 12,000 square feet) MS (Manufactured Housing Subdivision)

Master Plan Category	Uses and Density	Characteristics and Development Guidelines	Equivalent Zoning Category
MULTI-FAMILY (MF)	**Primary Uses*:*** Multi-story living, smaller multi-family buildings, single family attached/townhouses. **Other Uses:** Temporary or short-term housing options may be appropriate in certain areas. **Density:** 6 to 30 units per acre.	Intended to provide multi-family residential opportunities near existing infrastructure and services. Typically located near transportation corridors, parks, and school sites. Residences should be buffered from adjacent roadways, preferably with trees or other natural landscaping. **Public service standards:** Developments shall be served by municipal water/wastewater systems. Estimated water generation: 1.12 acre- feet/dwelling unit for single family; multi-family varies by individual development. Estimated sewer generation: 300 gpd/dwelling unit for higher-density residential development, 250 gpd/dwelling unit for multi-family. **Design standards:** Multi-family development and redevelopment of vacant parcels is encouraged. Development should be compatible with existing neighbors. The character of existing residential areas should be maintained. Standards should minimize conflict that may occur due to the compact form of this land use, including minimum setbacks, building heights, landscaping, lighting, parking, and noise. Pedestrian needs are important. Multi-family residential areas may be appropriate for short-term or temporary employer-sponsored workforce housing opportunities. For workforce housing proposals, Lander County will evaluate the need for modified development standards.	MF (Multi-Family)

NONRESIDENTIAL LAND USES			
Master Plan Category	**Uses and Density**	**Characteristics and Development Guidelines**	**Equivalent Zoning Category**
COMMERCIAL (C)	**Primary Uses:** Wholesale and retail centers, specialty shops, personal services. **Other Uses:** Business parks and supportive commercial activities and hotels where appropriate.	Create and preserve areas for businesses that provide a variety of wholesale and retail goods and services, serving neighborhood or community markets. **Public service standards:** Water requirement will vary by individual development; connection with community water system shall be required. Sewer requirement will vary by individual development; connection with community disposal system shall be required. **Design standards:** Buffering standards should be required adjacent to residentially zoned parcels and preferably should include trees or other natural vegetation. Commercial activity proposing 24-hour operations should not encroach on established residential areas. Pedestrian access and connection to adjoining residential areas should be encouraged. Parking areas should have adequate landscaping to discourage expansive hardscapes and paved areas. Transportation and circulation systems should allow for direct access by adjoining neighborhoods while discouraging cut-through traffic.	MF (Multi-Family) C-1 (Limited Commercial) C-2 (General Commercial)

Master Plan Category	Uses and Density	Characteristics and Development Guidelines	Equivalent Zoning Category
TOURIST COMMERCIAL (TC)	**Primary Uses:** Wholesale and retail centers, specialty shops, personal services, automobiles services, motels, RV parks, traveler-related services. **Other Uses:** Business parks and supportive commercial activities. More intense commercial uses than Commercial (C).	Tourist commercial uses are strongly encouraged in areas that support other urban and commercial uses that are associated with Lander County communities of Battle Mountain, Austin, and Kingston. Generally intended for major transportation routes through Lander County. **Design Standards:** Best suited for areas adjacent to major highways and interstates. Broad Street, Front Street, Muleshoe Road, and areas adjacent to Interstate 80 and U.S. 50 and State Route 305 support tourist commercial activity. **Public service standards:** Water requirement will vary by individual development; connection with community water system shall be required. Sewer requirement will vary by individual development; connection with community disposal system shall be required. **Design standards:** Buffering standards should be required adjacent to residentially zoned parcels and preferably should include trees or other natural vegetation as required by development code. Commercial activity proposing 24-hour operations should not encroach on established residential areas. Parking areas should have adequate landscaping to discourage expansive hardscapes and paved areas.	C-2 (General Commercial) TC (Tourist Commercial)

Master Plan Category	Uses and Density	Characteristics and Development Guidelines	Equivalent Zoning Category
INDUSTRIAL (I)	**Primary Uses:** Industrial operations. **Other Uses:** Supportive commercial uses may be appropriate.	Intended to provide for activities such as manufacturing, warehousing, mining, and construction. Employment and job creation opportunities are priority. For industrial proposals, the requirement to be served by public water/sewer system will vary by individual development. **Design Standards:** Each parcel is allowed one access point. Adjoining properties will share common access. Alternative access will be from less impacted of the two streets. No access to local streets that primarily serve residential uses. Proposal for industrial development must have direct access to existing or planned arterial road, unless 60% of proposal's transport is served by rail, in which case existing or planned collector is acceptable. Industrial uses are discouraged adjacent to residential or should provide large buffering to reduce impacts.	I (Industrial)
OPEN SPACE (OS)	**Primary Uses:** Conservation areas, recreation.	Intended to retain certain critical lands in the County. This designation applies to open areas with limited or no road access, water, sewer, and emergency services.	OS (Open Space)
GOVERNMENT PURPOSE (GP)	**Primary Uses:** Depends on parcel.	Intended for public facilities to serve Lander County residents, visitors, and industries.	GP (Government Purpose)
TRIBAL (TR)	**Primary Uses:** Depicts Tribal Lands	Tribally Owned Lands	TR (Tribal)
AUSTIN AREA (AR)	**Primary Uses:** A mixture of land uses which promote the goals and policies laid forth in the Austin Master Plan (2009).	Development in this area must take into account its overall impact to the Austin area, extension of public services and facilities, and unique natural and scenic qualities of the Reese River Valley. Increasing employment and business activity is a high priority for the Austin area.	AR (Austin Area)

Public Land

The initial Lander County Public Lands Policy Plan was developed between 1983 and 1984 as part of a state-wide effort resulting from the passage of Senate Bill 40. Nevada Division of State Lands (NDSL), in concert with local governments, developed a public lands policy plan for each of Nevada's 17 counties as well as a statewide element. The plan was adopted on October 4, 1984, by the Lander County Board of Commissioners (LCBC). The LCBC working under advisement of the Lander Public Land Use Advisory Planning Commission (PLUAPC) adopted an update to the plan on November 8, 1999, and again in 2005. The 2017 plan represents a review of existing and emerging public lands issues that are important to Lander County as it works with federal agencies under the National Environmental Policy Act (NEPA) and other public processes.

The majority of public land in Lander County is owned by the BLM. Below is a table highlighting the breakdown of public lands in Lander County. Refer to Figure 1-1 for a map.

Table 1-2 - Public Lands Inventory

Administered by	Acreage	%
BLM	2,646,848.78	91%
USFS	234,192.504	8%
University of Nevada	8,006.26	0.3%
Lander County	5,783.264	0.2%
Nevada Department of State Lands	3,383.7	0.2%
Bureau of Reclamation (BOR)	120	0.004%
State of Nevada	75	0.003%
Nevada Department of Transportation	37.47	0.001%
USDA/USFS	19.62	0.001%
Nevada Rural Housing Authority	6.52	0.0002%
Total	**2,898,473.12**	**100%**

In the 2021 Master Plan, these public lands are generally categorized as Rural to plan for future opportunities to convey public lands into county ownership. The lands are generally without necessary infrastructure to support significant development and/or have resource constraints such as steep slopes, flood zones, and other sensitive environmental areas, fitting with the definition of the Rural Master Plan category.

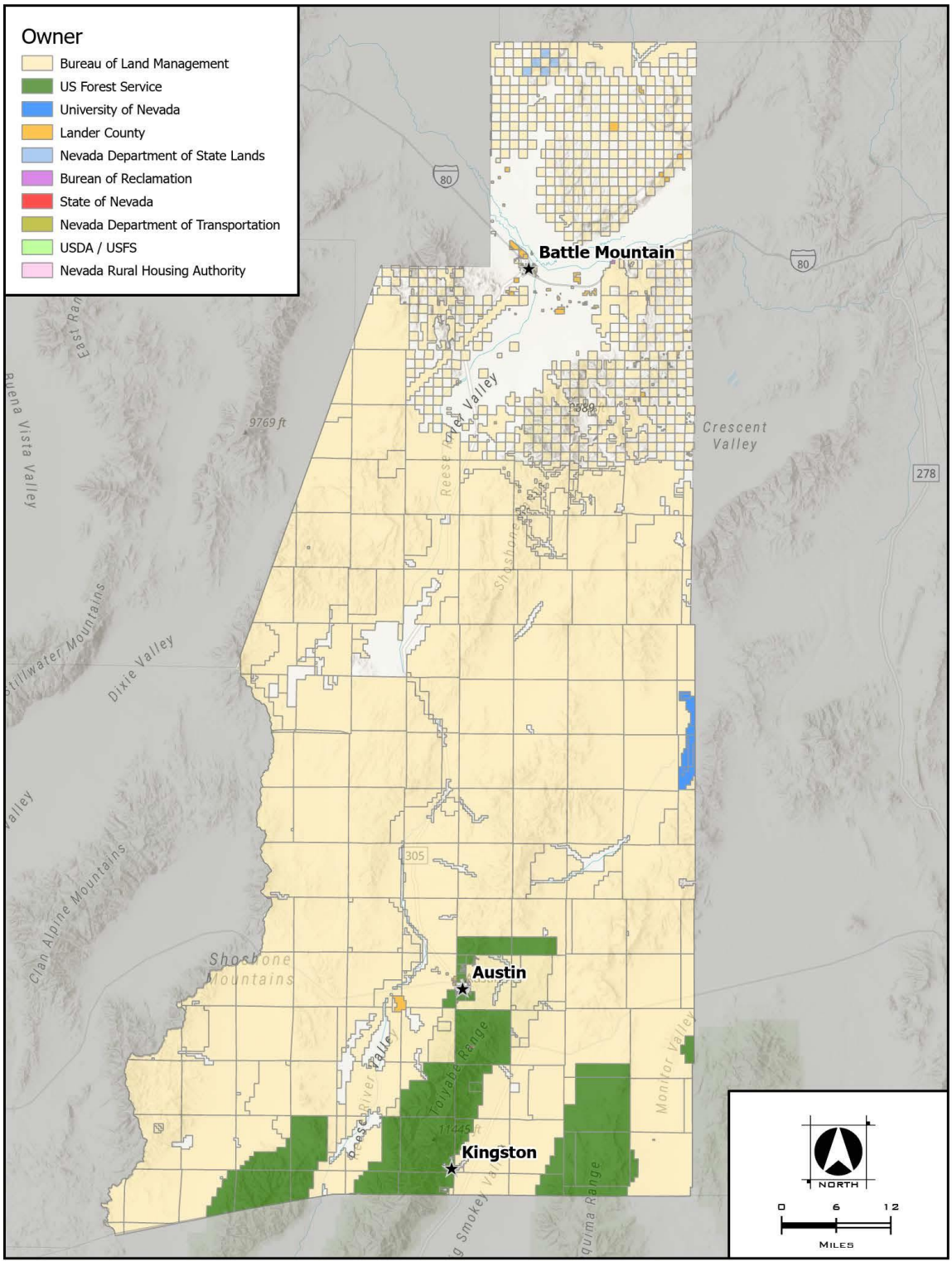


Figure 1-1: Public Lands Map

Looking to the Future

Land Use Mapping Gaps

A Master Plan geographic information system (GIS) layer did not exist prior to this update. The project team created a master plan layer using parcel data from the Lander County Assessor that contained zoning for the parcels. A Master Plan designation was assigned to each parcel depending on the existing zoning or parcel size. As development patterns in Lander County change over the years, Lander County staff should revisit the Master Plan on a five-year basis to ensure that the plan is reflective of current conditions. Future Master Plan amendments should be reflected in the GIS mapping.

New Master Plan Categories

Several Master Plan categories were added to the 2021 Master Plan, including Rural Ranchettes (RR), Low Density (LD), Multi-Family (MF). The Commercial and Tourist Commercial designations were split into separate categories. These additions and modifications will help clarify land use types and better organize the categories with the type of development desired for each.

Work with Political Entities to Pass a Lands Bill

As discussed in the Public Lands section, the conveyance of public parcels could provide additional space for development and recreational or public opportunities for Lander County. The National Defense Authorization Act (Act) was signed into law (Public Law 113-291) in 2014, allowing a process for conveying BLM and BOR public lands for future public uses. If Lander County seeks to use public lands in the future, the conveyance process is an avenue for acquiring these lands.

In April 2021, a draft bill (FLO212209) was introduced to Congress outlining the Lander County conveyance process. Two specific uses for conveyed federal lands are included in the bill: 1) conveyance for watershed protection, recreation, and parks, and 2) conveyance for airport facilities. Additional discussion of wilderness areas is included in the bill and discussed in the Conservation chapter of this Master Plan. With this bill, Lander County has the opportunity to convey certain parcels into county ownership and develop them for uses outlined in the bill. This process would create additional available, valuable land for the county to use for public purposes such as parks or recreation facilities. Future efforts by the county with this bill will include endeavoring into the conveyance process and re-envisioning the use of these public lands to suit the needs of the current and future population and visitors or industries.

Area Plans

Lander County is divided into three towns with distinct histories and populations and thereby differing goals and visions for their communities. The following section describes Battle Mountain, Austin, and Kingston Canyon.

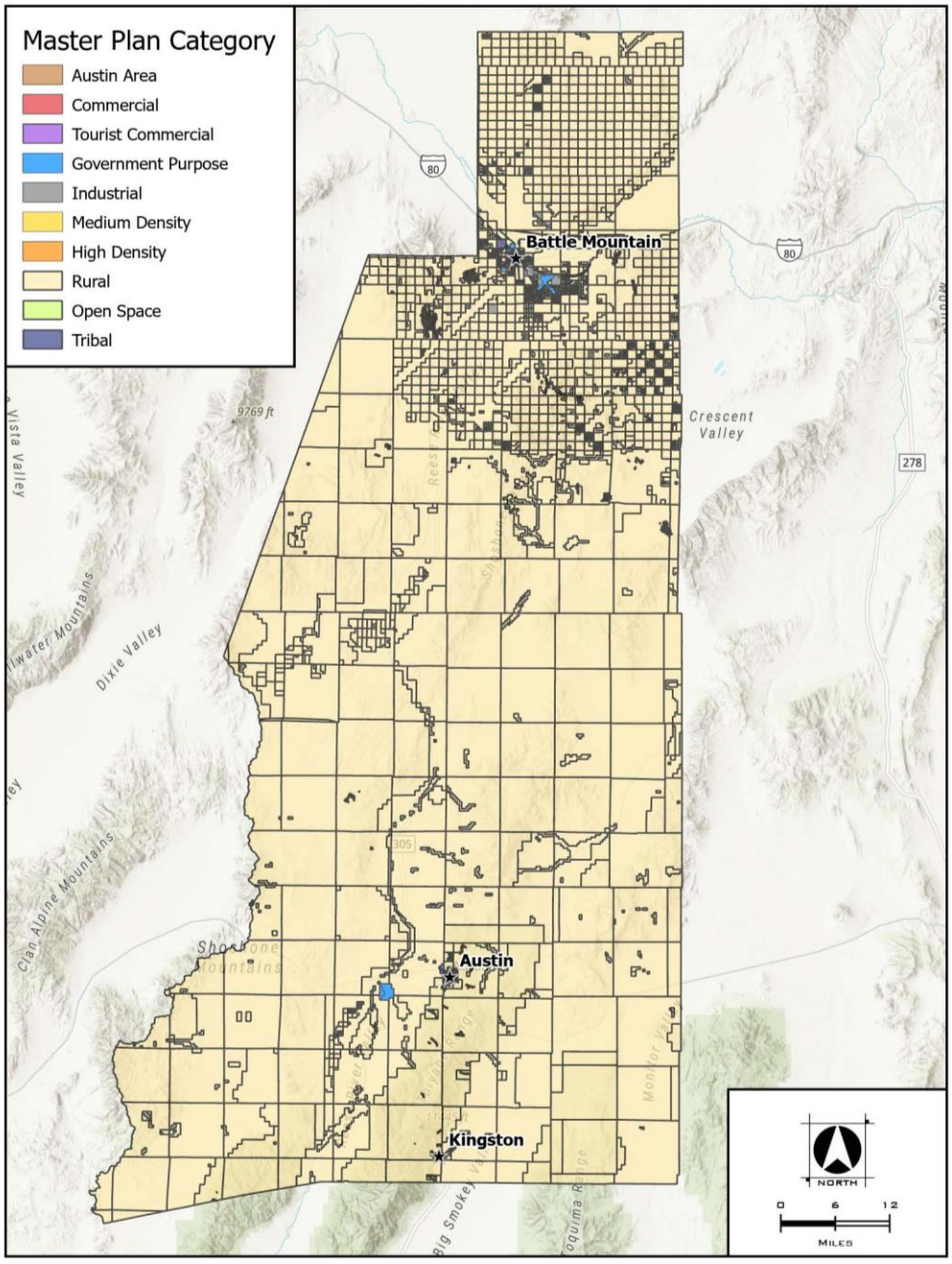


Figure 1-2: Overall Master Plan Map
(Refer to Figures 1-3 through 1-5 for Battle Mountain, Austin, and Kingston Maps)

Battle Mountain[1,2]

The Battle Mountain and Lander County regions are part of the ancestral lands of the Newe, later renamed Shoshone by white settlers during the 1820s. The traditional western territory of the Shoshone covered southern Idaho, the central part of Nevada, portions of northwestern Utah, and the Death Valley region of southern California. The Battle Mountain region was the boundary area between the Newe (the ancestors of the Shoshone) and the Northern Paiutes, known to the Newe as Tonomudza. A focal point for this area were rabbit and antelope drives for the indigenous population. Beginning in the early 19th century, overland immigrants began exploiting this region for fur trading, mining, and cattle ranching. Mining and shipping activity was further spurred by the establishment of the Central Pacific Railroad. Tourism grew in the region beginning in 1930, the start of the paving of the major highways. Mining, livestock, and tourism continue to be important parts of the Battle Mountain economy and lifestyle.

Quick Facts About Battle Mountain	
Founded in:	1870
Population:	3,705 residents (2020 Census)
Recreational Opportunities:	Mountain biking Motocross Off-highway vehicle (OHV) Raceway Recreation Center Parks Hunting and trapping Swimming and fishing Wildlife viewing Heritage tourism

Master Plan	Acres	%
High Density	454.5	31.28%
Government Purpose	374.76	25.79%
Tourist Commercial	261.59	18%
Commercial	127.94	8.81%
Industrial	47.22	3.25%
Rural	181.13	12.47%
Medium Density	5.74	0.40%

Development Considerations

Battle Mountain is the main population center in Lander County. This area has the largest amount of high density and commercial parcels compared with other parts of the county, suitable to accommodate residential and employment needs. It is anticipated that Battle Mountain will continue to see growth over the next 20 years in both population and employment opportunities. As growth occurs, Lander County should continue to promote adequate buffering between land use types, preferably including trees or other natural vegetation as required by Lander County development code. There are growing concerns about individual sewage disposal systems and water quality. Lander County should monitor this over the next few years and promote expansion of public water and sewer service for more intense development areas.

[1] (Te-Moak Tribe of Western Shoshone 2018)
[2] (Marschall 2010)

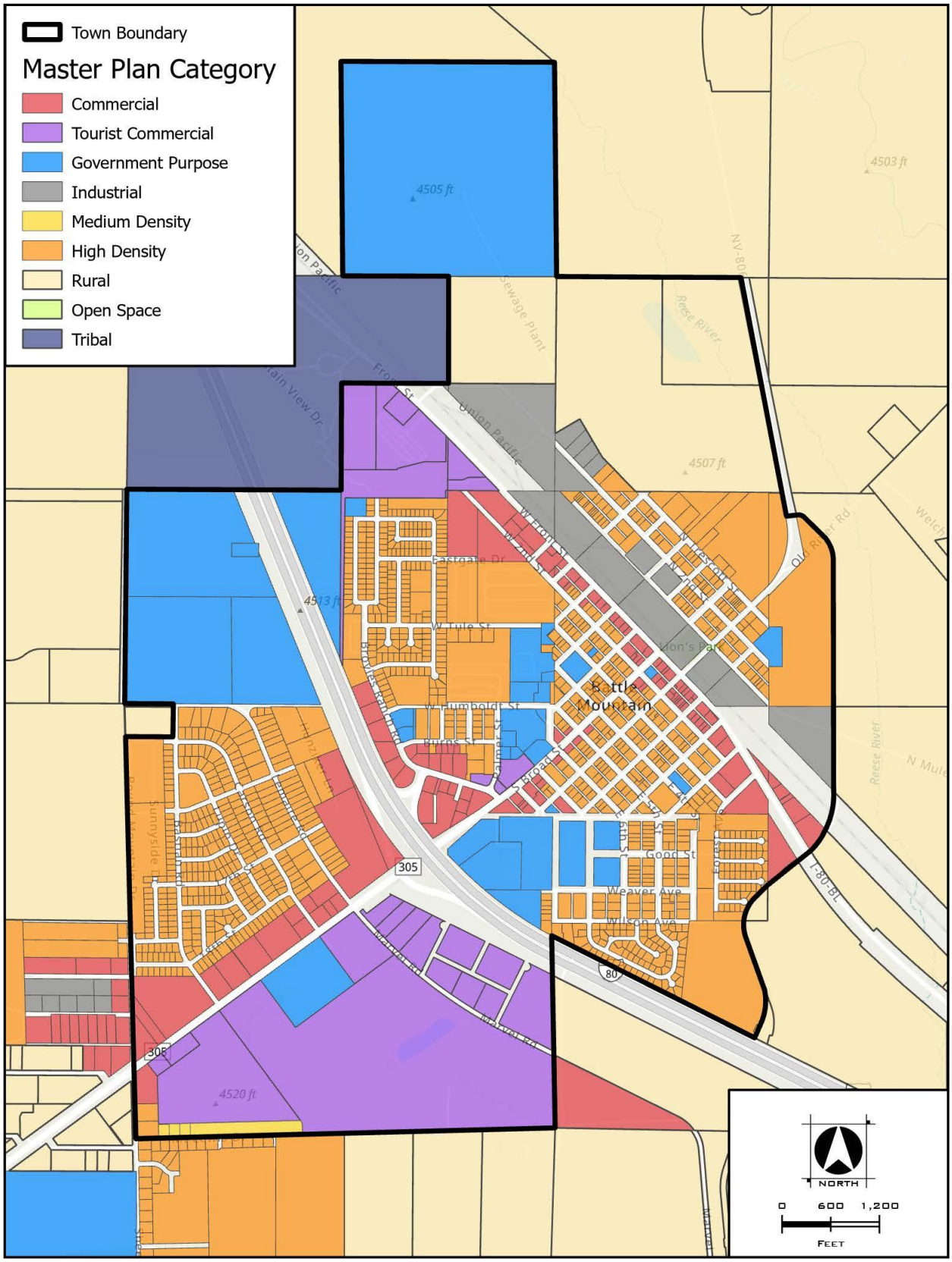


Figure 1-3: Battle Mountain Master Plan Map

Austin

Austin is located in the geographic center of Nevada on U.S. Highway 50. The city was incorporated in 1864, and its early history surrounded the extraction of its rich mining resources. The mining industry peaked in the late 1860s and early 1970s. The Nevada Central Railroad extended to Austin in 1880, aiding mining developments and enhancing Austin's position as a commercial center. Despite this new railroad connection, mining activity diminished in the late 19th century and caused the population to dwindle significantly by 1890. Today, Austin has 113 residents, as reported in the 2019 census data. Austin's historic district displays the town's mining history. Austin maintains its own master plan; this document does not supersede any element of the Austin Master Plan.

Gridley Store, Austin, Nevada
Source: Ken Lund (Licensed by CC BY-SA 2.0)

Quick Facts About Austin	
Founded In:	1862
Population:	167 residents (2020 Census)
Average rainfall/snowfall:	13.4 inches annual rainfall 89.5 inches annual snowfall
Average Temperatures:	July - high 88°F, low 54°F January - high 42°F, low 19°F
Growing Season:	104 days
Recreational Opportunities:	Parks, ball fields, swimming pool Equestrian/mountain Biking, OHV trails Hiking, camping Hunting, fishing Heritage tourism
Important Features:	Thirty-seven-acre historic district Eleven sites and buildings listed on the National Register of Historic Places (NRHP)

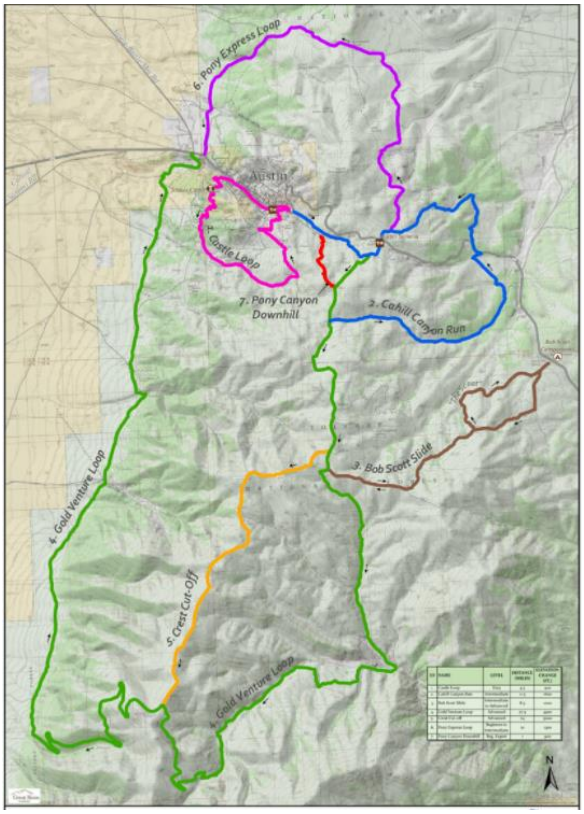
Master Plan	Acres	%
Austin Area	202.731	75.87%
Government Purpose	8.008	3%
Commercial	15.474	5.79%
High Density	41.004	15.34%

Development Considerations

Historically, the major environmental constraint in Austin is its topography. Steep hillsides on both the north and south sides of town present a development challenge as well as a natural viewshed that is vitally important to the character of Austin. Pony Canyon's drainage runs directly through the center of town from east to west, culminating in the Reese River Valley. Major flood areas in Austin have been remediated and currently exist only along Main Street. The presence of many important historic buildings and landscapes in Austin, including many within the Austin Historic District, provide limitations but also opportunities for adaptive reuse and heritage tourism.

Recreation in Austin

Austin is rich in recreational opportunities, including mountain biking, hiking, and wildlife viewing. Seven mountain biking trails are located in the area, ranging from easy to expert/advanced trails.[3] Other amenities include hot springs, camping sites, hunting areas, and a historic district.



Mountain Biking Trails in Austin; Source and Full Size Map: https://austinnevada.com/biking/

Spencer's Hot Springs
Source: Michael Pujals, 2016; Licensed by CC0 1.0

Camping in Austin

[3] (Austin Nevada n.d.)

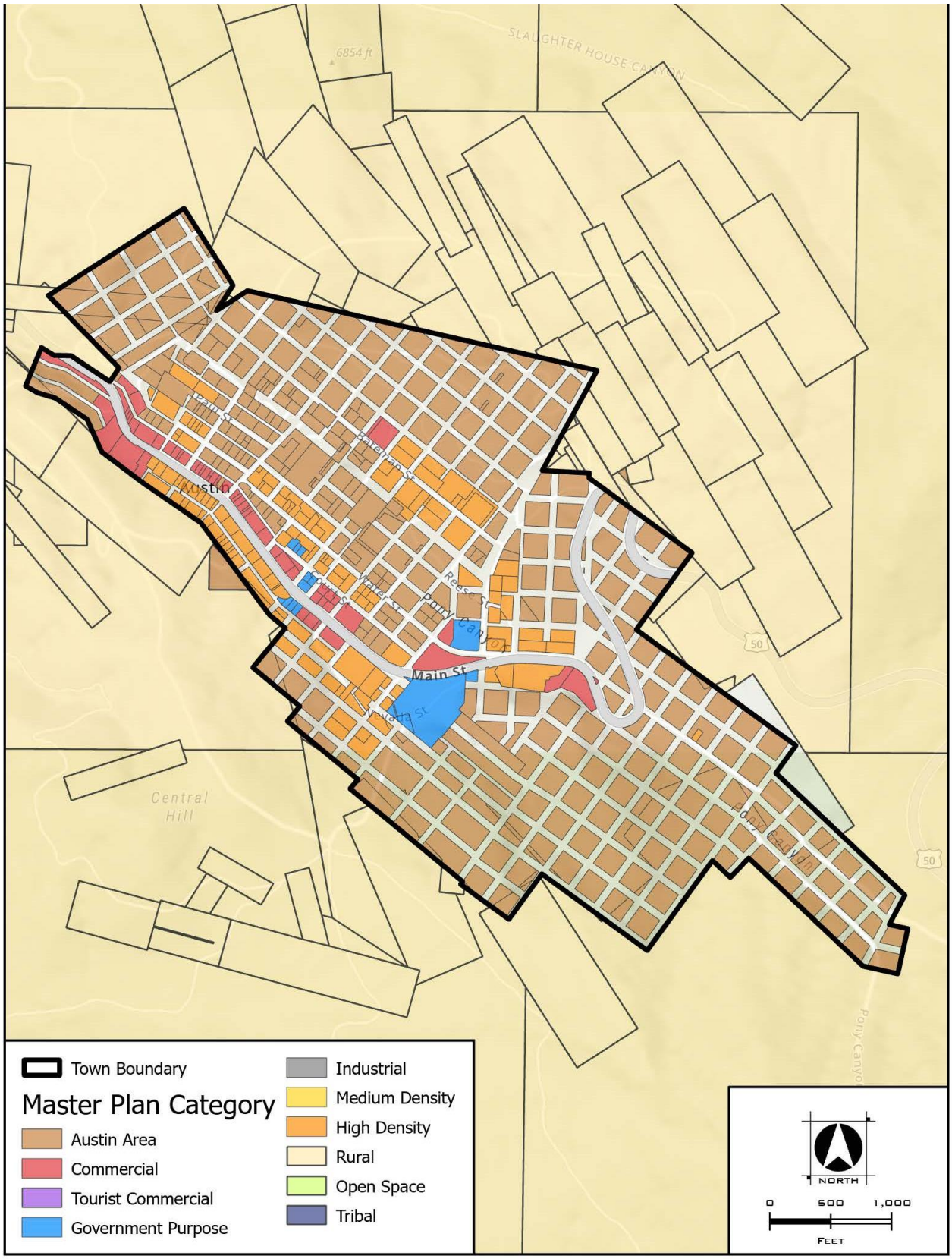


Figure 1-4: Austin Master Plan Map

Kingston Canyon

Kingston Canyon, a historic mining district, is a short 30-mile drive south of Austin. It is named after the Kingston Mine discovered in 1863 and was the location of several silver mines in the 1860s. Remnants of these are scattered throughout the canyon, and one large stone mill can be seen across from the Kingston Lodge. Kingston hosts some of the best trout fishing in the state. Some of the most beautiful scenery in Lander County can be seen here, including the Kingston Canyon Creek campgrounds and Groves Lake.

Quick Facts About Kingston	
Founded In:	1865
Population:	194 (2020 Census)
Recreational Opportunities:	Trout fishing Horseback riding Hiking Chucker/deer hunting Camping
Important Features:	Kingston Canyon Kingston Canyon Creek Groves Lake

Master Plan	Acres	%
Open Space	149.532	18.1%
High Density	653.681	79.14%
Commercial	22.7981	2.76%

Development Considerations

The Kingston Town Board formed a separate Master Plan in 2005 that was intended to guide the community for 50 years. The goal of the 2005 Kingston Master Plan is sustained, envisioning a “viable plan that will serve our citizens in keeping their rural lifestyle intact, without putting undo strain on our resources, such as fire protection, medical, and water, but still allow for positive future growth” (pg. 3). While the Kingston Master Plan has been incorporated into this Master Plan, it does not supersede the existing Kingston Area Plan but serves as a supplement to the 2005 plan. By incorporating the two plans, the County can include any vital information from the surrounding community that may affect the growth and future of Kingston.

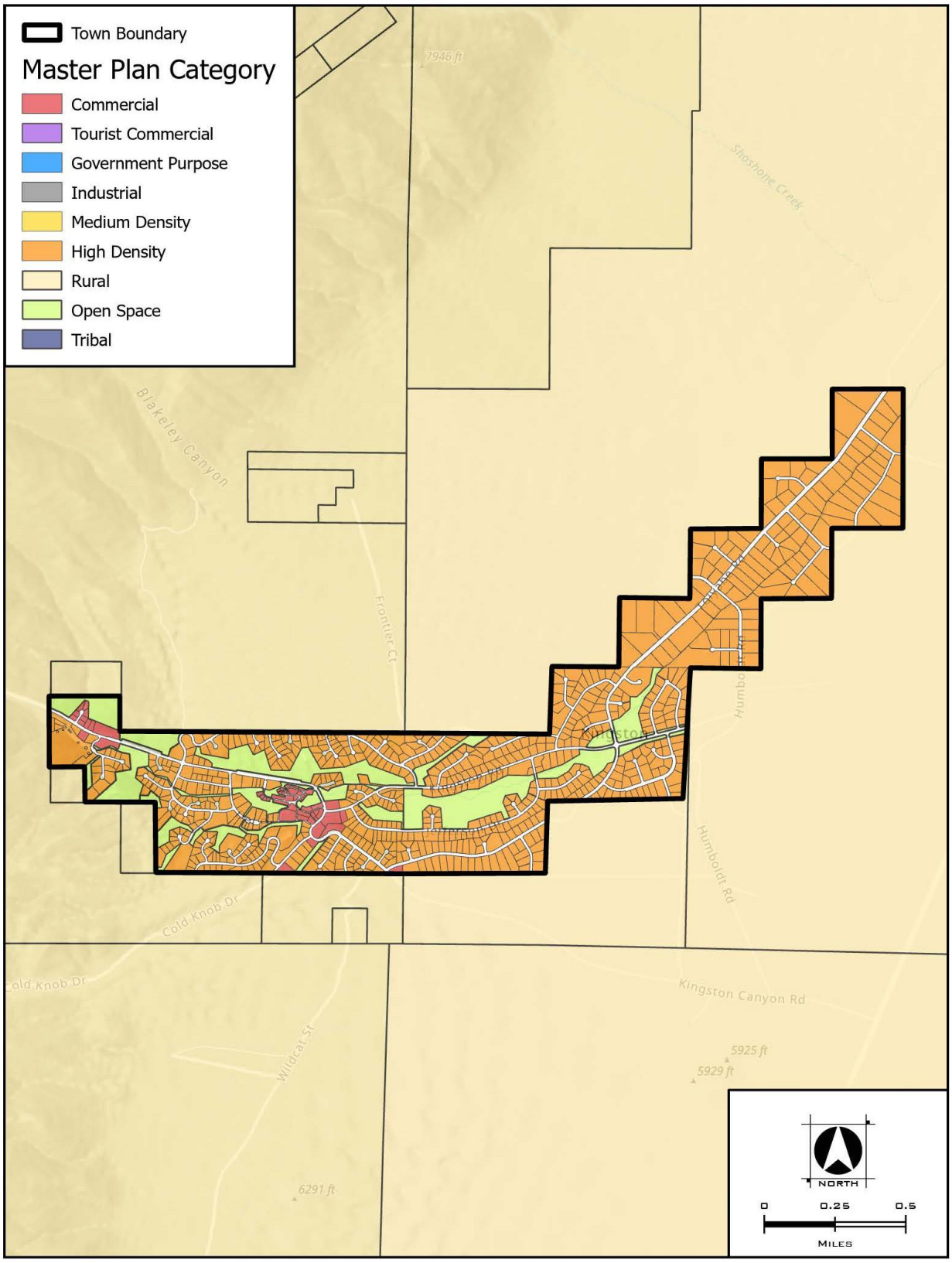


Figure 1-5: Kingston Master Plan Map

Historic Preservation

A rich history is embedded in the landscape of Lander County. Its archaeology reflects thousands of years of human occupation in the mountains and basins, and historic resources reflect the influence of westward expansion on Nevada. The persistence of these invaluable cultural and historical landscapes is dependent on the stewardship of their communities. This section of the Master Plan provides a brief overview of some of the known cultural resources in Lander County (refer to Figure 1-6) and a framework for balancing historic preservation with the need to accommodate growth and change in this community for current and future generations. Due to the length of occupancy of this area, this list is not comprehensive but provides some locations and relevant information on its history and any known or anticipated preservation priorities or concerns. The NRHP lists 13 sites throughout Austin, and the Nevada State Register lists 3. In addition, the Nevada State Historic Preservation Office lists 10 Historical Markers throughout Lander County.

A section of the California Trail has been identified in Lander County, and the county is continuing to identify the details of this historic trail and its future preservation.

Hickison Petroglyph Recreation Area[4]

Hickison Summit is located on U.S. Highway 50, approximately 30 miles southeast of Austin at the northern end of the Toiyabe Range and situated in a pinyon forest. The site is located on the road to the ranch of John Hickerson (an alternative spelling of the site name), after whom the site was named. This site was interpreted as a hunting locality by Trudy Thomas because the most common motif at the site was thought to represent hoof prints. An alternate interpretation identifies the marks as vulviforms (representations of female genitalia), possibly indicating that the site was the location of puberty or reproductive rituals. Hickison Summit has been developed by the BLM for public enjoyment, with a scenic interpretive trail, camping and picnic facilities, and restrooms.

Hickison Petroglyph Area
Source: Famartin, 2014, Licensed by CC BY-SA 4.0

[4] (Woody, Online Nevada Encyclopedia 2009)

Toquima Cave[5]

Toquima Cave is a site believed to have been utilized by indigenous peoples as a temporary dwelling between 3,000 and 1,500 years ago. This site is located in the Humboldt-Toiyabe National Forest, about 25 miles southeast of Austin. The site was listed in the NRHP in 2002 and was excavated as part of a larger study conducted by the American Museum of Natural History throughout the Monitor Valley. Toquima Cave is one of several pictograph sites in Nevada. Native peoples consider it a sacred site and continue to use the location for ceremonial activities. A campground is located near the site, and a chain-link fence across the mouth of the cave keeps visitors at a safe distance.

Toquima Cave | Source: WildEarth Guardians, 2016;
Licensed by CC BY-NC 2.0

Stokes Castle[6]

Ruins of Stokes Castle

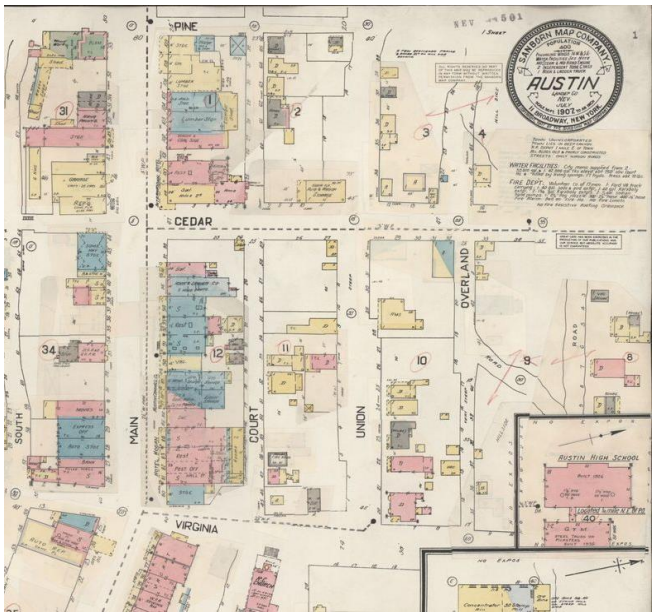
One of the most recognizable historic landmarks in Lander County is Stokes Castle, built in 1897 for Anson Phelps Stokes, an important individual to the Nevada Central Railroad and Austin mining history. The original building was modeled on a family painting of the Roman Campagna and featured balconies cantilevered on railroad rails, plate-glass picture windows, a castellated parapet, and a rooftop terrace shaded by a canvas awning. The building was occupied by Stokes, his sons, a Chinese cook, and other guest between 1897 and 1898. The ruins of Stokes Castle remain, heavily vandalized and missing many of its original elements, but preserved by a family member in 1950 against plans to remove and transport the castle to the Las Vegas Strip. The landmark is now owned and operated by the Austin Historical Society.

[5] (Woody, Online Nevada Encyclopedia 2009)
[6] (Department of the Interior, National Park Service 2003)

Austin Historic District

Austin contains numerous historical buildings associated with its mining history. A section of Austin was designated a historic district in 1971. Refer to Figure 1-6 for a map of locations. This historic district includes buildings and sites associated with the growth of the town into a mining and commercial center in Nevada during the late 19th century. Ten buildings or sites are located in the historic district[7], as listed below:

Historic Buildings	
Building/Site	**Built/Period of Significance**
Lander County High School	1926
St. Augustine's Catholic Church	1866
Austin Masonic and Odd Fellows Hall	1876
St. George's Episcopal Church	1878
Austin City Hall	1866
Gridley Store	1863
Austin Methodist Church	1866
Lander County Courthouse	1871
Austin Cemetery	1863
Nevada Central Turntable	1880



Portion of Sanborn Map - Austin, Nevada (1907)
Source: Library of Congress

Conservation Priorities/Concerns for Sites

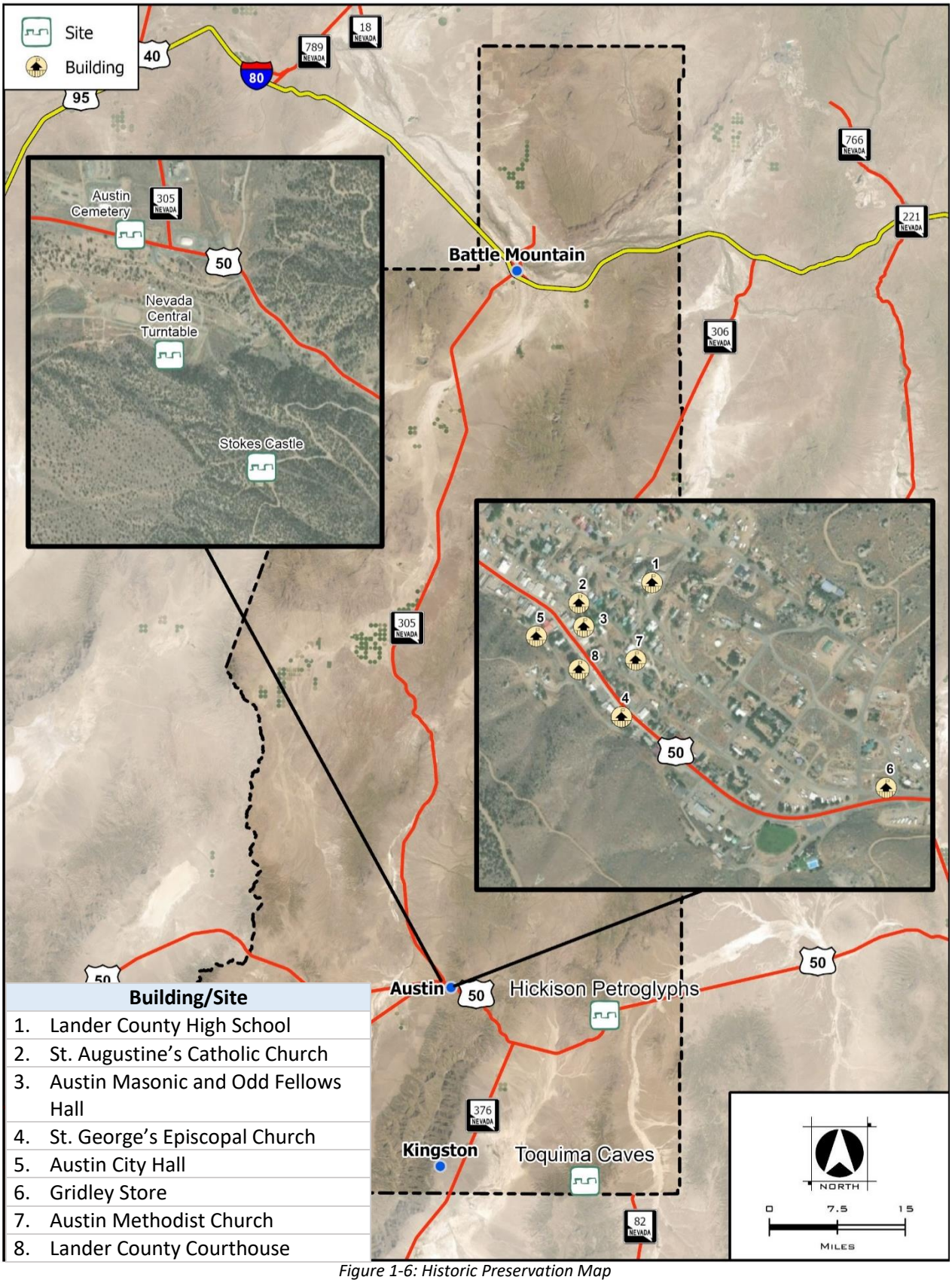
Each building or site in the Austin Historic District has a different history of maintenance and repair. Current buildings undergoing rehabilitation and reconstruction include the Austin Community Center.

The Nevada Division of Forestry determined that the following historic properties are at increased risk of fire[8]:

- Austin Historic District (all sites)
- Stokes Castle
- Toquima Cave

Measures to protect the county from fire hazards can mitigate this risk to resources, including reducing vegetation communities surrounding these areas that are a known fuel risk.

[7] (National Park Service - NRHP Database 2021)
[8] (Associates 2008)

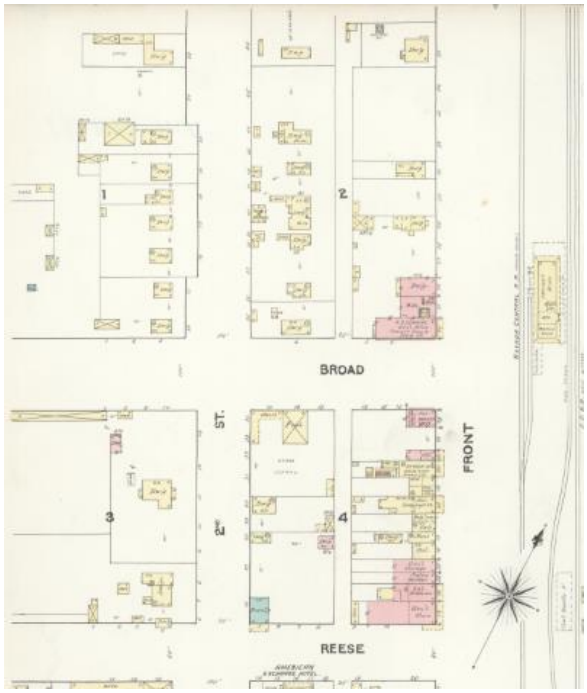


Building/Site	
1.	Lander County High School
2.	St. Augustine's Catholic Church
3.	Austin Masonic and Odd Fellows Hall
4.	St. George's Episcopal Church
5.	Austin City Hall
6.	Gridley Store
7.	Austin Methodist Church
8.	Lander County Courthouse

Figure 1-6: Historic Preservation Map
Source: NRHP Geodatabase, Accessed April 2021

Future Directions for Historic Preservation[9,10]A substantial number of prehistoric and historic cultural resources are located in Lander County and listed in the NRHP. This register, administered by the National Park Service, is a list of districts, sites, buildings, structures, and objects significant in American history, architecture, archaeology, engineering, or culture. State, federal, and tribal historic preservation officers nominate sites to be on the register. Private individuals or organizations, governments, or tribal members often initiate the listing process and prepare the documentation for review by a professional review board. Listing generally provides honorific recognition of property but can ensure that properties are considered during planning efforts for any federally funded, permitted, or assisted projects. The listing can also qualify the property for tax credits or grants.

However, it is a common misconception that private property owners are restricted from altering or demolishing properties listed on the historic register. No rules, restrictions, or regulations for historic properties apply to private property owners who do not have a federal nexus, which is any project involving federal monies, permitting, or other discretionary oversight.



Portion of Sanborn Map - Battle Mountain, Nevada (1890)
Source: Library of Congress

Certified Local Government/Ordinances

Some municipalities, to take an active role in historic preservation of private properties, have included historic preservation ordinances that require an additional oversight process by the local government, generally an established historic resources commission. These types of ordinances can range from very restrictive (e.g., requiring approval of external modifications prior to building permit) to minimally restrictive (e.g., notice of proposed demolition to the public, generally to ensure that adequate time is available to take photographs or document the building prior to destruction). A variety of options are available depending on the role Lander County wishes to take in preservation of cultural resources. To further protect publicly and privately held cultural resources important to the community, the County has the ability to become a certified local government (CLG). CLGs are entities that are recognized by the National Park Service and State Historic Preservation Office; they serve as a demonstration of the community's commitment to historic preservation and provide funding and technical assistance to protect resources. The general requirements to become a CLG include establishing a qualified historic preservation commission, enacting local legislation for the designation and protection of historic properties, creating a survey and inventory of local resources, and engaging with the public in local preservation. CLG certification happens jointly with the local government, the State Historic Preservation Office, and the National Park Service. For example, Storey County, a rural county with an important archaeological and mining history similar to Lander County, is a CLG and has additional oversight and funding for cultural resource management in their county.

[9] (Service, National Register of Historic Places FAQs 2021)
[10] (Service, Become a Certified Local Government (CLG) 2021)

CONSERVATION & NATURAL RESOURCES

Conservation & Natural Resources

The Conservation & Natural Resources element of the Master Plan outlines policies and action programs for protecting the County's land, water, and air resources as growth and development occurs. This element provides guidelines for conserving the County's important natural resources while satisfying the requirement for a conservation plan as outlined in the NRS.

Goals

1. **Protect and encourage ranching, farming, agricultural activities, and supportive industries.**
2. **Limit conflicts and encroachment from developing lands on agricultural lands and areas with sensitive natural resources.**
3. **Promote development of economical and sustainable renewable energy projects and encourage efficient use of energy resources.**
4. **Protect important environmental resources and open space.**
5. **Balance the importance of the mining industry with the vitality of the economy and livelihood of the population with conservation goals, policies, and requirements.**

Policies

CNR.1 Locate known fault lines on all parcel and subdivision maps and require adequate setbacks from faults.

CNR.2 Review areas that possess severe geologic hazards, where public safety may be jeopardized and, if appropriate, plan these areas for minimal or no development.

CNR.3 Coordinate with BLM, USFS, and Soil Conservation Service to minimize the spread of noxious weeds. Coordinate road grading policy for Lander County to minimize noxious weeds.

CNR.4 Encourage new development activities to limit total ground clearing activities.

CNR.5 Continue to work with the USFS and/or BLM to adopt consistent and complementary road standards for developments within the boundaries of the National Forest and/or public lands.

CNR.6 Encourage maximum retention of trees and other vegetation that stabilize steep hillsides, retain moisture,

prevent erosion, and enhance the natural scenic beauty, and, where necessary, requires additional landscaping and/or revegetation.

CNR.7 Ensure that all private and commercial Renewable Energy Facilities (REFs) comply with all applicable Lander County, Nevada State, and federal codes, regulations, and necessary permits.

CNR.8 Minimize impacts from alternative energy and geothermal development.

CNR.9 Establish adequate monitoring and mitigation measures to offset any potential impacts created by geothermal development and development of other REFs and establish a procedure to vet proposed renewable energy projects to ensure sustainable and efficient energy development.

CNR.10 Promote geothermal development, except where mitigation measures will not protect the existing environmental standards. Apply adequate standards for all phases of geothermal exploration and development, including the restoration of all such areas once the resource becomes nonproductive.

CNR.11 Require the developer of geothermal resources to comply with local, state, and federal laws and regulations governing the disposal of geothermal fluids. Before approval is given for resource development, a disposal plan must be submitted to and approved by the Lander County Board of County Commissioners.

CNR.12 In addition to impacts to resources, require adequate bonding for REF development to ensure that site restoration and clean-up is incorporated into special use permit requirements.

CNR.13 Support policies and programs identified in the Lander County Policy Plan for Federally Administered Lands, 2005 and incorporate such policies into the Master Plan.

CNR.14 Encourage BLM to minimize impacts from land exchanges or sales in the Humboldt River Basin. Due to the checkerboard pattern of ownership, land transactions in the Humboldt River corridor have the potential to impact farm and livestock operations as well as increase the cost of public services to private lands.

CNR.15 Promote the management of feral horses on public lands to the Appropriate Management Level (AML) established by a federal, state, or local entity to ensure that populations can be supported by the existing land capacity.

CNR.16 Encourage development proposals to incorporate the standards contained in “Wildfire Threat Reduction Recommendations for Nevadans” (published by the Living with Fire Program, http://www.livingwithfire.info/), where appropriate.

CNR.17 Develop and implement the policies of a Lander County Water Resources Plan.

CNR.18 Define, identify, and protect natural groundwater recharge areas for aquifer recharge; require proposed projects and proposed land use changes in areas with good recharge potential shall be to include project features or adequate land for passive recharge.

CNR.19 Ensure that alternative sewage disposal, groundwater treatment, or other techniques are implemented when adverse surface or groundwater impacts occur as a result of a concentration of septic systems. The selection of techniques to achieve this performance standard shall be based on cost, longevity of the solution, and existence of a credible entity to be responsible for the continuing performance of the selected system. Future individual septic

systems shall not be allowed when ground or surface water contamination will result from their use.

CNR.20 Consider water conservation programs to the extent that they are shown to be cost-effective when water, wastewater, and environmental benefits are weighed against implementation costs.

CNR.21 Allow new water resources, including imported water, to be developed provided they further the goals of the Master Plan and Water Resources Plan. Imported water includes water from basins that have origins within Lander County.

CNR.22 Subject to existing state and local regulatory review, new water supply commitments, including utility will-serve letters and the creation of domestic well lots and parcels, may be limited when a water resource or combination of resources exceeds the perennial yield.

CNR.23 Pursue the use of reclaimed wastewater for irrigation, recharge, or other permitted uses to the extent that such use is an efficient use of water resources and water rights. To the extent that reuse water is available to meet a new proposed non-potable water demand that is consistent with the use of reclaimed water, potable water shall not be supplied to meet the demand. Potable reclaimed water (A+ reuse category) is allowed if a project follows all restrictions and regulations of Nevada Administrative Code and receives all applicable Nevada Department of Environmental Protection (NDEP) permitting.

CNR.24 Protect water quality, minimize erosion and sedimentation, and preserve natural drainage functions, riparian habitat, and aesthetic values. Lander County shall review development proposals and implement appropriate mitigation measures, if necessary.

CNR.25 Make available adequate water resources to maintain the variety of important uses in Lander County, such as agriculture, mining, municipal and industrial, and geothermal development. Projects that reduce or eliminate water resources available to support uses in Lander County shall be opposed.

CNR.26 Monitor and track any changes that diminish the groundwater recharge and relationship among groundwater aquifers in Basins 56, 57, 58, and 59. Lander County should consider a watershed management plan that examines the hydrologic relationships between groundwater aquifers.

CNR.27 Prepare land use plans for selected hydrographic basins. The land use plans will consider current uses of water and resources needed to maintain healthy and viable basins. Once prepared, the land use plans will be incorporated into the Master Plan.

CNR.28 Prohibited floodway encroachments: Every new encroachment, including fill, new construction, substantial improvement, and other development, is prohibited in a designated floodway, except as provided below:

- Improvements may be allowed in the floodway if it is demonstrated through hydrologic and hydraulic analysis and certified by a Nevada registered engineer that the proposed improvements will not result in any increase in flood levels during the occurrence of the base flood discharge and that the improvements meet county standards.
- Variances shall not be issued within any designated floodway if any increase in flood levels during the base

flood discharge would result

CNR.29 Restrict development in floodplains that would constrict or otherwise result in higher floodwater levels or peak flows, or impact to floodplain functions.

CNR.30 Use the FEMA Flood Insurance Maps as the basis for delineation of floodplains and floodways, unless more recent research and surveys are presented that establish a more accurate delineation.

CNR.31 Develop and implement water conservation measures.

CNR.32 Minimize the use of high water demand vegetation for decorative uses on public and private project landscaping.

CNR.33 Have the Lander County Board of County Commissioners adopt landscaping ordinances requiring that people pay for the full cost of the water they use and providing for drought resistant, low-water-consuming vegetation, and efficient irrigation systems in all developments. Have the Lander County Planning Department develop and adopt standards for water conservation devices.

CNR.34 Encourage new public and private development to use water conservation landscaping and fixtures.

CNR.35 Have the Lander County Planning Department include xeriscaping provisions in the Lander County Development Code. The provisions will provide economic incentives to developers by adjusting the water rights dedication requirements to reflect the reduced water demand of water conservation landscaping and fixtures.

Regulating Laws and Statutes Relevant to Conservation

This Master Plan provides guidance and vision for the conservation of resources in Lander County. No portion of this document may supersede federal and state regulations, statutes, or permitting requirements. Relevant regulating information and entities for Lander County include:

Nevada Revised Statutes

- NRS Chapter 548 - Conservation
- NRS Chapter 407 - State Parks and Monuments
- NRS Chapter 445A - Water Controls
- NRS Chapter 445B - Air Pollution
- NRS Chapter 445D - Environmental Covenants (Uniform Act)
- NRS Title 45 - Wildlife
- NRS Title 46 - Mines, Minerals, Oil and Gas
- NRS Title 47 - Forestry; Forest Products and Flora
- NRS Title 48 - Water
- NRS Title 49 - Agriculture

Federal Environmental Laws

- Endangered Species Act of 1973
- Clean Air Act of 1990
- Clean Water Act of 1972
- Comprehensive Environmental Response, Compensation, and Liability Act of 1980
- Federal Migratory Bird Treaty Act of 1918
- National Environmental Policy Act of 1969
- Resource Conservation and Recovery Act of 1976

Physical Environment

Topography

Lander County is characterized by its dramatic basins and ranges. Elevation within the County ranges from 11,473 feet at Bunker Hill in the Toiyabe Range to 4,510 feet at Battle Mountain in the northwest corner of the County. Crossing Lander County from west to east, one encounters the following mountain ranges:

- Desatoya Mountains
- Shoshone Mountains/Shoshone Range
- Battle Mountain Range
- Fish Creek Mountains
- Toquima Range
- Toiyabe Range
- Cortez Mountains

Climate[1]

Many areas of Nevada, including portions of Lander County, are among the most arid areas in the United States. Potential annual water loss through evaporation exceeds the annual precipitation rate even at the higher elevations. Most of the land in Lander County is desert shrubland, although sufficient water is available to allow livestock to graze in some locations. Development has been limited by a scarcity of recoverable freshwater. The individual basin-fill aquifers, which together compose the largest known groundwater reserves, receive little annual recharge and are easily depleted. Precipitation in the mountain ranges may be 20 inches or more per year depending on the year, while precipitation in Battle Mountain averages about 12.3 inches per year. March to May is the wettest period in Battle Mountain with 1.5 inches of precipitation per month. August and September are the driest months, averaging 0.47 inches per month. Average temperatures range from 18°F to 40°F in January and from 53°F to 87°F in July.

Cultivated and Extracted Natural Resources

Agricultural Lands - Farms and Ranching in Lander County[2]

The agriculture industry includes growing crops, raising animals, harvesting timber, and growing and harvesting fish and other animals. Crop production job numbers rose approximately 38% between 2010 and 2020 in Lander County, from 15 to 20 jobs. Animal production and aquaculture decreased by approximately 28% between 2010 and 2020, from 69 to 50 jobs. Agriculture establishments include farms, ranches, dairies, greenhouses, nurseries, orchards, and hatcheries. The two activities associated with this land use are agricultural production and agricultural support activities.

Agriculture in Lander County primarily includes alfalfa hay production, beef cattle, and sheep. Important agricultural areas include farm and ranch operations concentrated in the Reese River Valley, Antelope Valley, Humboldt River Basin, and Big Smoky Valley. Outside these areas, farm and ranch operations are scattered throughout the County. Public lands and forest service lands are used for livestock grazing. The Lander County cattle and calves inventory decreased from 2012 to 2017. In 2012, inventory was 21,066 head and decreased to 15,771 by 2017. This trend follows the overall decrease in animal production in this economic sector of Lander County.

As of January 1, 2016, farmers in Nevada are required to obtain a Producers Certificate to sell their farm products directly to the public. At present, there are only four certified producers in Lander County as compared to 205 certified producers statewide.

The 2012 Census of Agriculture by the U.S. Department of Agriculture (USDA) reports a total of 124 farms in Lander County. The 2017 census shows that number dropped slightly to 117 farms. However, alfalfa production and overall farming cultivation grew in Lander County between 2012 and 2017. Alfalfa hay and other hay production averaged just over 90,000 tons in 2002 and 2003. By 2008, Lander County had 28,000 acres under cultivation, producing 144,000 tons of hay. In 2017, 153,278 tons of hay and haylage was cultivated, with 33,633 acres harvested.

[1] (Lander County 2010)
[2] (US Department of Agriculture 2012-2017)

Table 2-1 includes information on the number of farms and farm acreage for Lander County and select other counties in Nevada.

Table 2-1 - Farms in Nevada Counties

County	Number of Farms	Land in Farms (acres)
Lander	117	329,373
Eureka	86	578,711
Elko	526	2,180,039
Humboldt	298	990,113
Churchill	504	249,832
Douglas	239	118,320
Lyon	312	181,354
Washoe	353	501,310

Source: USDA, Census of Agriculture[3]

Minerals and Mining[4]

Mining continues to be a growing and vital component of the Lander County economy due to rich natural resource deposits. Table 2-2 provides information on the current mines, operators, and their associated commodities. This list is not comprehensive; Lander County is extremely rich in mineral deposits and has a lengthy history of mining claims. Active mines are shown in Figure 2-1 as cataloged by the Nevada Bureau of Mines and Geology at the University of Nevada, Reno.

Table 2-2 - Active Mining Operators and Commodities

Project/Permit	Operator	Commodity
Argenta Mine	Baker Hughes Oilfield Operations, Inc.	Barite
Cortez Hills (open pit and underground)	Nevada Gold Mines	Gold, silver
Cortez Pipeline Mine	Nevada Gold Mines	Gold, silver
Fire Creek Mine	Hecla Mining Co.	Gold, silver
Greystone Mine	M-I Swaco	Barite
May Turquoise Mine	Red Widow Mine Co.	Turquoise
Mountain Springs Mine	M-I- Swaco	Barite
Phoenix Mine	Nevada Gold Mines	Gold, copper, silver
Cove Project (proposed)	i-80 Gold Corp	Gold

[3] (US Department of Agriculture 2012-2017)
[4] (Bureau of Land Management - Battle Mountain District Office 2012)

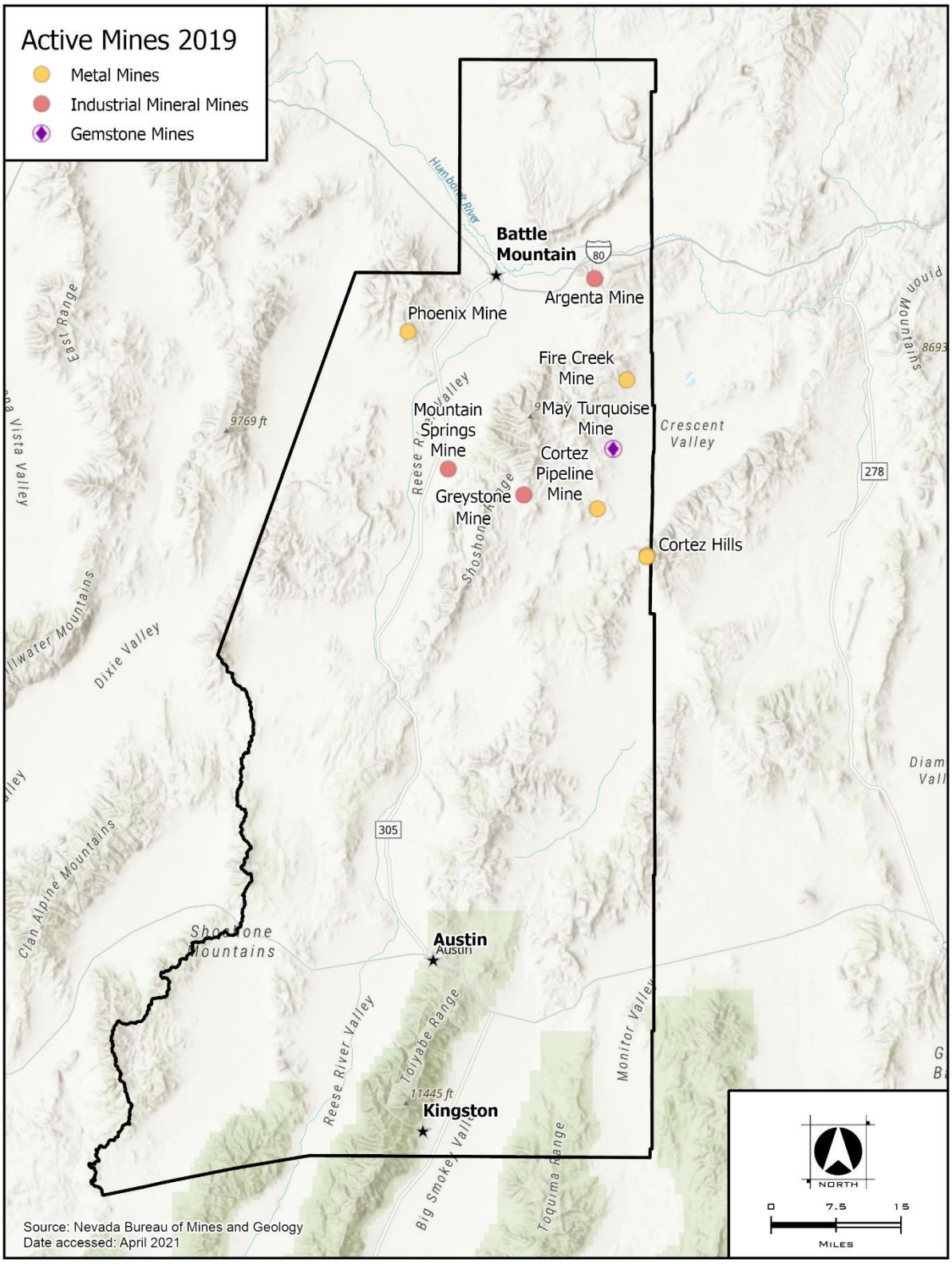


Figure 2-1: Active Mines in Lander County

Alternative Energy Resources

McGinness Hills Geothermal Plant | Source: Nevada BLM

Geothermal Resources

Hot Springs and wells are scattered across the state, with at least 300 thermal wells, springs, and spring clusters. Almost all of these waters have been appropriated for some beneficial use under Nevada water laws. There are several known geothermal resource areas (KRGAs). Lander County has the potential to develop additional geothermal resources. Figure 2-2 provides an overview of the geothermal wells and areas with geothermal energy potential. In recent years, exploration and possible development activity has increased in and around Lander County. Potential project sites include Jersey Valley, Pumpernickel Valley, Reese River, and Grass Valley.

An area of high heat flow, compared to the rest of the state, is the Battle Mountain High. The Beowawe Geysers located in Lander and Eureka Counties have some of the highest reported subsurface temperatures of all geothermal areas in Lander County. Other geothermal areas are found at Smith Creek Valley, Buffalo Valley, Hot Springs Ranch south of Battle Mountain, and Spencer Hot Springs.[5]

Below is a list of geothermal resources providing energy resources to NV Energy:[6]

- **Beowawe Power - 17.7 megawatts:** This geothermal power station is owned by Terra-Gen Power and operates in Eureka and Lander Counties of Nevada. It has produced energy since 2006.
- **Jersey Valley - 22.5 megawatts:** This geothermal project is owned by Ormat Technologies and is located in a remote area in Lander and Pershing Counties of Nevada. The project came online in 2012.
- **McGinness Hills - 96 megawatts:** The McGinness Hills geothermal project is owned by Ormat Technologies Co. and is located in Grass Valley, approximately 12 miles from Austin. Two unique attributes were present for the McGinness Hills geothermal project: 1) no modern hot springs or other thermal features exist in this area, making it a "blind" geothermal system, and 2) the site was located in Category 1 sage grouse habitat.[7]

[5] (Lander County 2010)
[6] (NV Energy 2021)
[7] (Nordquist and Delwiche 2013)

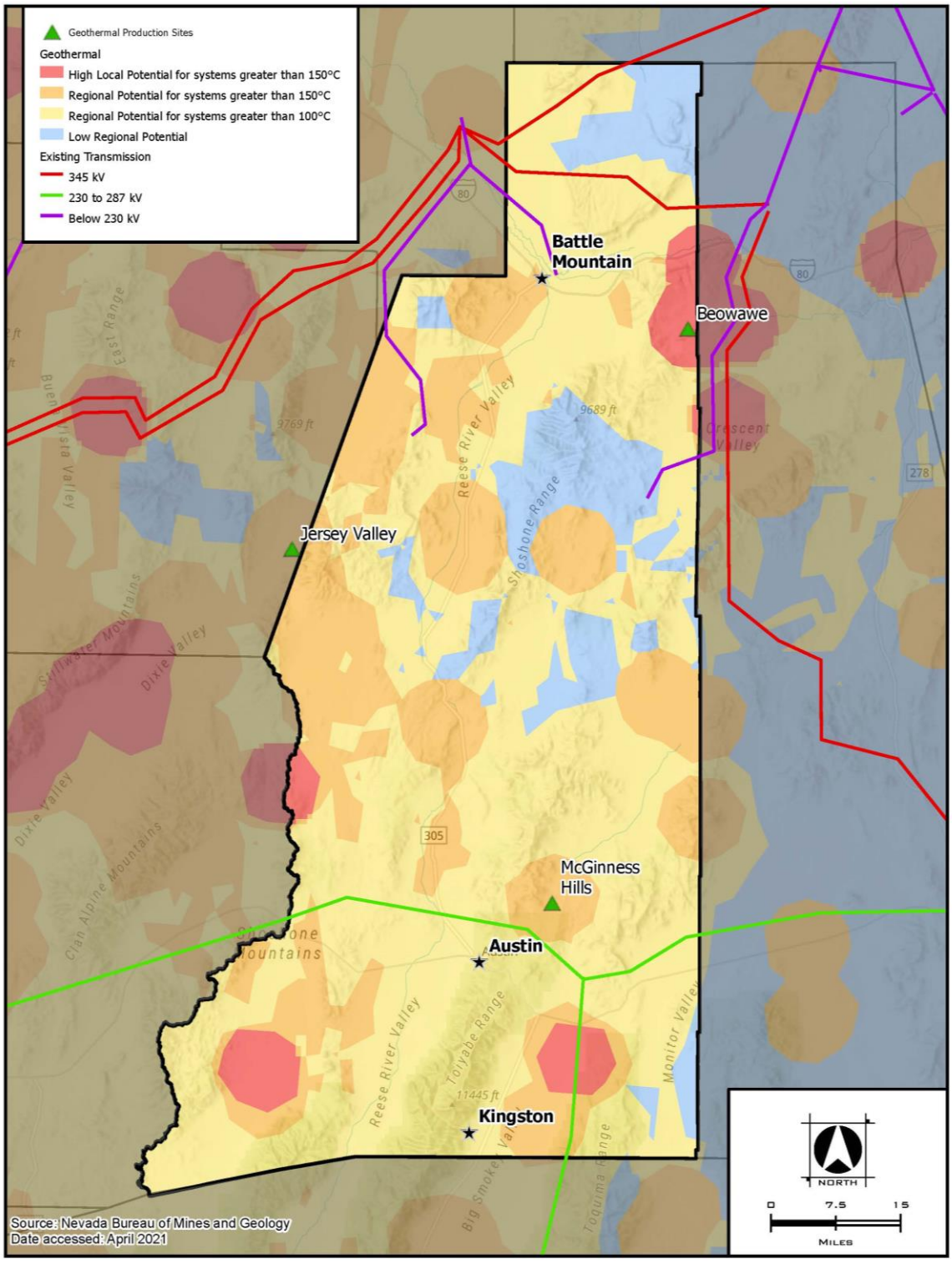


Figure 2-2: Existing and Potential Geothermal Resources in Lander County

Solar and Wind Energy

Lander County has the potential to expand other alternative energy sources and develop more sustainable options to support the current and future residents and development of the County. Areas for solar potential, per Figure 2-3, may be located in some flatter areas of the County between mountain ranges.

Wind energy potential is limited in Nevada, but certain locations in Lander County may have potential for wind energy. Figure 2-3 displays areas with solar and wind potential. Most areas for wind potential are generally along the east side of the Toiyabe Range, with some other potentially suitable areas interspersed.

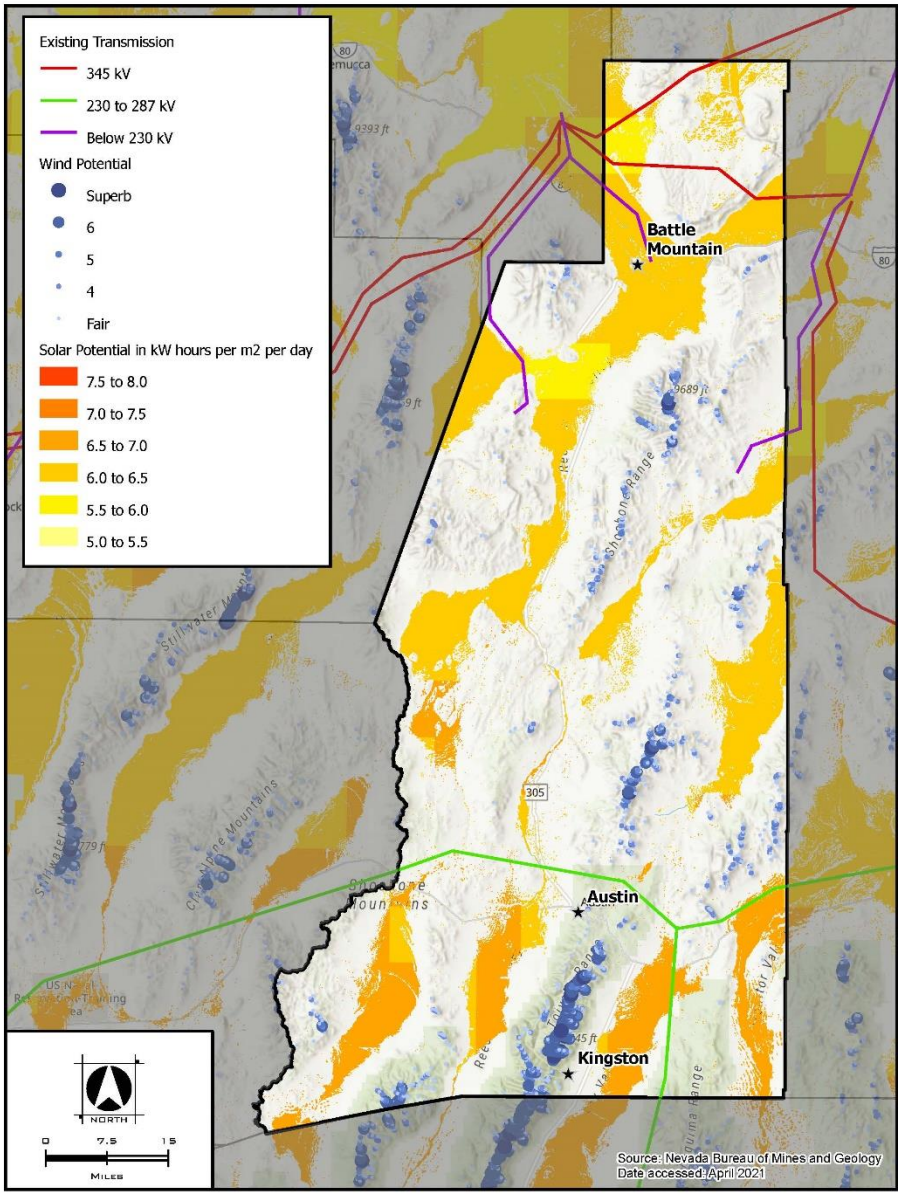


Figure 2-3: Solar and Wind Potential in Lander County

Non-Living Resources

Water Resources

The major wetlands in Lander County follow the flow of the Humboldt River through a meandering path across the northern part of the County from east to west. Historically, this area has been a source of irrigation water for the ranching interests along both sides of the river and is dependent primarily on the climatic changes in rainfall and winter snowpack of the mountain tributaries.[8] Refer to Figure 2-4.

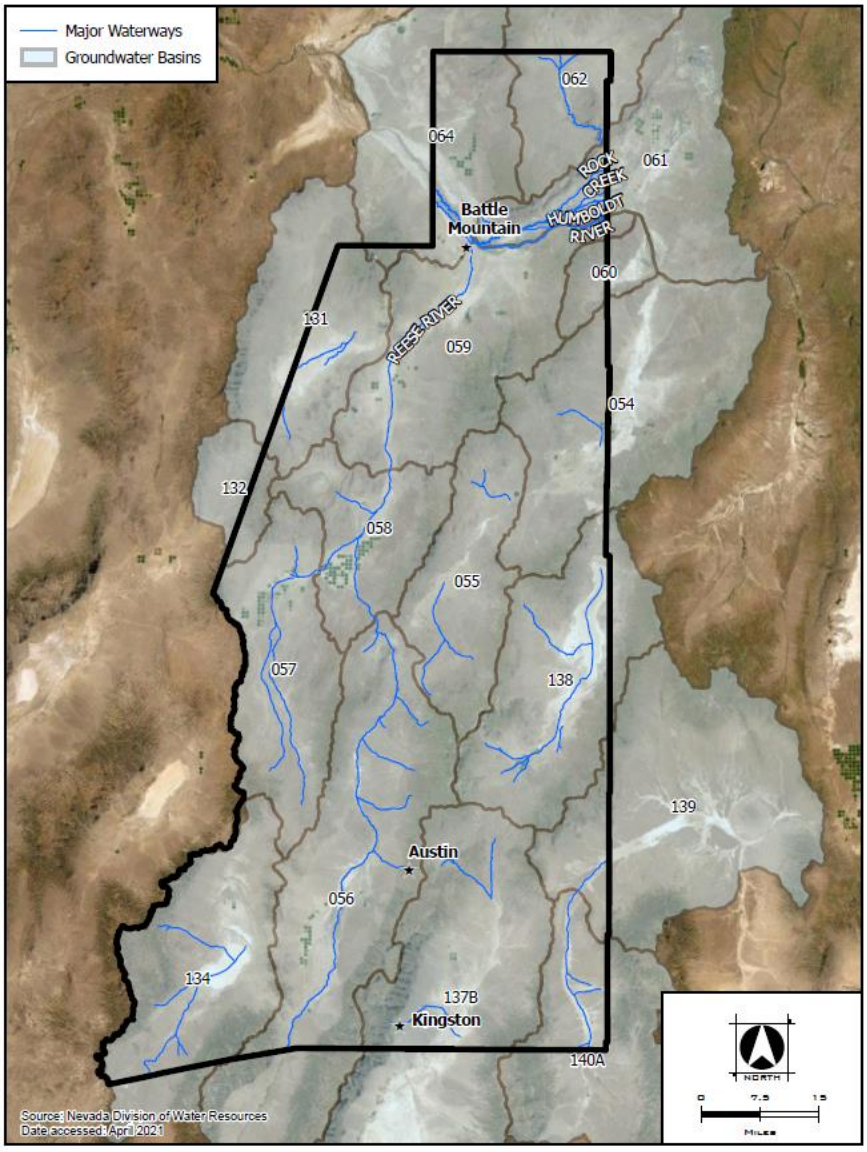


Figure 2-4: Hydrographic Basins and Waterways

[8] (Lander County 2010)

Surface Water[9]

The hydrology of Lander County is typical of the basin and range environment. Precipitation is seasonal, with rain or snow in the winter and thunderstorms in the summer. Stream flows are seasonal, with the peak flows typically occurring in the spring. Major surface water features in Lander County are shown in Figure 2-4. There are three major streams in Lander County: the Humboldt River, the Reese River, and Rock Creek.

Groves Lake

Humboldt River

The dominant hydrologic feature in the region is the Humboldt River, which has had a significant impact on the history of the development of Battle Mountain. Water records kept sporadically for flow in the river since 1896 show an average discharge of 302 cubic feet per second (cfs), or 218,600 acre-feet per year (AFY). The drainage area above Battle Mountain is an impressive 8,870 square miles, which can cause serious flooding during unusual conditions. Several irrigation diversions exist upstream, which have some impact on flow in the Humboldt River during the growing season. During the 1990s, the highest peak flow occurred on June 13, 1995, when the Humboldt River reached a flow of 4,010 cfs. High flows in the river begin to build in February and March, with the onset of spring snowmelt. Peak flows historically occur in June and rapidly decrease in July to base flow conditions by August. Base flows continue until February of the following year.

Reese River | Source: Famartin, 2015
(Licensed by CC BY-SA 3.0)

Reese River

In contrast, the Reese River has a drainage area of 2,330 square miles at Battle Mountain and an average discharge of 10.4 cfs, or 7,530 acre-feet (measured at Ione, upriver). Peak flow on the Reese River during the 1962 flood was estimated at 4,760 cfs, compared to 167 cfs at Ione. It has a similar hydrograph as the Humboldt River, with peak flows occurring in June in most years. Periods of no flow are recorded in some years. The Reese River is fed by several tributaries draining the west slopes of the Toiyabe Mountains, including Cottonwood Creek, Big Creek, Italian Creek, Silver Creek, and Boone Creek. During intense or unusual storm events, surface flows from Antelope Valley can reach the Reese River.

Rock Creek

Rock Creek and its tributaries drain much the area west of the Tuscarora Mountains. The headwaters of Rock Creek are in the unnamed mountain range on the northern side of Willow Creek Valley in Elko County. Rock Creek is joined by Willow Creek and flows southward in a rugged canyon to Rock Creek Valley. Flows of each stream are influenced by irrigation diversions and releases from Willow Creek Reservoir. Rock Creek is then joined by Antelope Creek, cuts through the Sheep Creek Range by way of another rugged canyon and enters Boulder Flat. Rock Creek at the gaging station where it enters Boulder Flat discharges about 29,000 AFY. Flow of the stream probably enters Humboldt River in years of above-normal runoff. Rock Creek is joined by Boulder Creek in the lowlands between the Sheep

[9] (Lander County 2010)

Creek Range and the Argenta Rim and then enters the Humboldt River about two miles east of Battle Mountain. Rock Creek has no baseflow near the Humboldt River.

Other Surface Water Features

Other significant surface water features are a number of smaller streams located throughout the County, most of which are perennial in the upper reaches and become ephemeral near the valley floors. There are no major lakes or reservoirs in the County with the exception of Groves Lake, which is approximately 10 acres in size. There are a host of smaller reservoirs associated with local ranching operations. Two of the largest are located at Iowa Creek Ranch and Smith Creek Ranch.

Groundwater[10]

Groundwater occurs in porous alluvial basins adjacent to the Humboldt and Reese Rivers as well as Rock Creek and other water courses in the region. Groundwater is also associated with fractures in the bedrock of upland mountain ranges. Recharge occurs primarily from precipitation and infiltration, in the case of the Humboldt River. Groundwater discharge from the Humboldt River Basin is estimated to be about 30,000 AFY. Figure 2-5 shows groundwater basins contained in whole or in part in Lander County. There are a total of 18 groundwater basins in Lander County. Only three of those are hydrologically closed units.

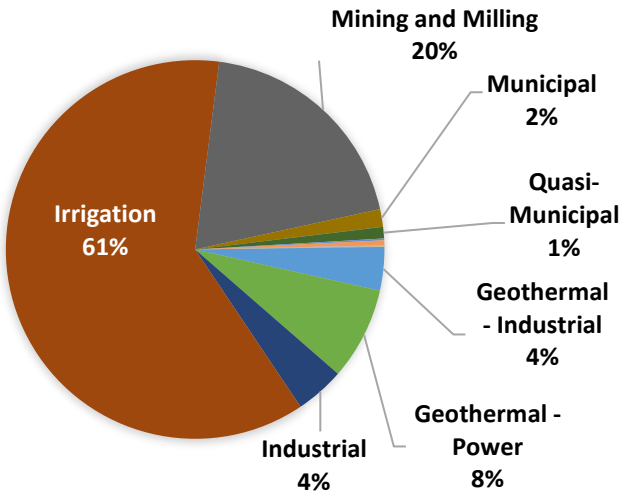


Figure 2-5: Distribution of Water Uses in Lander County Hydrographic Basins

Note: Slices less than <1 % not labeled. Refer to table for basins with additional uses (e.g., recreation, domestic)

Allocated Groundwater[11]

Eighteen hydrographic (i.e., groundwater) basins are entirely or partially within the bounds of Lander County. Lander County has a variety of water users (refer to the Figure 2-5). Table 2-3 provides information on each basin and the allocated amount for each use within the basin. Note that Lander County is not the only water recipient of these basins; the basin may provide water resources for a variety of users within adjacent counties.

[10] (Lander County 2010)
[11] Nevada Division of Water Resources – Hydrographic Area Summaries

Table 2 - 3 - Hydrographic Basins Providing Water to Lander County[12]				
Basin	**Area of Basin (sq. mi.)**	**Annual Allocated Amount (AFY)**	**Manner of Use (in order of total AFY)**	**Counties within Hydrographic Basin**
054 - Crescent Valley	752	17,088.64	Mining and Milling Municipal Irrigation Stock Water Quasi-Municipal	Eureka Lander
055 - Carico Lake Valley	376	3,989.78	Irrigation Mining and Milling Stock Water	Lander
056 - Upper Reese River Valley	1138	39,528.02	Irrigation Mining and Milling Quasi-Municipal Stock Water Municipal	Lander Nye
057 - Antelope Valley	452	31,444.76	Irrigation Stock Water Quasi-Municipal	Lander
058 - Middle Reese River Valley	319	41,007.06	Irrigation Stock Water	Lander
059 - Lower Reese River Valley	588	22,211.46	Irrigation Mining and Milling Municipal Industrial Stock Water Construction Domestic Commercial	Lander Eureka
060 - Whirlwind Valley	94	31,366.94	Geothermal - Power Irrigation Mining and Milling Industrial Stock Water	Eureka Lander
062 - Rock Creek Valley	444	2260.43	Mining and Milling Stock Water	Elko Lander Eureka
064 - Clovers Area	720	29,447.41	Irrigation Industrial Mining and Milling Municipal Recreation Stock Water Environmental Construction	Humboldt Lander Elko

[12] Nevada Division of Water Resources - Hydrographic Area Summaries

Table 2 - 3 - Hydrographic Basins Providing Water to Lander County[12]				
Basin	**Area of Basin (sq. mi.)**	**Annual Allocated Amount (AFY)**	**Manner of Use (in order of total AFY)**	**Counties within Hydrographic Basin**
128 - Dixie Valley	1,303	15,218.88	Geothermal - Industrial Irrigation Industrial Wildlife Quasi-Municipal Stock Water	Churchill Pershing Lander
131 - Buffalo Valley	504	22,040.13	Mining and Milling Irrigation Stock Water	Pershing Lander Humboldt
132 - Jersey Valley	142	267.25	Irrigation Stock Water	Pershing Lander
134 - Smith Creek	582	3,195.57	Irrigation Stock Water Mining and Milling	Lander Nye
137B - Big Smoky Valley, Northern Part	1,323	56,846.52	Irrigation Mining and Milling Quasi-Municipal Stock Water Other Commercial Domestic Recreation	Nye Lander
138 - Grass Valley	595	13,321.86	Mining and Milling Irrigation Stock Water	Lander Eureka
139 - Kobeh Valley	139	15,920.70	Mining and Milling Irrigation Stock Water Domestic	Eureka Lander
140A - Monitor Valley, Northern Part	529	287.58	Irrigation Stock Water	Nye Lander Eureka

Living Resources

Land Cover/Vegetation Habitats

Land cover in Lander County varies depending on geography but largely is comprised of the arid desert characteristic of central Nevada, with some areas of variation. The Southwest Regional Gap Analysis Project (SWReGAP) is a multi-institutional cooperative effort that provides land cover information for Arizona, Colorado, Nevada, New Mexico, and Utah.[13] The land cover database reveals the majority of Lander County is comprised of Inter-Mountain Basins Big Sagebrush Shrubland (1,430,491 acres or 40.5%) followed by Great Basin Xeric Mixed Sagebrush Shrubland (515,719 acres or 14.6%).

Desert Shrubland in Lander County

Pinyon-Juniper Woodlands
Source: Famartin, 2013 (Licensed by: CC BY-SA 3.0)

These types of ecological systems are characteristic of semi-arid climates and are dominated by *Artemisia tridentata ssp. tridentate*, commonly called big sagebrush or Great Basin sagebrush. They are generally located in shrublands with limited annual precipitation, with most precipitation falling as snow[14].

Great Basin Pinyon-Juniper Woodland (434,311 acres or 12.3%) is generally located on dry mountain ranges of the Great Basin region and warm, dry sites of mountain slopes, mesa, plateaus and ridges at elevations ranging between 5,200 to 9,100 feet. The tree canopy of these areas is largely composed of *Pinus monophylla* (pinyon pine) and *Juniperus osteosperma* (Utah juniper).[15] The remaining land cover is largely comprised of similar desert ecology, with some variation as displayed in Figure 2-6.

[13] (Southwest Regional Gap Analyis Project (SWReGAP) 2005)
[14] (NatureServe Western Ecology Team 2015)
[15] (NatureServe Explorer 2015)

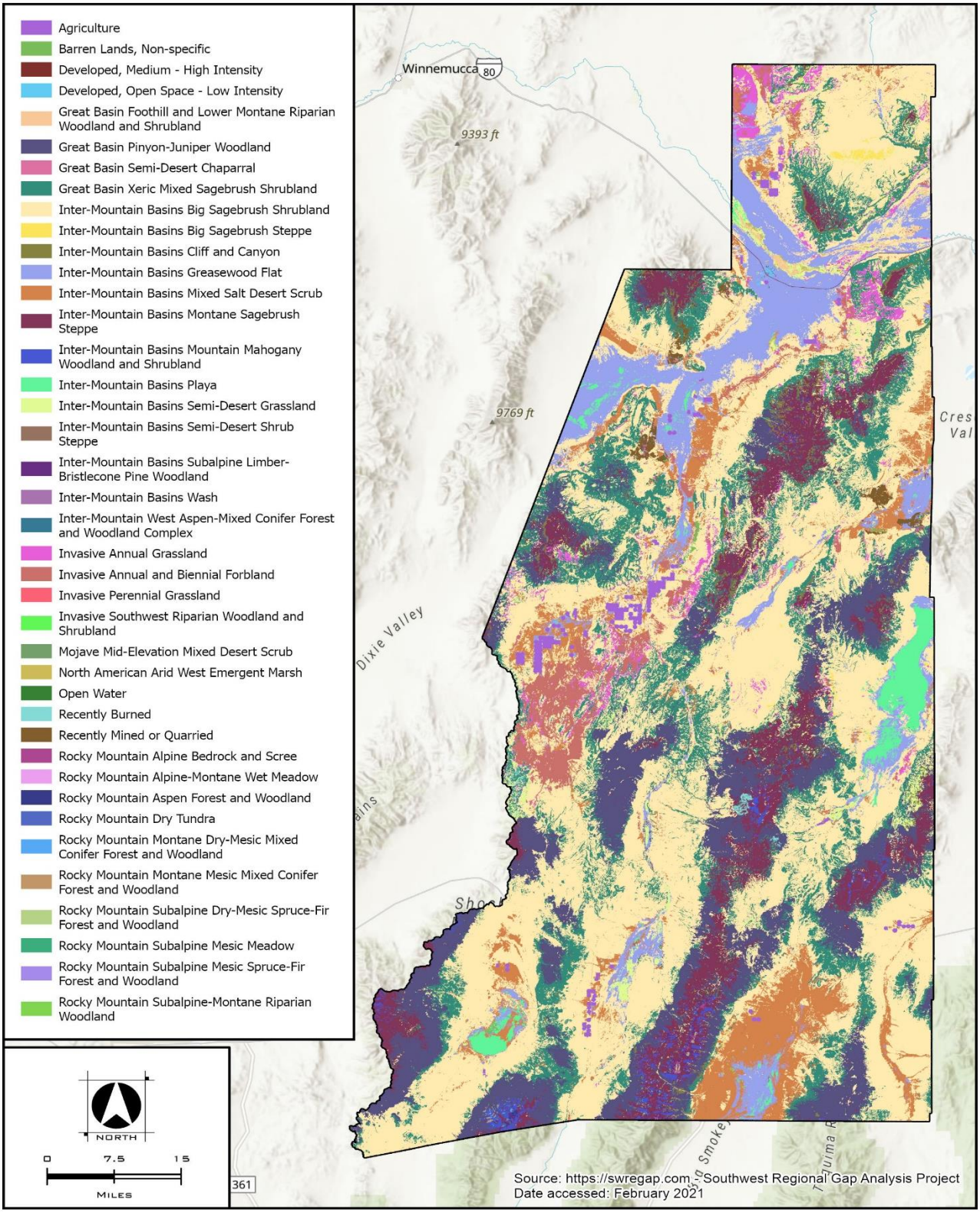


Figure 2-6: Land Cover Found in Lander County

Sensitive, Threatened, and Endangered Vegetation[16]

The Nevada Natural Heritage Program tracks and provides a list of at-risk species in the state. In Lander County, 27 vascular plants are included on the at-risk list. A list of sensitive plants is shown in Table 2-4. Note that many species may be considered at-risk or sensitive by other agencies; however, no plant species on this list are subject to the Endangered Species Act. Development proposals in Lander County are encouraged to consult with a certified botanist or arborist to determine if any endangered, sensitive, or threatened plant species are located on a property.

Table 2-4 - Sensitive Plant Species in Lander County

Cusick hyssop (*Agastache cusickii)*	Toiyabe buckwheat *(Eriogonum esmeraldense var. toiyabense)*
Eastwood milkweed (*Asclepias eastwoodiana*)	Heavenly buckwheat *(Eriogonum ovalifolium var. caelestinum)*
Winged milkvetch (*Astragalus pterocarpus*)	Lahontan Basin buckwheat *(Eriogonum rubricaule)*
Elko rockcress *(Boechera falcifructa)*	Sand cholla *(Grusonia pulchella)*
Ophir rockcress (*Boechera ophira*)	Sharsmith stickseed *(Hackelia sharsmithii)*
Goodrich biscuitroot (*Cymopterus goodrichii*)	Toiyabe gilia (*Ipomopsis congesta var. nevadensis)*
Desert whitlowcress (*Draba arida*)	Holmgren smelowskia *(Nevada holmgrenii)*
Snake Range whitlowcress *(Draba serpentine)*	Watson spinecup *(Oxytheca watsonii)*
Watson goldenbush (*Ericameria watsonii)*	Lahontan beardtongue *(Penstemon palmeri var. macranthus)*
Windloving buckwheat (*Eriogonum anemophilum)*	Tiehm beardtongue *(Penstemon tiehmii)*
Beatley buckwheat *(Eriogonum beatleyae)*	Reese River phacelia *(Phacelia glaberrima)*
Rollins clover *(Trifolium rollinsii)*	Saltmarsh allocarya *(Plagiobothrys salsus)*
Dainty moonwort *(Botrychium crenulatum)*	Alpine goldenheads *(Tonestus alpinus)*

[16] (Nevada Natural Heritage Program 2021)

Conservation Strategies for Sensitive, Threatened, and Endangered Vegetation

Preserving the unique and sensitive species of Lander County is vitally important to maintaining the diversity of the County's landscape for current and future residents. Prior to development, particularly any large scale development in the County, a clear understanding of the environmental conditions will aid in determining appropriate mitigation measures. On public lands, the responsible federal or state agency is able to provide guidance and review of proposals as well as advise of any legal permitting requirements that would guide the development process. On private lands, sensitive areas can be protected through fee simple purchases, purchase of development rights, or conservation easements. NRS 111.390 through 111.440 is the Nevada Conservation Easement law and provides state regulatory guidance on the conservation easement process.

Final conservation strategies will vary depending on the landowner and the situation. Conservation strategies and goals discussed in this chapter are intended to shape the county development code to also ensure that the costs and benefits of disrupting or preserving sensitive species, particularly plant species, are weighed accurately.

Invasive Species[17]

Noxious weeds and invasive plants occur throughout Lander County. Two species, hoary cress and Russian knapweed, are found along gravel and dirt roads in the County. Hoary cress, also called whitetop, is a deep rooted, invasive mustard perennial that poses a threat to both crop and rangelands in the Western U.S. Accidentally introduced to North America from western Asia and eastern Europe as a seed contaminant, hoary cress currently infests more than a quarter million acres of public and private land and is found on the noxious weed lists of 14 states and one Canadian province. They are commonly found on alkaline and disturbed soils and are highly competitive with other plant species. The plants usually bloom in mid-June, with pod development completed by the third week of July. A single plant established in the absence of competition has been reported to spread over an area 3.7 miles in diameter during its first year of development.

Hoary Cress
Source: Nevada Department of Agriculture

Russian Knapweed
Source: Colorado State University, Cooperative Extension

Russian knapweed is a creeping perennial that reproduces from seed and vegetative root buds. It emerges in early spring, bolts in May to June, and flowers through the summer into fall. Russian knapweed is toxic to horses. The key to controlling Russian knapweed is to stress the weed and cause it to expend nutrient stores in its root system.

[17] (Lander County 2010)

Forests

Wilderness Areas

Lander County currently has no designated wilderness areas, but several areas are being studied for the potential to become wilderness areas (Figure 2-7).

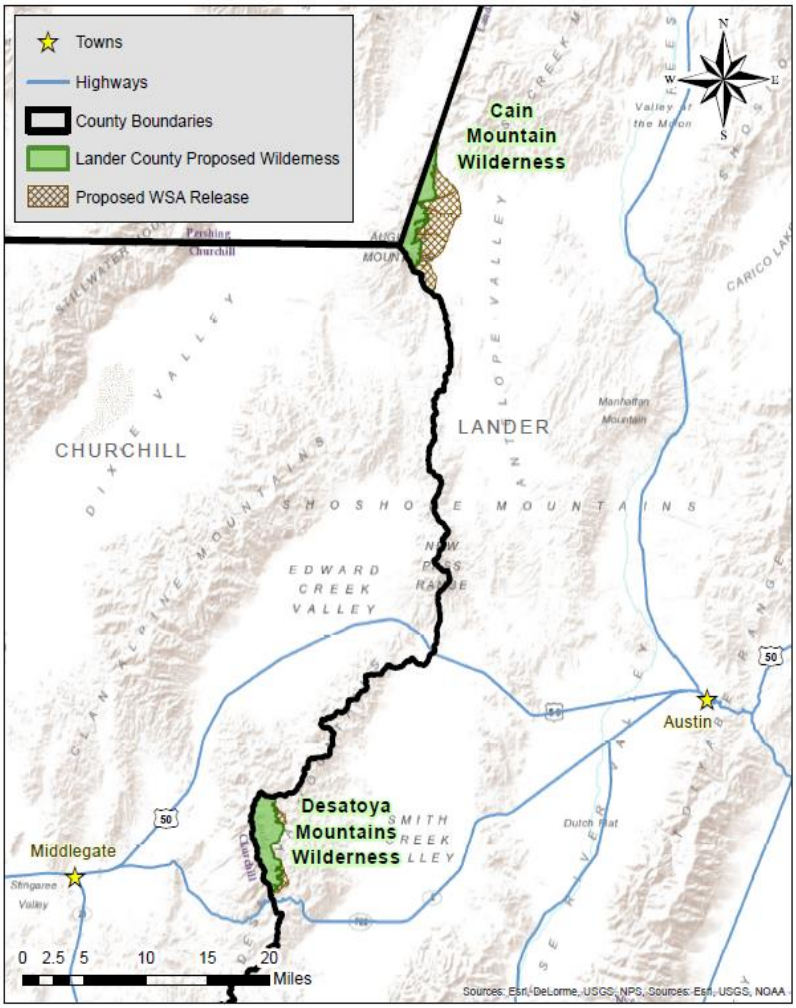


Figure 2-7: Proposed Wilderness Areas
Source: Lander County Land Management and Conservation Act

Wilderness areas are special locations on public lands that retain a primitive character without permanent improvements and are generally unaffected by human actions or occupation. Commercial uses, motorized vehicles, and the construction of any structure or installation area is restricted within wilderness areas.

Federal agencies are required to create an inventory and review public lands that fulfill certain characteristics of wilderness, namely roadless public lands 5,000 acres or larger and roadless islands of the public lands that contain characteristics of the Wilderness Act of 1964.[18]

Wilderness characteristics include areas that:

(1) appear to have been affected primarily by the forces of nature, with the imprint of man's work substantially unnoticeable;
(2) have outstanding opportunities for solitude or a primitive and unconfined type of recreation;
(3) have at least 5,000 acres of land or is of sufficient size as to make practicable its preservation and use in an unimpaired condition; and
(4) may also contain ecological, geological, or other features of scientific, educational, scenic, or historical value.[19]

Wilderness study areas are places with wilderness eligibility characteristics (meeting minimum size, naturalness, and outstanding opportunities for recreation) and are treated like designated wilderness areas unless released by an act of Congress stating that the area is not eligible for designation. Wilderness and wilderness study areas are protected by the National Wilderness Preservation Act.[20] Wilderness areas can be suggested by the President but are officially designated through an act of Congress.

[18] (Bureau of Land Management 2016)
[19] (Wilderness Act 1964)
[20] (Bureau of Land Management 2021)

The Lander County Land Management and Conservation Act (2021) officially designates two wilderness areas: the Cain Mountain Wilderness and the Desatoya Mountains Wilderness. Two previous wilderness study areas will be released: the Augusta Mountain wilderness study area and a 1,088-acre section of the Desatoya wilderness study area. The act states that these areas were sufficiently studied and determined not suitable for designation and are to be released for other uses.[21] Figure 2-7 provides a map of the wilderness areas and the proposed wilderness release areas.

Wildlife

A variety of animal habitats are located in Lander County. The Nevada Department of Wildlife (NDOW) provides public data on several wildlife species in Nevada. These animals include ruffed grouse, wild turkey, mountain quail, California quail, dusky grouse, white-tailed jackrabbits, mule deer, elk, pronghorn, and bighorn sheep. NDOW tracks these particular animals since they are important for hunting and trapping recreation and subsistence in Lander County as well as the health and diversity of the environment.

Pronghorn Antelope
Source: USDA Agricultural Research Service

Figures 2-8 and 2-9 note the boundaries of big and small game wildlife, as categorized by NDOW. This map is not a comprehensive inventory of all types of animals existing in Lander County but provides an overview of habitats deemed important to the state of Nevada for planning and other purposes.[22]

White-tailed Jackrabbit
Source: U.S. Fish and Wildlife Service (

Dusky Grouse
Source: U.S. Fish and Wildlife Service

[21] (LandsBillFinalPlaceholder)
[22] (Nevada Department of Wildlife 2021)

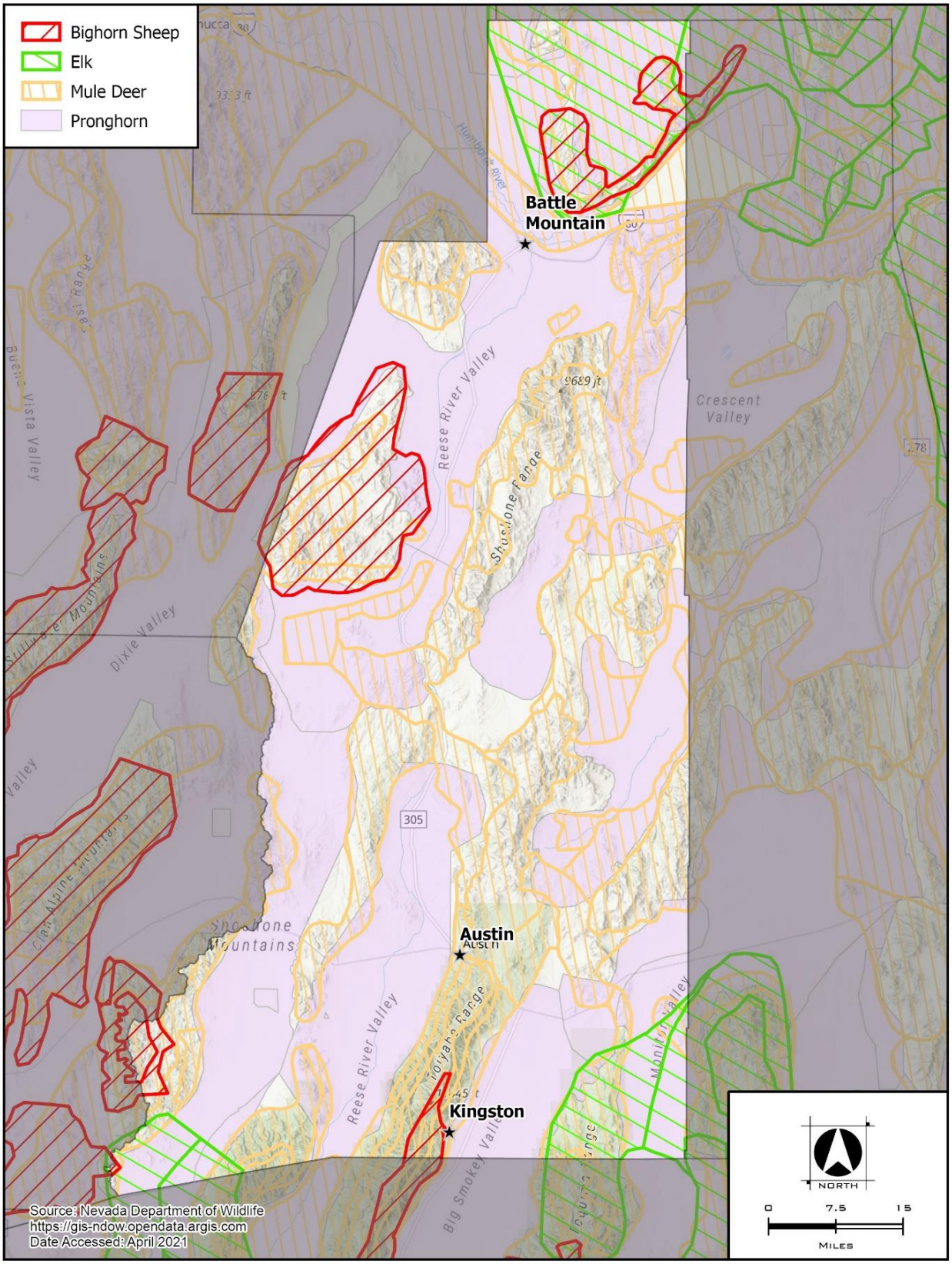


Figure 2-8: Big Game Habitat

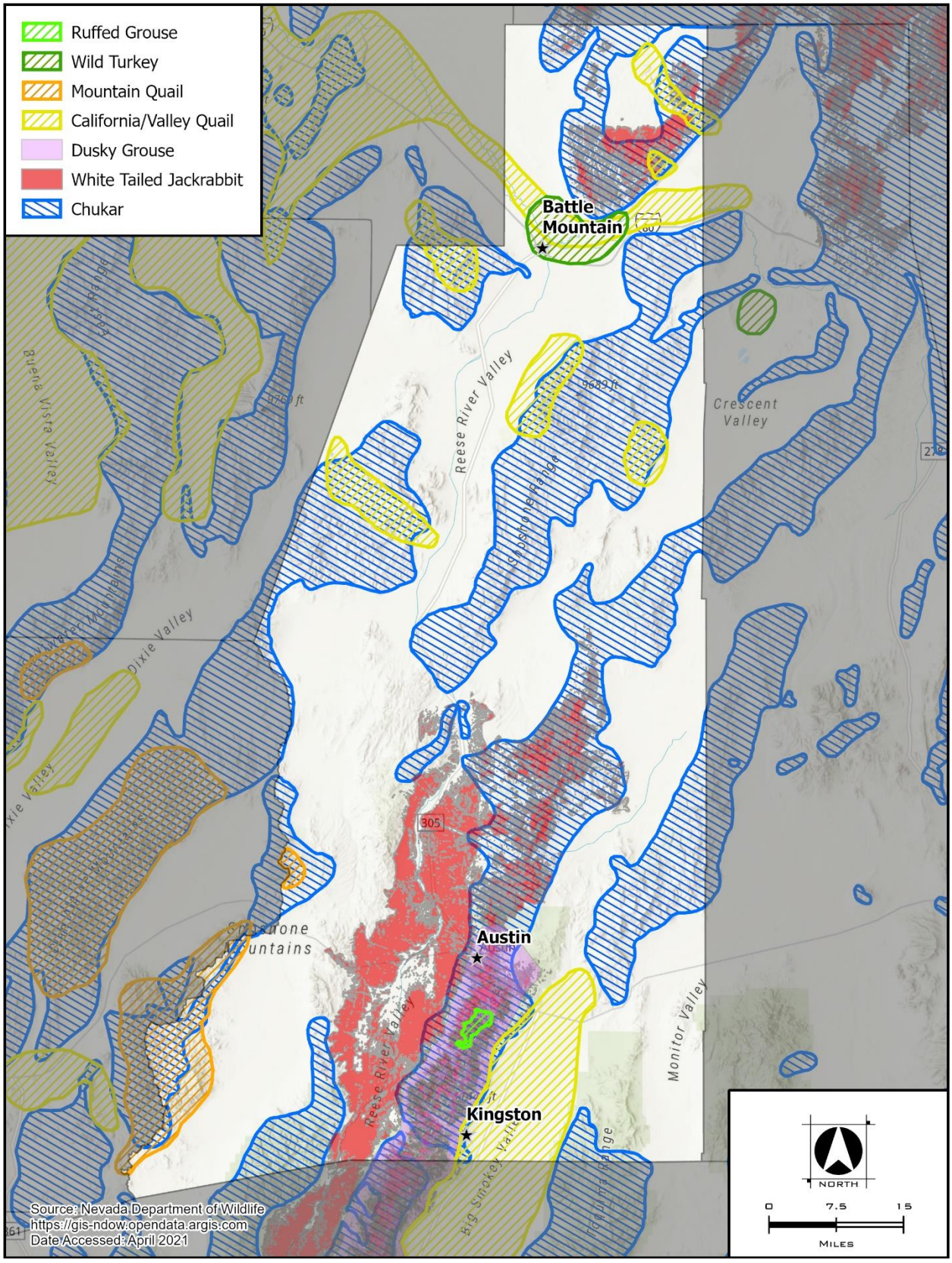


Figure 2-9: Small Game Habitats

Sensitive, Threatened, and Endangered Wildlife

The U.S. Fish and Wildlife Service (USFWS)indicates that several species of wildlife in Lander County are endangered, threatened, or proposed endangered.[23] Table 2-5 shows the wildlife, status, and notes if critical habitat is located in Lander County.

Table 2-5 - USFWS Endangered, Proposed Endangered, and Threatened Species

Species	Status	Critical Habitat	Source
Gray Wolf (*Canis lupus*)	Proposed Endangered	None for this species	USFWS
Southwestern Willow Flycatcher *(Empidonax traillii extimus)*	Endangered	Yes, portion of lower Lander County	USFWS
Yellow-billed Cuckoo (*Coccyzus americanus*)	Threatened	Proposed critical habitat	USFWS
Lahontan Cutthroat Trout *(Oncorhynchus clarkia henshawi)*	Threatened	None for this species	USFWS

Lander County has 52 sensitive vertebrate animal species and 11 sensitive invertebrate species per the Nevada Natural Heritage Program, including the species above as well as dozens of other mammals that may be at risk or sensitive due to environmental or human interactions.

Table 2-6 - Sensitive Wildlife in Lander County

Amphibians/Reptiles/Fish	
Northern Leopard Frog (*Lithobates pipiens)*	Columbia Spotted Frog (Great Basin Pop) (*Rana luteiventris pop. 3)*
Lahontan Cutthroat Trout *(Oncorhynchus clarkii henshawi)*	Desert Horned Lizard (*Phrynosoma platyrhinos*)
Northern Rubber Boa (*Charina bottae*)	Great Basin Collared Lizard (*Crotaphytus bicinctores*)
Long-Nosed Leopard Lizard (*Gambelia wislizenii*)	Pygmy Short-Horned Lizard (*Phrynosoma douglasii*)
Birds	
Olive-Sided Flycatcher *(Contopus cooperi)*	Black Rosy Finch *(Leucosticte atrata)*
Loggerhead Shrike *(Lanius ludovicianus)*	Pinyon Jay *(Gymnorhinus cyanocephalus)*
Northern Goshawk (*Accipiter gentilis*)	American Pipit *(Anthus rubescens)*
Greater Sandhill Crane (*Antigone canadensis tabida*)	Gray-Crowned Rosy Finch *(Leucosticte tephrocotis)*

[23] (U.S. Fish & Wildlife Service 2021)

Table 2-6 - Sensitive Wildlife in Lander County	
Birds, continued	
Golden Eagle (*Aquila chrysaetos*)	Lewis's Woodpecker (*Melanerpes lewis)*
Short-Eared Owl (*Asio flammeus*)	Long-Billed Curlew *(Numenius americanus)*
Long-Eared Owl *(Asio otus)*	White-faced Ibis *(Plegadis chihi)*
Western Burrowing Owl (*Athene cunicularia hypugaea)*	Flammulated Owl *(Psiloscops flammeolus)*
Ferruginous Hawk (*Buteo regalis)*	Bank Swallow *(Riparia riparia)*
Swainson's Hawk *(Buteo swainsoni)*	Pine Siskin *(Spinus pinus)*
Greater Sage-Grouse *(Centrocercus urophasianus)*	Brewer's Sparrow *(Spizella breweri)*
Bats	
Pallid Bat (*Antrozous pallidus)*	Townsend's Big-Eared Bat *(Corynorhinus townsendii)*
Hoary Bat *(Lasiurus cinereus)*	Spotted Bat (*Euderma maculatum)*
California Myotis (*Myotis californicus)*	Silver-Haired Bat *(Lasionycteris noctivagans)*
Western Small-Footed Myotis *(Myotis ciliolabrum)*	Long-Eared Myotis *(Myotis evotis)*
Long-Legged Myotis (*Myotis volans*)	Little Brown Myotis (*Myotis lucifugus)*
Fringed Myotis (*Myotis thysanodes)*	Mexican Free-Tailed Bat (*Tadarida brasiliensis*)
Canyon Bat (*Parastrellus hesperus*)	
Mammals	
Pygmy Rabbit (*Brachylagus idahoensis*)	Sagebrush Vole *(Lemmiscus curtatus)*
American Pika (*Ochotona princeps)*	American Water Shrew (*Sorex palustris)*
Inyo Shrew (*Sorex tenellus*)	Kit Fox (*Vulpes macrotis*)
Western Jumping Mouse (*Zapus princeps*)	

Table 2-6 - Sensitive Wildlife in Lander County	
Invertebrates	
Apache Silverspot Butterfly (*Speyeria nokomis apacheana*)	Elongate Cain Spring Pyrg (*Pyrgulopsis augustae*)
Large Gland Carico Pyrg (*Pyrgulopsis basiglans*)	Small Gland Carico Pyrg (*Pyrgulopsis bifurcate*)
Ovate Cain Spring Pyrg (*Pyrgulopsis pictilis*)	Sadas Pyrg (*Pyrgulopsis sadai*)
Pallid Wood Nymph (*Cercyonis oetus pallescens*)	Nevada Viceroy (*Limenitis archippus lahontani*)
Nevada Viceroy (*Limenitis archippus lahontani*)	Dark Sandhill Skipper (*Polites sabuleti nigrescens*)
Pallid Skipper (*Polites sabuleti basinensis)*	California Floater (*Anodonta californiensis*)

Sage-grouse

Sage-grouse male displaying at lek | Source: USFWS

Sage-grouse are a Nevada protected game bird found in 15 of Nevada's 17 counties, including Lander County. The species habitat includes central Washington, southern Idaho, and Montana, parts of southern Canada and Great Plains, eastern California, south-central Nevada, southern Utah, western Colorado, and northern New Mexico. Historically, sage-grouse were abundant across Nevada and the west. However, because of diminishing habitat of slow-growing sagebrush due to development, fire, invasive weeds, and other factors, an effort is being made to list the sage-grouse as an endangered species. To help avoid such a listing, Nevada governor Kenny Guinn appointed a team of approximately 25 people from diverse backgrounds and interests to a sage-grouse conservation team in June 2000. The mission of the team, as defined by Governor Guinn, is "to conserve and protect Nevada's sage-grouse and their habitat." The NDOW team has worked to provide research and guidance on the conservation of this species. While greater sage-grouse still thrive in much of the species' range in Nevada, the conservation team is attempting a proactive strategy to find solutions to localized problems before the species truly reaches a threshold of vulnerability from which recovery might be difficult.[24]

Sage-grouse pose a unique conservation concern since the species only breeds between late February through May within certain areas called "leks." These leks are generally in the same location each year and can comprise large areas of land up to 20 hectares. There is evidence that some leks in the United States have persisted in the same

[24] (Nevada Department of Wildlife 2021)

Sage-grouse only breed in areas called "**leks**." **Leks** are generally in the same location every year and can comprise **up to 20 hectares.** There is evidence that some leks in the United States have persisted in the same location for up to 67 years.

Disturbance or alteration of vegetative cover can cause a lek to shift or be abandoned. The size and sensitivity of these areas make this species uniquely challenging to conserve.

locations between 28 to 67 years.[25] Sage-grouse may abandon or shift lek locations due to persistent disturbance or alteration of vegetative cover. Encroachment of pinyon-juniper woodlands also affects sage-grouse habitat, fragmenting the shrub-steppe ecosystems of the species.[26] NDOW tracks the location of leks and sage-grouse habitat to monitor development that may affect the breeding and livelihood of the species. Although not endangered, the particularity of their breeding and nesting locations as well as the vast areas that comprise their habitat makes this species especially susceptible to the threats of human encroachment and development if they are not considered in planning and growth efforts of Lander County.

Fisheries/Harbors

Fishing is a popular activity in Lander County, which has 124 lakes, rivers, and other fishing spots.[27] Groves Lake is a popular fishing destination and is stocked regularly by NDOW. The lake/reservoir was constructed in 1969 for recreational use and provides a location for primarily angler fishing. Normal selection of fish includes rainbow and brown trout. Unfortunately, the lake has been progressively leaking, and the water level no longer reaches full capacity[28].

Rainbow Trout (top), Brown Trout (bottom)
Source: USFWS

[25] (Connelly, Hagen and Schroeder 2011)
[26] (Coates, et al. 2017)
[27] (Fishing Works 2021)
[28] (Nevada Department of Wildlife 2021)

Resource Threats and Hazards

Fire Hazards[29]

The Nevada Division of Forestry develops Community Wildfire Protection Plans (CWPPs) that address wildfire and hazard protection, specifically the challenges between the wildland-urban interface. The last update of the CWPP occurred in 2008. To mitigate fire risk, the CWPP states that "the highest priority should be given to protecting and enhancing existing stands of native vegetation and to adopting a holistic approach to ecosystem management. Well-managed stands of vegetation will protect resources and values at risk from the impacts of catastrophic wildland fire and provide needed habitat for flora and fauna and the people that call Lander County and the Great Basin their home."[30] The plan suggests larger scale projects may be cost-prohibitive, but smaller scale projects can be undertaken to break up fuel continuity or protect water resources.

Large-scale fire mitigation projects may be cost-prohibitive; however, small-scale fire projects can help when focused on:

1) breaking up fuel continuity
2) protecting water resources and native vegetation

Pollution Control - Water and Air

Surface water quality is generally good in Lander County. Surface water has variable amounts of total dissolved solids (TDS) but generally have less than 325 milligrams per liter (mg/l), making it suitable for all uses. Specific conductance, a good measure of water quality, typically ranges from 300 to 500 micromhos. The pH of local surface water is in the mildly alkaline range, around 8.0, with dissolved calcium, sodium, and sulfate. Suspended sediments can be very high at times during runoff events.

The State Air Quality Planning Division monitors and reports on air quality for all Nevada counties, including Lander County. Under the Clean Air Act of 1970, the Environmental Protection Agency (EPA) is required to set National Ambient Air Quality Standards (NAAQS) for six common criteria air pollutants: ozone, particulate matter, carbon monoxide, nitrogen dioxide, sulfur dioxide, and lead. Any use that will result in significant emissions from these pollutants is required to obtain a permit from NDEP. Locally, the County controls for air quality with a dust ordinance controlling the disruption of dust and soil during development or other activities.

Flood Control[31]

Lander County is a participant in the National Flood Insurance Program (NFIP) and is therefore required to adopt and enforce a floodplain management ordinance that meets minimum NFIP requirements. Communities that do not enforce these ordinances can be placed on probation or suspended from the program. When a community is placed on probation, an additional $50 charge is added to the premium for each policy sold or renewed in the community.

Flood insurance is not available in a community that does not participate in NFIP. Federal agencies are prohibited from approving any form of financial assistance for acquisition or construction purposes in a Special Flood Hazard Area in a non-participating community, i.e., loans guaranteed by the Department of Veterans Affairs, insured by the Federal Housing Administration, or secured by the Rural Housing Services. If a presidentially declared disaster occurs

[29] (Wildland Fire Associates 2013)
[30] (Wildland Fire Associates 2013, 69)
[31] (FEMA 2021)

in a non-participating community, no federal financial assistance can be provided for the permanent repair or reconstruction of insurable buildings.

The following standards of construction are required in all special flood hazard areas:

- Electrical, heating, ventilation, plumbing, air conditioning equipment, and other service facilities must be designed or located to prevent water from entering or accumulating within the components during conditions of flooding.
- Non-residential construction must be elevated either to or above the base flood elevation.
- All new construction with fully enclosed areas below the lowest floor (excluding basements) that are usable solely for parking of vehicles, building access, or storage must be designed to automatically equalize hydrostatic flood forces on exterior walls by allowing for the entry and exit of floodwaters.
- All new and replacement water supply systems must be designed to minimize or eliminate infiltration of floodwaters into the system.
- All new and replacement sanitary sewage systems must be designed to minimize or eliminate infiltration of floodwaters or discharge from the systems into floodwaters.

On-site waste disposal systems must be located to avoid impairment to them or contamination from them during flooding.

Flood Mapping[32]

In 2000, a request was submitted by the U.S. Army Corps of Engineers to FEMA for an evaluation of the effects that modifications to an existing levee (from State Route18 [SR18] to just downstream of Interstate Highway 80 [I-80]) and construction of a new levee along the Reese River (from just upstream to approximately 7,000 feet upstream of I-80) would have on the flood hazard information shown on the effective Flood Insurance Rate Map (FIRM) and Flood Insurance Study (FIS) report. The modifications to the existing levy will include raising it to meet the minimum freeboard requirement of 3.0 feet.

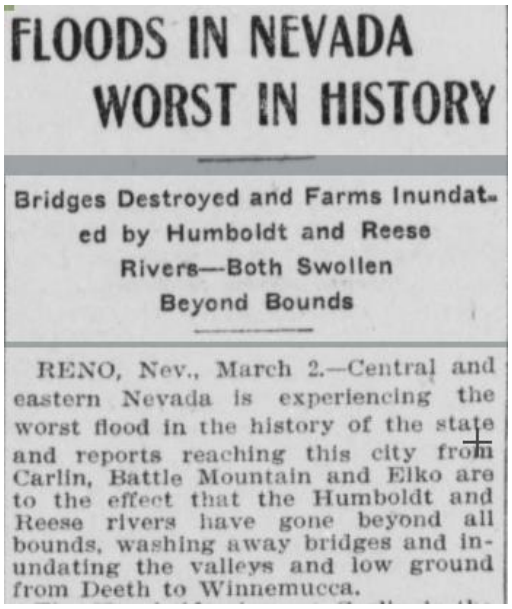
This proposed project will have a major impact not only on the reclassification of the flood plain and flood insurance of residents of Battle Mountain but also will provide a positive impact for recruiting future businesses and prospective industries to the area. Currently, Lander County is obtaining easements and has secured funding for the local share of the project. State representatives in Congress are being encouraged to move the U.S. Army Corps of Engineers to follow through with their previous commitment to fund the project.

Extensive flooding occurred at Battle Mountain in February 1962, before construction of the U.S. Army Corps of Engineers levee. Floodwaters were impounded by the Southern Pacific Railroad line, and the embankment was breached. The levee now extends along the western bank of the Reese River from I-80 to State Highway 305. It is important to note, however, that the levee does not meet the current FEMA evaluation criteria for the no Special Flood Hazard Area since it does not provide three feet of minimum freeboard during the 100-year flood. As a result, growth is hampered because of the high cost of insurance, and businesses are reluctant to locate in a floodplain. Resolution to the floodplain issue in Battle Mountain is not expected to be resolved for several years. The current flood zone designations remain in place for the foreseeable future.

[32] (Lander County 2010)

Areas with Flooding Potential[33]

The greatest flood potential exists along the Humboldt River. Battle Mountain is located very near the confluence of the Humboldt and Reese Rivers. Historical data for this area indicates property damage from flooding has been a long-term occurrence (see image). Flow in these rivers is highly variable. Peak flows of 5,800 cfs occurred in the Humboldt River in May 1952. Peak flows to the Reese River occurred in June 1963 with peak flows of 2,140 cfs. No flow was recorded in September and October 1948, September 1949, and September 1959. During a wet year such as 1962, annual discharge was 331,000 acre-feet on the Humboldt River. Peak flow of 221 cfs occurred in Kingston Creek in May 1984, resulting in washed-out roads in the area. A maximum of 385 cfs was measured a year earlier on May 28, 1983. Kingston Canyon reservoir has a moderating effect on peak flows in this watershed. Proper spillway functioning has always been a concern for Groves Lake.



FLOODS IN NEVADA WORST IN HISTORY

Bridges Destroyed and Farms Inundated by Humboldt and Reese Rivers—Both Swollen Beyond Bounds

RENO, Nev., March 2.—Central and eastern Nevada is experiencing the worst flood in the history of the state and reports reaching this city from Carlin, Battle Mountain and Elko are to the effect that the Humboldt and Reese rivers have gone beyond all bounds, washing away bridges and inundating the valleys and low ground from Deeth to Winnemucca.

Article About Flooding
Source: Los Angeles Herald (March 2, 1910)

Severe flooding last occurred at Battle Mountain in May 1984, when a sudden warming trend rapidly melted snowpack. This flow was estimated between the stations at Elko and Imlay by the USGS to be about 7,500 cfs. This is close to the 100-year peak flow for the Humboldt River. The resulting 100-year flood plain (see Figure 2-10) as defined by FEMA covers most of Battle Mountain and all of the Humboldt and Reese River Valleys.

[33] (Lander County 2010)

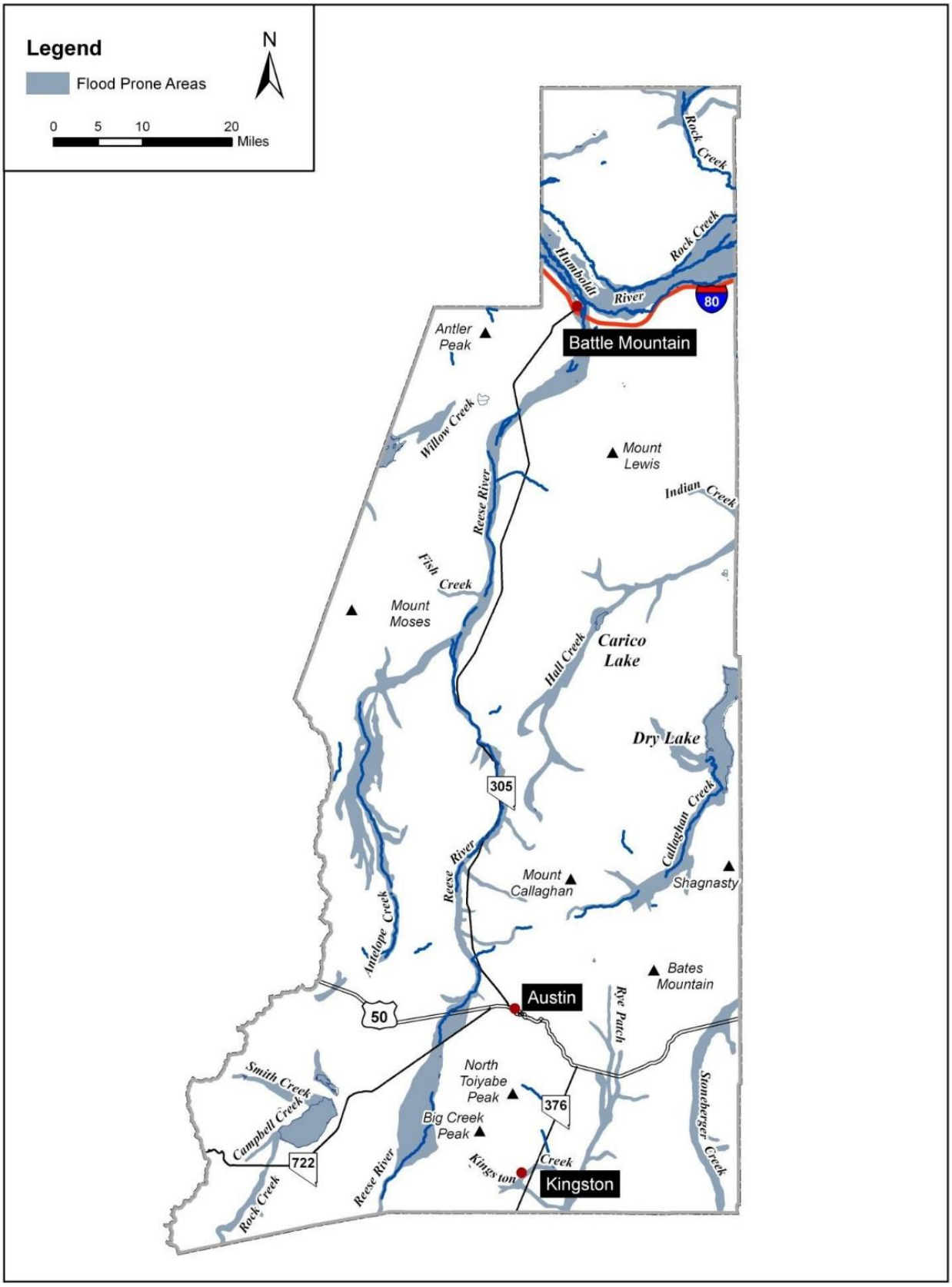


Figure 2-10: Flood-Prone Areas
Source: Lander County Master Plan (2010)

Earthquakes and Seismic Risk[34]

Seismic activity in Nevada can be uncertain. How can good planning protect against earthquakes?

- Note major fault lines on parcel/subdivision maps
- Create adequate setbacks from faults to protect citizens and their property

Recorded substantial magnitude earthquakes in eastern Nevada have been associated with surface fault rupture along a north-south trend near the western boundary of Lander County. Many faults occurring in the County are Quaternary alluvium, making them potentially active. Between 1970 and 1981, approximately 100 earthquakes ranging from Mercalli (M) 3.0 and M 6.0 have occurred within 60 miles of northern Lander County. In 2008, the city of Wells, approximately 100 miles east of Battle Mountain, experienced a 6.0 earthquake that caused major damage to many historic structures downtown. USGS reports that there is a large 39-mile-long fault located in this region, known as the Independence Valley Fault Zone but that this fault was probably not the source of the earthquake since its location is too far southeast of the epicenter of the Wells earthquake.

In the northern Shoshone Range, southeast of Battle Mountain, a predicted maximum credible event (largest possible) on a local active fault could produce an M 7.0 earthquake. This level of seismic risk should be considered in local development codes. Major fault lines should be located on all parcel and subdivision maps. Lander County should establish adequate setbacks from faults.

[34] (Lander County 2010)

Looking to the Future

Conservation of natural resources is fundamental to the long-term sustainability of any region, but in particular natural resources are vital to the recreational tourism of Lander County. Future priorities will consider how to balance the need for land development to provide housing and employment opportunities for residents while still maintaining the wide-open spaces and natural diversity that characterize the County.

Preservation of Agricultural Lands/Heritage

Lander County has a rich history of agricultural uses, and the majority of water usage within the hydrographic basins of Lander County is for irrigation. One way that Lander County seeks to promote and preserve agriculture and livestock uses is through the introduction of the Rural Ranchettes land use category. This category was designed to provide a middle ground between larger rural uses and primarily residential uses, creating a new land use that promotes residential uses mingled with supportive agricultural and livestock uses. As Lander County assesses suitable lands to receive this land use designation, the County is able to take an active role in preserving the smaller-scale agricultural and ranch lands that may be lost by the creation of larger, corporate farms. Another avenue that the County can explore is encouraging farmers and ranchers to place conservation easements on properties to preserve existing irrigated agricultural lands in perpetuity.

Alternative Energy Potential

As detailed in the Alternative Energy section, Lander County has the potential to create alternative energy plants, providing resilient energy sources to residents and industries in the County with the potential to export to other counties. The State of Nevada Renewable Portfolio Standard, as set forth in NRS 704.7801, has set a goal of 50% renewable energy by 2030. The portfolio standard requires each electric utility in Nevada to sell a percentage of electricity from renewable sources. This percentage increases every year until reaching the 50% standard. For calendar year 2020, not less than 22% of the total amount of electricity sold by the provider to its retail customers in Nevada must be from renewable sources. The Governor's Office of Energy manages several tax incentive, grant, and loan programs to encourage the development of clean energy in Nevada. Lander County may be interested in pursuing these programs in the future to support these state-wide efforts and take advantage of incentives. Lander County supports the growth of these utilities to create a more resilient energy system for the County and the state.

Resource Preservation

Lander County can create some regulatory mechanisms to aid in the conservation of resources. As development applications are reviewed, the County should utilize maps and information in this Master Plan to analyze potential impacts to resources. Nevada does not require any environmental review for development proposals, although legislation has been proposed in the past (e.g., Senate Bill 277 in the 2015 legislative session). Environmental review under NEPA is only triggered if a project involves a "federal nexus," i.e., federal funding, permits, or other discretionary oversight by a federal entity. It may be appropriate for the County to develop measurable environmental review criteria in the future zoning code update to review significant development proposals and/or projects proposed in sensitive development areas. The establishment of specific environmental review criteria could include information on prime farmland soils, wildfire hazards, geologic hazards, riparian areas, historic and cultural resources, floodplains and wetlands, threatened or endangered species, wildlife habitat and wildlife migration corridors, wellhead protection areas, and other environmental resource matters addressed in the Master Plan and other documents adopted by the County.

HOUSING

Housing

The purpose of this element is to provide a method for entities to identify the projected growth in population and to set forth plans, policies, and action programs through which the needs of the projected population, including housing, will be met.

Goals

1. **Keep growth in Lander County at a sustainable level that natural and fiscal resources can support.**
2. **Direct development to locations with existing public services, including municipal water and wastewater connections.**
3. **Increase awareness of the affordable housing needs in Lander County and increase diversity of available homeownership opportunities.**
4. **Increase housing opportunities for households with special needs, including persons with physical and mental disabilities, the elderly, and at-risk children, as well as support veteran housing.**

Policies

H.1 Support redevelopment efforts in central Battle Mountain that meet a variety of housing needs, both temporary and long-term.

H.2 Maintain the integrity of established residential neighborhoods. Adjacent and infill residential housing shall be consistent with existing development in terms of improvements and design. Mobile homes, modular homes, and manufactured housing not contained within a mobile home park shall comply with the same standards as site-built homes, including density, lot standards, building placement standards, parking, and foundations. Exterior siding and roof structure will not be made of non-reflective material.

H.3 Promote development that enhances the quality, desirability, and integrity of neighborhoods.

H.4 Continue to support and retain Nevada Rural Housing Authority and USDA first-time homebuyer programs in Lander County.

H.5 Pursue state and local home rehabilitation and weatherization programs to reduce ownership expenses and improve health and safety concerns.

H.6 Promote cooperative efforts to preserve and expand current attainable and workforce housing.

H.7 Promote the provision of a variety of housing options throughout the County.

H.8 Support cost-effective options for the development of new affordable housing, including prefabricated, modular, and manufactured housing, with proper site design and infrastructure improvements, including connection to municipal water and wastewater service.

H.9 Work with local housing groups to assist disabled persons with accessibility modifications. Encourage housing finance agencies such as USDA, Nevada Housing Division, and Rural Nevada Housing Authority to make available housing rehabilitation funds for accessibility projects in Lander County.

H.10 Work with local housing groups to assist disabled persons with accessibility modifications. Encourage housing finance agencies such as USDA, Nevada Housing Division, and Rural Nevada Housing Authority to make available housing rehabilitation funds for accessibility projects in Lander County.

H.11 Cooperate with developers in the production of dwelling units accessible to persons with disabilities and encourage developers to consider incorporating minimal changes in the percentage of new units, which would make them more usable for persons with disabilities while not otherwise affecting their marketability.

Housing Conditions

Lander County's existing housing stock is dominated by manufactured homes, single-family residences, and owner-occupied housing. The overall housing profiles differ between the population centers located along the U.S. I-80 corridor in the north (Battle Mountain) and the population centers located along the U.S. Highway 50 corridor in the south (Austin and Kingston).

Housing Inventory

Lander County has a total of 2,657 housing units. Of these, 2,198 are occupied, with a homeowner vacancy rate of approximately 1.2% and a rental vacancy rate of 17%. Table 3-1 provides information on total occupied units in Lander County.

Table 3-1 - Select Statistics on Lander County Housing

County Household Characteristics				
Population	6,534			
Median Household Size	2.54 per household			
Median Age	37.4			
Median Household Income	$88,030			
Housing Characteristics				
	Battle Mountain	**Austin**	**Kingston**	**Lander County**
Population*	3,391	156	122	6,109
Total Housing Units	1,707	166	N/A	2,657
Vacant Housing Units	242	101	0	459
Owner-Occupied Housing Units	1,465	65	58	2,198
Homeowner Vacancy Rate %	1.2%	0.0%	0.0%	1.2%
Renter-Occupied Housing Units	113	0	0	120
Rental Vacancy Rate %	22.3%	0.0%	0%	17%

Source: University Center for Economic Development - College of Business, University of Nevada, Reno
*Source: Nevada State Demographer – Final Governor's Certified Series of Population of Nevada's Counties and Incorporated Cities, 2019 counts.

Over 50% of the housing stock in Lander County consists of manufactured homes, with slightly over one-third consisting of other single family residences. Few multi-family units exist in Lander County. Figure 3-1 provides a breakdown of existing housing stock, per the land use codes in 2021 Lander County Assessor Parcel Data.

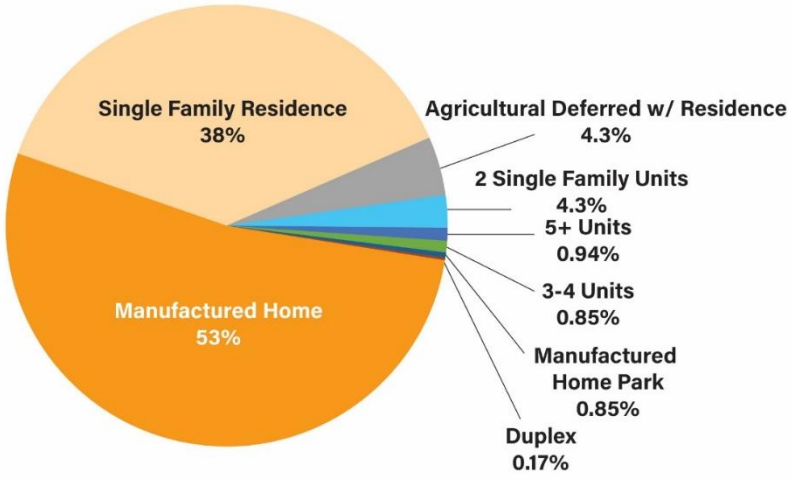


Figure 3-1: Housing Stock Breakdown | Source: Lander County Assessor Office Parcel Data (2021)

Aging Housing Stock

Due to the existing property tax structure of Nevada, a significant percentage of the existing housing stock in Lander County will be at the end of its 50-year depreciation schedule by 2029. This means the assessed taxable value of the houses will be worth one-quarter of a new house of equal value. Figure 3-2 provides a breakdown of the age of housing stock in each area of the County.

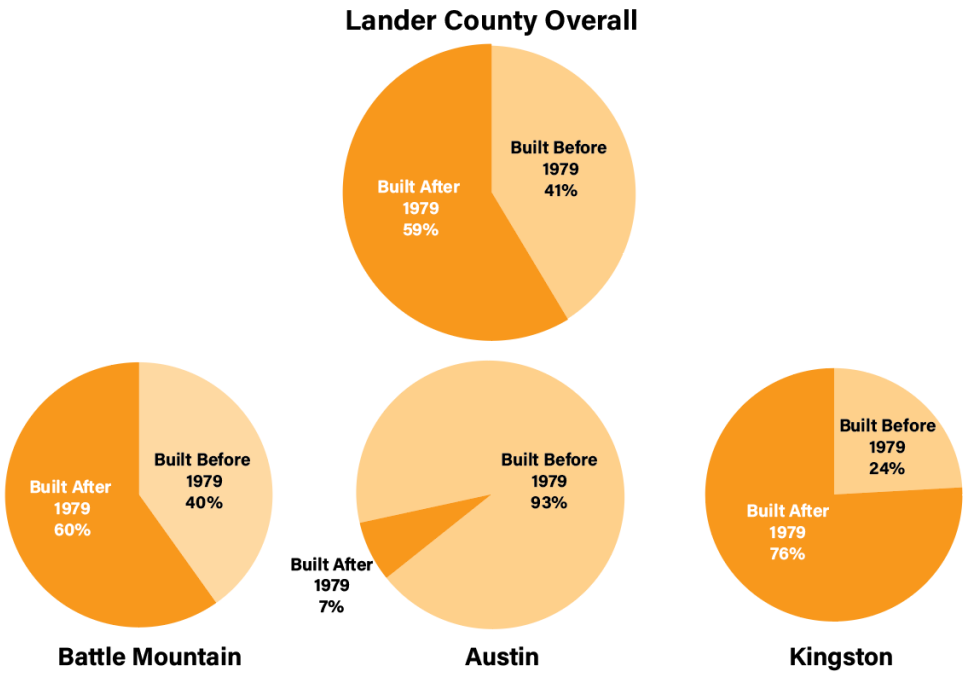


Figure 3-2: Age of Existing Housing Stock
Source: University Center for Economic Development - College of Business, University of Nevada, Reno (2020)

Affordable Housing

Affordable housing has a variety of definitions. The federal guideline for housing affordability is when a household spends no more than 30% of its income on housing costs, including rent or mortgage and utilities. The U.S. Department of Housing and Urban Development (HUD) considers households who exceed this 30% limit to be cost-burdened, and these households may experience challenges paying housing costs as well as other necessities such as food, clothing, transportation, and medical care. For Nevada, the specific definition of affordable housing (NRS 278.0105) is "housing affordable for a family with a total gross income that does not exceed 80% of median gross income for the county".

Cost-Burdened

Households who spend more than 30% of their income on housing costs, including rent, mortgage, and utilities.

Source: U.S. Department of Housing and Urban Development (2018)

In Lander County, a substantial difference exists between the percentage of cost-burdened homeowners and cost-burdened renters. Figure 3-3 illuminates the issues with affordable rental properties in Lander County and specifically Battle Mountain. Between 2013 and 2019, the percentage of cost-burdened renters ranged between 32% and 51% of the renter population while the percentage of cost-burdened homeowners with and without mortgages ranged between 0% and 12%.[1]

[1] (United States Census Bureau 2013-2019)

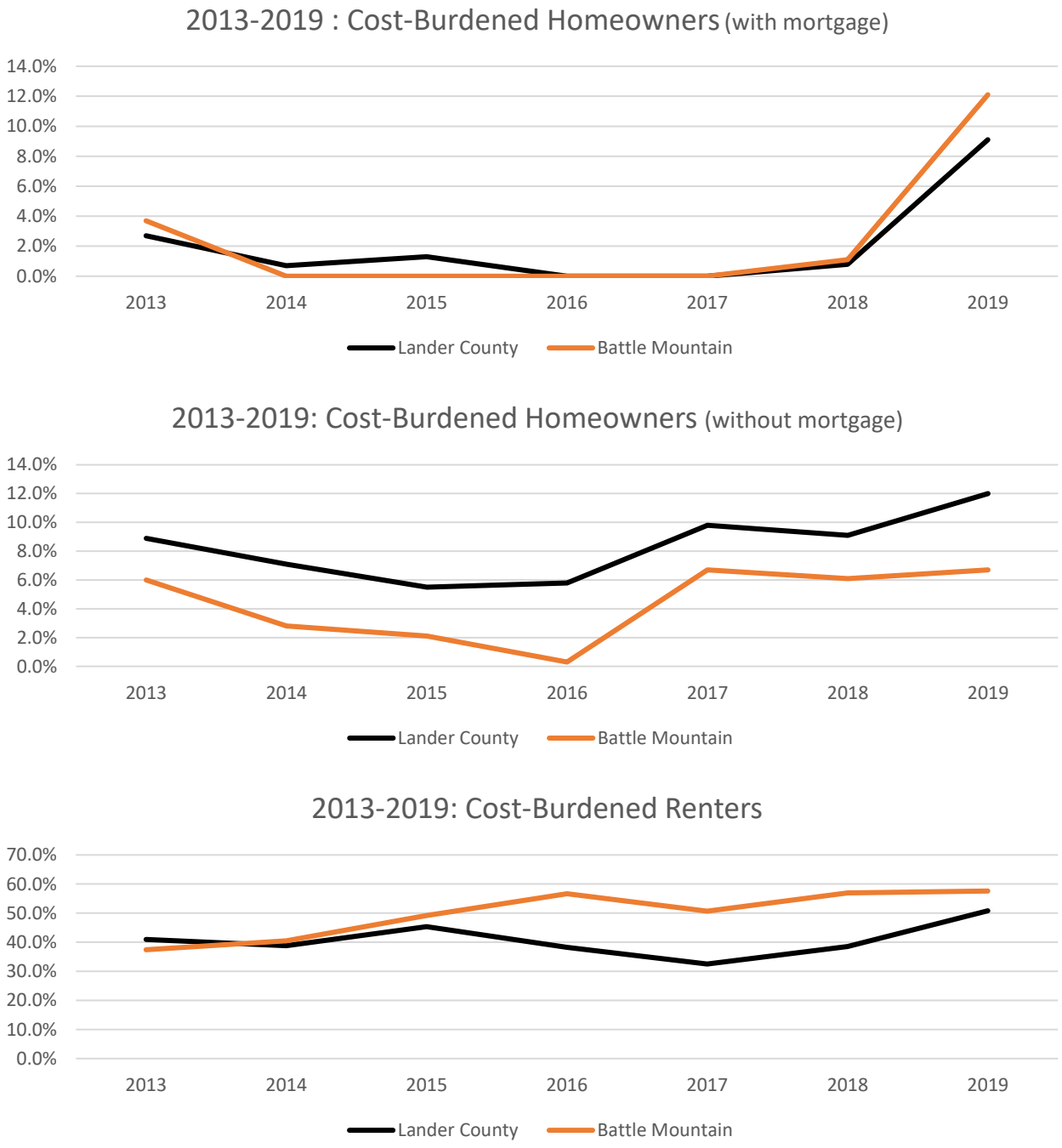


Figure 3-3: Cost-Burdened Homeowners and Renters in Lander County

Table 3-2 provides a comparison of these affordability statistics in surrounding rural counties.

Table 3-2 - Rural County Affordability Statistics				
Renters	**Elko County[1]**	**Eureka County[1]**	**Humboldt County[1]**	**Lander County[1]**
Median Gross Rent	$952	N/A	$841	$842
Cost-Burdened %	22.3%	N/A	41.4%	50.8%
Homeowners	**Elko County[1]**	**Eureka County[1]**	**Humboldt County[1]**	**Lander County**
Median Housing Value	$212,500	$120,100	$180,600	$179,900[2]
Cost-Burdened % (with mortgage)	16.8%	8.3%	17.6%	9.1%[2]
Cost-Burdened % (without mortgage)	16.1%	3.2%	11.3%	12%[2]

Source: [1]Census Bureau - American Community Survey Estimates 2019, Tables DP 04, S1101, S2001
[2]University Center for Economic Development - College of Business, University of Nevada, Reno

In Lander County, the Nevada Rural Housing Authority is responsible for promoting affordable housing and related programs. This quasi-public entity is responsible for planning, construction, purchasing, and managing properties with a variety of affordable housing programs. Three government-subsidized or subsidized tax credit projects are located in Lander County, providing a total of 68 units.[2] In addition to supporting new construction of government-subsidized housing, the Nevada Rural Housing Authority also provides rental assistance to low-income households, the disabled, the elderly, and veterans through the Housing Choice Voucher Program and the Security Deposit Program. The Home at Last Homeownership Program also provides services for prospective homeowners to secure affordable mortgages and down payment assistance.

Housing Projections

Housing projections were generated by the University Center for Economic Development using the Nevada State Demographer estimates, incorporating the effect of expected job growth in regional mining projects. Based on projected growth, 346 housing units are estimated to be needed to accommodate the addition of new residents and workforce housing for growing mining industry jobs.

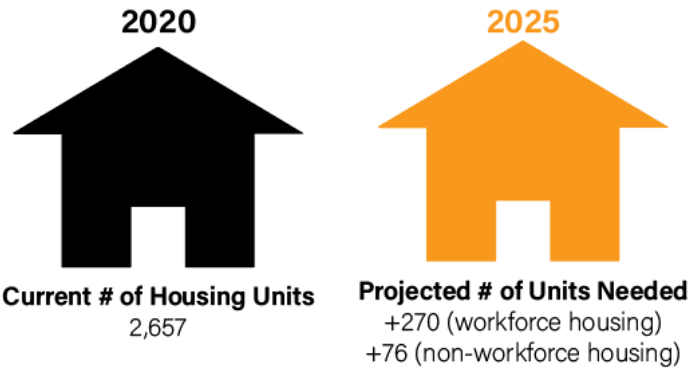


Figure 3-4: Projected Housing Units Needed
Source: University Center for Economic Development - College of Business, University of Nevada, Reno (2020)

[2] (Vogt Santer Insights 2014)

Looking to the Future

Housing Opportunities and Constraints

Encouraging Diversification and Affordability of Housing Stock

Housing stock contains more than 91% single family or manufactured houses. The County lacks a substantial stock of multi-family housing and a diversity of housing from the predominant detached, single family and manufactured housing. To encourage more multi-family options, Lander County reorganized the land use category, calling out the new designation Multi-Family in this Master Plan to allow for higher-density housing options in appropriate areas. Lander County will have the option to add this Master Plan designation to certain areas of the County, or private property owners may submit a Master Plan amendment to facilitate development of a new project. Future updates to the zoning code will include additional guidelines for scale, density, and placement of different types of housing, including multi-family, townhouses, duplexes, and accessory dwelling units. An increase in multi-family and diversity of other housing types may provide additional rental housing stock for this area and alleviate cost burden on rental households in Lander County. Lander County will also continue to work with Nevada Rural Housing Authority and other local, state, and federal entities to provide subsidies and other funding to support affordable housing efforts.

Redevelopment Opportunities

Redevelopment opportunities are most likely to occur in Battle Mountain and Austin, where revitalizing city centers like downtown corridors can create more walkable and accessible options for services. Encouraging adaptive reuse and redevelopment of properties has the potential to bring new life to existing commercial corridors or create new opportunities in areas with existing infrastructure while bringing employment opportunities closer to residents.

Austin, Nevada | Source: Jasperdo, 2014, Licensed by CC BY-NC-ND 2.0

Aging Population and Housing Opportunities

Coupled with the rising average median age of residents, Lander County will require concentrated attention to aging-in-place planning strategies to ensure adequate quality of life for current and future residents, with a likely smaller property tax base (refer to Figure 3-5). In addition, housing affordability is an important concern for this region as members of the population move into retirement and fixed income, creating the potential for affordability issues and increasingly cost-burdening residents.

As populations age, adjustments to the existing community services may be necessary to accommodate demographic changes in the community. Age-friendly communities can be encouraged in any city or county, including rural communities. Nationally, research shows most rural senior citizens (57%) prefer to remain in their current residences as long as possible rather than move into a senior care facility during retirement. Rural residents show the highest desire to remain in their homes as they age compared to suburban and rural counterparts.[3] Compared with urban and suburban adults, 45% of rural adults intend to stay in their current residences and never move but are more likely to explore building accessory dwelling units or explore a shared living situation with a family member or caregiver to help with everyday activities as they age.[4]

[3] (AARP 2019, 13)

[4] (AARP 2019, 19-20)

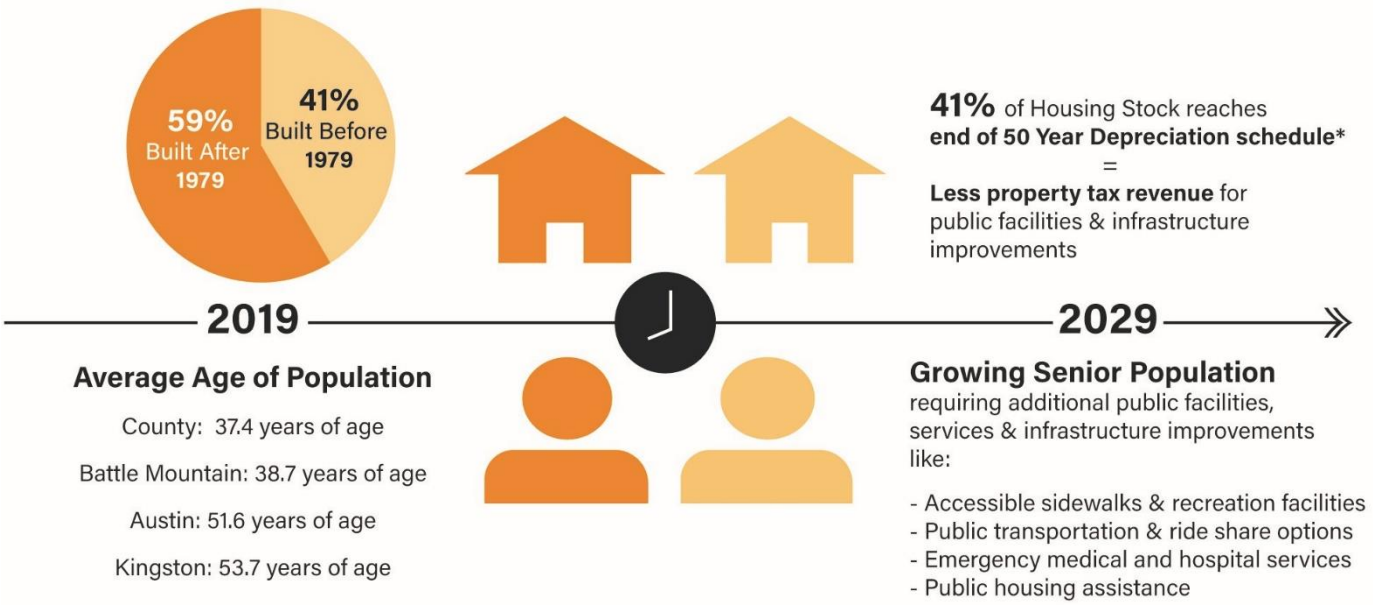


Figure 3-5: Aging Population and Housing Stock
Source: University Center for Economic Development - College of Business, University of Nevada, Reno (2020)

Rural communities face unique risk factors for aging populations compared with urban or suburban communities, namely access to health care, support services like accessible transportation options (public transit or ADA-accessible routes), aging housing, and social isolation.[5] Most rural adults in the United States drive, walk, or have others drive them within their communities and indicate they are more likely to continue driving as they age. Table 3-3 includes specific risk factors for Lander County residents and strategies to improve aging-in-place and the livelihoods of the senior population in the community.

[5] (AARP 2019) (Skoufalos, et al. 2017)

Table 3-3 - Aging Population and Housing Stock	
Rural Risk Factor	**Existing or Proposed Strategies**
Lack of accessible transportation to complete activities of daily living	- Explore public transportation methods, including safe and easy-to-use ride share options. - Improve walkability by improving ADA-accessible pathways/connectivity.
Lack of new housing options	- Promote development of housing in unconstrained areas - Encourage maintenance of existing housing through code enforcement. - Establish guidelines to allow a mix of housing types - Create opportunities for shared living spaces and accessory dwelling units.
Social isolation	- Improve parks and recreation areas to include accessible or universally designed amenities. - Work to ensure that public facilities are accessible to all age ranges.
Healthcare	- Ensure that emergency services and local medical and hospital resources can accommodate a growing senior population and are located in reasonable proximity to community members. - Encourage mobile medical facilities to provide healthcare to rural areas.
Sources: AARP 2018, Skoufalos et al. 2017	

ECONOMIC DEVELOPMENT

Economic Development

The economic growth of a community is fundamental to its vitality and affects all other Master Plan elements, influencing public facilities, conservation efforts, land use decisions, and housing/population needs.

Goals

1. **Foster a diverse regional economy that adapts to changing needs of the workforce and supports resiliency.**
2. **Capitalize on outdoor recreation, lifestyle, and agriculture as business opportunities to diversify the economy.**

Policies

ED.1 Enhance and protect existing non-cyclical economic activity or sectors. Such sectors include:

- Tourist commercial relationship to I-80 and Highway 50:
  - Hotel/motels and traveler services
  - Interstate truck and vehicle traffic
  - Rail operations
- Government functions
- Ranching and agricultural operations
- Outdoor recreation/tourism
- Basic services and trade
- Power plant operations

ED.2 Conduct industrial site inventory/evaluation for Lander County communities.

ED.3 Initiate a capital planning effort that addresses the improvements needed to support economic development and expansion of business activity.

ED.4 Continue to support efforts to enhance and develop outdoor recreational opportunities on public lands that increase visitors and tourists to Lander County. The recreation element identifies specific development efforts.

ED.5 Provide recreational development recommendations to public land management agencies for resource management plan and forest service plan updates.

ED.6 Recreation development should minimize conflicts with existing public land users such as livestock operators, mining, other commodity-based users, and establish outdoor recreational use areas which minimize conflicts with traditional users.

ED.7 Develop public lands for tourism-based recreation to be consistent with the Lander County Plan for Public Lands.

ED.8 Support Development of industrial sites in Lander County.

ED.9 Identify sites that are located in close proximity to municipal services; provide infrastructure support expansion to sites where adequate lands and infrastructure is available.

ED.10 Identify sites where additional rail use and development can occur since rail-served industrial development is particularly important in northern Lander County

ED.11 Encourage alternative energy development that does not encroach on community areas or existing residential and commercial/business establishments; minimize impacts from such development.

Current Trends

In general, Lander County has outperformed most of the other communities and counties in the northeastern Nevada region and has even outperformed the state of Nevada and the United States in terms of overall size and growth in median household income, median family income, and per capita income. Lander County also had one of the lowest percentages of residents living below the poverty level in northeastern Nevada. It was also lower than state and national poverty rates, although certain groups are experiencing poverty at a higher level than the overall community. The County also has a much higher civilian unemployment rate than other communities throughout northeastern Nevada over the seven-year period from 2013 to 2019.

Local Economy and Outlook

Economic Sectors

Historically, the Lander County economy has relied on cyclical, resource-based industries such as mining and agriculture. Table 4-1 provides information on the top 10 industries in Lander County (ranked by the number of jobs), with median average salary and total industry earnings. A substantial difference exists between the total industry earnings of the mining industry, average job earnings, and total jobs when compared with other industries, underpinning the importance of the mining industry to the economy of Lander County (Table 4-1).

Table 4-1 - Top 10 Lander County Industries in 2018 by Total Jobs

Rank	Industry	# of Jobs	Average Annual Earnings per Job[1]	Total Industry Earnings[1]
1	Mining[2]	2,114	$132,919	$265,344,762
2	Government (Federal, State, Local)[3]	567	$76,336	$41,424,954
3	Truck Transportation	114	$100,086	$11,517,553
4	Agriculture, Forestry, Fishing, and Hunting[4]	88	$26,910	$4,666,753
5	Food Services and Drinking Places	87	$18,664	$1,646,862
6	Food and Beverage Stores	79	$19,862	$1,465,089
7	Gasoline Stations	75	$29,109	$2,488,413
8	Repair and Maintenance	58	$84,552	$5,398,789
9	Accommodation	56	$17,447	$1,608,915
10	Amusement, Gambling, and Recreation Industries	45	$27,600	$1,278,885

Source: Nevada Economic Assessment Project, University of Nevada, Reno (2021)

[1]Average annual job earnings are included in this table; however, this data may be skewed depending on the standard deviation (i.e., the amount of variation in the dataset) of average salaries, with extremely low- or high-paying individual jobs potentially skewing the average earnings per job for the industry. For combined subsectors, sectors with <10 jobs in Emsi 2019. Four were excluded from # of Jobs and Average Annual Earnings per Job columns. Average Annual Earnings is the average of all combined jobs in sector. Total Industry Earnings is combination of all earnings in subsector.

[2]NAICS Sector 21 combined subsectors, including 211, 212, and 213.

[3]NAICS Sector 90 combined subsectors, including 901, 902, and 903.

[4]NAICS Sector 11 combined subsectors, including 111, 112, 113, 114, and 115.

Employment Statistics

Given Lander County's small residential population base and relatively high average annual median age, its existing and available civilian workforce has remained small. The relatively small workforce requires employers in Lander County to import workers from larger population centers in the region, including the cities of Winnemucca in Humboldt County and Elko in Elko County.

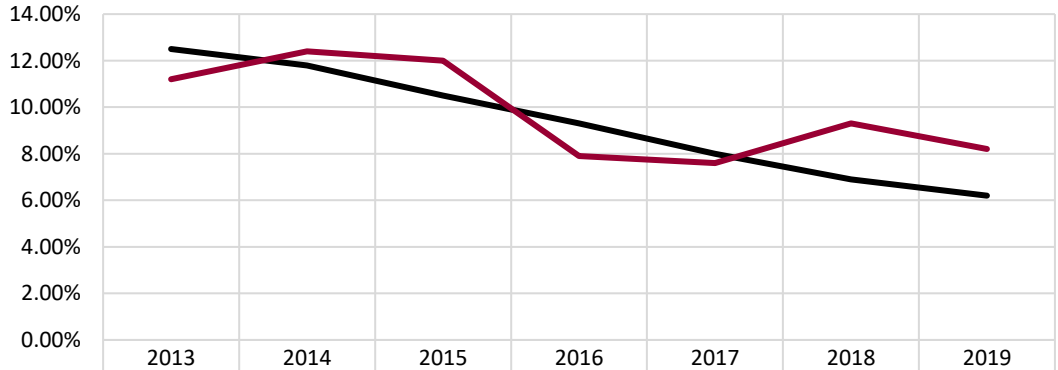
Table 4-2 - Select Statistics on Household/Family Income and Employment - 2019

	Lander	Elko	Eureka	Humboldt	State
Median household income	$81,006	$74,801	$67,882	$66,009	$54,763
Median family income	$88,463	$82,709	$97,831	$77,157	$64,567
Per capita income (per individual per year)	$30,874	$31,279	$32,578	$28,713	$28,128
Percentage of families with income below poverty level	9.6%	9.1%	12.4%	10.6%	12.7%
Civil labor force unemployment rate	8.2%	4.7%	0%	3.4%	6.2%

Source: University Center for Economic Development - College of Business, University of Nevada, Reno (2021)

Unemployment Rates

Compared with the state average that consistently dropped between 2013 and 2019, the Lander County unemployment rate has varied year to year, which may be attributed to the cyclical nature of some of the economic sectors (e.g., mining, agriculture). Figure 4-1 provides a chart of unemployment rates over time.



	2013	2014	2015	2016	2017	2018	2019
State Unemployment	12.50%	11.8%	10.5%	9.3%	8.0%	6.9%	6.20%
County Unemployment	11.20%	12.4%	12.0%	7.9%	7.6%	9.3%	8.2%

Figure 4-1: Lander County Employment Rates
Source: American Community Survey 5-Year Estimates, years between 2013-2019, Table DP03

Poverty Rates

The percentage of individuals and households living below the poverty level remained well below the state average until 2018, when it spiked to 15.4% before declining to 9.7% in 2019. However, two populations have seen a substantial increase in the percentage living below the poverty level—children under 18 and individuals over 60. The poverty rate percentage in both populations exceeded the state percentage in 2016 and has trended upward (refer to Figure 4-2).

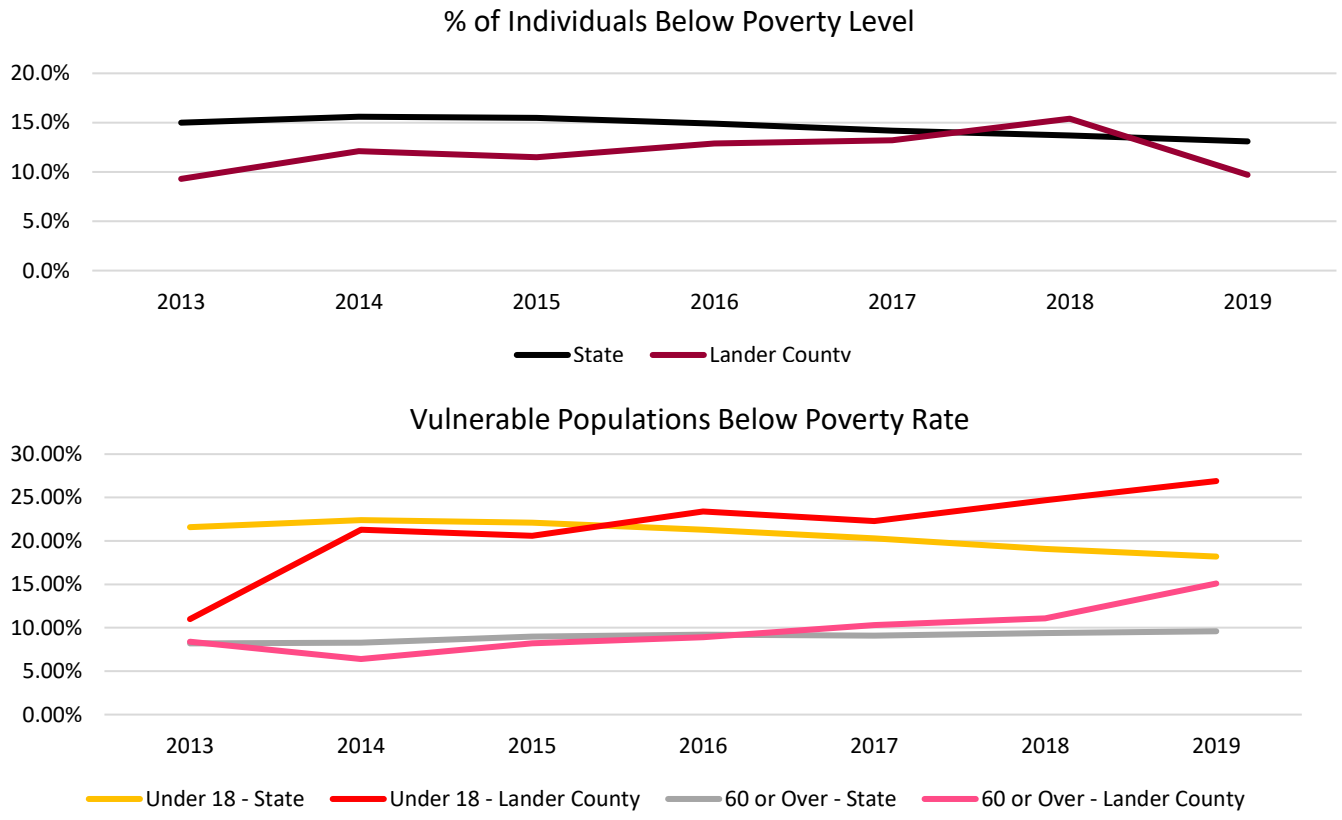


Figure 4-2: Poverty Rate Graphs 2013-2019
Source: American Community Survey 5-Year Estimates, years between 2013-2019, Table S2201

Building Permits

Residential building permits spiked considerably in 2013, with a total of 80 units constructed, including 15 single family structures and 65 multi-family structures with three to four units. However, since 2013, building permits have dropped considerably, with a range of two to seven units built, all single family structures, and several years without any building permit activity. So far in 2021, one residential building permit has been issued for a single family structure in Lander County[1] (refer to Figure 4-3). Presently, there are no commercial or industrial parcels under construction, with the exception of one professional office associated with the Lander County Hospital District currently.[2]

[1] (U.S. Department of Housing and Urban Development 2013-2021)
[2] (Lander County Assessor's Office 2021)

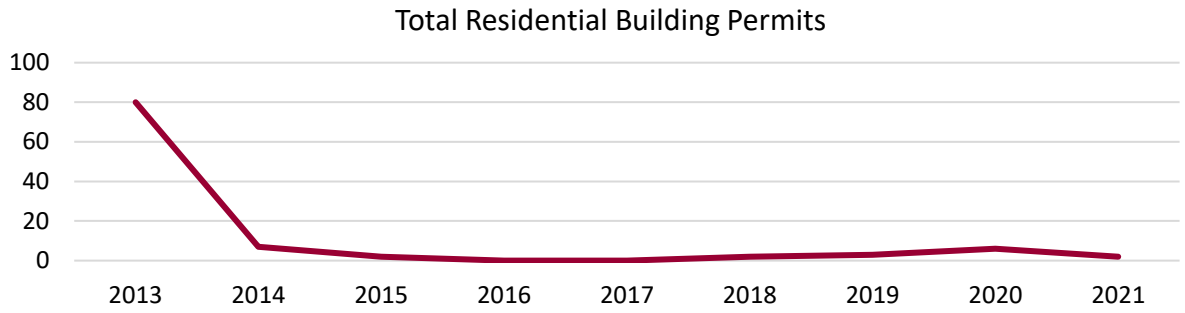


Figure 4-3: Total Residential Building Permits 2013-2021
Source: SOCDS Database, U.S. Department of Housing and Urban Development (2021)

Commercial and Industrial Parcels

Lander County currently has a total of 214 parcels used for commercial purposes and 46 used for industrial purposes.[3] Figure 4-4 provides a breakdown of the various commercial and industrial uses for these parcels.

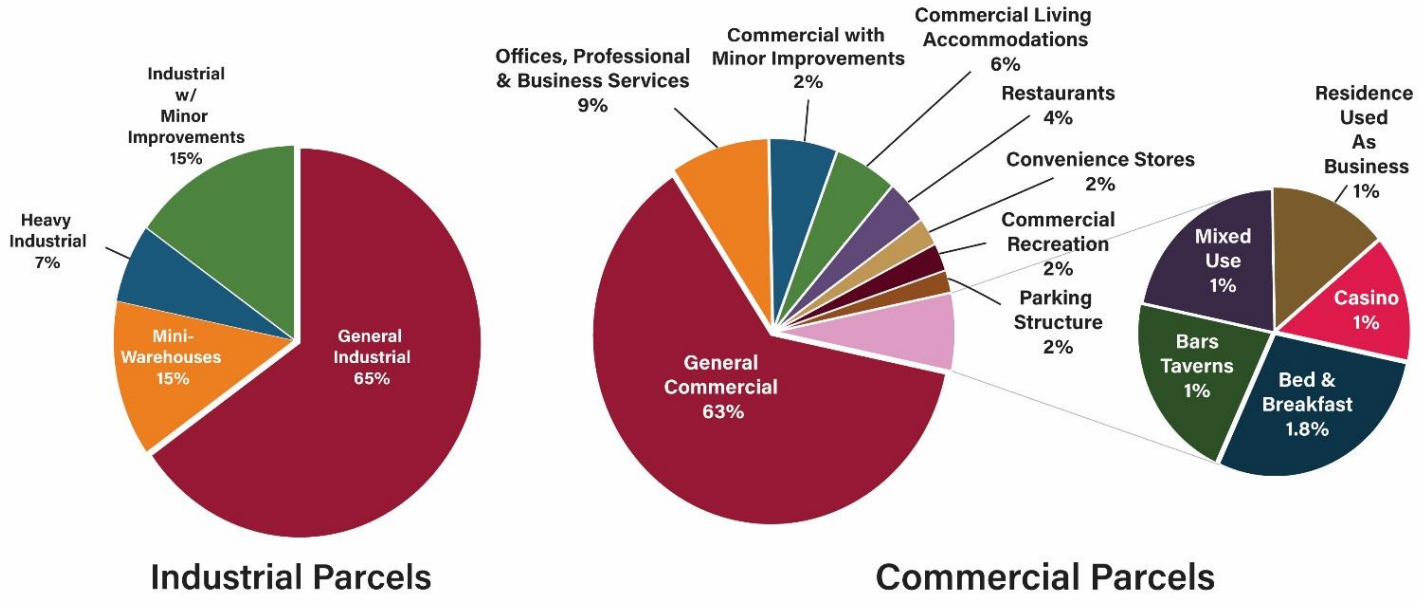


Figure 4-4: Industrial and Commercial Uses for Lander County Parcels
Source: Lander County Assessor Parcel Data (2021)

[3] (Lander County Assessor's Office 2021)

Focus Areas for Economic Development

In 2020, Lander County partnered with the University Center for Economic Development to update its comprehensive economic development strategy (CEDS). This plan is meant to guide economic development in Lander County between 2020 and 2025. Several priority goals were established and analyzed for feasibility, opportunities, and constraints (refer to Figure 4-5).

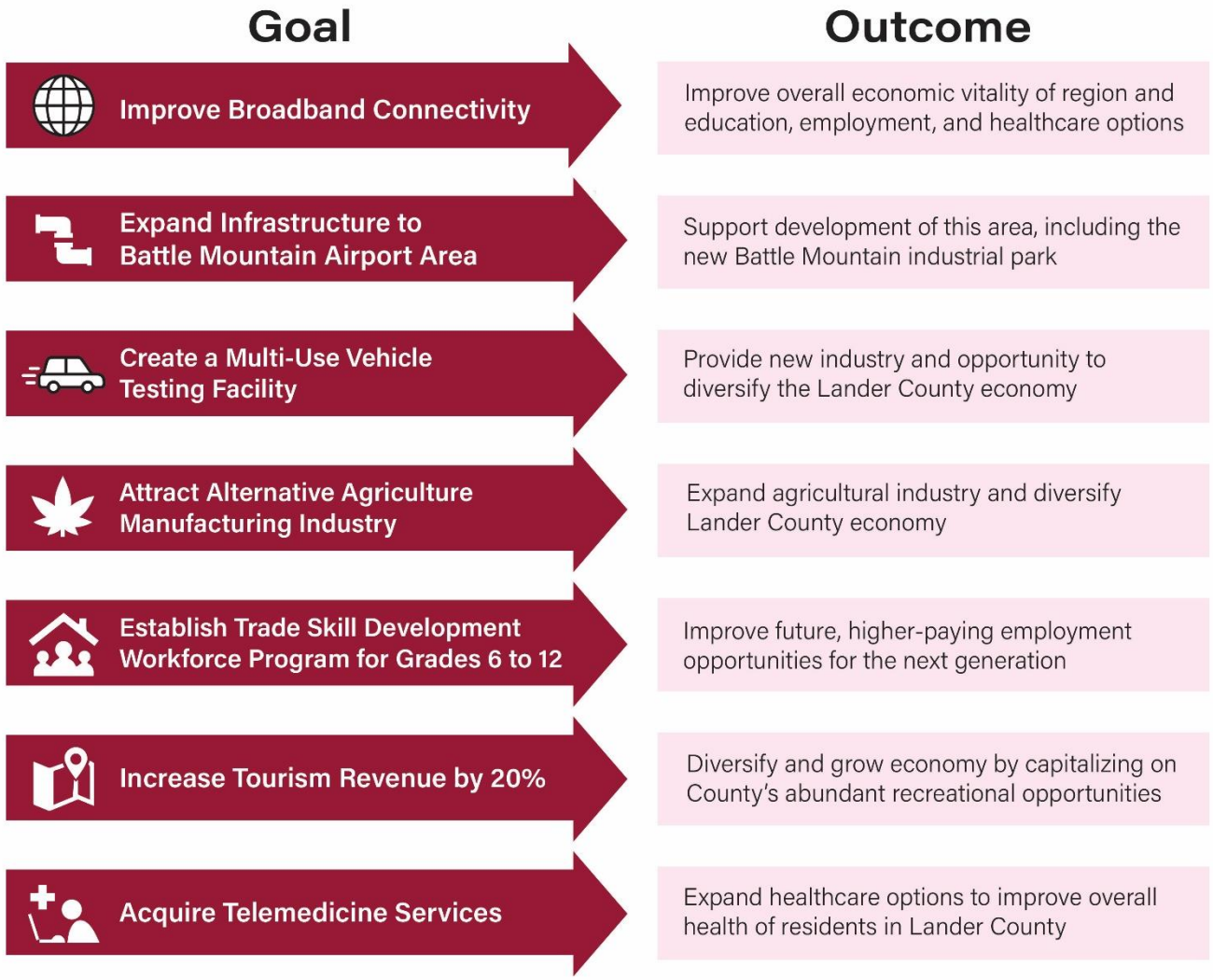


Figure 4-5: Consolidated CEDS Goals 2020-2015
Source: University Center for Economic Development - College of Business, University of Nevada, Reno (2020)

Looking to the Future

Implement CEDS Goals and Priorities[4]

The CEDS outlines specific strategies to improve economic conditions in Lander County between 2020 and 2025. Several areas addressed in the report, including expanding broadband service throughout the County, are currently in the planning phases. Future economic development efforts should use the CEDS report to guide decision-making. Implementing the majority of the goals will require careful collaboration with other entities and measuring progress based on the conditions outlined.

Expand Tourism/Recreation

Through development of the CEDS, Lander County created a goal to increase tourism revenue by 20% in the next five years, a 4% increase per year. To meet this goal, the County will need to develop a new five-year comprehensive marketing and advertisement strategy, design and construct visitor amenities (visitor's center, museum information station, community ambassador program), and create other tourism infrastructure and tools, including signage, mobile applications, improved website, and tourism guides. This process will also include developing a reuse plan for the historic County Courthouse to encourage heritage tourism and reuse of this building for tourist or entrepreneurial workspace amenities. The effort will require collaboration between the chambers of commerce for Austin and Battle Mountain and the Lander County Convention and Tourism Authority as well as other public and private entities (e.g., hotel and motel owners).

Alternative Agricultural Industries - Hemp

Exploration of alternative agricultural manufacturing, including hemp, is a section of the agricultural sector that Lander County is interested in pursuing and included as a CEDS goal. Hemp is a growing industry in the United States and particularly the west coast. This goal will require outreach and education of existing farmers on this commodity and the creation of Grower's Co-op to facilitate its cultivation. A regional processing plan will also further this goal, allowing for in-county processing and production of various products from hemp. This goal will require collaboration between the Lander County Development Authority, Lander County, and agricultural producers in Lander and Eureka Counties to promote regional development of this industry.

Renewable Energy Development - Reusing Reclaimed Mining Areas[5]

In February 2012, the Lander County Economic Development Authority contracted with Telesto Nevada Inc. to create a feasibility evaluation report to determine how renewable energy could be installed on existing or reclaimed mine sites. This report resulted from collaborative efforts with the BLM, Lander Economic Development Authority, and Nevada mining industry, forming a group called the Renewable Energy Development Feasibility Study (REDS). The report determined that geothermal energy was the most feasible renewable energy type on these sites in Lander County; however, geothermal resources are currently not coexisting with active mine sites. Other renewable resources, such as solar and wind, also have the potential to be located on existing or previous mine sites. Lander County, partnered with the REDS participants, may consider further exploring the opportunities presented in this report to expand renewable energy resources that may bring employment and other economic opportunities to the County.

[4] (Steinmann 2020)
[5] (Telesto Nevada Inc. 2012)

PUBLIC FACILITIES

Public Facilities, Services & Recreation

This section provides a guide for orderly and planned extension of the public services and facilities needed for the present and future residents of Lander County.

Goals

1. **Provide adequate public services and facilities commensurate with future needs in Lander County in a manner that is cost-effective and efficient to construct and operate.**

2. **Provide adequate public services and facilities that support development and improve the quality of life in Lander County.**

3. **Identify future major public facility and service improvements required in Lander County.**

4. **Minimize the creation of new domestic wells and septic systems within urbanizing areas where groundwater recharge occurs and the existing density of individual well and septic systems are at or nearing state-recommended standards.**

Policies

PF.1 Plan, design, construct, operate, and maintain all water supply facilities outside the existing or proposed Kingston water service area. Ensure that a safe and dependable water supply is available.

PF.2 Working with municipal water service providers, ensure that all capital improvement programming, funding, and construction for municipal water facilities are consistent with the goals, objectives, and policies in the Lander County Master Plan and appropriate service and facility plans.

PF.3 Prohibit the creation of new private water and wastewater utility companies in Lander County; water services are to be provided by local government agencies in Lander County.

PF.4 Require the use of water meters in Lander County. Water meters are essential to provide for water conservation, equity in billing for water use, and effective management of water resources.

PF.5 Ensure that areas planned for more intense development (parcel size less than 2.0 acres or nonresidential development) are served by a community water supply system and municipal sewer service in accordance with adopted County policies and ordinances. Dedicate all new systems and facilities to Lander County or the appropriate water service provider.

PF.6 Ensure that sufficient water rights are dedicated to Lander County or appropriate water service provider when new parcels are created. Ensure that water rights are the type and quantity required by water service providers in Lander County.

PF.7 Require municipal water service in all existing service areas and areas planned for future service expansion.

PF.8 Establish wellhead protection areas for municipal wells. Ensure that development proposals within designated wellhead protection areas do not create the potential for groundwater contamination.

PF.9 Encourage water purveyors to develop wellhead protection programs that can be integrated with local government new business or development review processes. Review applicable wellhead protection plans and consult with water purveyors when reviewing development proposals to determine if there is a conflict between the proposed development and a wellhead protection zone that poses a risk that cannot be reasonably mitigated or addressed in the development process.

PF.10 Have the County Public Works Director review plans for proposed facility improvements to ensure that such facilities meet Lander County standards prior to dedication.

PF.11 Have the County Public Works Director or a Nevada licensed engineer designated by Lander County provides construction management services for facilities to be constructed by parties other than Lander County.

PF.12 Ensure that the costs to provide water services are paid by those receiving services.

PF.13 Ensure that development requiring water service pays for the cost associated with facilities, capacity utilization, and treatment requirements.

PF.14 Ensure that off-site improvements, including water line extensions to serve new development created as a result of a parcel map or subdivision map or an existing parcel or parcels, are paid for by those requiring such service and at the actual cost to construct the improvement.

PF.15 Ensure that the cost to expand or improve storage, pumping or water treatment to serve new development created as a result of a parcel or subdivision map or an existing parcel or parcels is properly accounted for and allocated to those requiring such improvements.

PF.16 Review utility operating policies and ordinances to ensure that accurate cost recovery methods exist; ensure that appropriate changes to policies and ordinances are made.

PF.17 Coordinate all wastewater management facilities in Lander County outside the community of Kingston.

PF.18 Ensure that public utility system operators in Lander County have planning, design, construction, operation, and maintenance responsibility for all wastewater treatment and collection facilities. Lander County is responsible for wastewater treatment and collection in unincorporated areas.

PF.19 Ensure that wastewater treatment and collection facilities are developed in accordance with a capital improvements program. Have Lander County Sewer and Water District update and/or maintain current facility plans for wastewater treatment and sewer collection facilities.

PF.20 Construct sewage treatment and collection facilities concurrent with development of land uses generating demand for those facilities. Providing sewer collection to commercial and industrial zoned areas east of State Route 305 toward the airport could increase the prospects for additional economic development.

PF.21 Include all planned development with parcels less than 2.0 acres in the service area of a community sewage treatment facility. Do not overlap sewage treatment facility service areas overlap. Do not provide centralized/community sewage treatment facilities to areas planned for rural development (parcels larger than 4.5 acres).

PF.22 Ensure that the provision of sewage treatment services is not used to alter the adopted pattern or timing of development in Lander County.

PF.23 Establish programs for the provision of centralized service to those areas with failing septic systems or other service inadequacies to meet existing needs, and areas with the potential to pollute the water supply if developed on septic systems.

PF.24 Consider areas with a history of failing septic systems for municipal wastewater collection and treatment. Develop a voluntary water sample monitoring service to test well water samples from homeowners who volunteer for this service to determine if septic tank contamination or other issues are present.

PF.25 Update sewer and water master plans for community areas in Lander County.

PF.26 All new projects within or adjacent to the existing or proposed service areas may be required to connect to a subregional or regional wastewater treatment plant to provide dry sewers in anticipation of being connected to such a facility or to design the project so that the residences can be served by sewers installed in the public rights-of-way.

PF.26 Acquire additional lands for expansion of Battle Mountain cemetery. Work with adjacent landowners to secure additional sites for expansion. If land is not available for the expansion of the existing site, select and secure a new location for future development.

PF.27 Maintain wildland fire prevention activities in Lander County communities.

PF.28 Maintain fuel management programs for communities with agencies such as the Nevada Division of Forestry, BLM, and USFS.

PF.29 Support fire management policies established in the Lander County Policy Plan for Federally Administered Lands.

PF.30 Plan for the location of transmission lines designed and or/designated to operate at 200 kilovolt (kV) or greater that is consistent with any BLM plan, any transmission plan prepared by the Office of Energy and that is coordinated with the plans of adjacent jurisdictions. Require utility providers to locate transmission lines within an established corridor, as shown on the Above- Ground Utility Map and within all zoning, permitting, and other local, state and federal requirements.

PF.31 Allow amendments or additions to be made to the Above-Ground Utility Map, allowing for the location outside of established corridors if the applicant holds at least one public workshop and coordinates with Lander County, adjacent jurisdictions, the Nevada State Office of Energy, and BLM. The following findings must be made by the Lander County Board of Commissioners prior to approval:

1) Coordination occurred between the Nevada State Office of Energy, BLM, and any adjacent jurisdictions to establish consistency with any applicable transmission or resource management plans or any above-ground utility plans of adjacent jurisdictions.
2) Corridors do not conflict with existing or planned infrastructure or utility projects.
3) Project is designed to ensure safety and minimize impacts to the community.

PF.32 Facilitate development of recreational improvements on public and Forest Service lands.

PF.33 Have the Board of County Commissioners, the Lander County Public Land Use Advisory Planning Commission, and the Planning Commission review and comment on improvements and management initiatives proposed for Lander County.

PF.34 Ensure that recreational improvements limit conflicts with traditional users such as grazing, mining, and hunting/fishing interests.

PF.35 Ensure that recreational improvements provide direct benefits to local residents and the quality of life in Lander County.

PF.36 Ensure the protection and enhancement of recreation activities and access to public lands, which is very important for Lander County residents.

PF.37 Encourage federal and state agencies to develop/update improvement plans for Big Creek and Kingston Canyon Recreation Areas. Encourage additional winter recreational opportunities such as snowshoeing, cross-country skiing, backcountry accommodations, and snowmobiling.

PF.38 Integrate recreation improvements to a general county capital improvements plan.

PF.39 Make pedestrian-safe access and trails available from residential developments to park, recreation, and school sites.

PF.40 Support efforts to develop more indoor/winter structured recreational opportunities in Lander County.

PF.41 During development review, identify land for additional recreational site(s) and improvements as well as needed access for recreational purposes such as OHV, equestrian use, and hiking and biking to and from surrounding undeveloped lands.

PF.42 Work with local school districts to coordinate development of recreational facilities that have mutual benefit to schools and Lander County residents.

PF.43 Develop a transportation capital improvements plan that addresses priority street and roadway improvements.

PF.44 Support streetscape improvements along U.S. Highway 50 through Austin.

PF.45 Discourage the creation of offset intersection when such intersections are 200 feet or less apart.

PF.46 Ensure adequate funding for new development requiring public streets and to maintain a new system of streets and roads.

PF.47 Require new parcels created to meet existing standards that are consistent with the surrounding areas/neighborhoods.

PF.48 Evaluate how best to utilize railroads and sidings to promote industrial development and job creation since railroads are important assets for industrial development.

PF.49 Undertake streetscape Improvements in Battle Mountain to achieve the following outcomes:

a. Improve the aesthetic for residents and visitors to the area through the use of landscaping and lighting.
b. Increase pedestrian safety particularly school age children walking to and from schools in Battle Mountain.
c. Unify and connect commercial areas in Battle Mountain.

PF.50 Update County-Wide Road Plan.

PF.51 Support transportation goals and policies in the Lander County Plan for Public Lands.

PF.52 Develop a county-wide road map that designates all transportation-related facilities, rights-of-way, and roads that are included in the county system.

Available Public Facilities and Services

Overlooking Town of Austin, NV at Sunset

Over the next 20 years, some locations in Lander County are expected to grow in population and size while other locations are expected to continue declining. Future efforts by the County will take into account new growth and development and scale efforts for capital and infrastructure improvements to provide the greatest investment of public funding and resources for the community. Growth in population and certain economic sectors can substantially influence the amount of demand and availability of resources in the County. Although Lander County is not projected to grow significantly, replacing aging infrastructure and providing adequate facilities and services to encourage growth are two important focal points for public facilities planning in the Master Plan.

Table 5-1 provides a summary of the facilities and improvements required for areas with residential Master Plan categories. Commercial and industrial Master Plan categories will vary depending on the use and location. More information on specific requirements for each category is located in the Land Use chapter.

Table 5-1 - Facilities and Improvements Required

Master Plan Category	R	RR	LD	MD	HD	MF
Legal Access	X	X	X	X	X	X
Grants of ROW and Easements	X	X	X	X	X	X
Curb, Gutter & Sidewalks				X	X	X
Electricity	X	X	X	X	X	X
Water						
Municipal	X	X	X	X	X	X
Domestic Well	X	X	X			
Wastewater						
Municipal	X	X	X	X	X	X
Septic	X	X	X			

- Service requirements for non-residential uses (Commercial, Tourist Commercial, Industrial, Government Purpose) will vary depending on project and location.
- This table is intended to provide guidance moving forward. Special cases may exist that do not completely follow this guidance. Lander County should use its discretion when applying this table.

Current Conditions and Trends

Water Resources

Lander County Combined Sewer and Water General Improvement District

The Lander County municipal water system is a well-functioning system with stable and consistent water pressures and supply. Approximately 1,234 water connections exist in Battle Mountain. The potable water system consists of four groundwater wells, two water storage tanks, a booster pumping station, two pressure regulation valve (PRV) stations, and several miles of transmissions and distribution mains. The water system has available excess capacity in groundwater supply, water storage, transmission, and distribution of water rights. Lander County Public Works designs, plans, and monitors these systems. The existing municipal water service area and proposed service area of Battle Mountain are shown in Figure 5-1. Figures 5-2 and 5-3 provide maps of the existing water infrastructure in Battle Mountain.

Table 5-2 - Population and Water Demand

Users	2016/2017
Total Active Customers	1,234 customers
Residential	1,064 customers
Commercial	170 customers
Water Pumped	311,814,016 gallons
Average Per Customer Per Day	692.4 gallons

Source: Water and Sewer Master Plan Update, Day Engineering (2017)

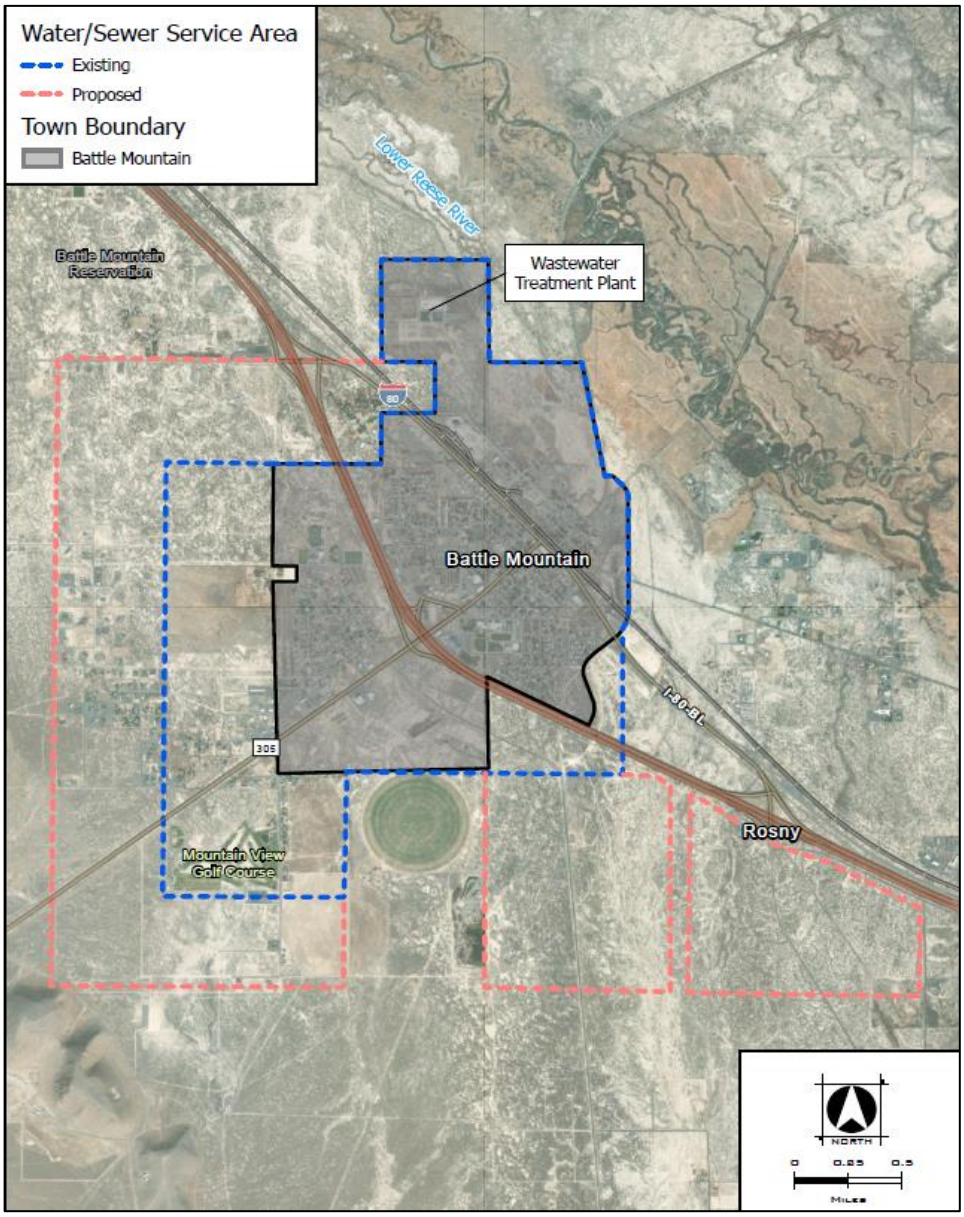


Figure 5-1: Lander County Water/Sewer Service Area
Source: Water and Sewer Master Plan Update, Day Engineering (2017)

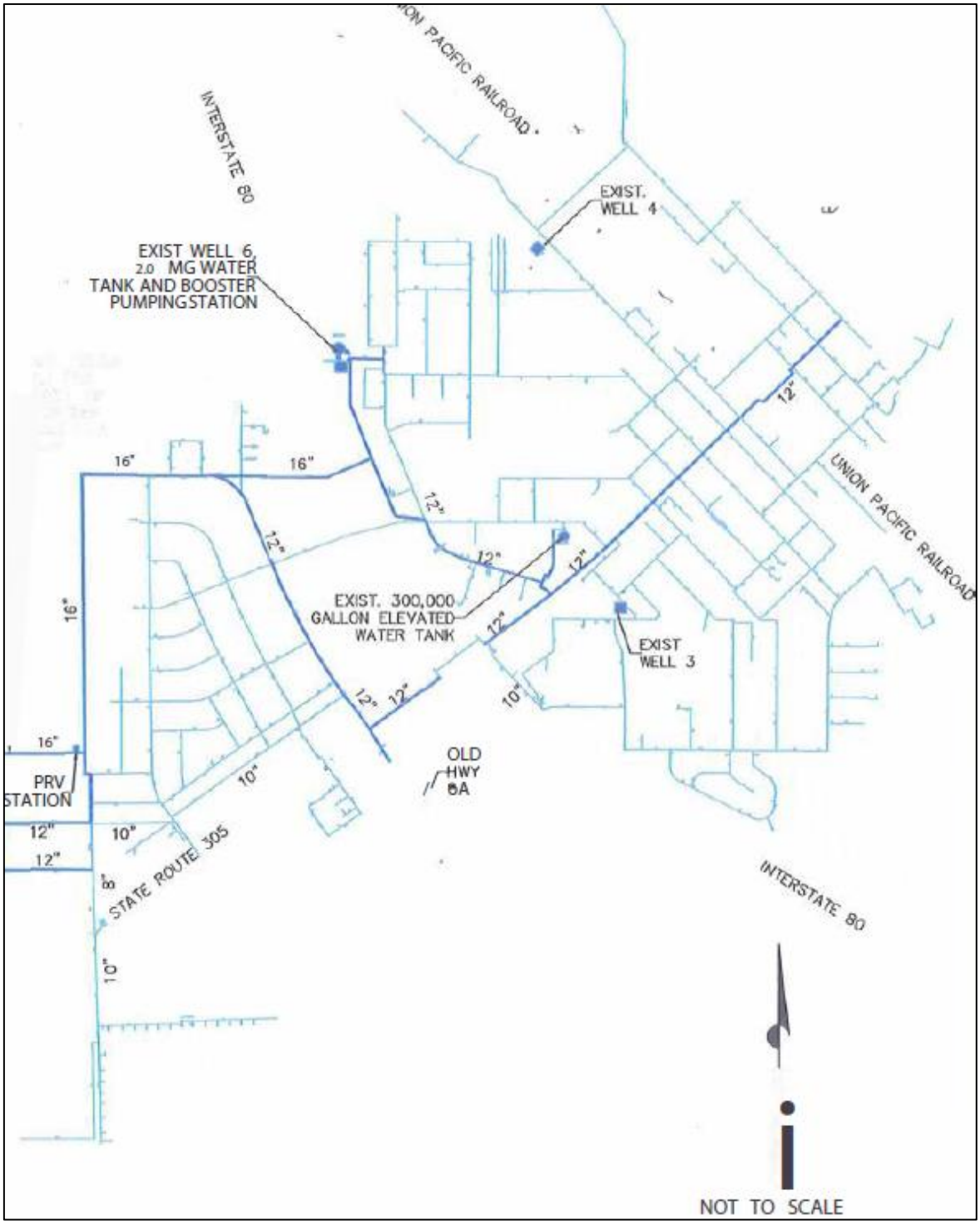


Figure 5-2: Battle Mountain Water Facilities Location Map
Source: Water and Sewer Master Plan Update, Day Engineering (2017)

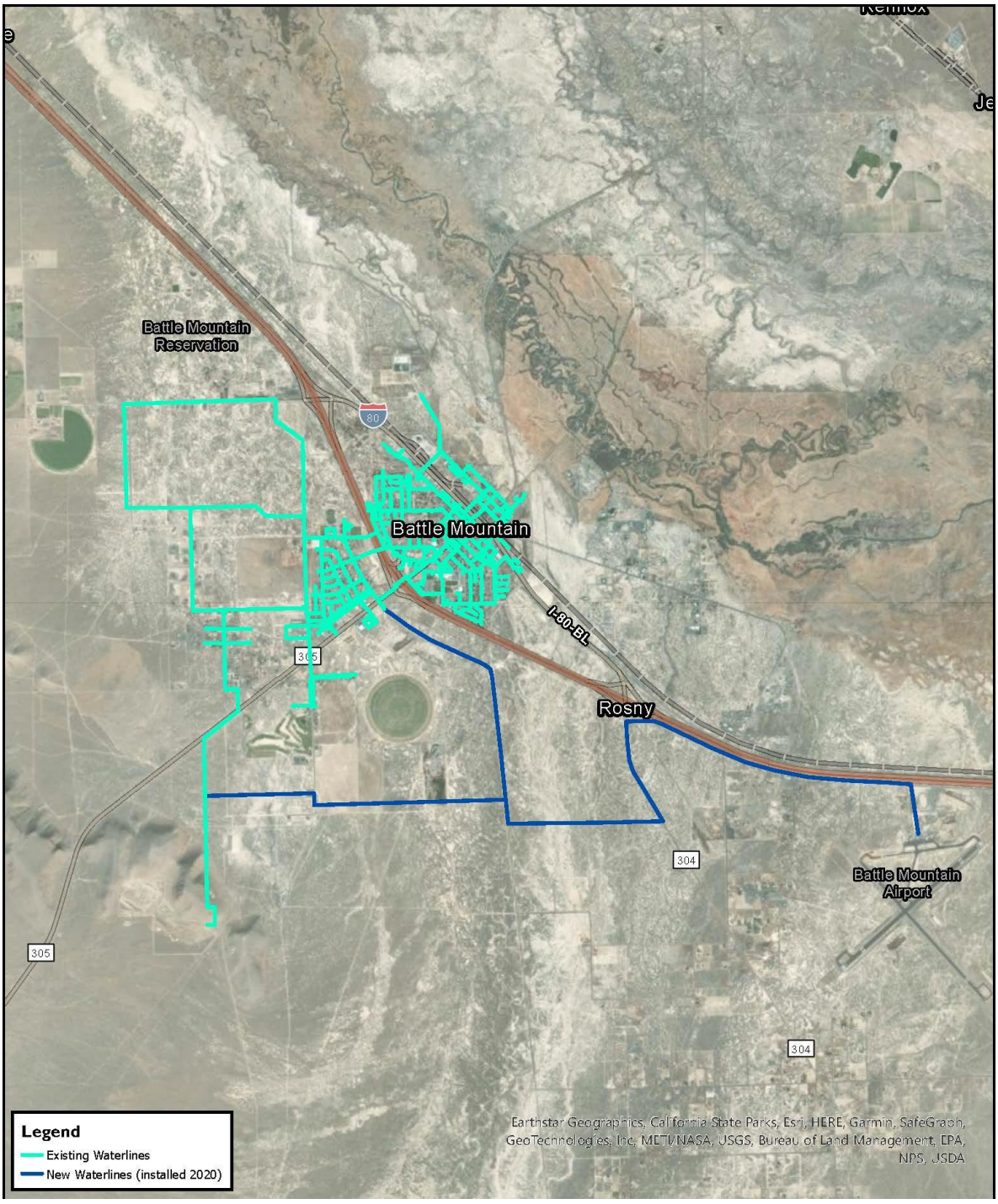


Figure 5-3: Water Facilities Location Map
Source: Water and Sewer Master Plan Update, Day Engineering (2017)

Water Rights

Groundwater is the sole source used to meet water demands in Battle Mountain. Battle Mountain has water rights in two basins: Basin 64 - Clovers area, which includes all of the non-potable town wells, and Basin 59 - Lower Reese River Valley. Both basins are over-allocated, meaning the existing water rights exceed supply. Basin 59 is a designated basin, meaning the State Engineer will no longer permit new appropriations (or water rights) in that basin. Table 5-3 provides the status of existing water rights in the Battle Mountain service area.

Table 5-3 - Allocated Municipal Water Rights

Well	Basin	Amount Allocated (acre-feet)	Status
1	64	724	Abandoned
2	59	---	Abandoned - Moved to Wells 7 & 8
3	64	0	Certified/Active
4	64	448	Certified/Active
6	64	1,091	Certified/Active
7	59	645	Permitted/Active
8	59	423	Permitted/Active
9	59	222 (temporary)	Temporary permit, expired after 1 year; reverted to Well 8
Airport	59	12.3	Certified/Active
Source: Water and Sewer Master Plan Update, Day Engineering (2017), page 30			

To maintain the rights of wells 7 and 8, Lander County will need to change the status of these water rights from "permitted" to "certified" with the State Engineer. Certified water rights are rights for which the owner has provided proof of beneficial use. Permitted water rights have been permitted by the State Engineer, but proof of beneficial use has not been provided. In Nevada, the doctrine of prior appropriation is used for water rights. The foundation of this doctrine is two principles—first in time, first in right and beneficial use. Simply, this concept means the oldest water right holders (priority right holders or senior rights holders) are entitled to their allocated water amount before newer (or junior) water rights holders. To maintain a water right, the water right holder must prove to the State Engineer that the water is being diverted and used for a beneficial purpose (or beneficial use).[1]

Water rights are a critical factor in future growth and full utilization of wells in Basin 59. The County may be able to purchase additional existing groundwater rights in Basin 59 and transfer these rights to Well 9, using an existing groundwater permit rather than an additional appropriation (the basin is "designated," meaning no new appropriations are allowed within it). Purchasing water from the mines and irrigation rights may be the best way to provide additional water in this basin.[2]

[1] (Welden 2003)
[2] (Day Engineering 2017)

Austin Water System[3]

Austin is in the Lander County Sewer and Water General Improvement District. Formerly, this district was separate from the remaining Lander County district but has since been consolidated. The Austin portion of the district has few customers and is primarily focused on reducing operational costs while maintaining safe and accessible water supply for the customers of Austin. Municipal water service was expanded into Austin by the 1986 Pipeline Project. Major expansions have included connecting the pipelines in 1988 to the school in the Reese River Valley and connecting to USFS area in 2004. Proposed improvements are included in the Looking to the Future section of this document as well as the Austin Preliminary Engineering Report prepared by Day Engineering in 2016.[4]

Table 5-4 - Population and Water Demand	
Users	Year - 2009*
Total Active Customers	311 customers
Residential	225 customers
Commercial	49 customers
Water Pumped	19,152,300 gallons
Average per customer per day	471 gallons
Source: Austin Preliminary Engineering Report, Day Engineering (2016), page 10 *More recent water use data was not available at the time of this Master Plan Update.	

Existing number of components and capacity of the Austin water system are included in Figure 5-4 below.

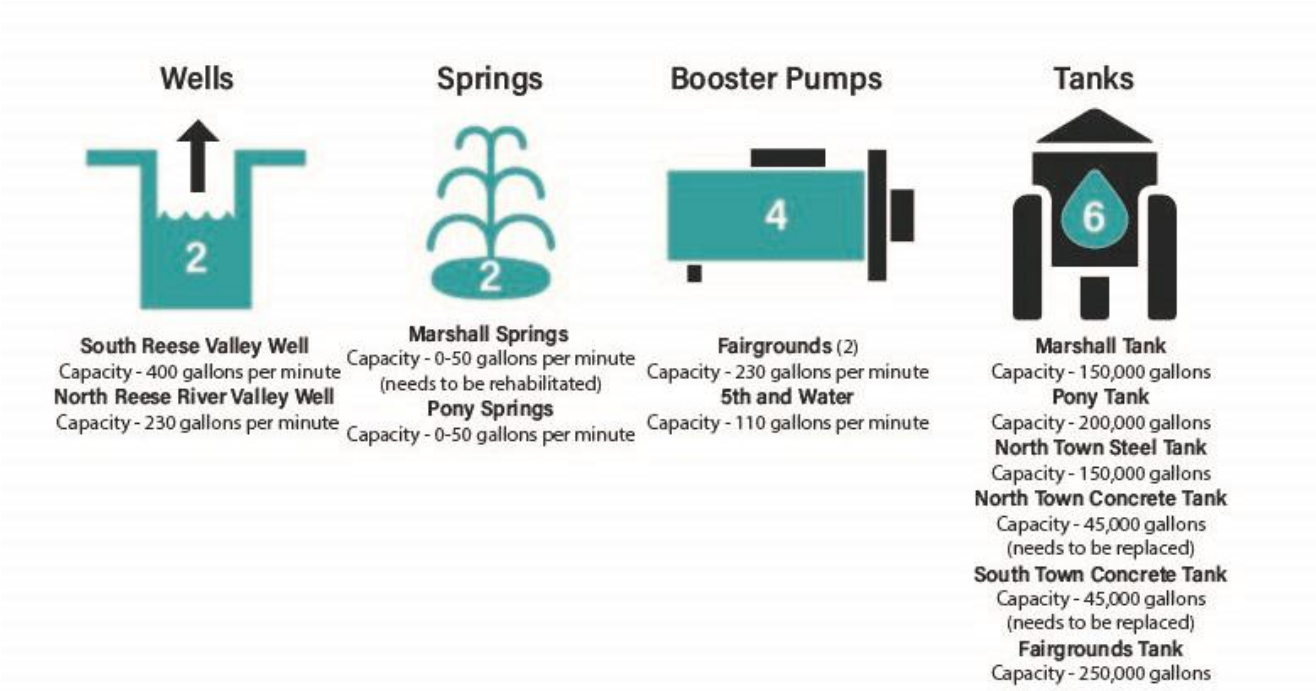


Figure 5-4: Austin Water Supply System Components
Info Source: Austin Preliminary Engineering Report, Day Engineering (2016), page 10

[3] (Day Engineering 2016)
[4] (Day Engineering 2016)

Challenges

Several conditions of Austin make repairing and maintaining the water system challenging. The remoteness of Austin creates issues since the town is 110 miles from an electrician, contractor, or qualified help as well as parts to repair any issues with the water system. An as-needed contract certified operator is available but seldom works in Austin due to the expense. The water district in Austin is directed by a five-person, volunteer board, and the operation of facilities is managed by one full-time operations employee and a part-time office employee. Additionally, the board has term limits determined by state law, making previous board members ineligible to serve after several years. The lack of personnel and continuity with board members makes planning and directing activities for the water system challenging. Monitoring progress toward goals is also challenging due to the loss of institutional knowledge as employees and board members resign and are replaced.

Water Quality

Water quality is a major issue for Austin. The water supply is provided by two springs and an underground well, with an additional underground well available for emergency purposes. There is an additional well located in the Reese River which contributes to the water supply. Uranium is naturally found in the spring water supplies, above the minimum regulations of NDEP, but is blended with well water to dilute to an allowable level. Water also is non-compliant with NDEP Bureau of Safe Drinking Water Standards for arsenic. Projects to remedy these issues are included in the Looking to the Future section of this document and the Austin Preliminary Engineering Report prepared by Day Engineering in 2016.[5]

Kingston Water System

The town of Kingston is served by its own community water system. The service area had a population of approximately 331 in 2009. The population as of 2020 was certified by the Governor as 120. There are another 214 property owners in the area paying a standby fee for undeveloped parcels that could connect to the system in the future. The system's two main groundwater wells produce approximately 350 gallons per minute. As a result, the current per capita daily demand ranges from 150 to 200 gallons. Total water delivered to customers could be as little as one-third (current estimates) of the total amount pumped each year. Kingston Town Water Utility has dropped its water waste to an average of 9%, down from 80%, due to improvements to the system, especially the Phase Four Water Improvements in 2007.

In a five-year period, Kingston nearly doubled in size based on utility hook-ups. In 1995, there were approximately 66 users, compared to 115 users in December of 2000 and 144 users in 2010. The level of growth between 1995 and 2010 was substantial. However, growth slowed down significantly from 2010 to 2020. Commercial development in the Kingston area is somewhat limited. There are several parcels in the town's service area that are currently used for tourist commercial and general commercial activities, such as a store, restaurant, real estate office, church, and lodging. The total number of active (155) and inactive (15) water customers utilize approximately 68% of the water currently under permit for two groundwater wells (could be much lower today considering the improvements to the system and decline in growth).

The Kingston water storage system has two storage tanks: a 225,000-gallon tank and 180,000-gallon tank. The distribution system is currently in good condition with some leakage among old meters. In the past, breaks in

[5] (Day Engineering 2016)

the distribution system accounted for the relatively high pumping rates. The main line in the core community area was replaced in 2001. In the past several years, approximately 50,000 feet of water distributions line has been replaced and new fire hydrants installed. The Phase four Project in 2007 replaced approximately 14,000 transmission lines, dropping the leak rate to approximately 9%.

There are no treatment requirements for the system at this time; however, the system is treated with disinfectant (chlorine). The town's water quality is generally characterized as good and meets primary and secondary drinking water standards. It is important to note that Kingston operates an induction well that receives infiltration from Kingston Creek. The current permit allows for diversion of 1.35 cubic feet per second or 605 gallons per minute and a total withdrawal of 231.8 acre feet per year. The town is currently permitted to pump 2,500 gallons per minute for a total of 268.2 acre feet annually from a second groundwater well. Both wells are located at a depth of approximately 80 feet. The town has rights to two springs that have a total diversion rate of .0259 cfs or 11.6 gallons per minute. The town's two wells cannot run at the same time; therefore, the highest pump rate for the wells is approximately 230 gallons per minute at one time. A new water source may be needed in the future.

Wastewater Treatment and Collection

Battle Mountain Sewer System

The Battle Mountain sewer system is publicly owned and operated. The system has approximately 1,080 connections. The system consists of six sewer lift stations and several miles of gravity mains and interceptors, and it was recently upgraded to a sequencing batch reactor (SBR) treatment plant with two SBRs, a chlorine contact basin, and an aerobic digester with three High Density Polyethylene HDPE single-lined ponds for biosolids storage[6] (Figure 5-5 displays the basics of this type of plant).

Because of the topography of Battle Mountain, the reach of gravity sewer mains is limited and requires several lift stations through the town. In the previous 2010 Lander County Master Plan and a study by Shaw Engineering in 2002, the sewage collection system was described as leaking and aging. Since that time, several parts of the system have been upgraded as part of improvements projects designed in the Shaw Engineering study in 2002.[7]

The treatment plant is capable of treating 0.80 million gallons per day (MGD) and may be expanded in the future to 1.2 MGD. All sewage from the town of Battle Mountain is discharged to the headworks at the treatment plant north of town on Animal Shelter Road. Chlorinated, treated effluent (or treated wastewater) was previously discharged to the Lower Reese River but is now discharged to a wetland discharge basin. The effluent is treated to Reuse Category D, which can be used for some irrigation and dust control. Figure 5-6 provides a map of the wastewater facilities and infrastructure in Battle Mountain.

[6] (Nevada Department of Environmental Protection 2021)
[7] (Day Engineering 2017, p. 68)

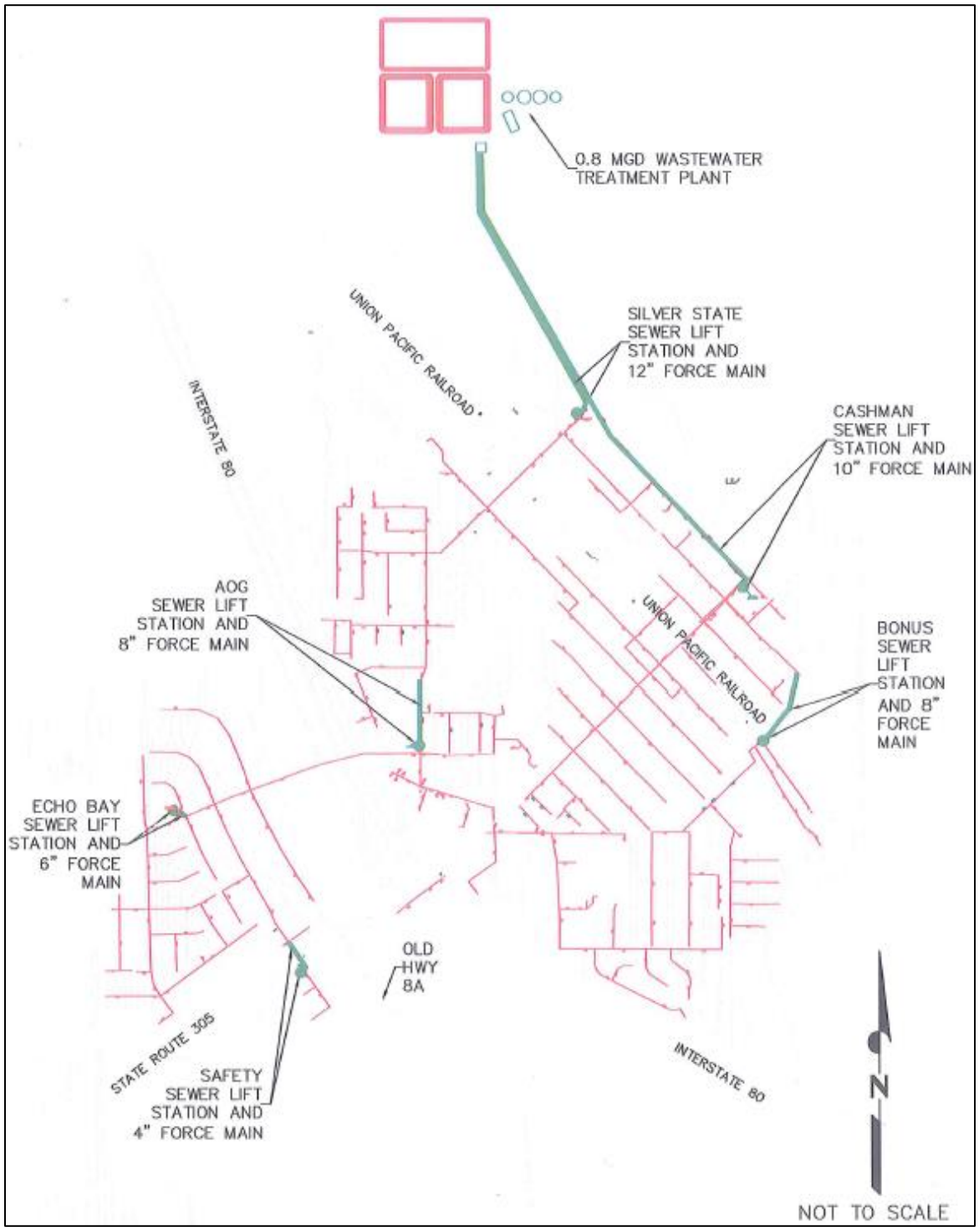


Figure 5-6: Battle Mountain Wastewater Infrastructure Map
Source: Water and Sewer Master Plan Update, Day Engineering (2017)

Austin Sewer System[8]

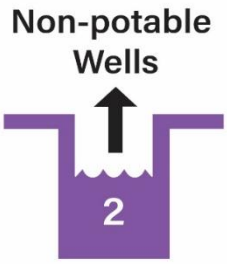
The Austin Sewer District has been consolidated with Lander County Combined Sewer and Water General Improvement District. The system in Austin serves approximately 166 customers (commercial and residential) with a buildout capacity of 800, which leaves the community with ample room to expand services. In the past two decades, existing settling ponds were relocated approximately two miles farther to the west to accommodate anticipated growth in the area west of Austin. The current system is capable of treating approximately 240,000 gallons per day. Effluent management occurs through the use of evaporation ponds. With the relocation of the sewer ponds, additional areas west of Austin can be developed utilizing municipal wastewater collection and treatment. Expansion of the system to the west of the treatment ponds will likely require construction of new collection facilities, including pumping facilities. Development in the area down gradient requires careful coordination to plan and finance required improvements.

Table 5-6 - Lander County Max Septic Density by Groundwater Basin

Groundwater Basin	NDEP Max Septic Density (Per Square Mile)	Highest Existing Septic Density (Per Square Mile)*
Battle Mountain		
Lower Reese River Valley	111	±60
Clovers Area	99	±98
Kingston		
Big Smoky Valley	200	±66
Austin		
Teels Marsh Valley	50	±7
* Based on center point of most dense area. Actual measurement may be more or less depending on a specific parcel location.		

Non-Potable Water Sources

A non-potable water system (for water not suitable for drinking water but suitable for other uses) is located in Battle Mountain and includes three deep wells, one water storage tank, and a booster pumping station. Non-potable water is available from Wells 3 and 4 (refer to Figure 5-2). Water from these non-potable sources helps relieve demand on potable sources for the peak months in the summer. Figure 5-7 and Table 5-5 provide information on this supply. The wastewater treatment facility currently produces effluent treated to Reuse Category D (Nevada Administrative Code [NAC] 445A.276), but it is currently not used for non-potable purposes other than discharge into wetland basins.



Well 3 - Irrigation
Elquist Park,
Junior High School Football and Baseball fields,
Altenburg Little League

Well 4 - Truck Filling
Truck filling for construction activities

Figure 5-7: Non-potable Well Uses in Lander County

Table 5-5 - Non-Potable Irrigation Usage

Users	May-November 2016
Elquist Park	2,529,000 gallons
JR HS Baseball Field	101,000 gallons
JR HS Football Field	3,501,000 gallons
JR HS Sprinklers	3,132,000 gallons
Altenburg Little League	803,000 gallons
Source: Water and Sewer Master Plan Update, Day Engineering (2017), page 42	

[8] (Lander County 2010)

Septic Systems and Water Quality

Historically, individual wastewater disposal systems (septic systems) have been used in Lander County for areas outside of municipal wastewater infrastructure. Of the 7,774 parcels in Lander County, only 1,038 (or 12%) are on septic systems. The non-septic system parcels are either served by municipal services or, in most cases, are vacant undeveloped parcels or do not have a use requiring a septic system. Septic systems can be a viable solution for rural areas that typically have limited municipal sewer service. However, septic systems can have the potential to contribute to poor groundwater quality in certain areas if they exceed the maximum density of septic systems per square mile within a groundwater basin as defined by NDEP. According to NDEP, there are sixteen groundwater basins in Lander County, each with a different maximum density for septic system use. Figure 5-9A depicts the groundwater basins in Lander County and areas with existing septic systems. Table 5-6 identifies NDEP-established maximum density for septic systems per square mile by groundwater basin for each of the more populated areas of Lander County.

Currently, the majority of the septic system density is located in Battle Mountain. Only one groundwater basin in Battle Mountain, Clovers Area, is at or near maximum septic system density. This area in the Clovers Area basin has been identified as an area to be served by municipal water and sewer service in the near future, which would prevent the area from becoming overly dense with septic tanks. Figure 5-9B depicts the groundwater basins in Battle Mountain and septic tank density specific to those areas as well as existing and future municipal service areas.

As Lander County grows, it is vital to understand the impact of septic systems on groundwater and particularly drinking water resources. Although the County encourages all new development in more densely populated areas to connect to the municipal wastewater infrastructure, it may not always be feasible. Existing septic systems and development outside of the municipal wastewater service area can contribute to water quality issues if not carefully mitigated or if more intense development is allowed outside of municipal serve areas.

Figure 5-8 demonstrates how residential septic systems operate. In Lander County, individual wastewater disposal systems are required to have a permit issued by the County. For subdivisions that include five or more lots served by septic, a permit from NDEP is also required.

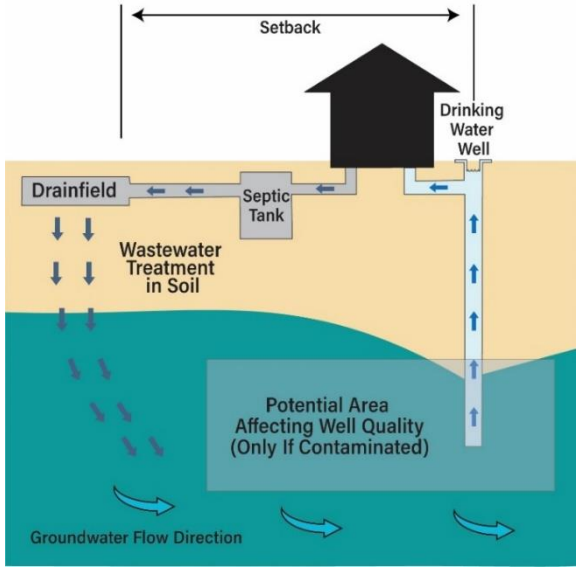
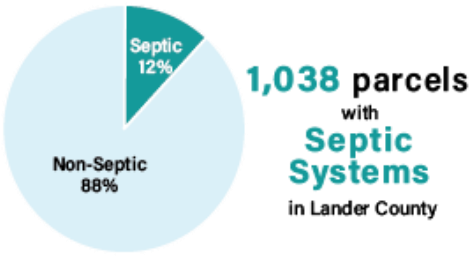


Figure 5-8: Septic Systems and Drinking Water



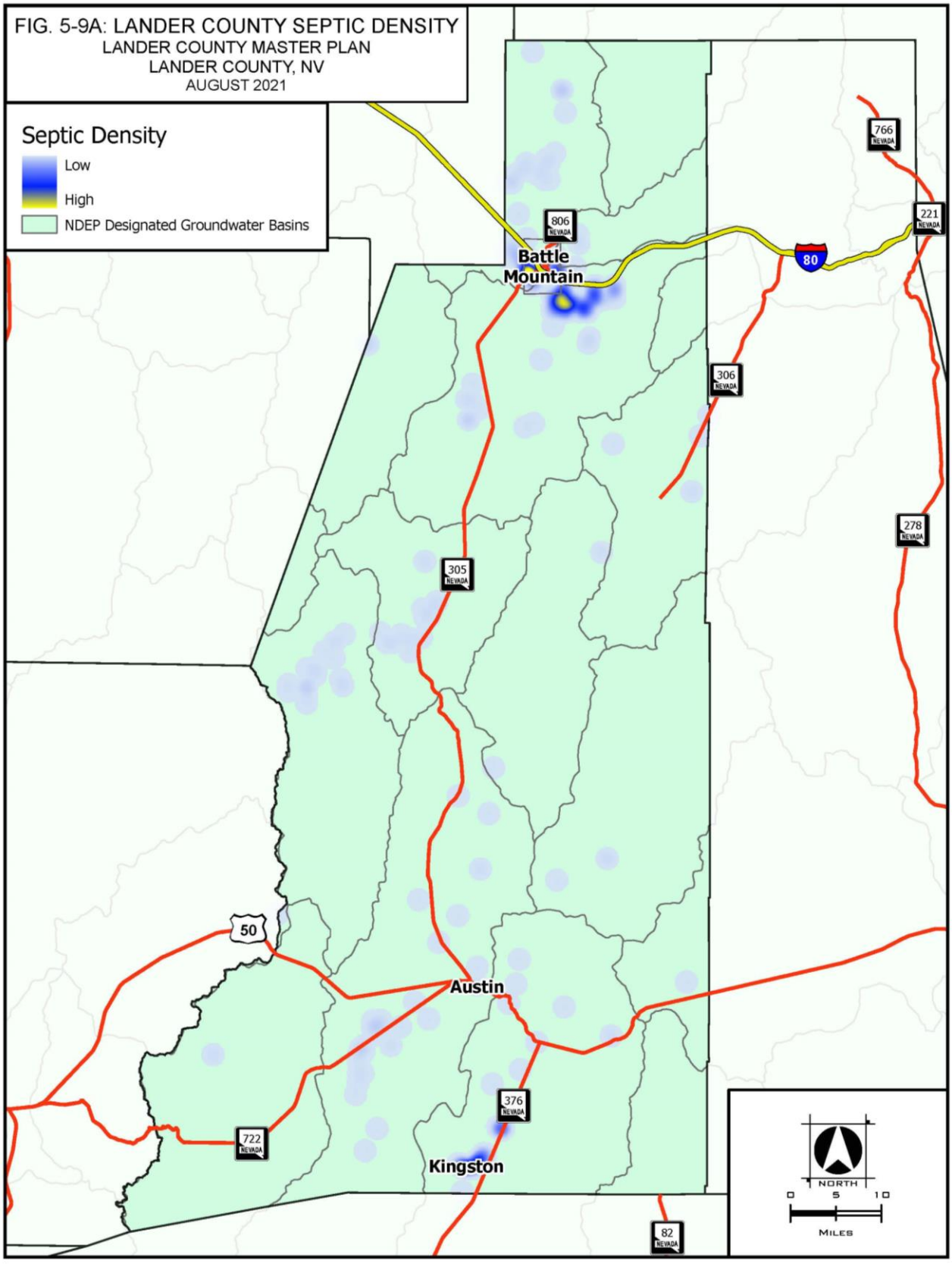


FIG. 5-9A: LANDER COUNTY SEPTIC DENSITY
LANDER COUNTY MASTER PLAN
LANDER COUNTY, NV
AUGUST 2021
Septic Density
Low
High
NDEP Designated Groundwater Basins
Battle Mountain
Austin
Kingston
766 NEVADA
806 NEVADA
221 NEVADA
80
306 NEVADA
278 NEVADA
305 NEVADA
50
376 NEVADA
722 NEVADA
82 NEVADA
NORTH
0 5 10
MILES

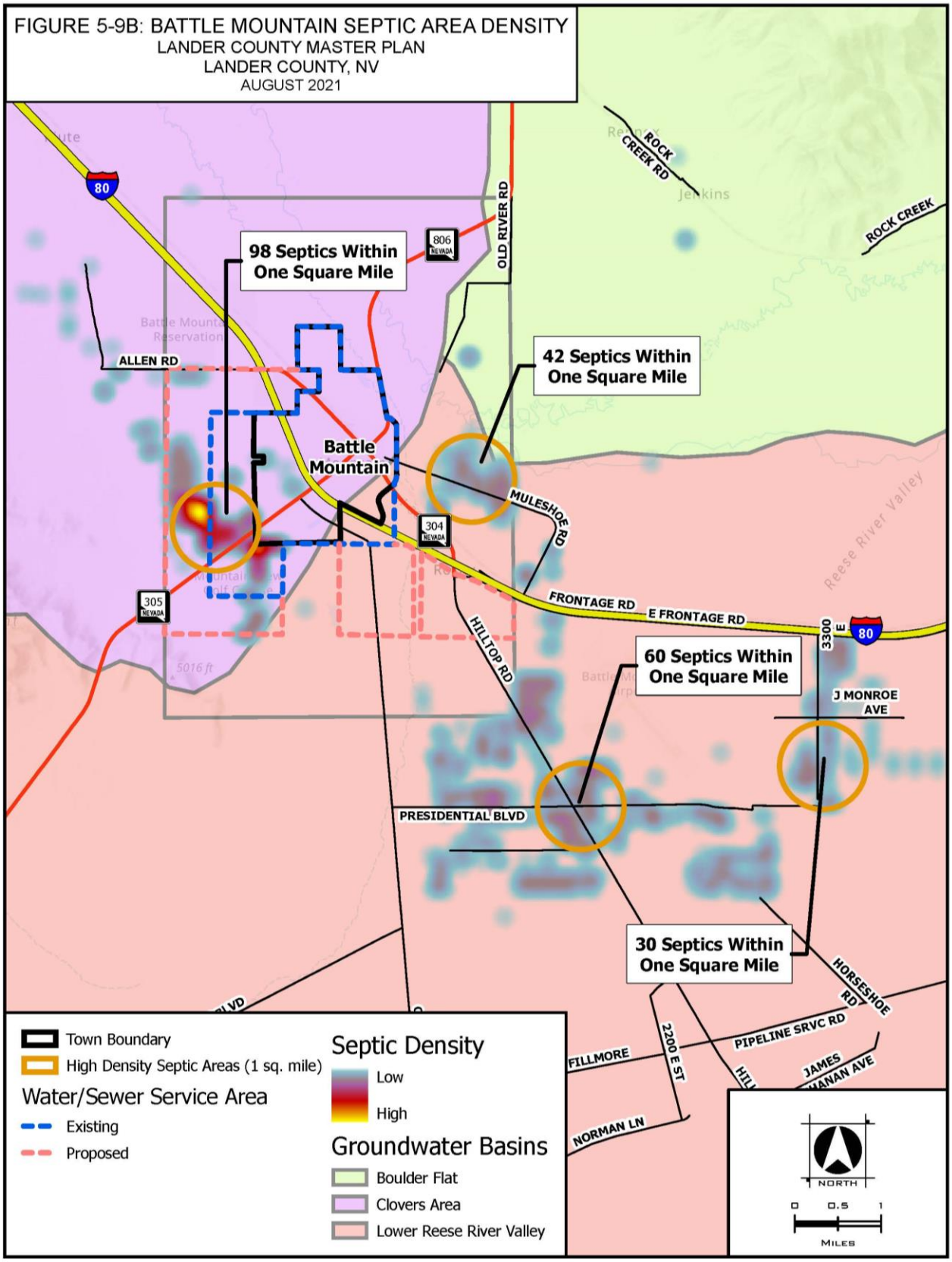


FIGURE 5-9B: BATTLE MOUNTAIN SEPTIC AREA DENSITY
LANDER COUNTY MASTER PLAN
LANDER COUNTY, NV
AUGUST 2021
98 Septics Within One Square Mile
42 Septics Within One Square Mile
60 Septics Within One Square Mile
30 Septics Within One Square Mile
Battle Mountain
ALLEN RD
OLD RIVER RD
ROCK CREEK RD
ROCK CREEK
MULESHOE RD
FRONTAGE RD
E FRONTAGE RD
HILLTOP RD
PRESIDENTIAL BLVD
J MONROE AVE
3300 E
HORSESHOE RD
PIPELINE SRVC RD
FILLMORE
2200 E ST
JAMES
NORMAN LN
Jenkins
Reese River Valley
Town Boundary
High Density Septic Areas (1 sq. mile)
Water/Sewer Service Area
Existing
Proposed
Septic Density
Low
High
Groundwater Basins
Boulder Flat
Clovers Area
Lower Reese River Valley
NORTH
0 0.5 1
MILES

Transportation

Lander County's large land area and low population result in a transportation network that is made up of interstates, U.S. highways, state highways, airports, and railroads focusing heavily on the movement of freight. Most transportation infrastructure is located in one of the three census-designated towns: Kingston, Austin, and Battle Mountain. The major roadways (I-80, U.S. Route 50, Nevada State Routes) connect to the state and nation physically and economically, providing a vital transportation network to distribute resources to and from the County. Preserving and improving these routes is crucial for the future of the County.

Figure 5-10 illustrates the existing transportation network through Lander County and each of the towns. Kingston and Austin have limited transportation options, with a high percentage of unpaved roads. I-80 and the rail line bisect Battle Mountain with mostly paved local streets and state highways and to a designated bicycle lane along Nevada State Route 305/Broad Street.

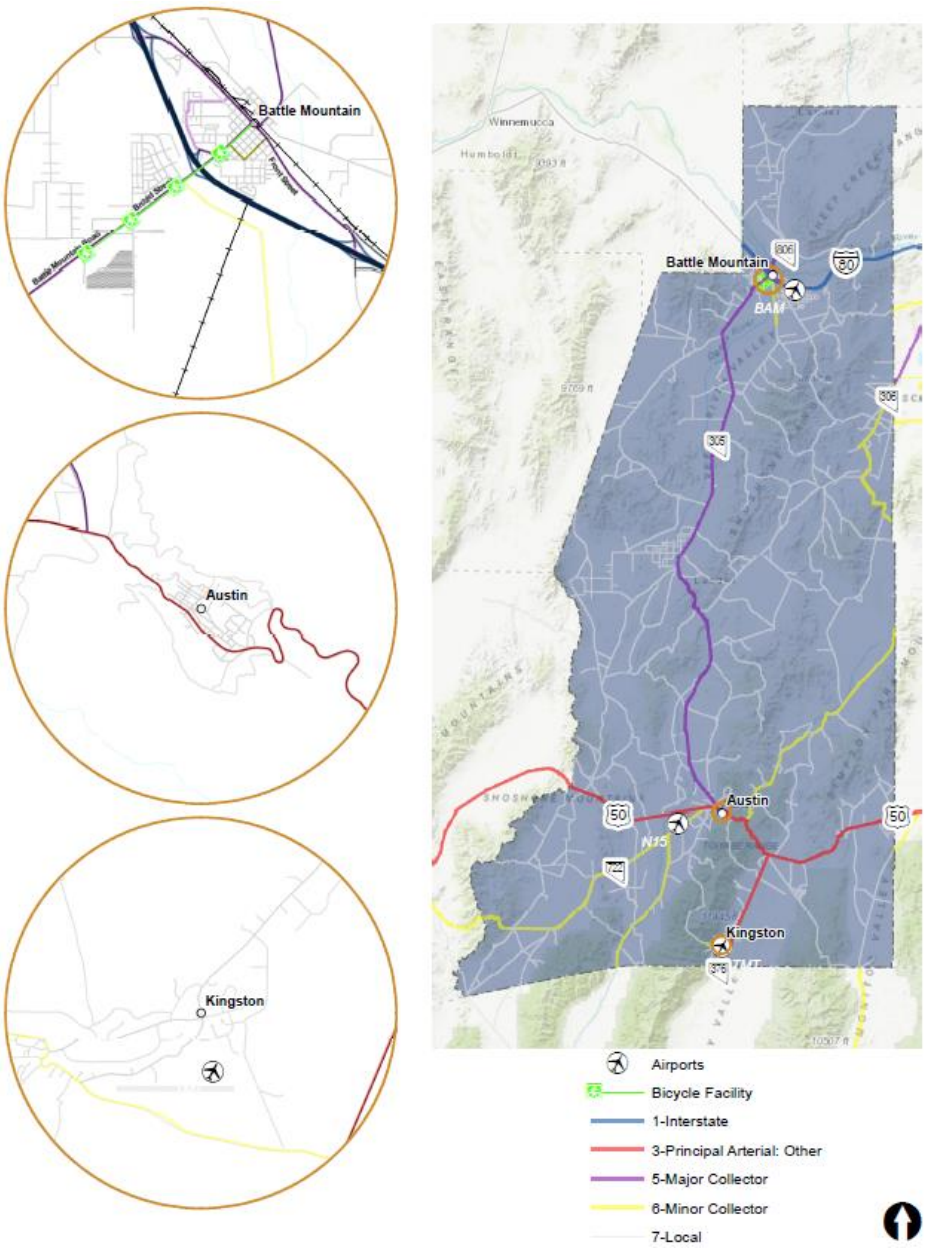


Figure 5-10: Transportation Infrastructure in Lander County

Rail - Freight[9]

The Union Pacific Railroad (UPRR) operates in the northern Nevada east-west corridor. As a condition of the merger with UPRR, BNSF Railway has trackage rights (i.e., an agreement between railroad companies in which the owner of tracks grants another railroad company some use of them). The two-route northern corridor serves Reno and Lander County and connects with Salt Lake City, Utah, Denver, Colorado to the east, and Sacramento, California and San Francisco to the west. Amtrak also operates once-a-day passenger rail service along this northern Nevada rail, which generally parallels I-80. However, this train does not have a stop in Lander County.

[9] (Nevada Department of Transportation, 2021)

Highway - Freight[10]

Four roadways that traverse Lander County are considered freight corridors, including:

- I-80: Primary Highway Freight System (PHFS); 2019 truck percentages vary from 40% to 44%
- U.S. Route 50: Critical Multistate Freight Corridor; 2019 truck percentages vary from 9% to 16%
- Nevada State Route 305: Other Nevada Freight Corridor; 2019 truck percentages vary from 4% to 20%
- Nevada State Route 376: Other Nevada Freight Corridor; 2019 truck percentages are 12%

Truck percentages are the percentage of trucks on a road compared to other vehicles. The truck percentages along these routes tend to be high compared to the rest of the country. They were calculated utilizing the Nevada Department of Transportation's (NDOT's) 2019 Vehicle Classification Distribution Report and the Traffic Records Information Access (TRINA).

Traffic Volumes[11]

Between 2010 and 2019, the Lander County roadway network experienced a 0.3% increase in traffic per year for the 10-year period. The seven NDOT functionally classified and identified roadways within the Lander County network and their corresponding 10-year and 5-year average percent volume changes is illustrated in Figure 5-11. A map showing the 10-year change in volume along the Lander County roadways is shown in Figure 5-12.

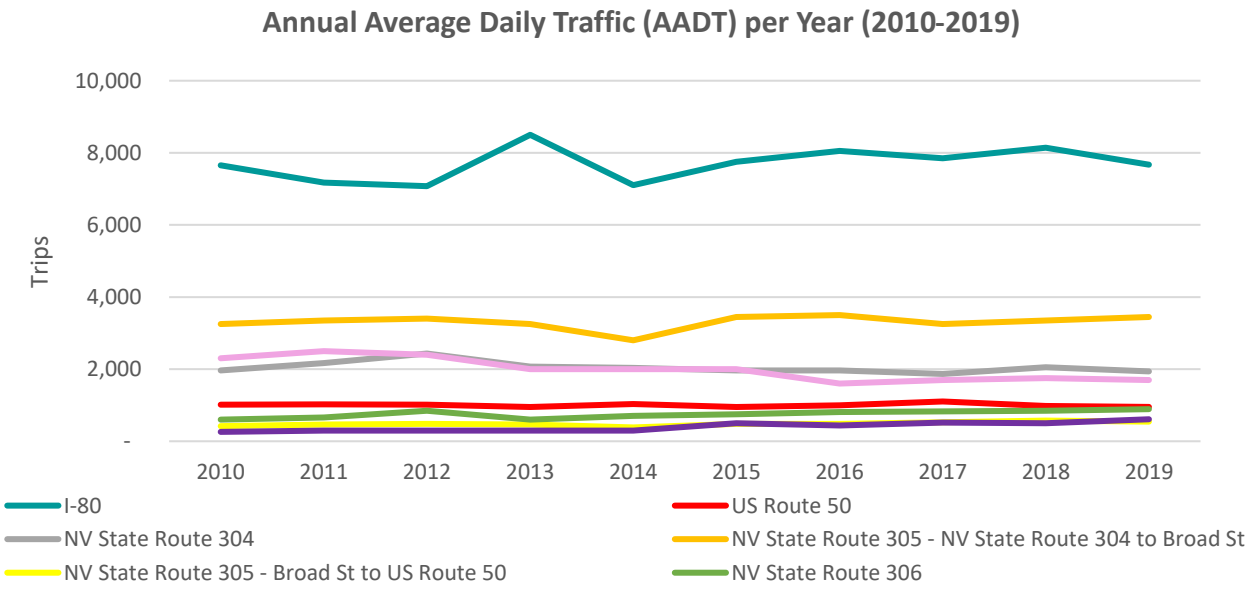


Figure 5-11: Annual Average Daily Trips (AADT) in Lander County

[10] (Nevada Department of Transportation 2016)
[11] (Nevada Department of Transportation 2019)

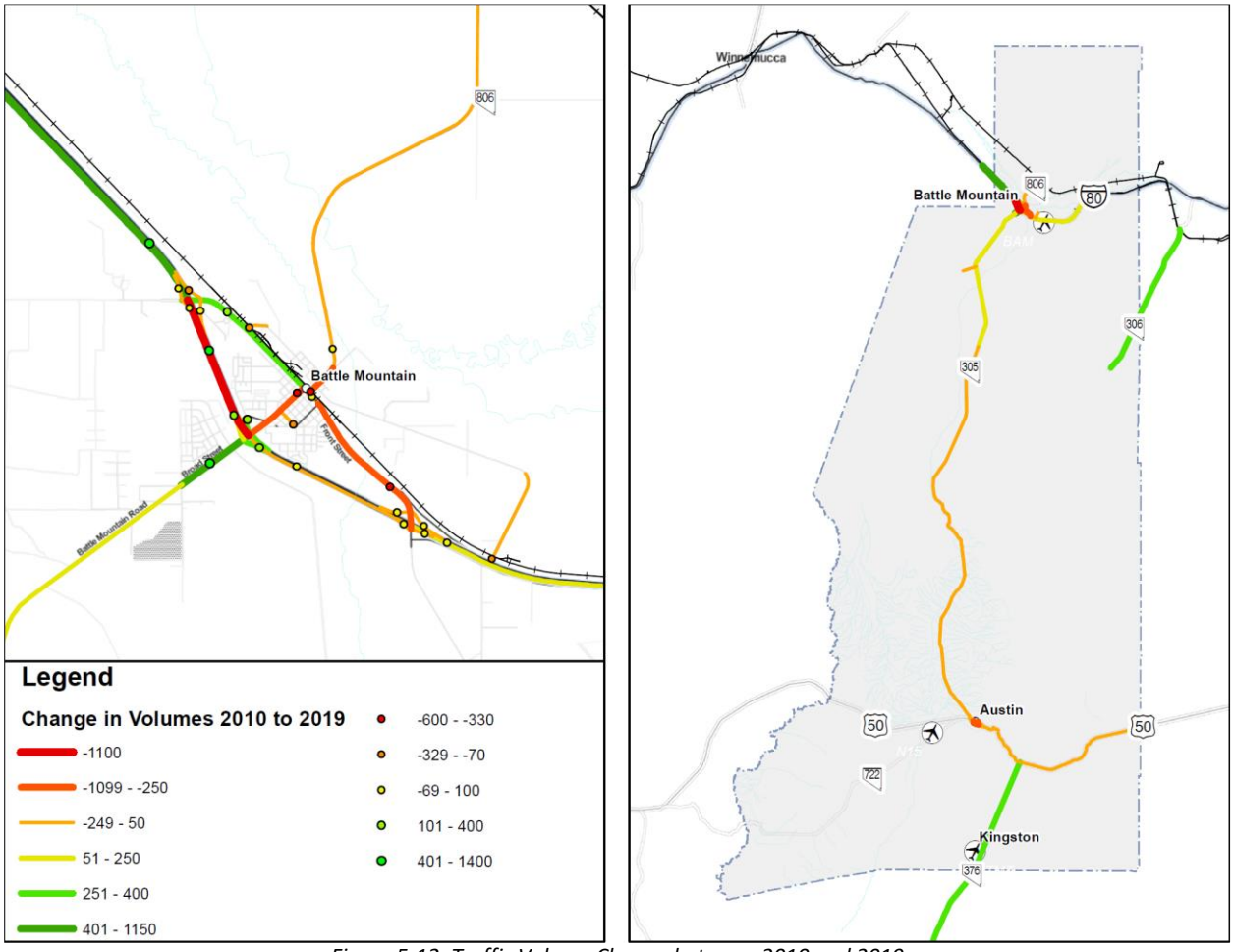


Figure 5-12: Traffic Volume Change between 2010 and 2019

Above-Ground Utilities

Lander County has several above-ground utility transmission lines that run across the County, crossing over the north and south areas (refer to Figure 5-13). In addition, NV Energy currently has an initiative called "GreenLink Energy," a new transmission and clean energy initiative that will "ensure reliable service, position the state to cost-effectively achieve its renewable energy and carbon reduction goals, promote economic development, and create thousands of jobs."[12] Part of the proposed transmission line will pass through the southern portion of Lander County.[13]

As required by NRS 278.160 (e) 93), Lander County will ensure that the location of any new transmission lines operating at over 200 kV or greater are consistent with any BLM Resource Management Plans, any transmission plans prepared by the Office of Energy, and the plans of adjacent counties/jurisdictions.

[12] (NV Energy)
[13] (NV Energy)

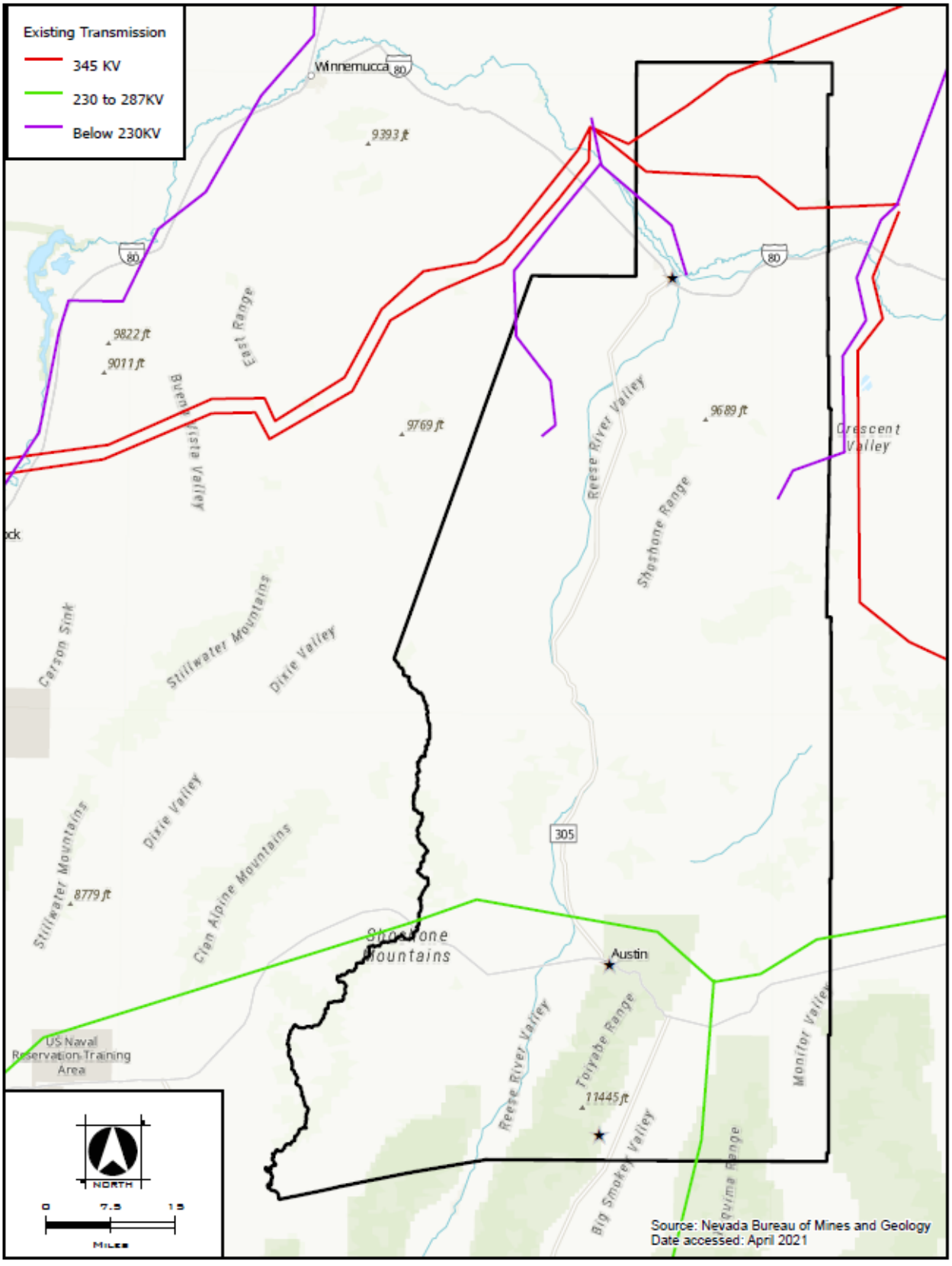


Figure 5-13: Above-ground Utility Locations

Other Facilities

Broadband Internet Access[14]

The Lander County Broadband Action Committee (LBAC) was formed to address the lack of scalable broadband access in the County. This lack of adequate internet access infrastructure is present in the higher density areas like Battle Mountain as well as the more rural locations of the County. If improvements are not made, it has the potential to affect future employment, education, healthcare, public safety, and the economic vitality of the region. A survey completed by LBAC in March 2020 found the majority of residential respondents (98.07%) and business respondents (93.02%) were interested in faster broadband speeds. The majority also indicated they believed the government and county should be involved in attracting better broadband service. Several funding sources and subsidies are anticipated to be used for expanding broadband infrastructure, including the Federal Communications Commission (FCC) Connect America Fund, USDA Community Connect Grant program, and Rural Digital Opportunity Fund. Lander County is currently working with several providers to determine the size and scope of a project in the area.

Solid Waste Disposal and Landfills

The Battle Mountain Sanitary Landfill provides waste disposal for Lander County. The County is the owner and operator of this facility, located approximately 3.5 miles southwest of Battle Mountain on an 83.3-acre area of county land. The facility has been expanded twice, increasing the landfill disposal capacity. The facility now operates with a total capacity of 1,138,000 square yards.[15,16] The facility is a Municipal Solid Waste (MSW) area-fill disposal site and is authorized to accept MSW, construction and demolition (C&D) waste, and various other special wastes.[17] The maximum amount of solid waste accepted at this site is not anticipated to exceed 20 tons per day during the active site life.[18] This facility was exempted from groundwater monitoring with the approval of the original permit application in January 1998.[19] It is anticipated that this landfill will serve the needs of the Lander County population for the next 50 years.[20]

Cemetery[21]

The Battle Mountain cemetery has just over four empty sections. Each section contains approximately 140 plots. It takes approximately five years to fill one section. As a result, the cemetery has just over 20 years before it is filled. Because the facility is land-locked, it is important to obtain additional lands to meet future capacity needs or Lander County will need to develop another site. Each section requires approximately 7,600 square feet. An additional section would require 45,600 square feet and expand the total remaining capacity to approximately 50 years. Because the site is

Austin Cemetery
Source: Ammodramus, 2014, Licensed by CC0 1.0

[14] (Lander County 2020)
[15] (Nevada Department of Environmental Protection 2018, p. 1)
[16] (Nevada Division of Environmental Protection)
[17] (Nevada Department of Environmental Protection 2018)
[18] (Nevada Department of Environmental Protection 2018)
[19] (Nevada Department of Environmental Protection 2018, p. 1)
[20] (Lander County 2010)
[21] (Lander County 2010)

currently undeveloped, expanding the cemetery to the south onto the Newmont property is an option to explore. Austin also has a cemetery, but it is projected to have sufficient capacity for future needs.

General Government and Public Safety[22]

General Government

Lander County general government functions are located in the Austin Courthouse, the Battle Mountain Courthouse and administrative offices in Battle Mountain.

Austin Sheriff's Department (left) and Old Lander County Courthouse
Source: Ken Lund, 2007; Licensed by CC BY-SA 2.0

Public Safety

Sheriff's Department

The Lander County Sheriff's Office is located in Battle Mountain with a substation in Austin. Response times to outlying areas of Lander County can be significant. The public safety complex was designed and constructed in 2000. The Sheriff's Department does not anticipate the construction or expansion of facilities in the near future. Construction or expansion of new facilities in the southern portion of the County is not anticipated over the next five-year period without significant population gains.

Fire Protection/Emergency Medical Services (EMS)

Fire protection for private property in Lander County is provided primarily through local fire departments and fire districts in Austin and Battle Mountain. Kingston maintains its own fire company. Response times outside the communities of Austin, Battle Mountain, and Kingston can be significant.

Wildland Fire Department | Source: Nevada Fire Info

Wildland fires are common throughout Lander County. The proximity of Kingston and Austin to wildland areas requires careful management of surrounding fuels and vegetation. Most wildfires in Lander County are caused by lightning strikes. Increasing use of public lands increases the threat from human-caused fires. BLM and the Nevada Division of Forestry have primary responsibility for wildfires in the area. Mutual aid agreements exist with the BLM and USFS.

[22] (Lander County 2010)

Austin

The Austin all-volunteer fire department/EMS consists of 8 to 11 members. Austin has two full-time emergency medical technicians (EMTs) and several volunteers. Response times to remote regions of the area can be as long as two hours—usually in cases of mutual aid involving BLM or USFS requests for help. For all practical purposes, the Austin services operate in the southern portions of Lander County. Several of the current volunteers have been trained by the State Fire Marshal's Office or in-house programs. Austin has the following community plans in effect: Emergency Hazardous Materials Plan, Pre-Attack Plan for Austin, All Risk County-Wide Disaster Plan, and Fuels Reductions Plan.

Battle Mountain

Battle Mountain's fire protection needs are served by an all-volunteer department organized under NRS 266.310. Its jurisdiction is principally the town of Battle Mountain and the area five miles around it. The town supports the department financially through the general fund. Some members of the department have had State Fire Marshal's Firefighter I and II training along with BLM wildfire training. Battle Mountain has the following community plans in effect: Emergency Hazardous Materials Plan, Pre-Attack Plan for Battle Mountain, All Risk County-Wide Disaster Plan, and Fuels Reductions Plan.

Wildland Fire | Source: Nevada Fire Info

Battle Mountain currently has two 4,000-gallon water trucks, two Type 1 structure trucks, three Type 3 urban/wildland trucks, two Type 6 wildland trucks with 250 gallons of water each, and one Type 6 fire rescue truck with jaws of life and 250 gallons of water. The hospital provides ambulance service.

Kingston

Kingston fire protection service is provided by the Town of Kingston Fire Company, which is funded by the town of Kingston through its general fund. Response times to immediate areas are usually short; however, in cases of mutual aid involving BLM or USFS requests for help, response time can be one to two hours. These services are able to provide sufficient fire protection for the area.

Schools

Lander County has three schools: one elementary school, one middle school, and one high school. Enrollment has fluctuated slightly between 2014 and 2019 but has remained fairly consistent (refer to Figure 5-14).[23] No new schools are planned for the future.

Table 5-7 - 2019 Education Statistics

	Lander	State
Total Students	1,002	485,768
Graduation Rate	78.4%	84.1%
Per Pupil Expenditures	$13,211	$9,601
Student/Teacher Ratio	21 students/teacher	24 students/teacher
Students Eligible for Free and Reduced Lunch	44.1%	51.2%

Source: Nevada Economic Assessment Project - Socioeconomic Baseline Report (2021)

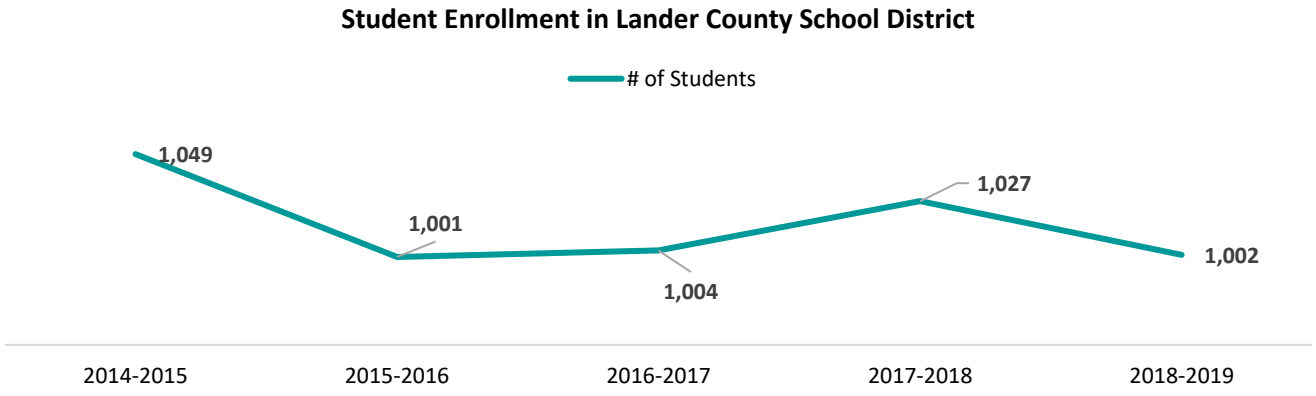


Figure 5-14: Student Enrollment in Lander County School District
Source: Nevada Economic Assessment Project - Socioeconomic Baseline Report (2021)

Special Populations[24]

Between 2014 and 2019, the number of students eligible for free and reduced meals increased substantially, with 29.27% eligible students in 2014 growing to 42.65% in 2019.[25] This matches a trend in Nevada overall and correlates with a growing percentage of children under the age of 18 experiencing poverty in Lander County. In terms of other student populations, Lander County saw a decrease in the English Language Learner (ELL) population and an increase in the Individual Education Program (IEP) population between 2012 and 2019. ELL students are those learning English in addition to their native language; this population decreased from 10.4% in 2012 to 7.4% in 2019. The IEP is for students with disabilities receiving special education services or accommodations in the school district. The percentage of students with IEPs rose from 10.4% in 2012 to 13.3% in Lander County, marginally higher than the state average of 12.2%. Lander County also has seen a substantial increase in educational attainment for veterans, with nearly 80% pursuing education beyond high school and a decrease from 120 to 1 without a high school diploma between 2010 and 2017.

[23] (Nevada Department of Education 2014-2020)
[24] (Borden, Lednicky, Rebori, Thomas, & Zapata 2021)
[25] (Nevada Department of Education 2014-2020)

Recreation

Recreational use is an important element of the Lander County economy. The County is looking for opportunities to increase tourism and recreational facilities for residents and visitors and to provide a means to diversify the economy and offset the cyclical impacts of mining. Often regarded as the Gateway to Nevada's Outback, Lander County has an abundance of recreational opportunities for nature-based activities. Lander County has made improvements in the last decade by constructing and enhancing trails for hiking, equestrian, and OHV uses and camping facilities. In addition to county parks, playfields, swimming pools, and sport facilities, the area around the County has over 500 miles of trails for motorized and non-motorized use and over 100 miles of mountain bike trails. Lander County draws Nevada residents from western and southern Nevada as well as out-of-state and international visitors who are interested in its unique and scenic outdoor recreational opportunities. Figure 5-15 provides a map of some of the parks and recreational opportunities in Battle Mountain, and Figure 5-16 provides an overview of larger recreational facilities in the County. Austin recreation is described in the Land Use chapter of this document.

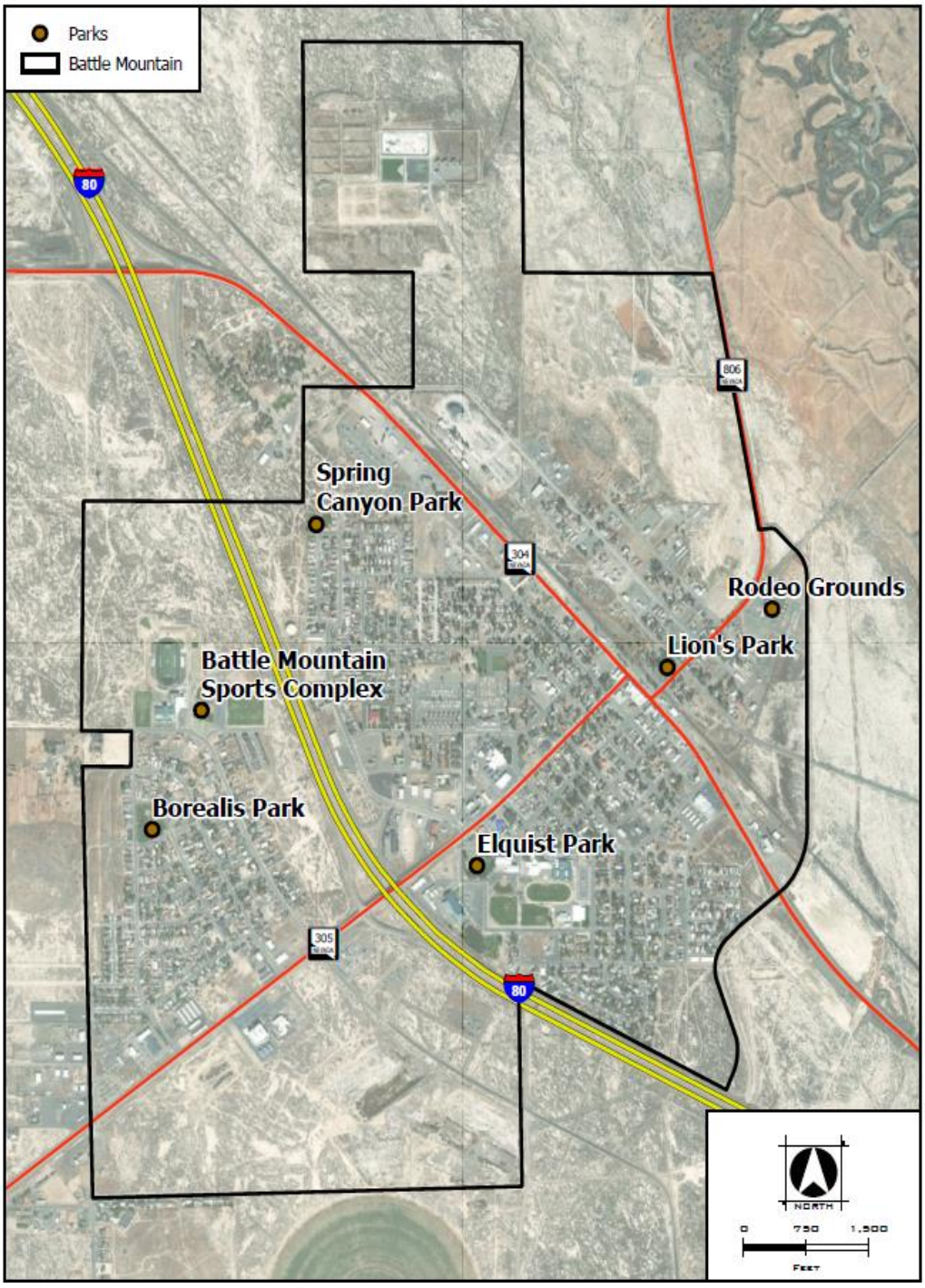


Figure 5-15: Battle Mountain Parks/Recreation Map

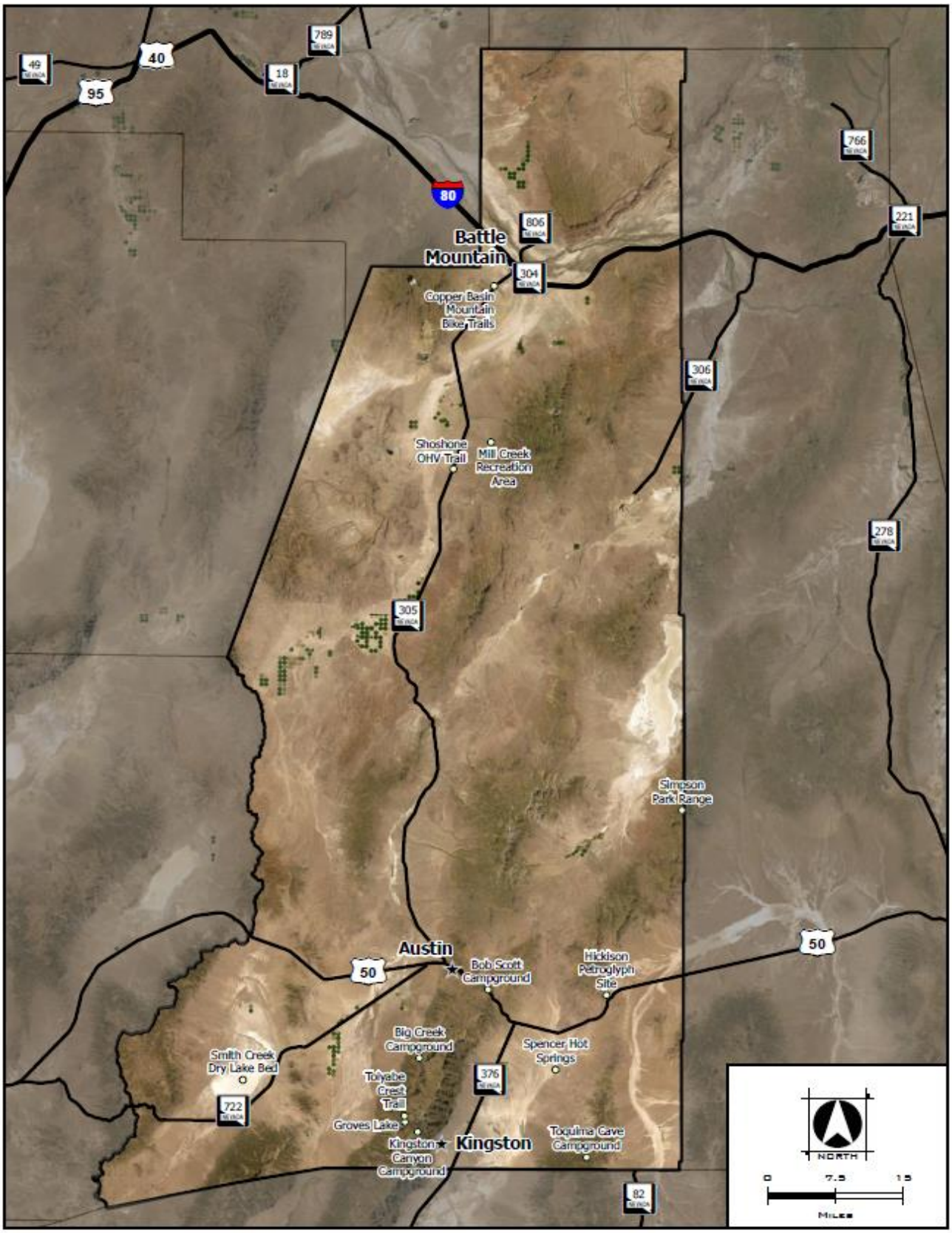


Figure 5-16: Recreational Opportunities in Lander County

Looking to the Future

Expanding Existing Infrastructure & Capital Improvements

In 2020, Lander County partnered with the University Center for Economic Development to update its Comprehensive Economic Development Strategy (CEDS). This plan is meant to guide economic development in Lander County between 2020 and 2025. Several goals related to infrastructure were developed in this plan, including:

- Establish broadband connectivity throughout the county by July 2021 in partnership with the Northeastern Nevada Regional Development Authority, other communities throughout northeastern Nevada, and the state of Nevada.
- Expand the existing water line, sewer system, and three-phase power to the Battle Mountain Airport industrial area to increase the size and capacity of the industrial park by 20%.
- Infrastructure investments to improve the Austin Community Center and Youth Center through historic preservation and revitalization efforts to an existing building in downtown Austin.
- Installation of ADA compliant pedestrian access facilities and lit crosswalks throughout the county to support the Safe Routes to Schools project. This includes improvements to the existing pedestrian crossing at Interstate 80.
- Flood levee improvements including raising the levee north of Interstate 80, creating new sections south of Interstate 80 along the Reese River Floodplain, and adding slope protection to new and existing portions of the levee.
- Establishment and installation of an Inland Port Industrial Rail Park to increase industrial commerce and transportation viability.
- Procurement of a larger site and construction of permanent facilities to support tourism, particularly annual cycling events which have a significant economic contribution to the County.
- Demolition of the existing Battle Mountain Fire House and addition of a fire truck with ladder.

Additionally, Lander County Community Health developed an assessment of needs following the COVID pandemic, including multiple efforts for future preparedness, response, and recovery. These efforts could benefit from American Rescue Plan Act (ARPA) funding and are summarized in the following list:

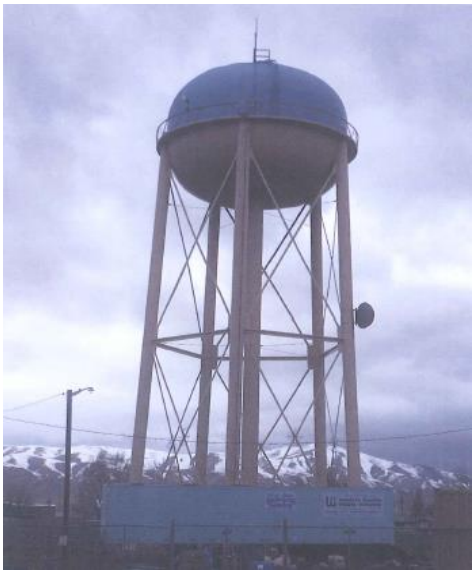
- Capital and equipment upgrades to improve Community Health Lab capabilities and expand testing for at-risk members of the community.
- Expanded health education, risk communication, and community preparedness.
- Increased clinical and administrative staffing, including physician, clinical assistant, and administrative positions.
- Capital improvements to the Community Health Clinic and additional treatment facilities in the Town of Austin.

Improvements to Existing Water and Wastewater Systems

Summary of Improvement Projects to Water Infrastructure in Battle Mountain/Austin

Battle Mountain

Proposed capital improvements to the water and wastewater systems were included in the Battle Mountain Water and Sewer Master Plan. The proposed improvements included the purchase of water rights, investigation of water quality and water loss, expansion of non-potable infrastructure, water quality and wellhead protection plans, improvements to a booster pump station, expansion of pipeline to serve the airport, and improvement or dismantling of an abandoned water tank. These capital improvements would cost a total of $6.87 million dollars to implement.



Abandoned 300,000-gallon Water Tank, to be demolished or repurposed for non-potable water

Required or suggested improvements to the wastewater system in Battle Mountain included installing a lined pond and overflow pipe at the facility, constructing a site to accommodate septic pumping truck, removing grease from traps and wet wells, inspecting the sewer collection system, upgrading sewer mains, and creating new lift stations to accommodate growing demand. These capital improvements would cost a total of $6.39 million dollars to implement. Full information on the proposed improvements, cost, and rationale for water and wastewater treatment projects are included in the Lander County Water and Sewer Master Plan Update, completed by Day Engineering in 2017.[26]

Austin

Proposed capital improvements to the Austin water systems were included in the Austin Preliminary Engineering Report of 2016. Existing physical components of the water system are in operable condition but need some rehabilitation and replacement—primarily, replacing the asbestos-cement pipe, improving Marshall Springs, and replacing the wood roofs of two concrete tanks.

The water supply is provided by two springs and an underground well, with an additional underground available for emergency purposes. Uranium is naturally found within the spring water supplies, above the minimum regulations of NEPD, but is blended with well water to dilute to an allowable level. Revised arsenic standards

[26] (Day Engineering 2017)

push the current water quality to non-compliance with the NDEP Bureau of Safe Drinking Water standards. A project is proposed to create a new water storage tank to provide adequate suction pressure for the existing booster pump station to address previous operational problems. The total cost for all capital improvements would be approximately $4.7 million, including cost for the tank, pipeline, rehabilitating the spring, and administration/contingency costs. A full breakdown of the project needs, costs, and other information can be found in the Preliminary Engineering Report prepared for Austin by Day Engineering in 2016.[27]

Individual Wastewater Disposal Systems (Septic Systems) and Water Quality

Expanded municipal sewer and water service should be explored in the near future to serve the more densely populated areas in Battle Mountain where septic system use is concentrated. More specifically, this area is in the Clover Area groundwater basin, where septic systems are currently at or near maximum density as defined by NDEP and depicted in Figure 5-9B. Once sewer and water service is provided, the Lander County Code of Ordinances requires existing residences to hook up to the new municipal service, which will prevent degradation of ground water quality in the future.

Lander County should continue to monitor growth areas, septic system densities, and water quality in the more densely populated areas served by individual septic systems. Areas identified for future growth should be included in future capital facility plans for sewer expansions. To prevent less densely populated and rural areas from becoming overly dense with septic systems in the future, Lander County should implement restrictions on land divisions for parcels served by septic systems. Limiting future land divisions served by septic systems to a minimum parcel size of two acres will help limit the allowed septic systems within a certain area while also encouraging future higher-density developments with parcels of one acre or less to target areas already served by municipal services.

Summary of recommendations for protecting groundwater from overly dense septic systems

Expanding Reclaimed Water/Non-Potable Water Infrastructure

Lander County, like most counties in Nevada, will likely grapple in the future with issues related to securing adequate water supply in a climate prone to drought and treating wastewater in closed basins. A solution of some municipalities is the exploration of expanding the use of reclaimed water for other applications. In Lander County, reclaimed water is used for irrigation and construction activities. In Nevada, the NRS allows for the use of reclaimed water for a variety of other purposes depending on the level of treatment, with recently expanded uses for potable (drinking water) purposes.[28] For areas with an excess of wastewater or compromised water quality due to individual septic systems, exploration of additional treatment options solves two problems at once: 1) increasing water supply and 2) resolving the issue of excess wastewater disposal. Expanding reclaimed water usage at a municipal level will require investing in advanced treatment systems and creating additional non-potable infrastructure.

[27] (Day Engineering 2016, p. 121)
[28] (Ormerod, Redman, & Singletary 2020)

Transportation

The future of transportation in Lander County is anticipated to heavily focus on freight as the overall population of the County continues to decrease. A workshop completed by NDOT for Lander County in 2020 established several goals (Figure 5-17). Many goals from the 2010 Lander County Master Plan are still applicable and included in Figure 5-17 below.

Road and Highway Goals

- Establish and enforce Lander County street and road standards for future development and improve traffic flow, pedestrian facilities, and community aesthetics.
- Maintain a transportation network supporting economic development and growth in Lander County while minimizing fiscal impact for future maintenance and required improvements.
- Develop streetscape improvements in Battle Mountain.
- For rural roads not likely to serve development, provide a shoulder of four feet in width, preferably eight feet on primary highways. Ensure that surface material provides a stable, mud-free walking surface.

Plans/Documents to Develop

- Establish Lander County street and road drainage standards.
- Create streetscape improvement plans in Battle Mountain.
- Create pedestrian improvement plans.
- Update the Lander Countywide Road Plan.
- Create a Lander Countywide Road Map with all transportation-related facilities, rights-of-way, and roads.
- Develop a transportation capital improvement plan to address priority street, roadway, and pedestrian improvements.

Railroad and Airport Goals

- Evaluate how best to utilize railroads and sidings to promote industrial development and job creation.
- Limit encroachment and development on lands adjacent to public airports.

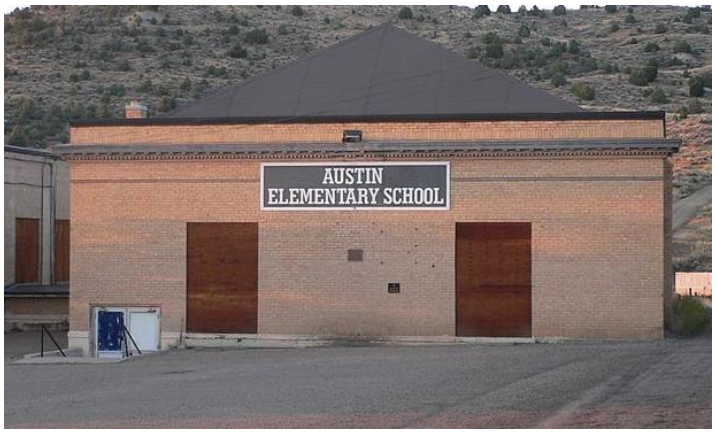
Pedestrian and Accessibility Goals

- Improve and provide pedestrian enhancements, including sidewalk, curb, and gutter within two blocks of schools and new roads/subdivisions and along all main roads.
- Identify transportation needs that serve pedestrian and ADA accessibility.

Figure 5-17: Lander County Transportation Goals
Source: Lander County NDOT Workshop (2020); Lander County 2010 Master Plan

Schools

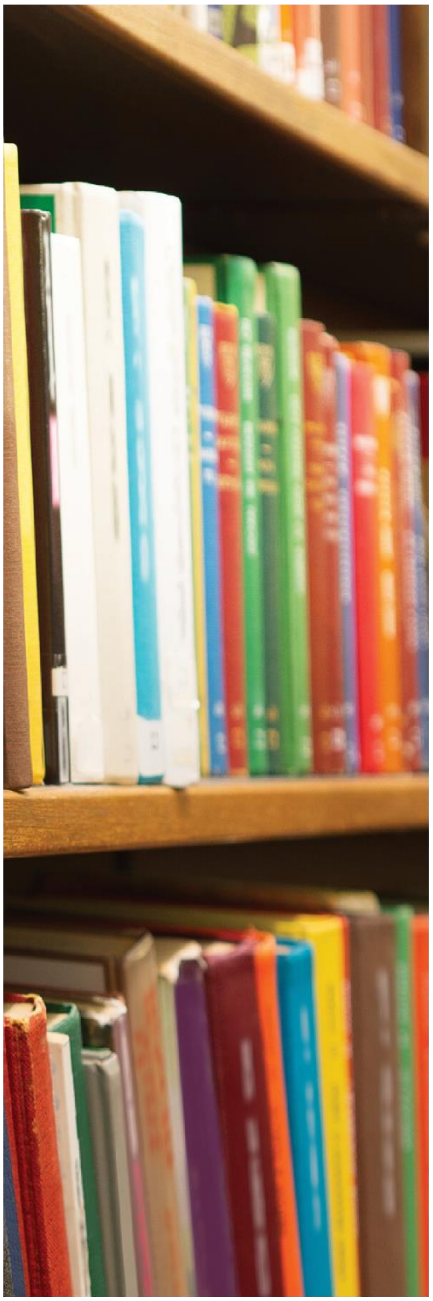
Lander County should continue to work with the school district to coordinate infrastructure improvements and planned growth.



Austin Elementary School / Lander County High School Gym

Parks and Recreation

Parks and recreation play an important role in Lander County's economy. Lander County should prepare a formal Parks and Recreation Plan to preserve these amenities and plan for new opportunities.



REFERENCES

References

AARP. (2019). 2018 Home and Community Preferences Survey: A National Survey of Adults Ages 18-Plus. AARP Research.

Austin Nevada. *Biking*. Retrieved on May 14, 2021, at https://austinnevada.com/biking.

Borden, B., Lednicky, J., Rebori, M., Thomas, L., & Zapata, D. (2021). Nevada Economic Assessment Project Socioeconomic Baseline Report, Lander County, Nevada. University of Nevada, Reno Extension.

Bureau of Land Management - Battle Mountain District Office. (2012). Final Mineral Assessment Report. Battle Mountain, NV: Bureau of Land Management - Battle Mountain District Office.

Bureau of Land Management - Battle Mountain District Office. (2012). Lander County Combined Sewer and Water GID #2 Right-of-Way Authorization: Town of Austin Water Improvement and Pipeline Project. Bureau of Land Management Battle Mountain District Office.

Bureau of Land Management. (2016). The Federal Land Policy and Management Act of 1976. Washington D.C.: U.S. Department of the Interior - Bureau of Land Management.

Bureau of Land Management. (2021). *Wilderness and Wilderness Study Areas*. Retrieved on April 13, 2021, from https://www.blm.gov/programs/national-conservation-lands/wilderness.

Census Hard to Count Maps. 2020. *Lander County Hard to Count Map*. Retrieved on April 27, 2021, from https://www.censushardtocountmaps2020.us/?latlng=40.31933%2C-116.41113&z=8&query=counties%3A%3A32015&promotedfeaturetype=counties&arp=arpRaceEthnicity&baselayerstate=-1&layers=libraries%2Cmajor%20roads&infotab=info-mrrlrs&filterQuery=false.

Coates, P. S., Prochazka, B. G., Ricca, M. A., Gustafson, K. B., Ziegler, P., & Casazza, M. L. (2017). Pinyon and Juniper Encroachment into Sagebrush Ecosystems Impacts Distribution and Survival of Greater Sage-Grouse. *Rangeland Ecology & Management, 70(1)*, 25-38. https://doi.org/10.1016/j.rama.2016.09.001

Connelly, J. W., Hagen, C. A., & Schroeder, M. A.. (2011). Characteristics and Dynamics of Greater Sage-Grouse Populations. In *Studies in Avian Biology*, by Knick, S. T. & Connelly, J. W., 53-67. Berkley, CA: University of California Press.

Day Engineering. (2016). 2016 Water Preliminary Engineering Report - Austin. Austin, NV: Lander County Combined Sewer and Water General Improvement District.

Day Engineering. (2017). Town of Battle Mountain Lander County Nevada - Water and Sewer Master Plan Update. Battle Mountain, NV: Lander County Public Works.

Department of the Interior, National Park Service. (2003). Stokes Castle - National Register of Historic Places Nomination Form. Lander County, NV: Department of the Interior, National Park Service.

FEMA. (2021). National Flood Insurance Program Rules and Regulations. Retrieved on April 29, 2021, from https://www.fema.gov/flood-insurance/rules-legislation.

Fishing Works. (2021). *Lander County Fishing Spots, Nevada*. Retrieved on April 13, 2021, from https://www.fishingworks.com/nevada/lander-nv/.

References

Hinton Burdick. (2020). Lander County Financial Statements for the Fiscal Year Ended June 30,2020, with Report of Certified Public Accountants. Battle Mountain, NV: Lander County Commissioners.

Lander County. (2020). Lander County Broadband RFP. Battle Mountain, NV: Lander County.

Lander County. (2010). Lander County Master Plan 2010. Battle Mountain, NV: Lander County.

Lander County Land Management and Conservation Act. (2020). S.3465 (116th United States Congress, March 12).

Lander County Land Management and Conservation Act. (2021). S.1411 (117th United States Congress, April 28).

Lander County Assessor's Office. (2021). Parcel Data. Battle Mountain, NV.

Marschall, P. (2010). Online Nevada Encyclopedia. Retrieved on April 12, 2021, from https://www.onlinenevada.org/articles/battle-mountain.

NatureServe Explorer. (2015). *Terrestrial Ecological System: Great Basin Pinyon-Juniper Woodland*. Retrieved on April 27, 2021, from https://explorer.natureserve.org/Taxon/ELEMENT_GLOBAL.2.722899/Great_Basin_Pinyon-Juniper_Woodland.

NatureServe Western Ecology Team. (2015). *Inter-Mountain Basins Big Sagebrush Shrubland*. Retrieved on April 27, 2021. https://explorer.natureserve.org/Taxon/ELEMENT_GLOBAL.2.722895/Inter-Mountain_Basins_Big_Sagebrush_Shrubland.

National Park Service. (2021). *Become a Certified Local Government (CLG)*. Retrieved on April 12, 2021, from https://www.nps.gov/clg/become-clg.html.

National Park Service. (2021). *National Register of Historic Places FAQs.* Retrieved on April 12, 2021, from https://www.nps.gov/subjects/nationalregister/faqs.htm.

National Register of Historic Places (NRHP). (2021). National Park Service - *National Register of Historic Places Data Base.* Retrieved on April 12, 2021, from https://npgallery.nps.gov/NRHP/SearchResults/.

Nevada Department of Education. (2014-2020). *Nevada Report Card.* http://www.nevadareportcard.com/DI/nv/lander/2020.

Nevada Department of Wildlife. (2021). *Bodies of Water - Groves Lake.* Retrieved on April 13, 2021, from http://www.ndow.org/Bodies_Of_Water/Groves_Lake/.

Nevada Department of Wildlife. *Sage-Grouse*. (2021). Retrieved on April 14, 2021, from http://www.ndow.org/Species/Birds/Sage-grouse/#:~:text=Sage%20grouse%20are%20the%20largest,well%20with%20Nevada's%20muted%20landscape.

Nevada Division of Environmental Protection. Battle Mountain Sanitary Landfill Fact Sheet - Permit Number SW090801. Carson City, NV: Nevada Division of Environmental Protection.

Nevada Department of Environmental Protection. (2018). Solid Waste Disposal Site Permit Class II - Permit #SW070REV02 - Battle Mountain Landfill. Carson City, NV: NDEP.

Nevada Department of Transportation. (2016). Nevada State Freight Plan. Carson City, NV: Nevada Department of Transportation.

Nevada Department of Transportation. (2019). 2019 Annual Traffic Report. Carson City, NV: Nevada Department of Transportation.

Nevada Department of Transportation. (2021). Nevada State Rail Plan. Carson City, NV: Nevada Department of Transportation.

Nevada Division of Water Resources. (2021). Hydrographic Basin Summaries. Carson City, NV: Nevada Division of Water Resources. http://water.nv.gov/UndergroundActive.aspx.

Nevada Natural Heritage Program. (2021). *Species Information Search*. Lander County Species List. Retrieved on March 18, 2021, from http://heritage.nv.gov/species/.

Nevada Department of Wildlife. (2021). Wildlife Distribution Geodatabases - Bighorn Sheep, Elk, Mule Deer, Pronghorn, Ruffed Grouse, Wild Turkey, Mountain Quail, California Quail, Dusky Grouse, White Tailed Jackrabbit, Chukar. https://gis-ndow.opendata.arcgis.com/search?tags=wildlife.

Nordquist, J. & Delwiche, B. (2013). The McGinness Hills Geothermal Project.

NV Energy. (2021). *Geothermal Resources*. Retrieved on April 13, 2021, from https://www.nvenergy.com/cleanenergy/renewable-energy-portfolio/geothermal-resources.

NV Energy. (2021.) *Solar Resources*. Retrieved on April 13, 2021, from https://www.nvenergy.com/cleanenergy/renewable-energy-portfolio/solar-resources.

NV Energy. (2021.) *Greenlink Nevada.* Retrieved on April 13, 2021, from https://www.nvenergy.com/cleanenergy/greenlink.

Online Nevada. (2009). *Online Nevada Encyclopedia*. Retrieved on April 12, 2021, from https://www.onlinenevada.org/articles/hickison-summit.

Ormerod, K. J., Redman, S., & Singletary, L. (2020). Fact Sheet 20-34 - Reclaimed Water: Uses and Definitions. Reno, NV: University of Nevada, Reno Cooperative Extension.

Skoufalos, A., Clarke, J. L., Ellis, D. R., Shepard, V. L., & Rula, E. Y. (2017). Rural Aging in America: Proceedings of the 2017 Connectivity Summit. Population Health Management. Retrieved on April 12, 2021, from https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5738994/.

Southwest Regional Gap Analyis Project (SWReGAP). (2005). *Land Cover Data*. Retrieved on March 2, 2021, at https://swregap.org/data/landcover/.

Steinmann, F. A. (2020). A Comprehensive Economic Development Strategy for Lander County, 2020 through 2025. Reno, NV: University of Nevada, Reno.

Te-Moak Tribe of Western Shoshone. (2018). *History & Culture*. Retrieved on April 12, 2021, from https://www.temoaktribe.com/history.shtml.

Telesto Nevada, Inc. (2012). Renewable Energy Development Study Feasibility Evaluation Report. Battle Mountain, NV: Lander County Economic Development Authority.

Tu, G. (2016). Design for Wuhan Green Sewage Treatment Plant Using SBR Activated Sludge Process. Helsinki Metropolia University of Applied Sciences. Retrieved April 12 from https://www.theseus.fi/bitstream/handle/10024/128646/3.5%20Finalthesis_TU%20%20pdf.pdf;jsessionid=2BC414920AF2D9DDFD648B004E7AC004?sequence=1.

U.S. Department of Agriculture. (2012-2017). National Agricultural Statistics Service - Lander County. Retrieved on April 14, 2021, from https://www.nass.usda.gov/Quick_Stats/CDQT/chapter/1/table/1.

United States Census Bureau. (2013-2018). American Community Survey Estimates 2013-2018. Food Stamps/Supplemental Nutrition Assistance Program - Table S2201. Washington, D.C.: United States Census Bureau.

U.S. Department of Agriculture. (2012-2017). National Agricultural Statistics Service - Lander County. Retrieved on April 14, 2021, from https://www.nass.usda.gov/Quick_Stats/CDQT/chapter/1/table/1.

U.S. Department of Housing and Urban Development. (2013-2021). Building Permit Database. Washington, D.C.: State of the Cities Data Systems (SOCDS).

U.S. Fish & Wildlife Service. (2021). *IPaC - Information for Planning and Consultation*. IPaC Resource List - Lander County. Retrieved from February 5, 2021, from http://heritage.nv.gov/species/.

United States Census Bureau. (2013-2018). American Community Survey Estimates, 2013-2018. Food Stamps/Supplemental Nutrition Assistance Program - Table S2201. Washington, D.C.: United States Census Bureau.

United States Census Bureau1. (2013-2018). American Community Survey Estimates, 2013-2018. Poverty Status in the Past 12 Months - Table ID S1701. Washington D.C.: United States Census Bureau.

United States Census Bureau. (2019). American Community Survey - 5-Year Estimates Data Profiles - Table S2001. Washington, D.C.: United States Census Bureau.

United States Census Bureau. (2013-2019). American Community Survey 5-Year Estimates Data Profiles - Table DP 04 - Battle Mountain CDP and Lander County. Washington D.C.: United States Census Bureau.

United States Census Bureau. (2019). American Community Survey 5-Year Estimates Data Profiles - Table S1101 . Washington D.C.: United States Census Bureau.

Vogt Sinter Insights. (2014). General Summary of the Ten County Rural Nevada Area Housing Demand Market Analysis. Nevada Rural Housing Authority: Carson City, NV.

Welden, F. W. (2003). History of Water Law in Nevada and the Western States. Carson City, NV: Research Division - Legislative Counsel Bureau.

Wilderness Act. (1964). Public Law 88-577 (16 U.S.C. 1131-1136) (88th Congress, Second Session, September 3).

Wildland Fire Associates. (2013). Landscape-Scale Wildland Fire Risk/Hazard/Value Assessment - Lander County, NV. Reno, NV: Nevada Fire Board - BLM.

Woody, A. (2009). *Online Nevada Encyclopedia*. Retrieved on April 12, 2021, from https://www.onlinenevada.org/articles/toquima-cave.

Zapata, D. (2021). Lander County Cultural Overview. Reno, NV: University of Nevada Cooperative Extension.