CLARK COUNTY NEVADA

HENDERSON

FUTURE LAND USE STUDY

for the

IVANPAH VALLEY GATEWAY

SEPTEMBER 2024

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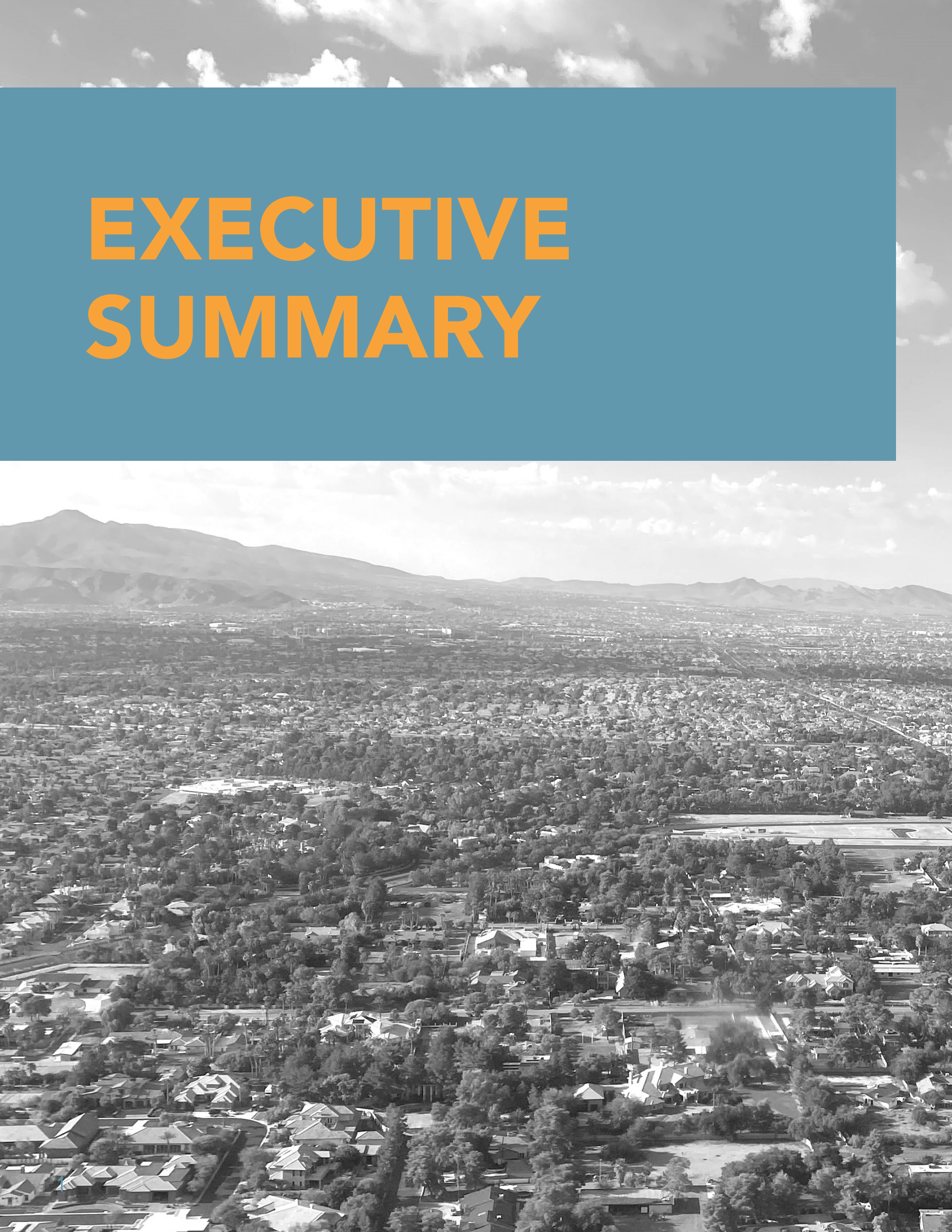
EXECUTIVE SUMMARY



Plan Purpose & Objectives

The purpose of the Ivanpah Valley Future Land Use Study – also referred to as the "Joint Land Use Study" or JLUS – is to provide a blueprint for potential future growth in a portion of southern Clark County in the event that the Southern Nevada Public Lands Management Act (SNPLMA) Disposal Boundary is expanded. The Study Area covers almost 31,000 acres of unincorporated land, including areas to the east and west of Interstate 15 (I-15) and adjacent to the southern Henderson city limit. Figures 1 and 2 display the Study Area's location and context.

This study recognizes that there is no certainty that the SNPLMA Disposal Boundary will be expanded. Furthermore this study recognizes that, if the boundary is expanded, the disposal process and subsequent timing for potential development within the Study Area is uncertain. Should the Disposal Boundary be expanded, and this area become available for future development, this study provides a framework for how Clark County and the City of Henderson, along with other partners and stakeholders, can collaboratively manage and direct development that is desirable, sustainable, and integrated within the larger regional context.

This study serves as a policy tool to provide guidance for responsible development within the Study Area using a 20+ year horizon. While it's quite possible that most, if not all, development would occur beyond this horizon, it's hard to plan effectively beyond that timeframe given the likelihood that conditions will change over time. While acknowledging these uncertainties and parameters, the analyses and outcomes of this study are based on current data and information available at the time of writing.

The Study Area and its surrounding context as it exists today. The Study Area is just south of Henderson between Sloan and Jean and primarily east of I-15

The approach to this work is modeled after traditional joint land use planning studies where multiple jurisdictions colloborate to identify shared goals and actions for adjacent or overlapping areas. Within this framework, Clark County and the City of Henderson designed this project to the specific context of Southern Nevada. This includes a focus on water supply and natural resources, open space and species habitat conservation, and the current regulatory landscape of the State of Nevada, the County, and the City. The objectives of this effort were to: seek public and stakeholder input; educate participants about the opportunities, benefits and tradeoffs associated with potential development within the Study Area; align with stated priorities in adopted plans (see page 21 and Appendix B); and gain consensus on a final land use concept and recommendations. The process began in the summer of 2022 and concluded the summer of 2024.

Key Findings

- The Study Area should provide multiple new job centers, especially for the growing advanced manufacturing industry and related industry clusters.
- The Study Area should include the development of complete communities,* with a thoughtful mix of uses to reduce the need for long travel distances and to provide daily needs and leisure activities locally; the Study Area should provide a spectrum of housing types, including opportunities for attainable housing, workforce housing, and affordable housing.*
- The Study Area should proactively promote strategic relationships between land use and transportation systems to allow for a true mix of multimodal access between destinations.
- The Study Area should incorporate sustainability, resource conservation, low-impact development, and climate mitigation to the greatest extent possible.
- Proactive planning and collaboration are crucial to achieve desired development goals for the Study Area and for the Las Vegas region as a whole.

Plan Elements & Organization

The study includes the following elements, which together comprise a high-level conceptual "blueprint" for the Study Area's long-term potential development:

Housing and employment projections inform a preferred development scenario. This scenario has balanced a diversity of housing to accommodate projected population growth while also promoting a vision for high quality employment and commercial services for residents and the workforce.

Study Area recommendations that align with adopted planning priorities of the City and County, acknowledge parallel planning efforts, and establish a forward-looking foundation for the Study Area.

Development principles and framework that acknowledge and address anticipated challenges, constraints and projected demand. This study outlines a preferred land use plan, development practices, and design standards to inform zoning and other development regulations for the Study Area, building from the City's and County's existing regulatory tools. Infrastructure and utilities are addressed at a high level due to uncertainty around the land disposal process and ultimate land management and service provision responsibilities.

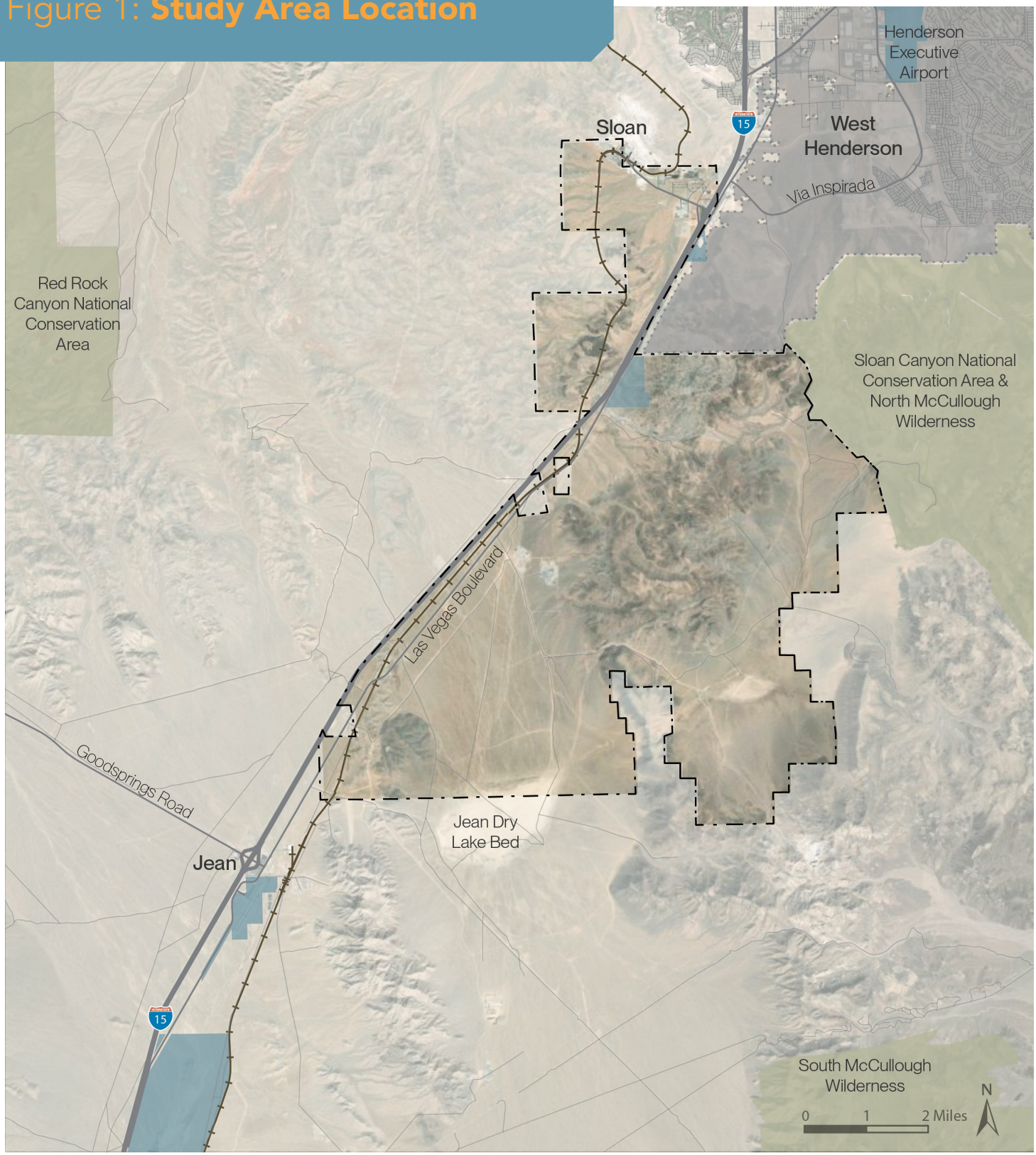
Conceptual plans that visualize development principles and proposed the land use framework. These concepts illustrate a hypothetical outcome reflecting intentions for built form, supporting infrastructure, relationships between different land uses, circulation, recreation and open space, and infrastructure.

Implementation plan that brings all elements together and ensures proactive planning for potential development. This chapter lays out a phased approach for further assessment, planning, and coordination for achieving the development framework and concepts laid out in this study, should SNPLMA amendments be adopted and the Disposal Boundary expanded.

This study and its supporting appendices articulate a desired future for potential development in the Ivanpah Valley.

 *See definitions in Appendix A

Figure 1: **Study Area Location**



LEGEND

- Study Area
- Railroad
- Major & Minor Roads
- City of Henderson
- Clark County Department of Aviation Property
- Conserved Wilderness

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INTRODUCTION

1

PURPOSE

Area Description

The Study Area for the Joint Land Use Planning Study is approximately 30,980 acres in southern Clark County, beginning approximately 9 miles south of Harry Reid International Airport. The northern portion of the Study Area abuts the City of Henderson, while the southern edge almost reaches the Town of Jean. Sloan and Enterprise are two unincorporated communities within the Study Area. I-15 and South Las Vegas Boulevard bisect the Study Area from northeast to southwest, with about 90% of the area lying to the east of these parallel transportation corridors.

The majority of the Study Area is undeveloped. However, a few private entities own parcels in the northern portions of the Study Area – housing residences and some industrial operations. A few parcels (including the site of a proposed future heliport) are owned by Clark County. The remainder of the Study Area is currently owned by the Federal Government's Bureau of Land Management (BLM). To the south of the Study Area, the State of Nevada owns a single large parcel in Jean (on the former penitentiary site), and Clark County owns the existing Jean Sport Aviation Center. Figure 3 illustrates property ownership within the Study Area.

Development constraints exist pertaining to natural resource and habitat protections, including legally required land and species conservation efforts, the popularity of existing trails and open spaces, and regional water conservation needs. See Figure 5 on page 15 for the locations of protected natural areas near the Study Area.

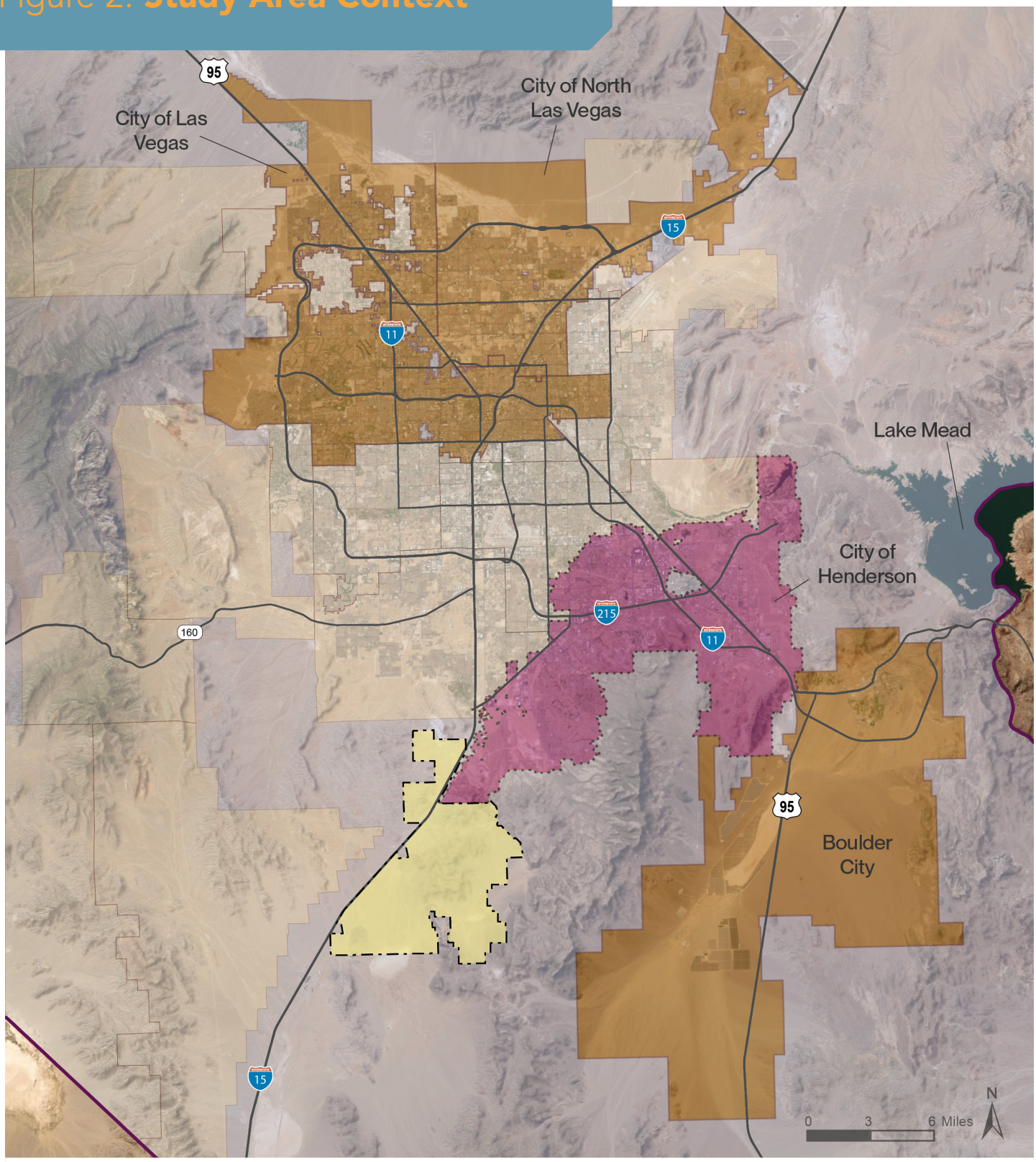
The Study Area is defined by the proposed expansion of BLM's Disposal Boundary in this area (more information provided on page 7), encompassing all land within the proposed expansion except for a portion that is reserved for the proposed Supplemental Nevada Supplemental Airport project (south of the Study Area). Details about the Disposal Boundary and expansion process are provided in the following pages.

Recent Growth Trends

Clark County has grown rapidly for several decades, despite some slower periods during the Great Recession and the early months of the COVID-19 pandemic. Non-migration growth is a significant source of population increases as more children are born to area residents. While Clark County's population grew 17% between 2011 to 2021, selected demographic groups grew even faster through domestic migration, continuing a trend that has been seen in prior decades. In many cases, people are moving to Southern Nevada because housing remains affordable relative to other metro areas in the U.S.[4]

As more households establish themselves in Clark County each year, the region's job growth is robust, with more talent present in the region than ever before. Together these factors present an opportunity to promote both new homes and high-paying, skilled jobs in the Study Area. The recommendations in the following sections detail how this could be achieved, in service of the larger Southern Nevada region.

Figure 2: **Study Area Context**



LEGEND

- Study Area
- Clark County/State Boundary
- City of Henderson
- Unincorporated Towns
- Unincorporated Clark County
- Other Municipalities
- Major Roads

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Why a Joint Land Use Study?

Joint Land Use Studies are used by local governments to strategically consider the future land uses, utilities, and transportation networks that surround and support them, working together with county, state, military, or other neighboring public sector entities.[5] In each case, a JLUS allows two different levels of government to consider their respective long-term priorities, governing laws, and regulations.

The impetus for this JLUS was a regional recognition by various leaders, policymakers, forecasters, and industry professionals that additional land available for development will be necessary to meet anticipated economic and population growth in the coming decades. In particular, freight and logistics operators, homebuilders, and commercial property owners all project long-term growth in their industries beyond what the existing Disposal Boundary could accommodate. While some growth will be accommodated through infill development or redevelopment within the existing metro area, consideration and planning for additional development outside the metro is necessary.

Since most of the land surrounding the Las Vegas metro is currently owned and managed by BLM, a portion of that land will need to be transferred from federal hands into local control for development to occur. The Southern Nevada Public Land Management Act of 1998 established a Disposal Boundary in the Las Vegas Valley and a fair market value auction process for the sale of Federal lands within the Boundary. Per the recognized need for additional land identified above, this current Boundary is proposed to be expanded – a process that requires a new act of Congress.

Migration, Population Growth & Housing Affordability

Nevada is among the fastest growing states in the nation, adding residents from domestic and international migration as well as a burgeoning local population. The state's rapid growth is projected to continue over the next 20+ years. Californians remain the largest numerical group of individuals relocating to Nevada, and specifically to the Las Vegas Valley.[1]

That said, many other geographic and/or cultural groups are also finding a specific attraction to this area. For example, Native Hawaiians and Pacific Islanders have moved to Clark County at the fastest rate of any demographic group, fueling a 40% increase in this population between 2011 and 2021 and now numbering about 22,000. A vibrant Hawaiian community is now established here.[2] Honolulu County, Hawaii is the most common origin for these transplants, with the 7th-highest number of net in-migration to Nevada among all US counties in 2020, and the highest of any non-California county.[3]

As more people decide to make the Las Vegas Valley their home, the demand for relatively affordable housing* and job opportunities continues to rise – both for current and future residents. This area of the Ivanpah Valley could be primed to supply many of the homes and businesses that will meet this demand, providing jobs, homes, and daily needs within close proximity for convenient access more sustainable travel habits.

*See definitions in Appendix A

The legislative vehicle for this proposed action is known as SNEDCA – or the Southern Nevada Economic Development and Conservation Act (a.k.a. "Clark County Lands Bill").[6] Among other solutions, SNEDCA would expand the Federal Disposal Boundary, making land within the Study Area eligible for disposal action. Following any future disposal action within the Study Area, Clark County is currently the default government entity charged with land use and zoning authority. However, the City of Henderson could annex portions of the Study Area and thus assume these roles. It is currently uncertain which portions, if any, of the Study Area would be annexed by the City. The adjacency of the Study Area to the current western limits of Henderson could yield impacts to the City regardless of any annexation action.

These factors led to the decision to jointly commission this effort, and to design it as a Joint Land Use Study. Together, Clark County and the City of Henderson seek to proactively guide and plan for potential future development in the Ivanpah Valley.

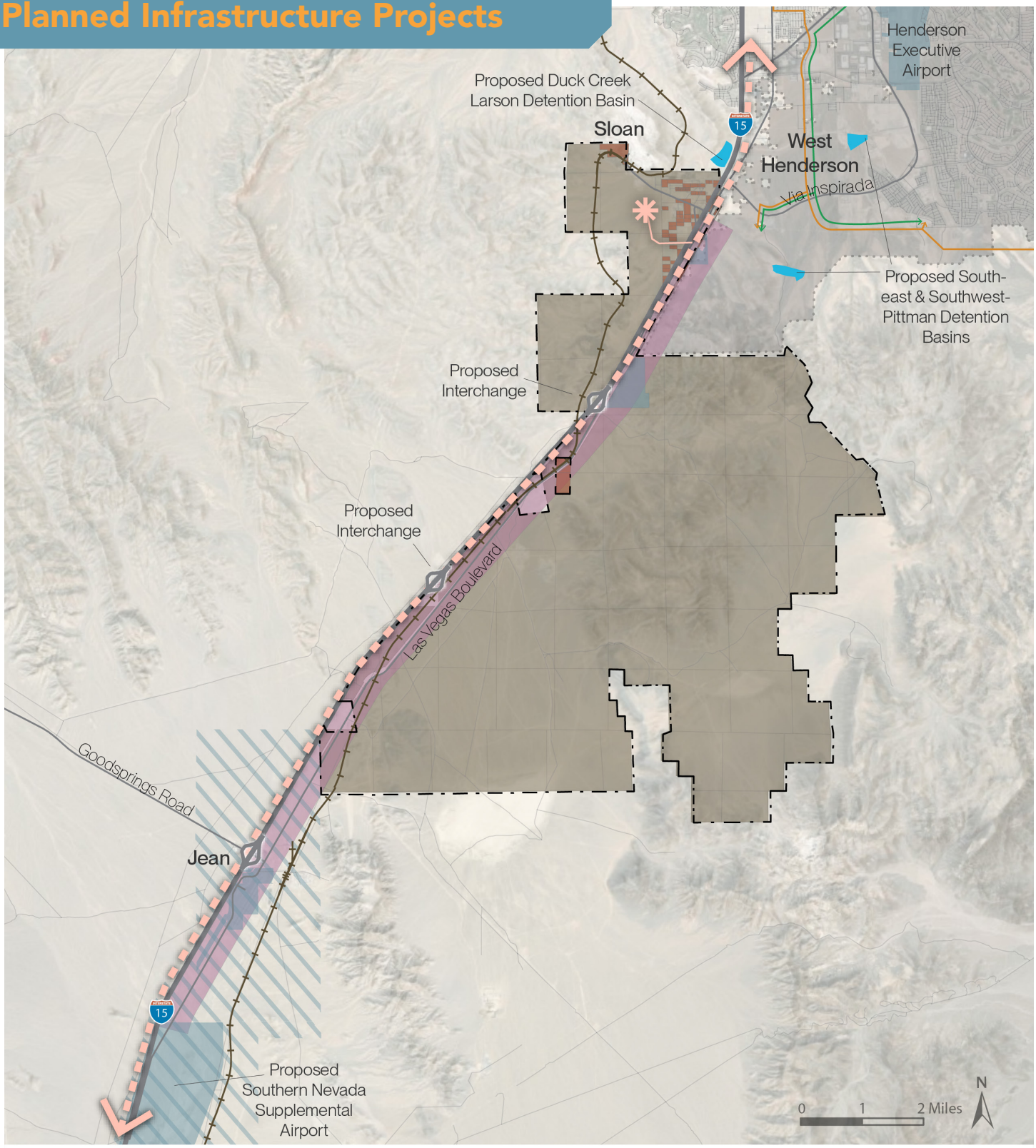
Planned Infrastructure Projects

The current infrastructure in the Study Area is somewhat limited. I-15 and Las Vegas Boulevard traverse the Study Area from north to south, and some paved roads exist in the Sloan area, while most other roads are unpaved. A flood conveyance is located in Jean at the southwest edge of the Study Area near the I-15 and State Route 161 interchange. Water and energy utilities infrastructure currently exist only in Sloan and along the I-15 corridor.

With regional growth approaching the Ivanpah Valley, several new infrastructure projects and upgrades to existing infrastructure are already planned (separately from this study and independent of SNEDCA's Disposal Boundary expansion) that will impact the Study Area if built. This includes (visualized in Figure 3):

- Expansion and changes to I-15 by Nevada Department of Transportation (NDOT). This includes two new planned interchanges within the Study Area boundary, the implementation of which depends on meeting specific criteria regarding demand/need for the area.
- Widening and expansion of Las Vegas Boulevard by Clark County.
- Construction of a high-speed passenger rail line between Los Angeles and Las Vegas by Brightline West. This includes center-running tracks inside the I-15 center median and a maintenance and storage yard in the Study Area. There are no planned stations within the Study Area.
- Additional flood conveyances and new detention basins near Sloan – the Duck Creek Larson basin immediately west of I-15 and the Southeast and Southwest Pittman basins just east of I-15.
- Construction of a new Horizon Lateral pipeline to convey water throughout the south end of the Las Vegas Valley and into the Ivanpah Valley. Two alignment alternatives are under consideration currently.
- A proposed supplemental commercial service airport by Clark County which, if approved, would be located several miles south of the Study Area. See page 17 for more details on the proposed Southern Nevada Supplemental Airport (SNSA) project.

Figure 3: **Property Ownership & Planned Infrastructure Projects**



LEGEND

- Study Area
- Railroad
- Major & Minor Roads
- City of Henderson
- BLM Property
- Private Properties
- Utility Corridor Property
- Clark County Department of Aviation Property
- Proposed North & South Horizon Lateral Alignments (water pipeline)
- Proposed SNSA Site & Noise Compatibility Buffer
- Proposed Brightline West Alignment & Storage Yard
- Proposed Detention Basins

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Through Congressional acts, the Federal Government has reserved a 2,640-foot (0.5 mile) wide utility corridor along I-15 to preserve land for future utilities infrastructure needs that will support growth in the region, particularly for the proposed SNSA.

BLM CONTROL & CONTINUED COLLABORATION

86% of Nevada's land is managed by the Federal Government, and the Bureau of Land Management (BLM) holds the bulk of that – 63% of the state's total area.[7] Almost 90% of Clark County's land is under the jurisdiction of a federal agency.[8] BLM leases much of their land for ranching, mineral and fuel extraction, and other purposes.

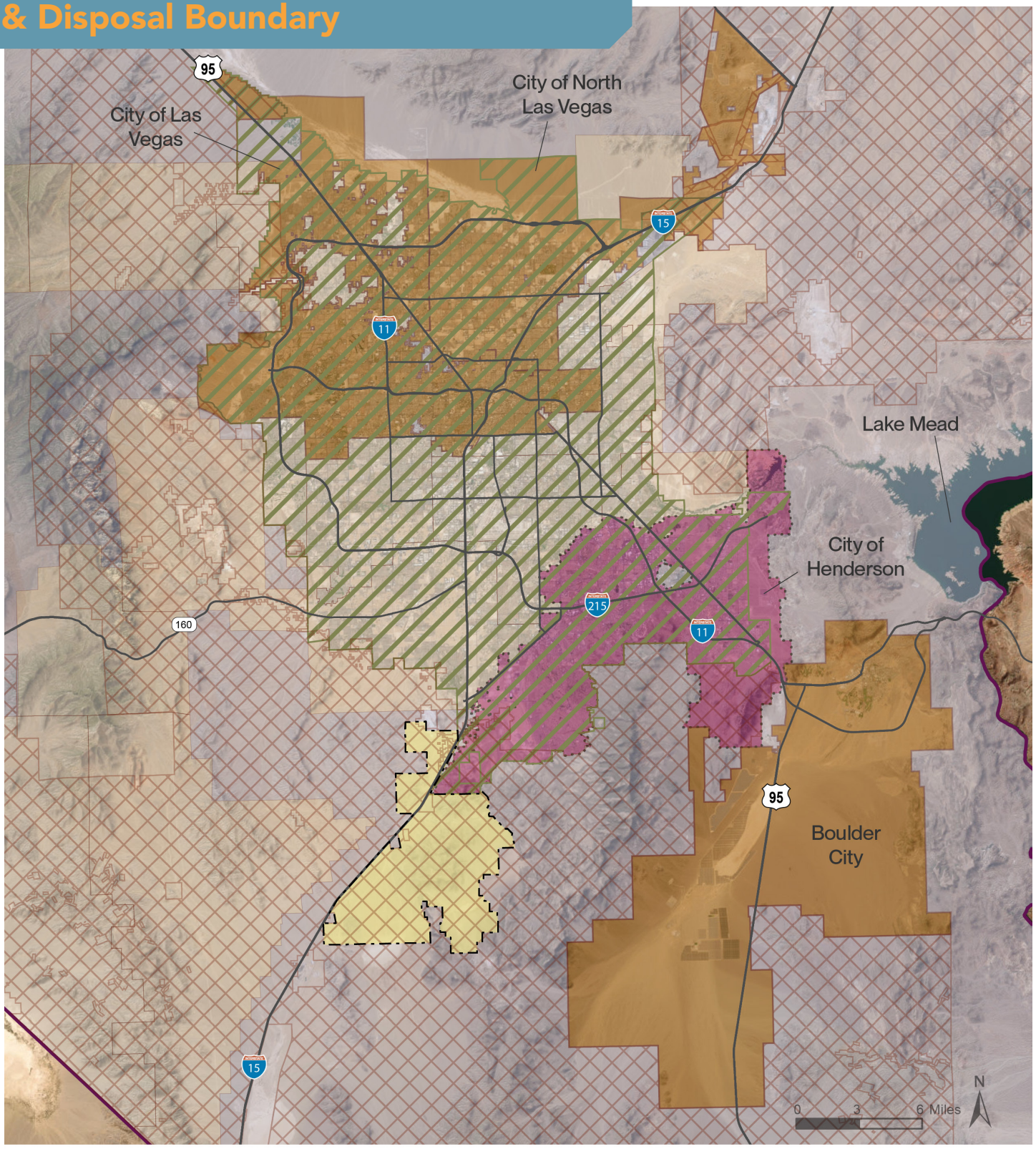
As mentioned, Congress has enacted several laws which govern the disposal of Federal lands. The two primary statutes which are applicable in Clark County are the Federal Land Policy and Management Act of 1976 (FLPMA) and the previously discussed SNPLMA which established the current Disposal Boundary and disposal auction process. Federal land can also be made available through a 99-year lease to the County and the City under the Recreation and Public Purposes Act of 1954 (RPP) so long as the lands are used for public purposes. Despite participating in nomination procedures, the County and City cannot predict which parcels will move out of federal control and become candidates for development or the timing of those actions.

The County and City expect continued collaboration with BLM and other federal agencies throughout and extending beyond the disposal process to ensure that necessary land use, infrastructure, facilities, and service needs are met. In some instances, the City and County may need to work with BLM to acquire Right of Way or easement access across BLM land into developable lands within the Study Area.[9] During the disposal process, a portion of lands will be reserved for necessary community infrastructure and services, such as schools, utilities, and affordable housing.* If the Disposal Boundary expansion does not move forward, the Federal Government will continue to administer and manage these lands.

Under SNPLMA, proceeds from land sales are spent by the Department of Interior as follows: 85% to fund the acquisition of environmentally sensitive lands and provide improvements of federal trails and recreation areas throughout Nevada, 10% is transferred to the Southern Nevada Water Authority or to Clark County, and 5% is transferred to the State General Education Fund. The SNPLMA disposal process has transferred thousands of acres in Clark County to private development and local control since its enactment. This is the primary planned method for local governments to accommodate future expansion around the Las Vegas Valley, assuming that the disposal boundary is expanded and the disposal action ensues.

*See definitions in Appendix A

Figure 4: **Existing BLM Management & Disposal Boundary**



LEGEND

- Study Area
- Clark County/State Boundary
- City of Henderson
- Unincorporated Towns
- Unincorporated Clark County
- Other Municipalities
- Land Currently Managed by BLM
- Current Disposal Boundary
- Major Roads

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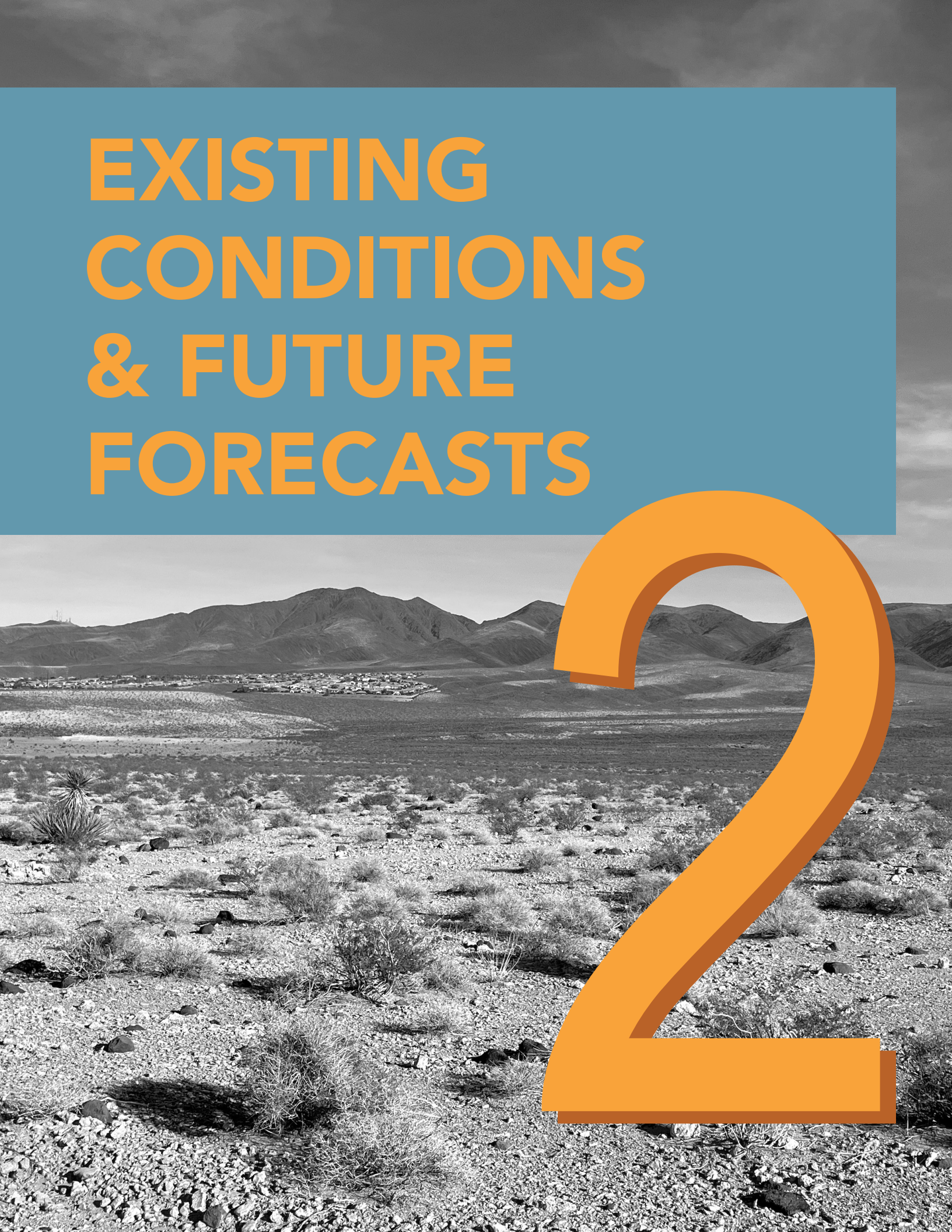
EXISTING CONDITIONS & FUTURE FORECASTS



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STUDY AREA CONDITIONS

The JLUS area covers about 30,980 acres of unincorporated land in Clark County to the south of Henderson and mostly east of I-15. The Study Area is largely undeveloped with very few residents and mostly under the federal land ownership of BLM. The Sloan Canyon National Conservation Area borders the Study Area to the northeast, the Town of Jean and the Jean/Roach Dry Lakebeds are located to the south. The area is characterized by desert vegetation, flatlands, gentle hills, and more rugged mountainous areas.

NATURAL & RECREATIONAL AMENITIES

Topography & Natural Areas

Terrain in the Study Area varies from flat to mountainous, with elevations that range from 850 feet to approximately 1,200 feet (Mean Sea Level). The geologic features in the northern and eastern portions of the Study Area were developed over millions of years, both through volcanic activity and the formation of thrust faults by shifting tectonic plates. The resulting landscape includes abrupt variations in terrain in some places, forming ridges, cliffs, and steep slopes of 12% or greater that are not suitable for development.[10] The western and southern parts of the Study Area, by contrast, have flatter terrain interspersed with dry lake beds and washes.

The Study Area lies within the Lower Sonoran biotic zone. Despite the typically dry conditions, alkaline soil in some places, and long, hot summers, the Vegas-Ivanpah Valley is not without natural flora and habitat that supports multiple animal species. The majority of land in this area is undeveloped Mojave Desert Scrub. Small pockets of Blackbrush, Salt Desert Scrub, and Playa ecosystems are also found in and around the Study Area.

Common flora also include creosote; sagebrush; various cacti including plains, pancake, and englemann prickly pear, buckhorn and teddy bear cholla, mountain ball, and salt bushes in the former lake beds; and various desert flowers, including desert marigolds, brittlebush, and globe mallow. Evergreens and deciduous trees are not common in these undeveloped desert conditions.[11] The most common fauna include desert rodents (mice, shrews, squirrels);

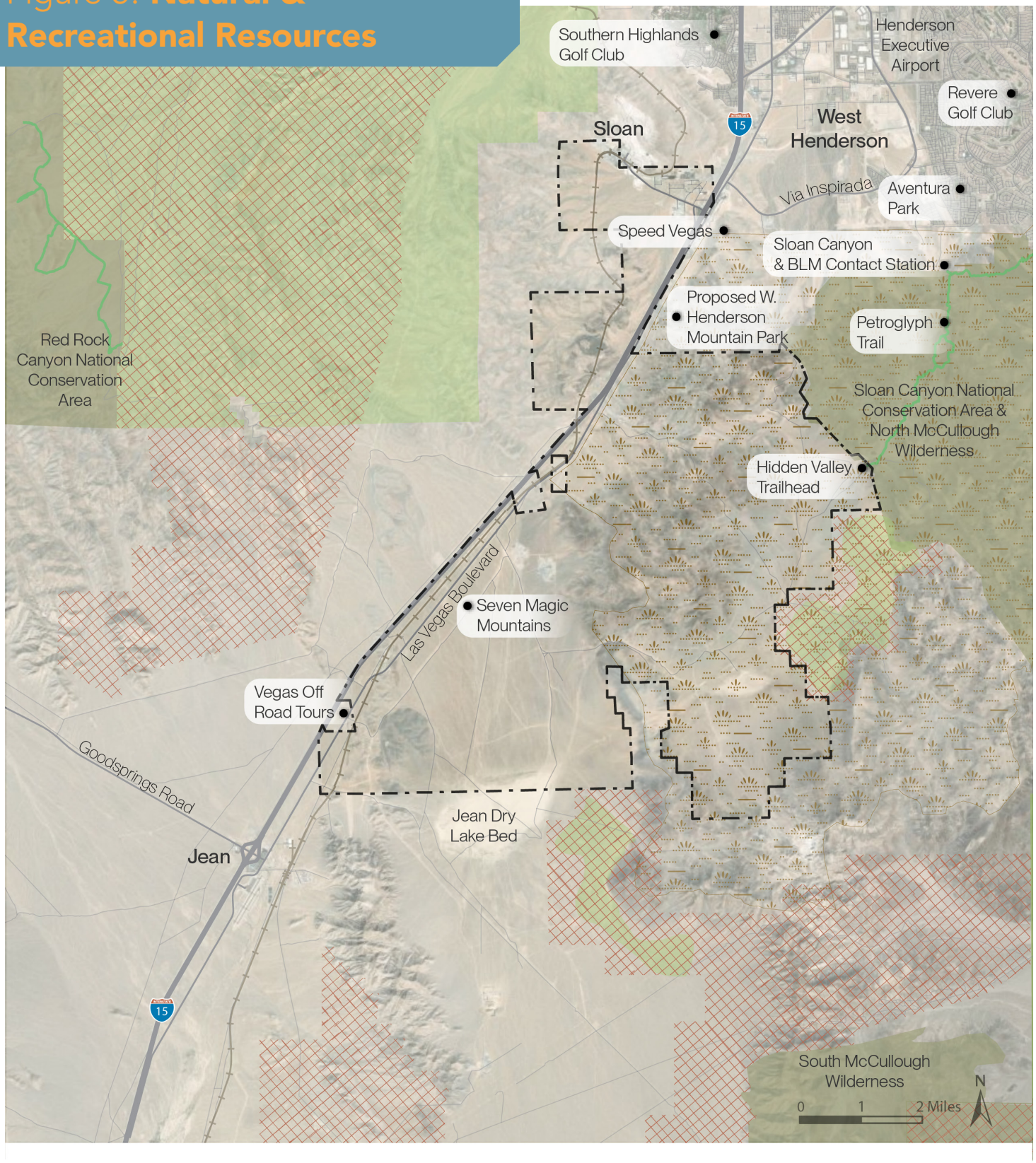
The Study Area and its surrounding context as it exists today. The Study Area is just south of Henderson between Sloan and Jean and primarily east of I-15. It is largely undeveloped and characterized by a mix of desert flatlands, gentle hills, and more rugged mountainous areas.

lagomorphs (rabbits, pikas); carnivores (racoons, skunks, weasels); artiodactyls (pronghorn, deer, sheep); and various lizards, snakes, frogs, turtles, birds, and insects. Notably, the desert tortoise (Gopherus agassizii) is listed as a threatened species under the Endangered Species Act of 1973, which is a contributing factor to some of the area's regulated and preserved lands.[12]

Figure 5 illustrates natural systems within the area. The Sloan Canyon National Conservation Area and North McCullough Wilderness lie to the east of the Study Area. Red Rock Canyon National Conservation area lies to the northwest, and the South McCullough Wilderness lies to the south. Several large conservation areas also surround the Study Area, as well as areas identified by BLM as Areas of Critical Environmental Concern (ACEC). The ACEC designation means "special management attention is required to protect and prevent irreparable damage to important historic, cultural, or scenic values, fish and wildlife resources or other natural systems or processes." These include the Paiute/Eldorado ACEC to the east of the Study Area, established to protect habitat areas of the desert tortoise, and the Ivanpah ACEC, abutting the Study Area to the south and established to protect biological resources.[13]

In addition, dry lakebeds are found throughout the area, the largest being Jean Dry Lake which lies at the southern extreme of the Study Area, just northeast of the Town of Jean. The Colorado River and Lake Mead lie farther east and northeast of the Study Area; otherwise, natural surface water is virtually nonexistent.

Figure 5: **Natural & Recreational Resources**



LEGEND

- Study Area
- Railroad
- Major & Minor Roads
- Conserved Wilderness
- Conservation Easement
- BLM Managed Public Trails
- Grazing Allotment (BLM)
- Areas of Critical Environmental Concern (BLM)

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Recreational & Cultural Amenities

The climate and ecosystems of this area provide ample beauty and opportunities for outdoor recreation (also illustrated in Figure 3). Because the majority of land in this area is publicly owned, it is largely available to residents and visitors for their enjoyment and recreational use. The neighboring conservation and wilderness areas provide hiking trails and scenic beauty. Various BLM four-wheeler roads and trails traverse and surround the Study Area, which offer opportunities for hiking, biking, horseback riding, and off-roading. Off-roading and car-racing are also popular in this area, with a few recreational businesses located along I-15 and elsewhere surrounding the Study Area. Additionally, the Mint 400 off-roading race takes place in the area every March, subject to annual approval of permits by BLM.[14] The City of Henderson also offers many existing parks, trails, and recreational facilities nearby, both private and public.

The Seven Magic Mountains sculpture is a land-based art installation placed by the Nevada Museum of Art in 2016. Accessed from Las Vegas Boulevard about ten miles south of Henderson, the brightly painted rocks reach a maximum of 35 feet high and attract many visitors, offering a unique vista in this region. The installation is planned to remain in place through at least 2027.[15]

Archaeologists have found historic petroglyphs in several locations to the east in the adjacent Sloan Canyon NCA. These more than 300 preserved art walls illustrate the Native American history and cultural background in this part of the Ivanpah Valley. The petroglyphs are accessible to the public along the Petroglyph Trail, which connects to the JLUS Study Area via the Hidden Valley Trail and Trailhead.

PROPOSED SUPPLEMENTAL COMMERCIAL SERVICE AIRPORT

Status & Intent

The existing Harry Reid International Airport (LAS) is located in the urbanized center of Clark County. It is immediately adjacent to the Strip and constrained by surrounding development. Thus, it is unlikely to accommodate anticipated growth in demand and activity for the region without significant property acquisition to allow expansion.[16]

As a result, the Clark County Department of Aviation (CCDOA) is planning for the construction of the proposed Southern Nevada Supplemental Airport (SNSA), which will operate as a supplemental commercial service airport in order to provide long-term, supplemental aviation capacity for the Las Vegas metro area. The site for the proposed SNSA is east of I-15 between the towns of Jean and Primm (see Figure 6 on the following page for the site's contextual location).

The proposed airport requires federal approvals from both the Federal Aviation Administration (FAA) and the Bureau of Land Management (BLM) and will require preparation of a full Environmental Impact Statement (EIS) under the National Environmental Policy Act (NEPA).

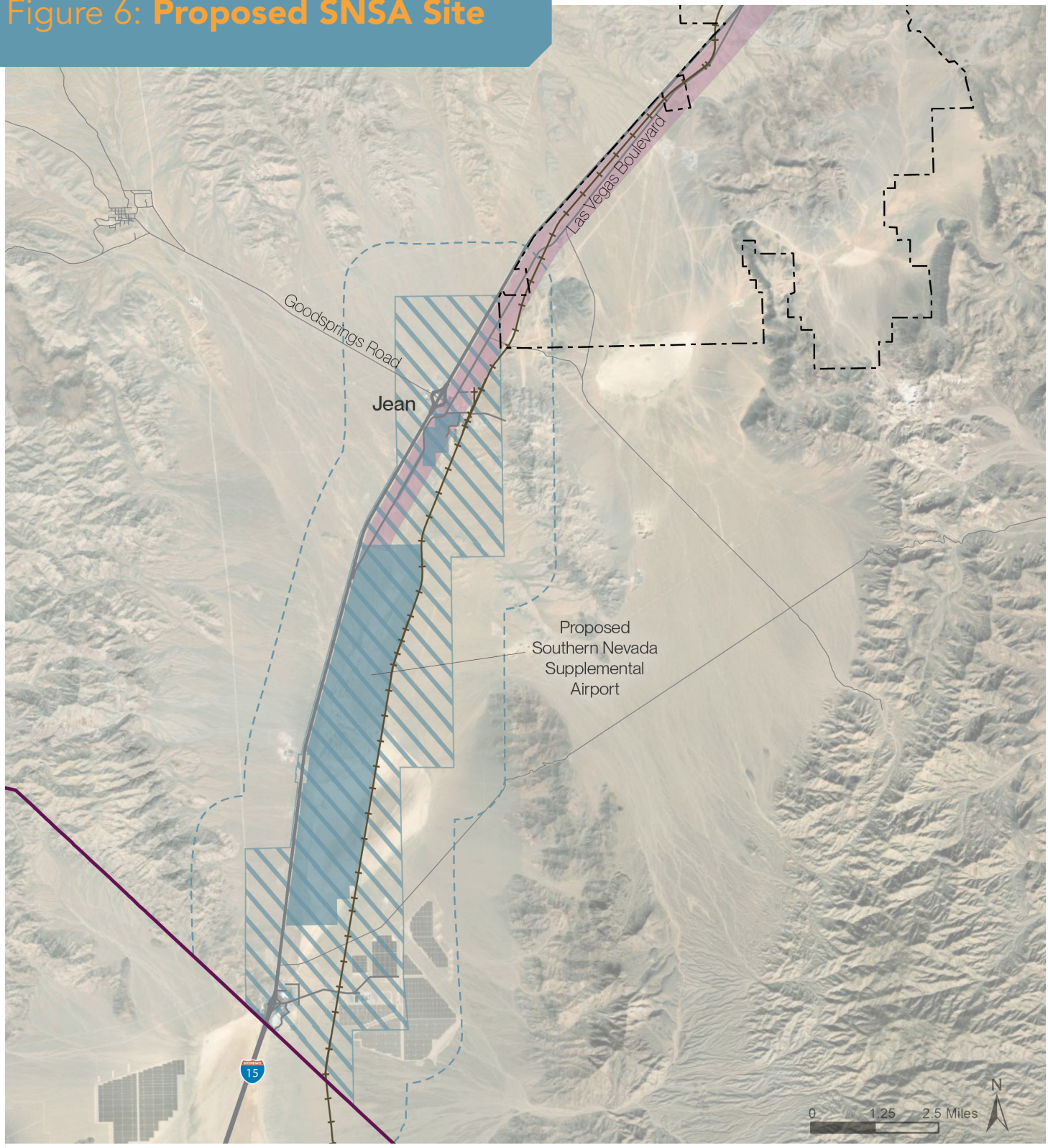
Potential Use & Utility

The SNSA site is over 7 miles long and encompasses approximately 6,000 acres. The site was identified by the United States Congress in the 2000 Ivanpah Valley Public Lands Transfer Act and, as directed by that law, the land was conveyed to Clark County in 2004.[17] If it receives the necessary federal approvals, the SNSA would be constructed with airport facilities that include up to two runways, associated taxiways, apron areas, passenger terminals and concourses, automobile parking facilities, airline and cargo storage areas, an Airport Traffic Control Tower (ATCT), access roads, and other appurtenant facilities, including but not limited to rental car facilities, general aviation (GA) facilities, airline support, cargo facilities, and a fuel farm.

Under Title V of the 2002 Clark County Conservation of Public Land and Natural Resources Act,[18] the United States will transfer an additional approximately 17,000 acres of land surrounding the airport site for use as a compatibility area (see Figure 6). This is contingent on the proposed SNSA project receiving a favorable Record of Decision following completion of environmental review under NEPA. If the 17,000 acres are transferred to the County, CCDOA will manage that land as airport-compatible uses subject to limits on development to ensure compatibility with the airport operations sited there. Unless or until the proposed SNSA receives the necessary federal approvals, the 17,000 acres of land will remain in federal ownership.

The 2002 Clark County Conservation of Public Land and Natural Resources Act also establishes a 2,640-foot-wide Transportation and Utilities Corridor (TUC) along the eastern side of I-15 between Jean and Sloan. This corridor is managed for the non-exclusive placement of transportation and utilities infrastructure. Finally, the National Defense Act of 2015[19] directs the BLM to convey an additional 2,320 acres of land for flood mitigation infrastructure upon a favorable Record of Decision.

Figure 6: **Proposed SNSA Site**



LEGEND

- Study Area
- Clark County/State Boundary
- Utility Corridor
- Clark County Department of Aviation Property
- Noise Compatibility Buffer
- 1-Mile Annexation Exclusion Area
- Major Roads

GROWTH TRAJECTORY

Preparing population and housing unit projections before knowing when the federal disposal action may occur presents a challenge to precisely estimating anticipated housing production or employment growth in the Study Area relative to the Las Vegas Valley as a whole. As a result, these estimates are based on the knowledge at hand when drafting this document (2040/45 projections) and are subject to change as new forecasts become available and conditions change over time.

Population & Households

Per UNLV Center for Business and Economic Development Research (CBER) forecasts, Clark County is expected to grow by 761,000 residents between 2025 and 2045.[20] This equates to an estimated 283,700 additional households and demand for 268,400 new housing units. This translates to an annual demand of approximately 13,400 new housing units.

Should development occur, the Study Area is estimated to capture approximately 10% of regional population growth and residential demand. This equates to an estimated 26,843 housing units - or 1,342 housing units annually - over the 20-year forecast period. Table 1 illustrates the estimated breakdown of demand for different housing types, based on regional trends.

Clark County is experiencing an acute shortage of housing supply at most price points, especially options affordable to low- and moderate-income renters and would-be first-time homeowners. This plan is a conceptual document looking several decades ahead, and the housing market could be in a different position by the time recommendations are carried out. That said, the household growth projections above hint at the possibility that housing supply and cost may remain a particular challenge in the long-term. The Study Area has the potential to help alleviate some of these pressures by proactively planning for new development to accommodate anticipated needs, including affordability.

Table 1: Housing Demand (2025-2045)

Housing Type	20-Year Unit Demand (%)	20-Year Unit Demand (#)
Single-Family	60%	16,106
Missing Middle*	10%	2,684
Multifamily	30%	8,053

Employment

Like population and housing, expected demand for economic growth and employment within the Study Area is grounded in recent trends and regional industry forecasts. Per CBER forecasts, the Las Vegas Metropolitan Statistical Area (MSA) is expected to grow by 368,000 jobs from 2021 to 2040, which equates to approximately 19,400 jobs annually or 1.3% annual growth. These forecasts are then applied across the region's industry sectors, with construction, manufacturing, healthcare, agriculture and mining, transportation and warehousing, professional services, real estate, public administration, education, and administrative and waste services all expected to grow at a higher rate than overall employment growth.

*See definitions in Appendix A

"Driving industries" (also known as "basic") are those that generate goods and services at a greater rate than is needed to support local communities. This means that goods and services are either exported or consumed by visitors, resulting in revenue from outside sources. Per 2022 data, in Clark County, these driving industries include:

- Agriculture and mining
- Construction
- Manufacturing
- Education
- Health care and social services
- Arts, entertainment, and recreation
- Accommodation and food service

It is expected that these industries will continue to be important for the regional economy and for Clark County. In total, it is forecasted that these industries will grow by 117,268 jobs in Clark County by 2040. Other supporting industries are expected to grow by a total of 90,321 jobs by 2040 in Clark County. Combined, this results in a total of 207,588 expected new jobs - or 11,533 annually.

Should development occur, the Study Area is expected to capture approximately 30% of anticipated industrial growth, while the capture for retail, hospitality, and office are expected to be 10%. While there are many uncertainties at this time regarding the timeline for potential development, these educated assumptions help in determining how much land is needed to meet expected demand. These details are provided in Chapter 3, with a more thorough discussion provided in Appendix C.

WATER & UTILITIES

The Region's Conservation Approach

The Colorado River provides the fresh water supply for virtually all of Clark County, stored in Lake Mead until ready for transmission and treatment. The Southern Nevada Water Authority (SNWA) oversees the allocation of water supply for the region and must ensure that water is conserved to guarantee a consistent supply and sufficient recharge. This entails limiting consumptive use, i.e. outdoor landscape watering and other water use that cannot be recaptured, and ensuring that all other water remains in the system for use. SNWA's approach has been to issue advisory recommendations to the region's member governments that they can adopt as regulations. These include:

- Limits on installation of new swimming pools, grass lawns, and other non-native landscaping;
- Recommendations for xeriscaping and native landscaping in place of the above; and
- Prohibition of landscape watering during specific days and times.[21]

SNWA works with the Las Vegas Valley Water District (LVVWD), Clark County Water Reclamation District (CCWRD), and City of Henderson Department of Utility Services, among other water provision and treatment agencies in the region. CCWRD maintains the final portions of the closed system, ensuring that water is treated, cycled back through the system, and returned to Lake Mead.

Colorado River Allocations

Operating guidelines for the Colorado River have historically been agreed upon between all government users of the river in a binational fashion, involving the United States and Mexico. Among users within the U.S., the Department of the Interior brokers agreements between the seven states (including Nevada) and Indigenous tribes that draw water from the river. Current guidelines are in place through 2026.[22] In light of historic drought and concerns that climate change will worsen these conditions over time, the parties agreed to additional conservation of 3 million acre-feet of Colorado River water between 2023 and 2026.[23] After 2026, the supply for Colorado River Lower Basin states (AZ, CA, and NV) may be voluntarily cut by up to 13% of the current legal water allocation.[24] SNWA is the Nevada entity that advocates for the state in this process, and has expressed its judgement that sufficient water will remain available to support the Las Vegas Valley's growth.[25] The SNWA water resource plan reflects this expectation.

As of right now, the Study Area is expected to have sufficient water allocation to support potential development, at least through the next 20 years. With the uncertainty around timing and outcomes for the Disposal Boundary expansion process, it will be important to continually reevaluate water allocation and availability that can support development in this area and sustain existing communities in the region. It is expected that development will follow any water-related regulations established by Clark County and the City of Henderson, with high-level guidance from SNWA. Appendix B contains reference details for adopted plans that address this topic.

Existing Utilities and Infrastructure

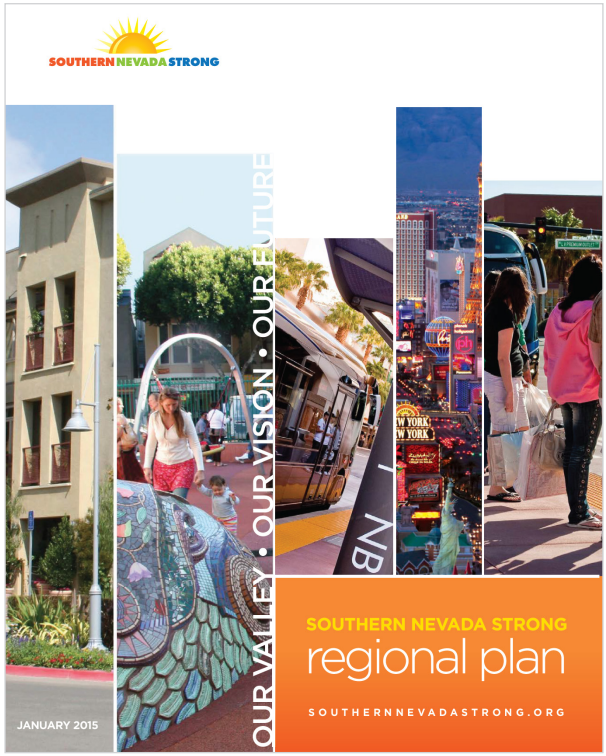
Because the Study Area is largely undeveloped at present, limited infrastructure exists. Dirt roads and trails can be found scattered throughout, while formal paved roads only exist immediately adjacent to I-15 and in the northwest where some development already exists. Sanitary sewer, potable water, and electricity are also virtually nonexistent in the vast majority of the Study Area, although adjacent roadways and development to the north and south offer convenient opportunities to connect future infrastructure with existing systems. Chapter 4 provides further details on infrastructure considerations.

Plans Governing the Area

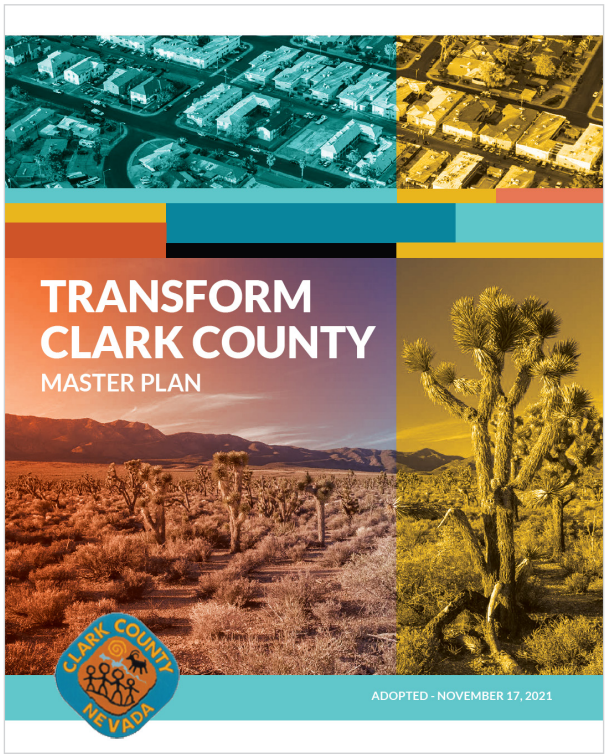
Several adopted plans provide valuable guidance from a regional context regarding key priorities, considerations, best practices, and regulations that pertain to the Study Area. Key plans and studies that influenced the development of this document are listed below. Further details can be found in Appendix B.

Federal, State & Regional Plans

- Southern Nevada Strong Regional Plan (2015)
- Access 2050: Regional Transportation Plan for Southern Nevada (2021)
- Vision 2025: A Comprehensive Economic Development Strategy for Southern Nevada (2021)
- Nevada State Freight Plan: A strategic framework for freight mobility and economic competitiveness (2017)

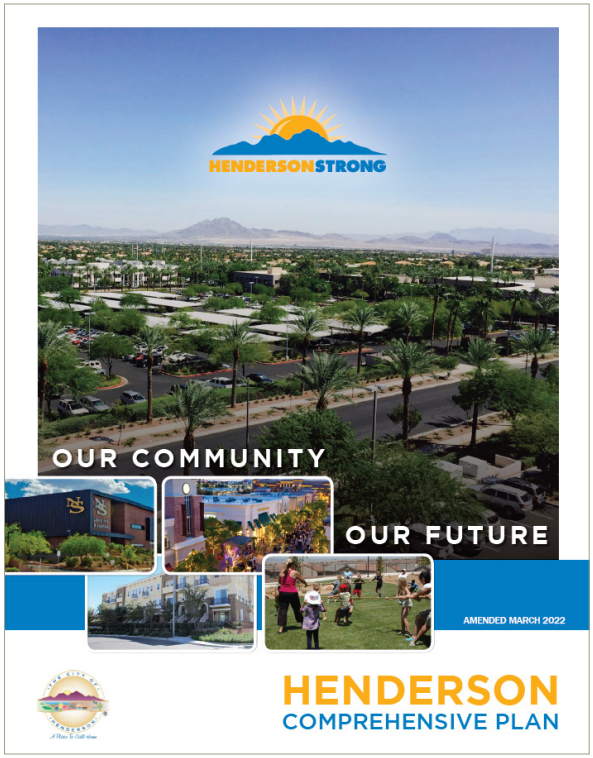


- Sloan Canyon National Conservation Area Resource Management Plan (2006)
- Regional Flood Control Master Plan Update (2023)



Clark County Plans

- Transform Clark County Master Plan (2021)
- "All In Clark County" Community Sustainability & Climate Action Plan (2023)
- Clark County Parks, Recreation & Open Space Plan (2022-2027)
- Multiple Species Habitat Conservation Plan (2000)



City of Henderson Plans

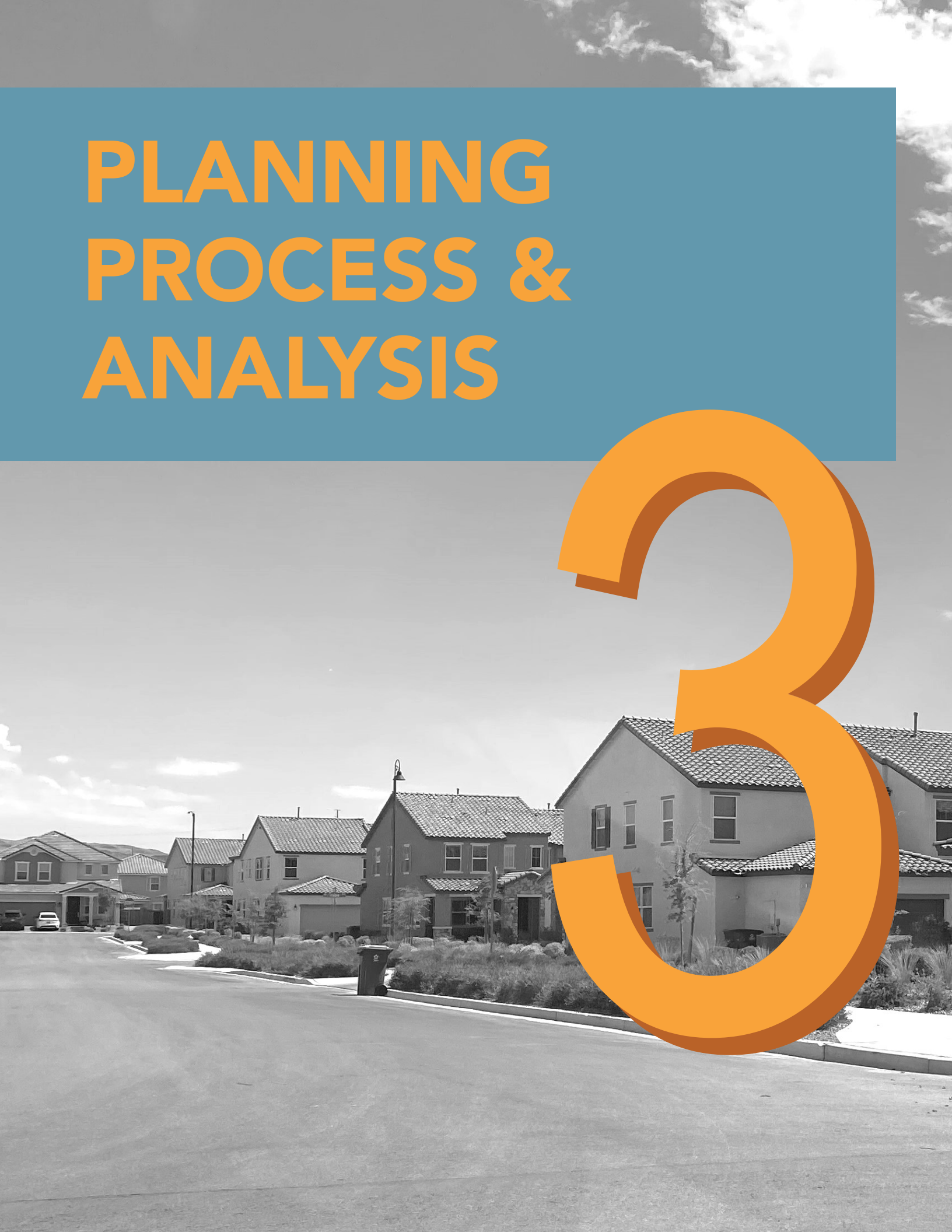
- Henderson Strong Comprehensive Plan (2017; updates in progress)
- West Henderson Land Use Plan Update (2014)
- Henderson Transportation and Mobility Plan (in progress)
- Henderson Open Space & Trails Plan (update in progress)
- Age-Friendly Henderson Action Plan (2024)
- 2024-2027 Henderson Strategic Plan (2024)

Industry Studies

- Southern Nevada Housing Market & Land Use Availability Analysis (2022)
- Southern Nevada Industrial Land Analysis (2020)

PLANNING PROCESS & ANALYSIS

3



APPROACH

Methodology

With goals of the JLUS identified by the City and County through an Interlocal Agreement and joint project solicitation, this study was created through an iterative 24-month process. First, a Public Outreach Plan and Project Overview were drafted to establish the technical experts to consult and to provide the public context on the study's intent. Stakeholders identified as having particular expertise important to the Study Area's present and future were invited to participate in the process to express their priorities, identify issues and opportunities, and guide the Study from their perspectives.

Next, the team developed three scenarios to consider a variety of possible land use combinations that could support anticipated demand and growth as well as other goals, such as habitat and natural resource conservation. These scenarios were developed using GIS analysis and a land demand analysis (see details on page 30). Identified land use categories included:

- Mixed employment, including office campuses and industrial sites
- Housing/neighborhoods
- Traditional mixed use
- Retail, hospitality and entertainment
- Open space and buffers

Other community facilities, such as schools, community centers, and libraries were assumed to be integrated within these distinct land use types. All three scenarios included all land use categories but differed in the ratio and positioning of each. This exercise was designed to consider and weigh different development priorities.

Scenario 1 focused on maximizing large employment sites to accommodate transloading, freight, processing, and advanced manufacturing activity, with a long-term goal of creating an intensive job center. The primary benefit and goal of this scenario would be the most significant positive revenue generation impact per acre.

Scenario 2 placed greater emphasis on residential neighborhoods, providing new construction opportunities and homes in a part of the region with close access to nature and to possible new job centers. The primary benefit and goal of this scenario would be the most significant positive impact on addressing the region's anticipated population growth and demand for new housing.

Scenario 3 focused more heavily on retail, commercial, hospitality, and entertainment uses, providing more of a regional draw for visitors than the other two scenarios. The primary benefit and goal of this scenario would be the most significant impact on drawing visitors and providing needed services and amenities to new southern Clark County residents.

These three scenarios were presented to a broad group of stakeholders. Based on feedback, the three scenarios were then refined into a single preferred alternative, which most closely resembled Scenario 2, but incorporated select elements of Scenarios 1 and 3. A refined version of this preferred alternative is presented in Chapter 4, serving as the high-level desired concept for potential development in the Study Area. This land use framework can inform proactive regulation decisions that will ultimately determine how the area may develop over time.

Using the preferred alternative, the team performed a revised assessment of economic projections, including anticipated households and jobs within the Study Area. These projections then informed the development of a high-level understanding for infrastructure and utilities demand, such as roadway capacity and water needs. These considerations were translated into a conceptual roadway and trails network map (see Page 97) to complement the land use framework. Further utilities and transportation assessment will be necessary as planning continues for potential development in this area.

Accompanying these items are 3D models and graphics to illustrate what each of the future land use types *could* look like in the Study Area. These include one 3D model for each land use type from a bird's eye view. Selected plan views and cross-sections were also developed to more fully demonstrate how the built environment, and the road/infrastructure network supporting it, could be laid out.

The team also wrote recommendations that reflect overarching principles of the preferred land use alternative and infrastructure framework. These recommendations are meant to drive implementation, including policy and regulatory actions, development guidelines, collaboration, and phasing considerations that Clark County and the City of Henderson can undertake.

Stakeholders

Approximately 40 stakeholders participated in one-on-one or small group interviews, representing more than 20 different organizations or County and City departments. Stakeholders were also encouraged to participate in a series of four focus groups across two strategic engagement windows during the project. Many of these stakeholders, as well as members of the general public, participated in three public open house events (two virtual, one in-person) to present draft materials. Additionally, a public comment period was held to provide stakeholders and members of the public an opportunity to comment on the final draft plan.

These engagement opportunities had dual purposes – initially, to learn about the operations, relationships, capacity, resources, challenges, and priorities of local organizations and key partners; then to ask participants what they envision for the Study Area, what challenges they anticipate, what concerns they have, and what strategic opportunities they see. During these sessions, participants were asked to weigh in on draft recommendations, land use scenarios, and other materials prepared during the planning process. Key partners within the study area were identified as stakeholders and provided valuable insights into the various local considerations and conditions. These groups will inevitably have a role in the implementation of this plan, making their input and involvement essential for future success. As the project progressed, additional stakeholders became involved as information was shared and the first public engagement events were held.

These conversations were crucial to the plan's development process, providing context and guidance for development goals, developing and refining the land use concept, and preparing recommendations for implementation. From technical expertise to lived experience, these comments and discussions helped the project team draft and refine recommendations, refine the land use concept, clarify language, and address critical topics and concerns. While it can

be difficult to balance multiple intersecting interests and issues, which are sometimes in conflict with one another, the engagement process was critical in this effort which strove to find that balance.

Acknowledging the uncertainty around disposal boundary expansion, proposed projects, and future conditions, key themes from engagement include:

- Excitement about the development and economic potential of this area, while others expressed concern about sprawling development from the existing metro core and potential impacts on the climate, natural resources, wildlife, and existing communities.
- Strategic coordination and collaboration is critical between stakeholders and jurisdictions to ensure success moving forward.
- Consistent and coordinated development regulations are needed area-wide to implement a shared vision and ensure cutting-edge, resilient, and sustainable development. The study area provides a unique opportunity for 'blank slate' development that should be implemented thoughtfully to promote resource conservation and supportive livable communities.
- Business attraction and competitive advantage will be crucial to this project. The focal point of the economy in this area could be an 'inland port' for the distribution and logistics industry, although stakeholders also reported a strong desire to balance this commercial center with development of complete communities.*
- Complete communities* should feature balanced attainable and affordable housing,* daily retail and service needs, recreation and entertainment, convenient multimodal connectivity, and a diverse array of job opportunities.
- New infrastructure, utilities, and services are essential for potential future development. New sources of funding may be needed in order to accommodate infrastructure, utilities, and services expansion.
- New development and business operations must be water-conservative and meet the stringent requirements of existing development codes to protect resource availability.

*See definitions in Appendix A

Key stakeholder groups include:

Brightline West

A business organization implementing the private high-speed passenger rail project that will connect suburban Los Angeles with Las Vegas. An affiliate organization, known simply as Brightline, operates a similar rail line in Florida.[26]

Bureau of Land Management, Nevada (BLM)

A branch of the U.S. Department of the Interior that manages public lands, including lands leased for mining and drilling, agriculture, conservation and habitat, or recreation. 48 million acres (67%) of land in Nevada is publicly owned. BLM currently owns almost all of the land within the Study Area.[27]

Clark County Board of County Commissioners

The seven-member service delivery organization that oversees county-wide policies and decisions. This elected body also governs the Las Vegas Valley Water District, Clark County Water Reclamation District, University Medical Center of Southern Nevada, Big Bend & Kyle Canyon Water Districts, and the Clark County Liquor & Gaming Licensing Board.[28]

Clark County Department of Aviation

Governmental department that manages Harry Reid International Airport and four other general aviation facilities in Southern Nevada. This agency is also leading the proposed Southern Nevada Supplemental Airport (SNSA) project.[29]

Clark County Office of Community & Economic Development

Governmental department that serves as a resource for developers, new businesses and companies interested in relocating to or expanding in Clark County.[30]

Clark County Parks & Recreation Department

Governmental department that manages trails, parks, playgrounds, open spaces, and other recreational assets, assesses needs, and provides recreational experiences for residents and visitors.[31]

Clark County Water Reclamation District (CCWRD)

Local agency responsible for the collection, treatment, and reclamation of wastewater which is then returned to Lake Mead – the drinking water source for more than 95% of Clark County. The District is a member of SNWA and serves more than 240,000 businesses and residential units in the area.[32]

Friends of Sloan Canyon

A non-profit organization that provides community support and educational resources to enhance the conservation, protection, and public enjoyment of Sloan Canyon National Conservation Area.[33]

Henderson Economic Development Department

Municipal department focused on business attraction and serves as a resource for business owners, entrepreneurs, developers, and the workforce.[34]

Henderson Parks & Recreation Department

Municipal department that manages recreational assets, assesses needs, and offers a variety of classes, programs, and experiences for residents of all ages.[35]

Henderson Utility Services Department

Municipal department that manages city water, wastewater, and reclaimed water services.[36]

Housing & Equity Advocates

Representatives from five different advocacy, community, and policy-oriented organizations that support the needs and perspectives of traditionally marginalized and underrepresented groups, including low-income households, people of color, people with disabilities, and others.

Las Vegas Global Alliance (LVGEA)

Public-private partnership organization that supports regional economic growth and success in the Las Vegas Valley.[37]

Las Vegas Valley Water District (LVVWD)

Not-for-profit agency established in 1954 to deliver safe drinking water, now serving more than 1.5 million residents across the Vegas metro and other parts of Clark County.[38]

Regional Transportation Commission of Southern Nevada (RTC)

Regional quasi-governmental entity providing public transportation services, transportation and regional planning (Southern Nevada Strong), and other transportation-related efforts to support the region.[39]

Southern Nevada Commercial Real Estate Development Association (NAIOP)

Professional organization related to office, industrial, and mixed-use real estate, to advance responsible commercial real estate development and advocate for effective public policy.[40]

Southern Nevada Home Builders Association (SNHBA)

Local trade association representing the residential construction industry in Southern Nevada, with more than 500 members. Selected individual homebuilders also engaged during the process.[41]

Southern Nevada Water Authority (SNWA)

Not-for-profit agency that addresses water issues regionally, providing guidance to seven member agencies who collectively serve more than two million residents. SNWA is a wholesale water provider, responsible for treatment, delivery, and the acquisition and long-term management of water resources for the region.[42]

Nevada Department of Transportation (NDOT)

State-level department established in 1917 to manage, maintain, and provide new transportation system infrastructure in the state of Nevada.[43]

Nevada Governer's Office of Economic Development (GOED)

State-level department established in 2011 to support high-quality job growth and economic development, guided by the State Plan for Economic Development.[44]

NET LAND DEMAND

Based on regional forecasts for population and economic growth and the assessed proportional capture of that growth within the Study Area, the following land demand is estimated between now and 2045. This estimated demand - should developmet proceed within that timeframe - would only account for a portion of the total Study Area's land. While additional demand for new development is anticipated beyond 2045, forecasting that far out is highly unreliable due to the likelihood of changing conditions over time. Future forecasting and associated planning will be necessary to establish an up-to-date understanding of expected demand and preferences. Further details on methodology and findings are provided in Appendix C.

Residential Development

Table 2 illustrates the estimated land demand for residential development, based on expected demand for a range of housing types. The total expected 20-year demand for residential development is approximately 6,155 acres - or 308 acres annually. This demand analysis is focused on generalized structural housing types as they relate to land acreage needed for development. Affordable and attainable housing* are assumed to be included within these types. Land demand for three general housing type categories are evaluated using average densities. Specific neighborhoods or housing developments within these three categories may exhibit lower or higher densities than the average.

Employment-Based Development

For the purposes of this Study, anticipated employment growth across all industries are grouped into the following development types:

Industrial development ("Industrial" and "Flex" sector types in Table 3) will achieve the greatest capture of regional demand in the Study Area, estimated to capture 30% of regional demand. This correlates to approximately 18.5 million square feet of space over 20 years, requiring approximately 2,800 acres of land. The estimated capture of retail, hospitality, and office demand is 10%. This results in demand for 1.5 million square feet of retail space (175 acres of land), 1.4 million square feet of hospitality space (133 acres of land), and 1.6 million square feet of office space (180 acres of land).

Table 2: Land Demand For Residential Development (2025 - 2045)

Housing Type	Average Density	Unit Demand	Land Demand (Acres)
Single-Family	3 DU/Acre	16,106	5,369
Missing Middle*	7 DU/Acre	2,684	383
Multifamily	20+ DU/Acre	8,053	403
Total		**26,843**	**6,155**

*See definitions in Appendix A

Table 3: Land Demand For Commercial & Industrial Development (2025-2045)

Geography	Demand by Sector (in sqft unless otherwise noted)				
	Retail	Hospitality	Office	Flex	Industrial
Clark County	15,181,500	14,465,100	7,828,600	8,534,900	53,282,000
Study Area					
Est. % Capture	10%	10%	10%	30%	30%
Est. Sqft Capture	1,520,000	1,446,510	1,566,000	2,560,000	15,985,000
Est. Acreage Demand	175	133	180	235	2,450
Total Square Footage Demand	**23,077,510**				
Total Acreage Demand	**3,173**				

TECHNICAL CONSIDERATIONS

The BLM Disposal Process

As established, the Federal Land Policy Management Act (FLPMA) of 1976 and the Southern Nevada Public Lands Management Act (SNPLMA) of 1998 created the existing BLM Disposal Boundary and land disposal process. A Resource Management Plan (RMP) was developed to manage the transfer of land within the boundary, which may occur in the form of a land sale, exchange, mineral conveyance, or Recreation and Public Purpose long-term leases.[45]

A parcel may be considered by the Federal Government for disposal if it meets criteria, such as:

- not manageable by another federal agency
- acquired for a specific purpose that is no longer relevant
- can serve a useful and meaningful purpose like expansion of communities or accommodating resident needs determined to outweigh the public objectives if kept as federal land.[46]

BLM then determines if sale or transfer is appropriate, following the requirements of the enabling laws. While the nomination of parcels by local governments is advisory only, many prior nominations have been granted and conveyed, paving the way for new uses ranging from industrial parks to affordable housing.[47]*

Traditionally, when ready to initiate a disposal action, BLM 1) places a notice in the Federal Register and accepts public comments for 45 days, and 2) notifies the state's governor and relevant political subdivision(s) so they can prepare for their role in administering land use regulation and zoning. Following these actions, BLM can proceed to auction the parcels at a competitive sale, priced at least at fair market value.[48]

The state and local governments can nominate specific parcels for disposal and previously did so using the RMP; however, BLM retains control over which parcels are sold and the timing of that action. The County is now seeking Congressional action to expand the disposal boundary to increase the amount of land that is eligible for sale nomination by BLM.[49]

*See definitions in Appendix A

The current lands bill—SNEDCA—is pending before the 118th Congress as of the writing of this Study and could significantly expand the SNPLMA. Its passage and signature by the President would authorize BLM to move ahead with the Disposal Boundary expansion and disposal action to Clark County, thus accommodating population growth and economic diversification. In addition, some land would be set aside to expand National Conservation Areas, preserve natural landscapes, and to conserve habitats.[50]

Nature & History

How should development proceed among the unique natural and cultural resources within the Study Area? This section details the priority considerations assuming passage of the SNEDCA lands bill and conveyance to the County. However, this review is not intended to be comprehensive, as other natural and historical considerations may arise by that point. Additional assessment and planning to mitigate potential impacts to valued natural and cultural resources should be pursued going forward.

The threatened species status of the desert tortoise calls for great care in preserving critical habitat and minimizing human disturbances before moving ahead with any development in this area. Clark County is aware of this challenge and has been operating since 2000 under a Multi-Species Habitat Conservation Plan that includes the desert tortoise; see Appendix B for details.[51] As such, no recommendations in this study change that effort. In fact, the land use recommendations of this plan encourage the preservation of significant wild lands, alongside the conservation of others for recreational uses.

When implementing the recommendations in this study, care and consideration should be taken to provide wildlife corridors to connect habitat areas and manage recreation areas to minimize human impact on wildlife and fragile ecosystems. Coordination with appropriate agencies and partners will be crucial to this effort.

While petroglyphs have not been found within the Study Area, archaeologists have located them in multiple locations to the east in the Sloan Canyon NCA. This study recommends that a portion of the land abutting the NCA and the McCullough Wilderness at the eastern edge of the Study Area be retained as open space, to protect the existing sites and minimize the possibility of human disturbance of petroglyphs yet to be identified. Additionally, the County and partnering entities should consider how archeologists, historians, and Indigenous voices from the area can contribute to the character of future neighborhoods and activity centers within the Study Area. Through placemaking and public art, new development has the potential to recognize, preserve, and uplift the cultural heritage of these lands.

The County and partnering entities should collaborate with the Nevada Museum of Art and the community at-large to determine the most appropriate future for the Seven Magic Mountains art installation. Its perennial popularity has added years on to its planned exhibition time.[52] If desired, the installation's continued presence and thoughtful, permanent incorporation into future development should be carefully considered and planned for.

Finally, the County is required to comply with federal Clean Air Act standards to ensure that the County meets, or is working to attain, National Ambient Air Quality Standards (NAAQS).[53] While there are limited tools available to modify the existing transportation system and developed areas of the County, this type of blank slate development presents an opportunity to promote multimodal transportation and reduced vehicle miles traveled (VMT) per person/household.

RECOMMENDATIONS

4

IVANPAH VALLEY DEVELOPMENT RECOMMENDATIONS

Based on our comprehensive assessment of relevant planning and regulatory documents, background research, and stakeholder input, the following recommendations capture key priorities for potential future development within the Study Area. These recommendations are followed by supporting materials that provide a greater level of detail and direction and comprise a complete land use framework for the Study Area. This framework incorporates specific Development Types that depict land use and character, design guidelines, infrastructure concepts, and policy and regulatory considerations to guide the County and City – and other partners - as planning progresses toward eventual development of the Study Area.

Recommendation #1: Provide a wide array of diverse housing options, including attainable market-rate housing as well as workforce housing and affordable housing. A spectrum of housing options in the Ivanpah Valley will accommodate growing demand and ensure that workers can live within a reasonable commuting distance of future job centers within the area. Residential development regulations and specific siting should be strategically coordinated to ensure that residents have easy access to public transit and active transportation opportunities, particularly for affordable housing, low-income families, and seniors. Existing policies, regulations, and tools of Clark County and the City of Henderson (or the creation of new ones) will provide specific guidelines and support for the development and preservation of affordable housing within the Study Area.

*See definitions in Appendix A

Recommendation #2: Encourage the growth of neighborhood-serving retail that is strategically mixed with other uses (such as residential) to ensure a strong customer base for business success and the provision of daily needs and leisure amenities for residents. Promote a higher-density combination of these uses in strategic locations to form community hubs.

Prioritize smaller retail footprints over the growth of large, single-use retail centers or clusters within the Study Area, as the region appears to have more than enough of these. A mix of brick-and-mortar retail with other uses will attract more residents and visitors alike. Complementary land uses include residences, experiential activities, entertainment, restaurants. and small-scale office or other service-based businesses.

Recommendation #3: Encourage industrial sector development in appropriate locations through land prioritization as it offers substantial revenue impact per acre and the region currently has a limited supply of large parcels to support this sector.

Recommendation #4: In early development stages, encourage the prioritization of strategic community hubs that have a higher concentration of economic generating uses, such as traditional mixed-use, manufacturing and distribution, business headquarters, and office parks.

Development phasing will start upon the approval and adoption of SNEDCA and subsequent land disposal action. Hubs of economic development should be prioritized in early development phases, assuming the availability of shovel-ready sites and appropriate utility connections. Such development will generate demand for other uses, such as residential, retail, and recreation or entertainment.

Recommendation #5: Promote high-quality, design-conscious development, in keeping with the Study Area's position as a gateway to the region. With perennial heavy visitor traffic approaching Las Vegas on I-15 from southern California, and the proposed Brightline West rail option, approach from the southwest remains a common entry point for many visitors. The Study Area's development would not change this fact, but the "gateway" would move southward as the metro's center of gravity advances in that direction. This provides a unique opportunity to visually welcome visitors to the Ivanpah and Las Vegas Valley.

Recommendation #6: Promote sustainable, low impact and water-efficient development that aligns with adopted standards and requirements for reducing water use and reclaiming/recycling water as well as other sustainability efforts. Strategically encourage cutting-edge development that is energy and resource efficient. Utilize incentives or overlay regulations for Building Performance Hubs that establish the Ivanpah Valley as a leading example for forward-thinking development trends that accommodate growth while considering resource constraints and the needs of future generations.

Recommendation #7: Utilize placemaking to curate a unique and distinct identity, establishing new community hubs and neighborhoods within the Study Area as regional destinations, rather than undefined and disjointed outward expansion. Placemaking within the Study Area will increase its attractiveness for businesses and employees, visitors, and residents alike. This is especially important because of its proximity to the Las Vegas metropolitan area, which is a significant attraction and gravitational center.

Recommendation #8: Align Study Area planning and development with best practices for public health. Encourage public health from the start by designing walkable neighborhoods and destinations and promoting outdoor recreation with thoughtful connectivity and placement of trails and parks.

As planning for potential development in the Study Area continues, multiple strategies should be considered and prioritized that align with best practices for promoting public health including 1) increasing physical activity in adults by providing nearby locations for aerobic physical activity, 2) promoting active transportation between destinations (reducing vehicle miles traveled) through design, land use, and infrastructure provision; and 3) limiting exposure to unhealthy air by siting residences distant from large transportation corridors like I-15 or manufacturing facilities. Ensure that appropriate development requirements are in place to preserve open space resources and provide integrated access to natural areas and recreation.

Recommendation #9: Emphasize economic integration of new development within the Study Area with the regional economy. This includes the promotion of business siting and growth in target sectors, including advanced manufacturing and distribution, business headquarter relocations or expansions, innovation and entrepreneurship, and others. Partnerships and coordination with existing businesses and economic development entities located within the Las Vegas metro will be crucial to regional success in the long-term.

Recommendation #10: Promote growth in the local outdoor recreation industry to increase access to the unique wilderness and open spaces in and around the Study Area, while balancing responsible management and protection of valuable natural resources. This effort will diversify tourism activities in the area and simultaneously provide recreational opportunities for residents. As appropriate, apply the City of Henderson's Sensitive Lands Overlay regulations – or similar tools – to protect sensitive landscapes, preserved open spaces, and natural habitats.

Recommendation #11: Support the attraction of national and regional freight distribution operators interested in southern Nevada.

Recommendation #12: Support the proposed Southern Nevada Supplemental Airport and coordinate with the Clark County Department of Aviation as necessary to ensure compatible development.

Recommendation #13: Continue to utilize airport overlay districts and consider land use regulations that dictate buffers or compatible-only land uses as a regulatory tool for land near airports and heliports. Consider expansions or revisions to existing standards as needed to mitigate any potential conflicts and adhere to best practices.

Development limitations and/or sound insulation for properties within an airport overlay district are a national best practice recommended by the Federal Aviation Administration. Clark County and the City of Henderson have relevant experience in applying these practices through their development codes for the adopted Airport Environs Overlays for airports within their jurisdiction.

Recommendation #14: Align Study Area planning with established best practices and standards identified by Clark County and the City of Henderson for transportation and mobility. Promote multimodal community and neighborhood development through design guidelines, strategic parcel platting, right of way allocations, funding decisions, and other regulatory strategies that move beyond "business as usual."

A multimodal community offers several options for daily trips, including but not limited to bus, bicycling, walking, carpooling, and driving a personal vehicle. Ensure that multimodal connections are provided to existing areas of development, including the northern edge where the Study Area abuts West Henderson, and west toward the I-15 corridor. Mitigate the experiential impacts of traffic and parking on the community.

Recommendation #15: Align Study Area planning and development with future capital investments and improvement programs (CIP) for Clark County and the City of Henderson. Tap available funds by incorporating new infrastructure projects into CIPs as early as posible and encourage or pursue projects that geographically align with already planned improvements. Coordinate with regional partners and service providers to identify additional funding needs and sources to ensure the viable and timely construction of high-quality infrastructure and implementation of services within the Study Area. As appropriate, deploy SNPLMA proceeds to develop specific types of facilities within the Study Area (e.g., trail networks, parks, etc.).

Recommendation #16: Coordinate future planning for potential development within the Study Area with regional goals and other planning and development efforts. Work as a region to promote climate impact mitigation and to address inequity.

PRIMARY LAND USE FRAMEWORK

The eight proposed Development Types include conceptual recommendations for average densities; the appropriate mix of land uses; circulation, access, and connectivity; and appropriate transitions between Development Types. Crucially, each Development Type includes several conceptual 3D models that illustrate how these elements comprise complete communities* when implemented together.

The Proposed Land Use Map (Figure 7 on the following page) lays out the proposed Development Types geographically to provide a cohesive visual concept for the land use framework. This map was developed to align with the development code of Clark County at a high level, while balancing that parameter with strategies that incentivize forward-thinking priorities and recommendations. These include discouraging sprawl and the need for long car trips to reach daily destinations, encouraging complementary land uses to be co-located, encouraging the production of housing at different price points and serving different preferences and needs, protecting and providing open spaces, and collectively assembling coherent, complete neighborhoods.*

Future Land Uses and Development Types

The eight proposed land use categories each have distinct development patterns and implications for infrastructure needs, intensity of activity, and relationship to neighboring areas – all of which shape the parameters for each Development Typology.

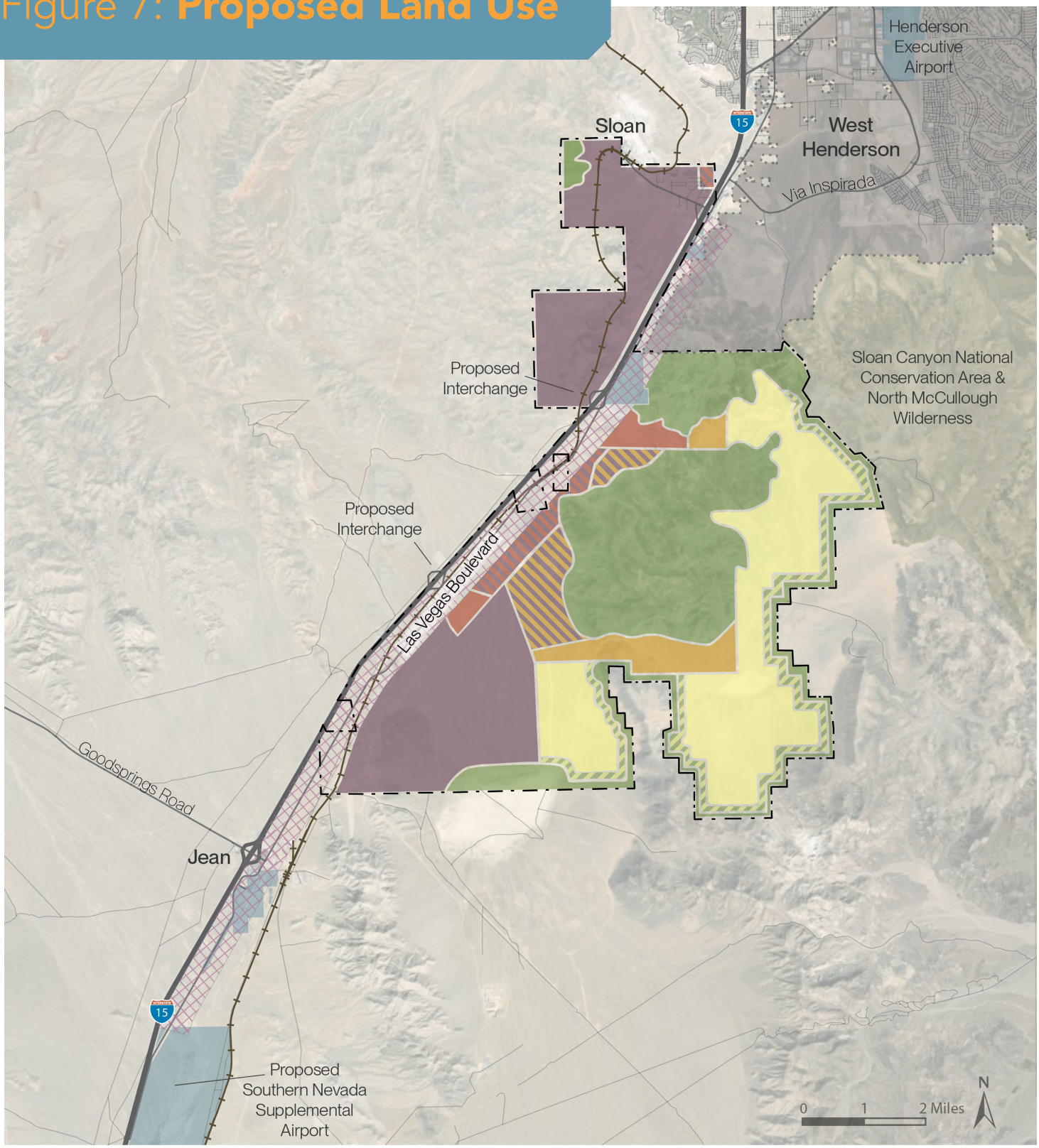
Table 4: Development Types & Land Use Mix

Development Types	Acreage	Percent of Total
Open Space	8,713	31%
Mixed Employment	8,162	29%
Residential	6,033	22%
Residential/Open Space Buffer	1,416	5%
Traditional Mixed Use/Mixed Employment	1,162	4%
Traditional Mixed Use	1,178	4%
Retail, Hospitality & Entertainment/ Mixed Employment	626	2%
Retail, Hospitality & Entertainment	514	2%

Note: The Study Area is about 30,980 acres, which includes the reserved utility corridor along I-15. Development Types are not applied to the utility corridor, thus the land use acreage totals are less than the total Study Area.

 *See definition in Appendix A

Figure 7: **Proposed Land Use**



LEGEND

- Study Area
- Railroad
- Major & Minor Roads
- Utility Corridor
- City of Henderson
- Clark County Department of Aviation Property
- Retail/Hospitality/Entertainment
- Traditional Mixed Use
- Mixed Employment
- Residential
- Open Space
- Transition Areas (mix of two land use types)

Development Types portray the intended characteristics and patterns for hypothetical development associated with each of the land use categories, in conjunction with the Design Guidelines outlined later in this chapter. Conceptual models for the eight Development Types are displayed in this section, which build from the typologies introduced in public and stakeholder engagement events throughout 2023, and incorporate elements from other portions of the Study process. The fundamental components of the Development Type models are:

General roadway hierarchy to provide high-level guidance on the hypothetical local road network character and intersection density (see proposed roadway network details on page 94).

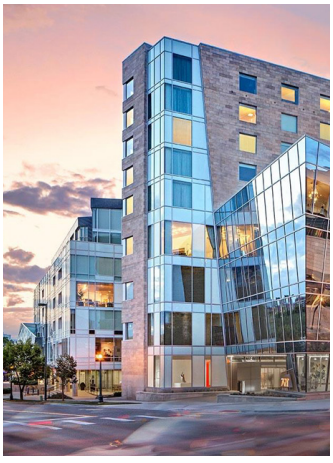
Block size to show differences between the Development Types that accommodate different target land uses and building types.

Integration of parks and recreation to illustrate that parks, open spaces, and connecting trails are part of each Development Type.

Integration of public facilities to show the physical relationship between public and private properties, and to illustrate that essential facilities are strategically incorporated into each Development Type, with some having more of these facilities than others, per anticipated uses and activities.

Integration of hubs that offer unique characteristics, such as higher densities, concentrated leisure activities, key attractions, and innovative sustainable development (see page 105 for details).

Intended scale, density, and transitions from one Development Type to another and between uses within a Development Type.




Sloan Canyon
NATIONAL CONSERVATION AREA


2001
9191
CITY OF HENDERSON FIRE STATION


SIXTY BRAINERD ROAD
EDGE

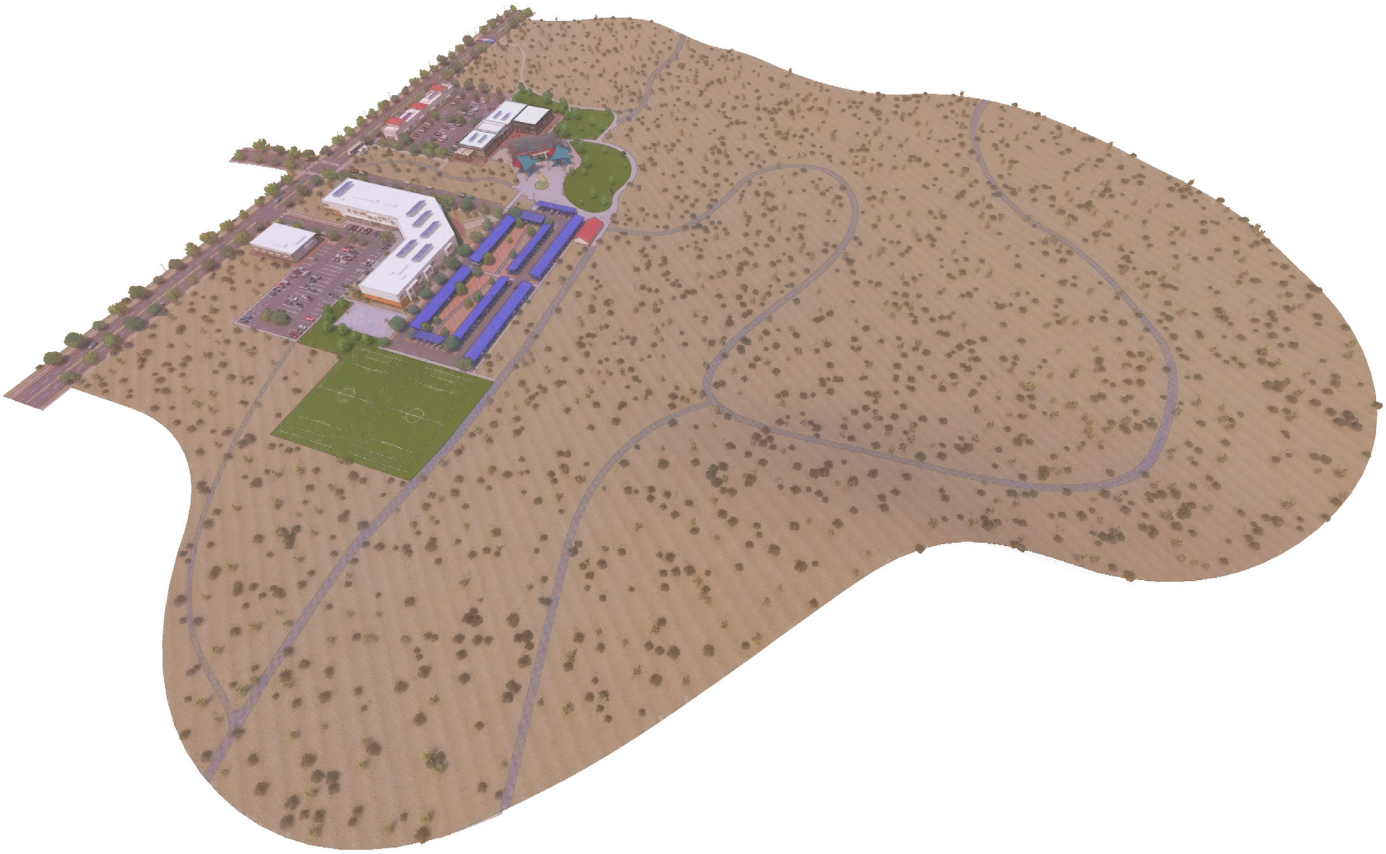

SAWMILL MARKET

OPEN SPACE

The Open Space Development Type is primarily comprised of conservation or recreational spaces, such as protected open space, public parks, and trails. This Type may also include civic spaces and public facilities, such as police and fire, schools, recreation centers, and libraries. Most of the Open Space acreage is found in the center of the Study Area where terrain is mountainous, however these spaces and facilities are also integrated throughout other Development Types.

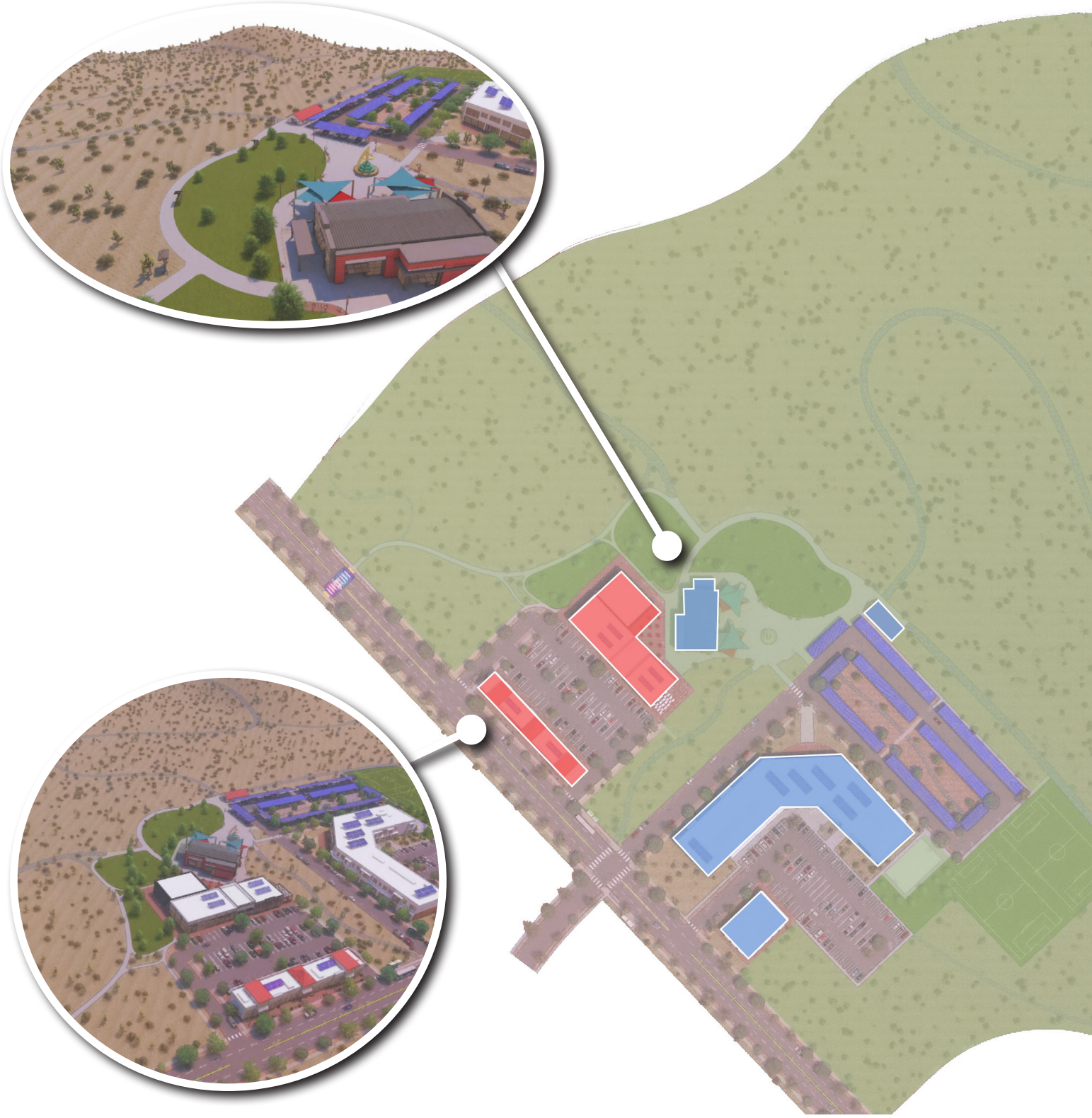
- 0 dwelling units per acre
- < 1 job per acre
- Example jobs: recreation instructor, law enforcement officer, librarian, firefighter, public lands manager, etc.

Open Space Public Lands



The Open Space concept is characterized primarily by a lack of change, i.e., these areas would mostly remain undeveloped and unaltered. Other than public facilities and civic spaces as noted above, the addition of recreational trails would be the primary form of new development. Given the relatively common occurrence of informal trails used by recreation enthusiasts in the Study Area today, formal trails and paths will be a valuable addition. Providing a combination of paved trails and unpaved trails in open space areas is recommended, as appropriate given the context. ADA accessibility should be prioritized for all trails that do not cater to specific recreational activities, such as mountain biking or hiking where the terrain is more mountainous. Finally, for safety reasons, natural elements that would cause a safety concern may be changed, such as removing loose rock or boulders on adjacent slopes that could increase the risk of rockslides.

Figure 8: **Open Space - Land Use Mix**



LEGEND

- Community/Civic
- Retail/Commercial
- Park/Plaza

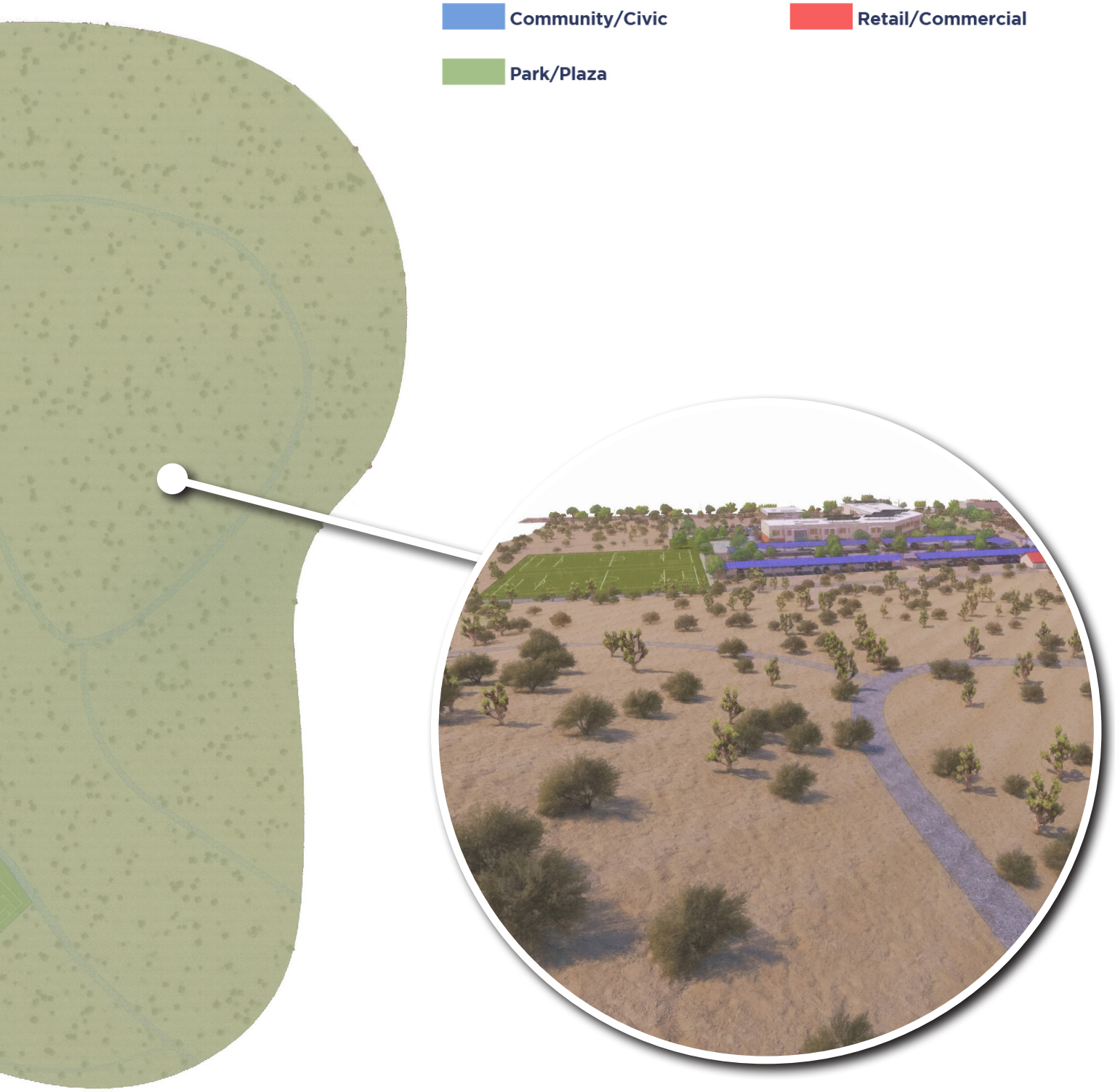
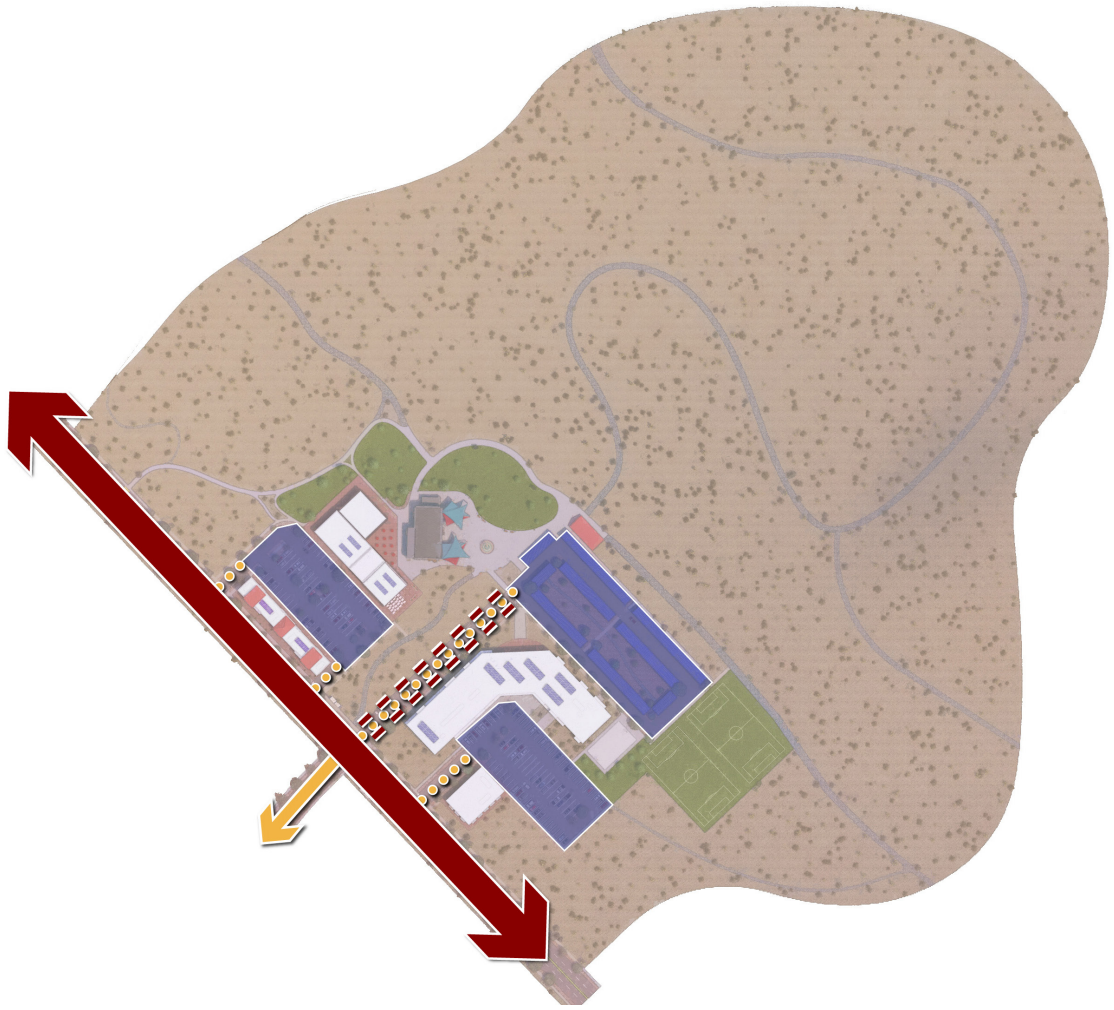


Figure 9: **Open Space - Roadway Network**

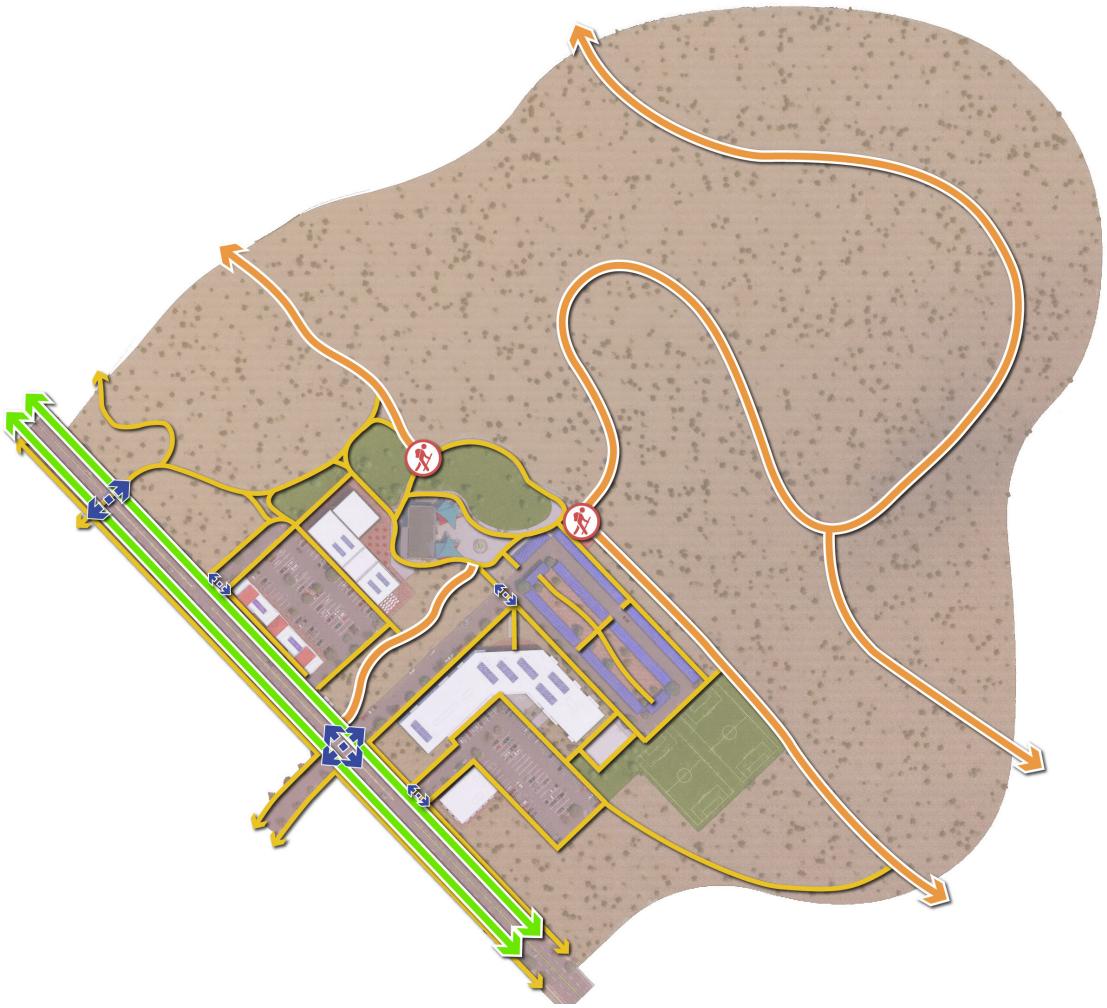


LEGEND

- Arterial Road
- Access Road
- Local Road
- Surface Parking Lot
- Street Parking

In general, Open Space areas are meant to be free of vehicular roads and limited to pathways. However, key access points and connections to the road network will be essential, including parking areas and/or bus stops.

Figure 10: **Open Space - Trails & Bikeways**



LEGEND

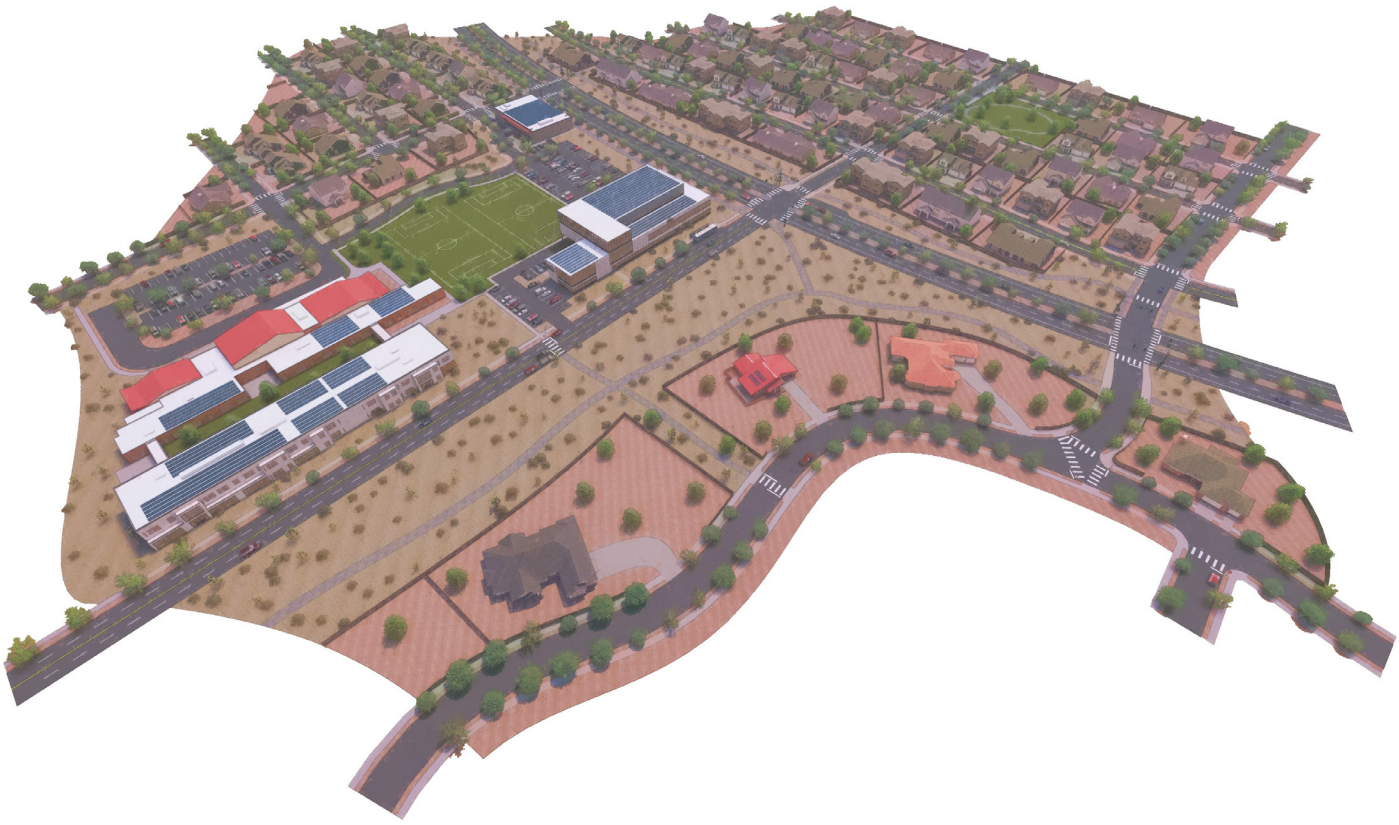
- Unpaved Multi-Modal Trail
- Pedestrian Trail/Sidewalk
- Marked Trailhead
- Bike Lane
- Street Crossing

RESIDENTIAL

The Residential Development Type is primarily comprised of homes and neighborhoods, ranging in size, type, density, tenure, and price point. These include large-lot single family estates; traditional or small lot single-family; small- and mid-scale multifamily (duplexes, triplexes, quads, townhomes); larger-scale multifamily apartments; and mixed use types. Higher density residential types are clustered closer to other Development Types and Community Hubs, while lower density residential types are found in outlying areas and at the fringe. To illustrate this range of densities and development patterns, the Residential Development Type is visualized in two models – Low Density Neiborhoods and Higher Density Neighborhoods. Residential development is also incorporated into other mixed-use Development Types.

- 1 - 15+ dwelling units per acre
- < 1 job per acre

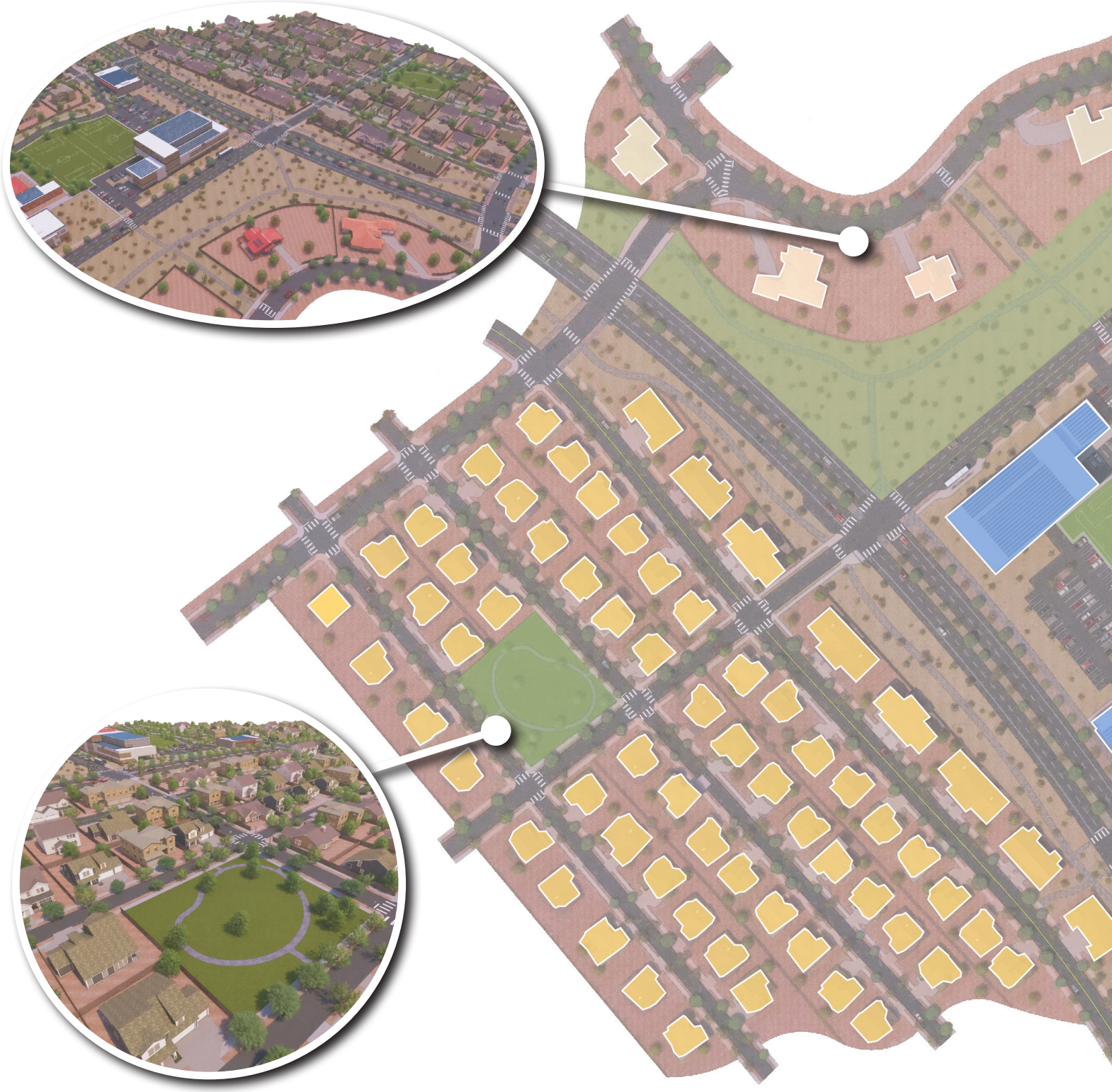
Low Density Neighborhoods



The Low Density residential area pictured above demonstrates a more limited density of homes, with single-family detached residences as the primary housing stock. Job-generating uses are generally not intended within in this Development Type, except for residents working from home or those working in public facilities, such as libraries or schools.

Parks, public facilities, and minor supporting uses are integrated components of these neighborhoods, including multi-generational playgrounds that provide a range of activities, sports fields, open spaces, picnic areas, libraries, recreation and community centers, schools, childcare centers, and public safety facilities. All households should have access to recreational amenities within a 10-minute walk or half-mile, per national best practices.

Figure 11: **Low Density Neighborhoods - Land Use**



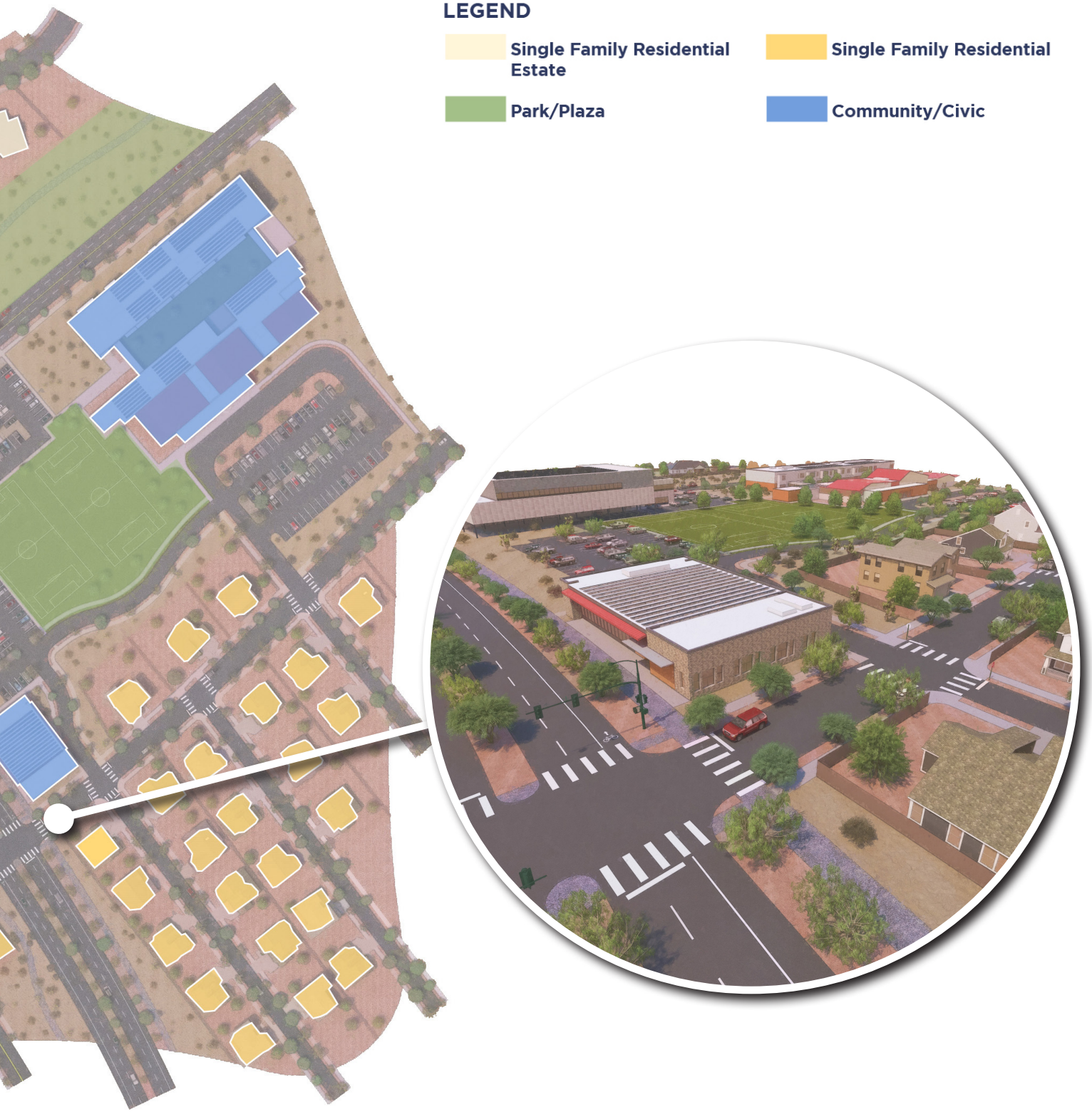
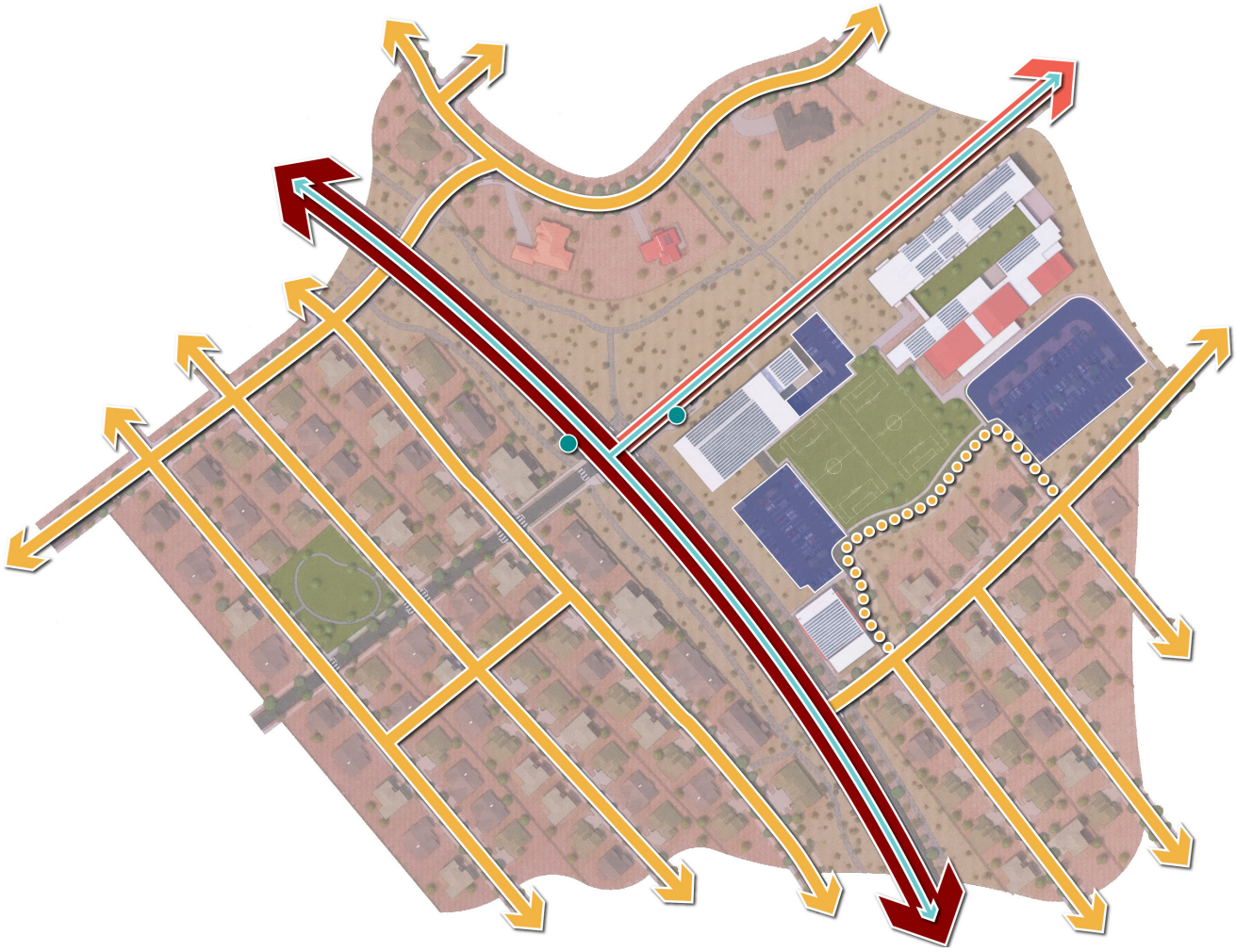

LEGEND
Single Family Residential Estate
Single Family Residential
Park/Plaza
Community/Civic

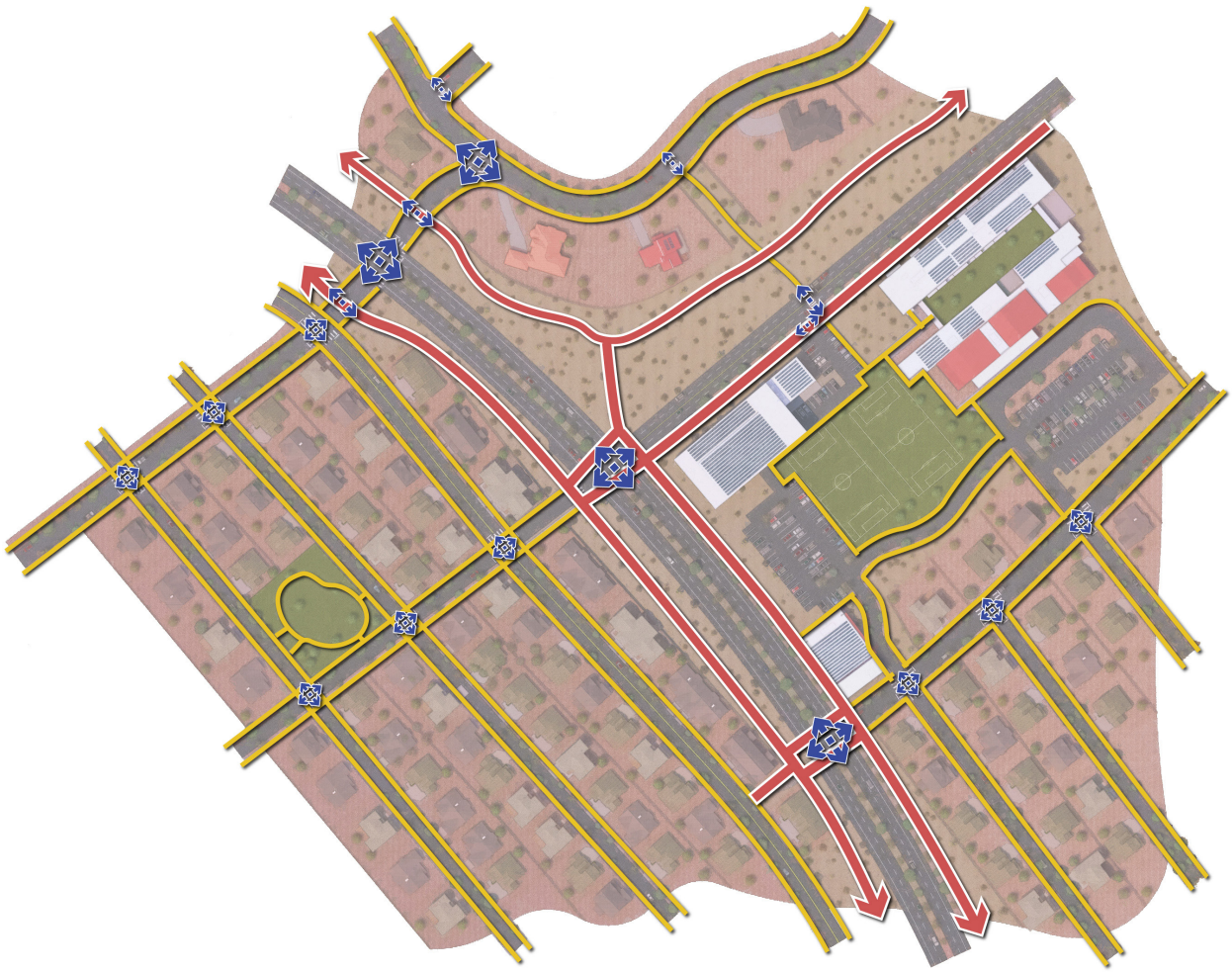
Figure 12: **Low Density Neighborhoods - Roadway Network**



LEGEND

- Arterial Road
- Collector Road
- Local Road
- Access Road
- Bus Route
- Transit Stop
- Surface Parking Lot

Figure 13: **Low Density Neighborhoods - Trails & Bikeways**



LEGEND

- Paved Multi-Modal Trail
- Pedestrian Trail/Sidewalk
- Street Crossing

Roadways are primarily local or small collectors that provide connection to larger collectors or arterials. Sidewalks, crosswalks, trails, bike lanes, and multi-use paths are amply provided, and block lengths are reasonable to promote walkability, although blocks and street formations may be more spacious and irregular. Connections to the larger trail network and transit stops are prioritized.

Higher Density Neighborhoods

The Higher Density residential area pictured above demonstrates the greatest density of homes of any Development Type concept, while maintaining a residential character. The limited jobs that may be located here are those working in property management, maintenance, leasing, etc., residents working from home, or those working in public facilities, such as libraries or schools.

Parks, public facilities, and minor supporting uses are integrated components of these neighborhoods, including multi-generational playgrounds that provide a range of activities, sports fields, open spaces, picnic areas, libraries, recreation and community centers, schools, childcare centers, and public safety facilities. All households should have access to recreational amenities within a 10-minute walk or half-mile, per national best practices.

Figure 14: **Higher Density Neighborhoods - Land Use**

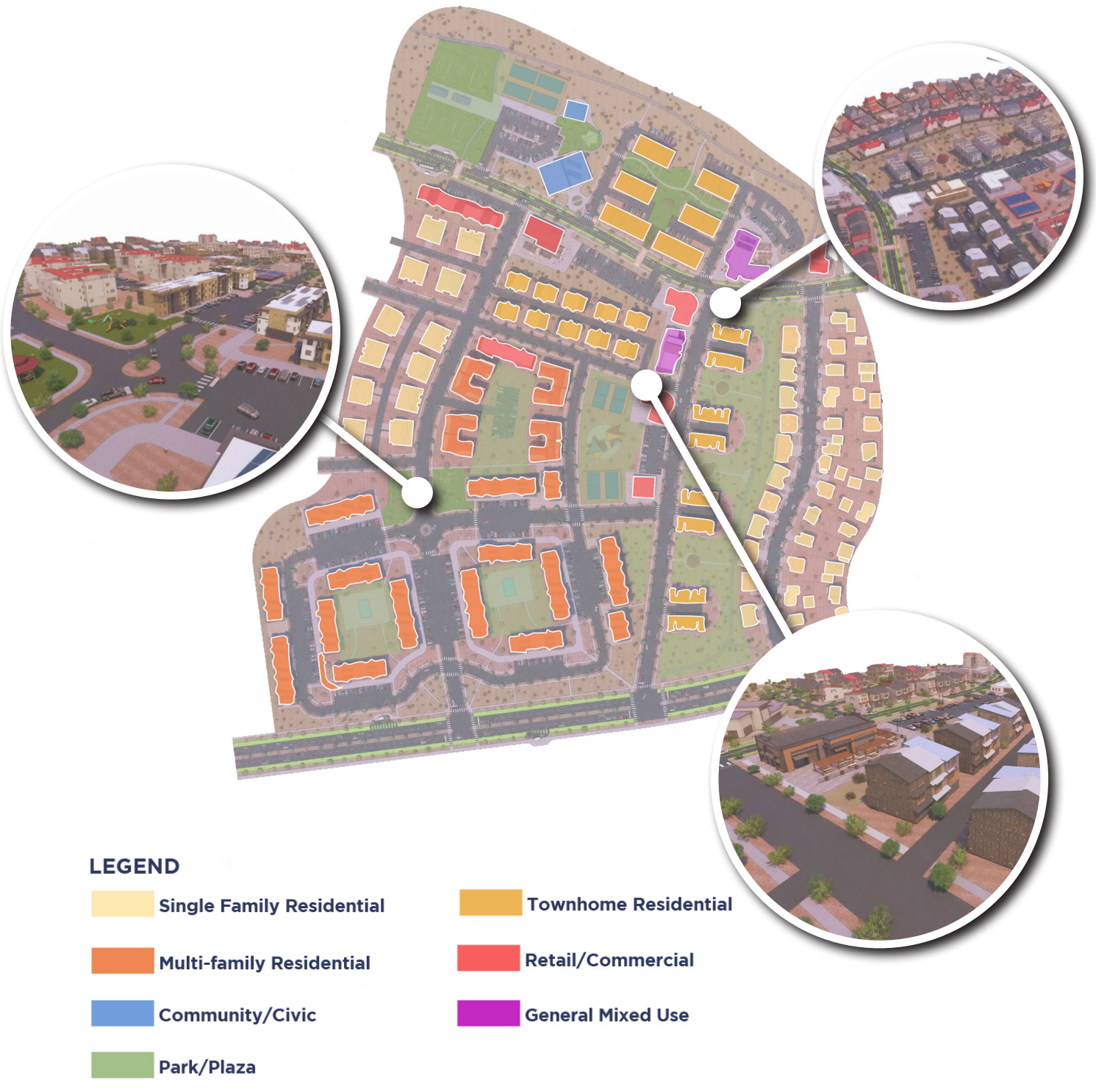


Figure 15: **Higher Density Neighborhoods - Roadway Network**

LEGEND

- Arterial Road
- Collector Road
- Local Road
- Access Road
- Bus Route
- Transit Stop
- Surface Parking Lot
- Tuck-Under Parking*
- Street Parking

* Definition provided in Appendix A

Roadways are primarily local or small collectors, while some higher density neighborhoods may abut larger collectors or arterials. Sidewalks, crosswalks, trails, bike lanes, and multi-use paths are amply provided and block lengths are reasonable to promote walkability. Streets generally follow a predictable grid, although some areas may be more irregular due to topography. Connections to the larger trail network and transit stops are prioritized.

Figure 16: **Higher Density Neighborhoods - Trails & Bikeways**

LEGEND

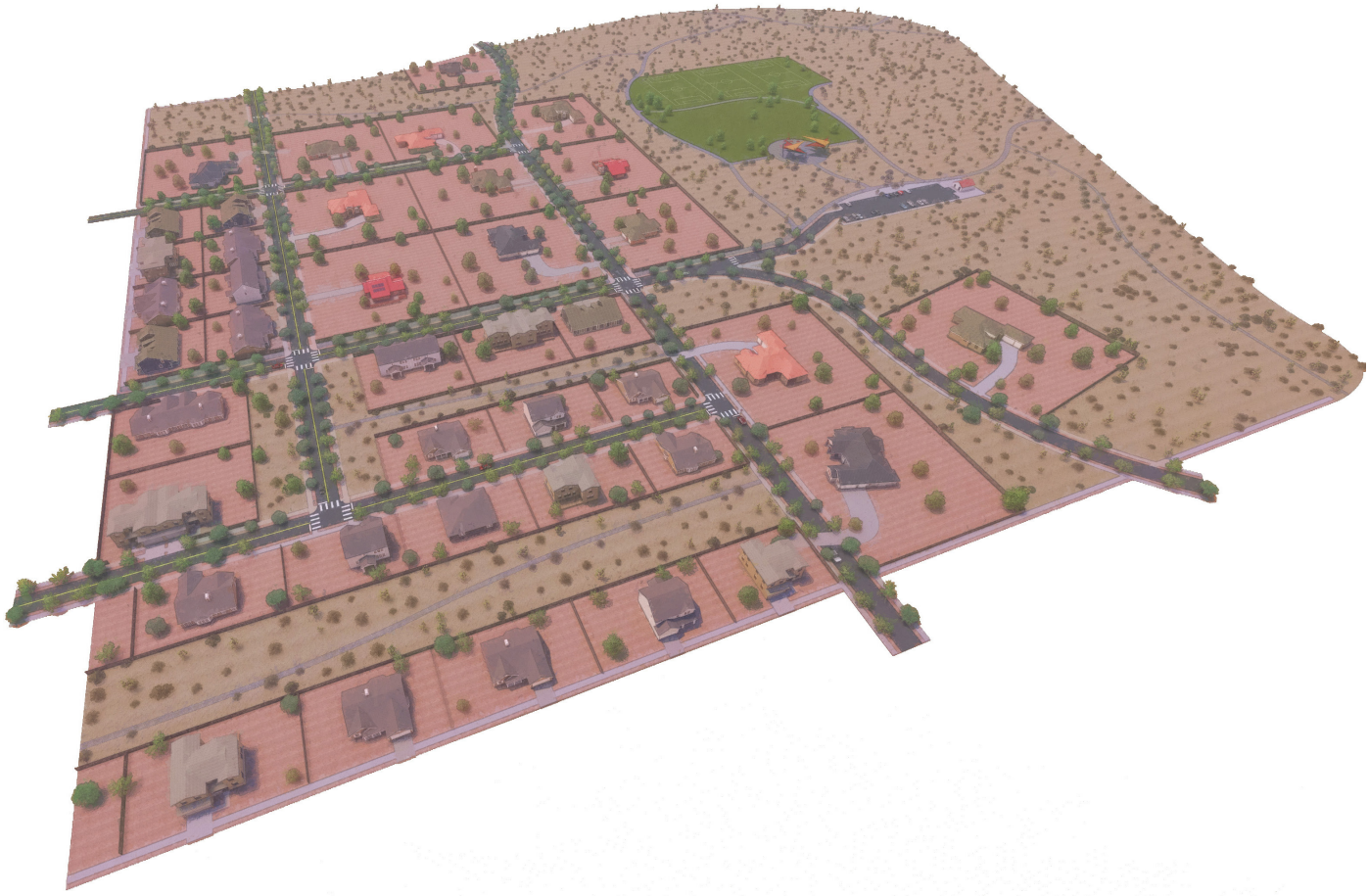
- Paved Multi-Modal Trail
- Unpaved Multi-Modal Trail
- Pedestrian Trail/Sidewalk
- Marked Trailhead
- Bike Lane
- Street Crossing

RESIDENTIAL / OPEN SPACE BUFFER

This Development Type serves as a buffer and transition between residential neighborhoods and protected open spaces that border the Study Area to the east and south, including the Sloan Canyon National Conservation Area. This Type is comprised of dispersed, low density single-family homes, such as estate or ranch-style homes. These spaces may also include trailheads for recreational access to neighboring public lands.

- < 2 dwelling units per acre
- < 1 jobs per acre

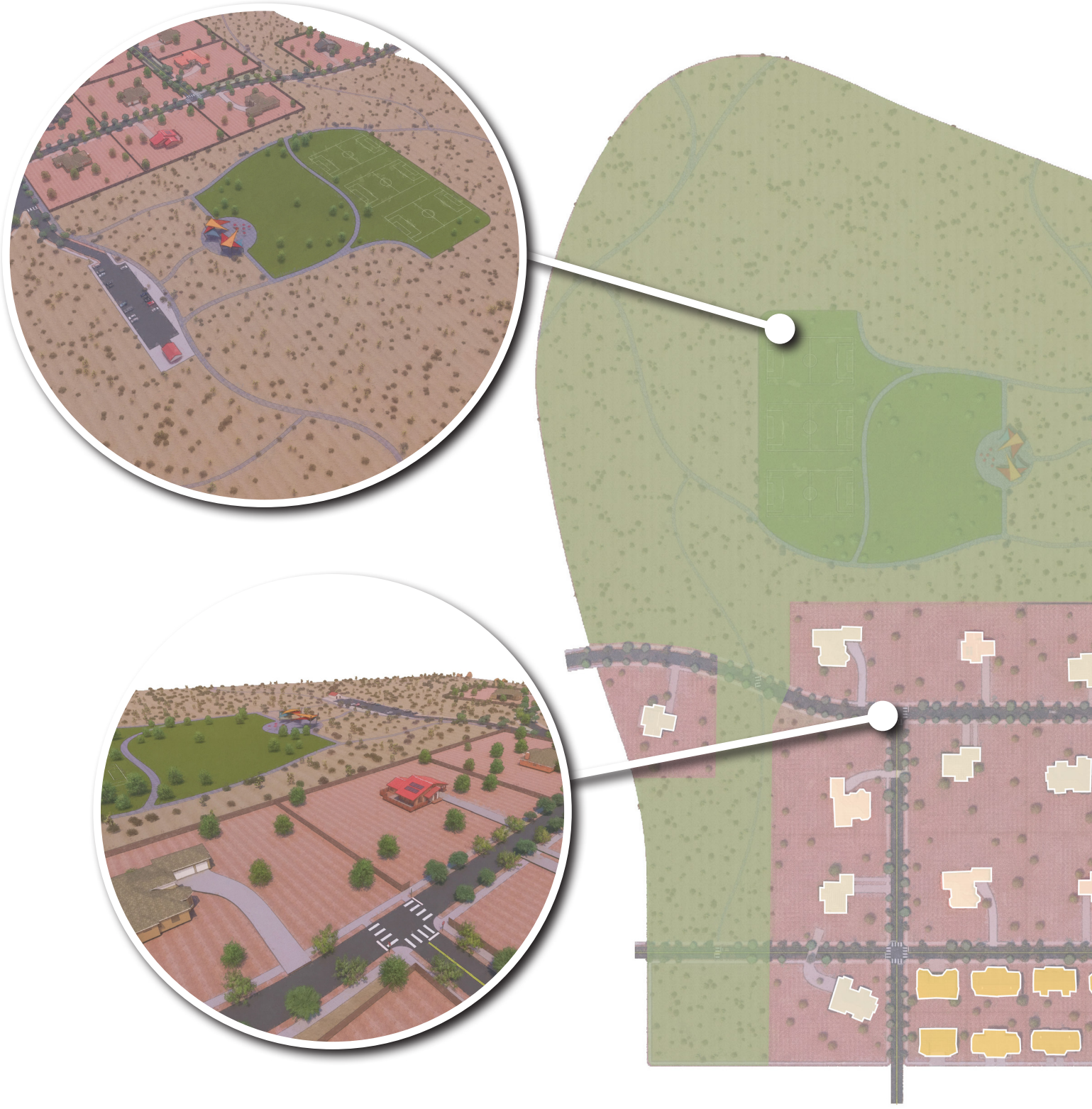
Low Impact Transitional Residential



The model shown above displays the transition between Residential Low and Open Space areas. These areas portray characteristics of more rural development, with limited impact to the natural environment. Residences are meant to be dispersed and low profile. Residents of these areas would enjoy nearly immediate access to natural areas, as their location would be adjacent to public lands and the trailheads that provide formal access to them. Views of mountainous areas should also be maintained.

While this Development Type is generally recommended for the periphery of the Study Area or surrounding the central open space area, it may also be used as a transition between differnt Development Types or where natural features (such as washes) are important to preserve.

Figure 17: **Residential/Open Space Buffer - Land Use Mix**



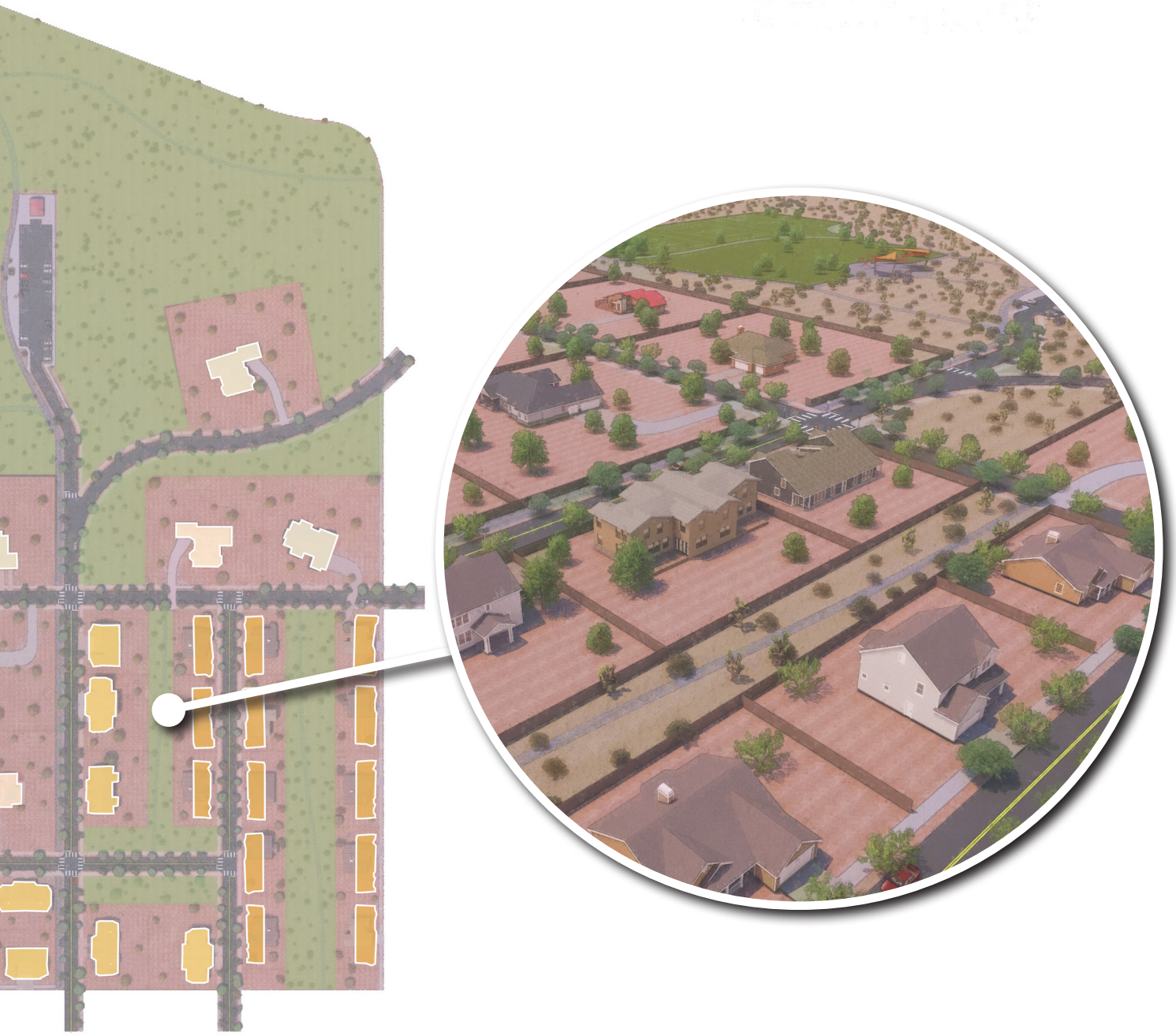
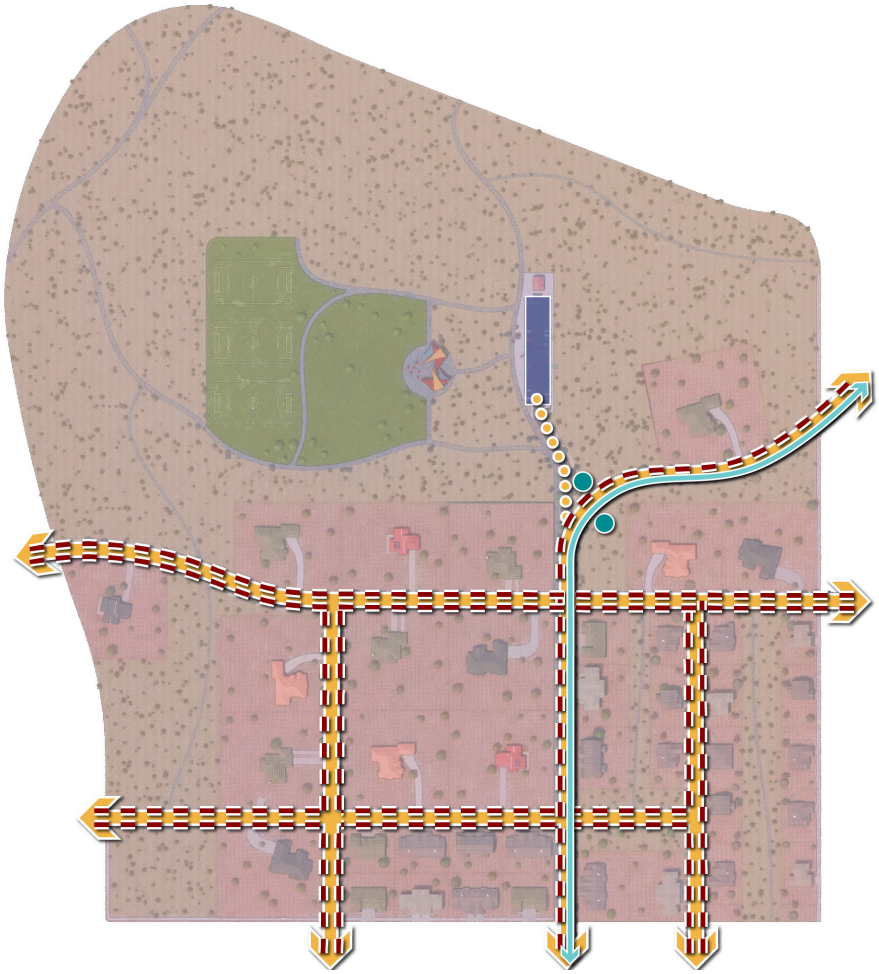

LEGEND
Single Family Residential Estate
Single Family Residential
Townhome Residential
Park/Plaza

Figure 18: **Residential/Open Space Buffer - Roadway Network**

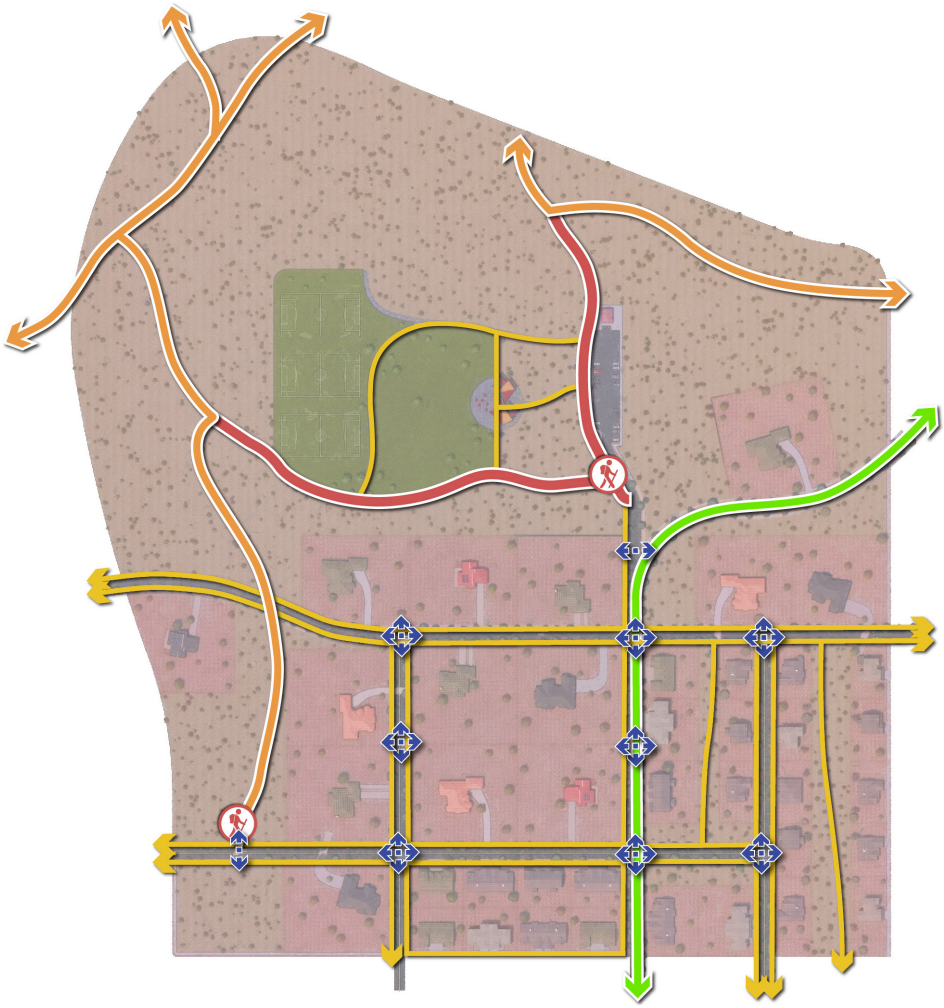


LEGEND

- Local Road
- Access Road
- Bus Route
- Transit Stop
- Surface Parking Lot
- Street Parking

Roadways are sparse in these areas and are limited only to local roadways that provide access to residences and trailheads. Roads are likely to follow topographical patterns and may not include robust infrastructure additions, such as bike lanes, due to the low level of traffic. Low profile parking areas should be provided at trailheads and trail connections should be prioritized to these access points.

Figure 19: **Residential/Open Space Buffer - Trails & Bikeways**



LEGEND

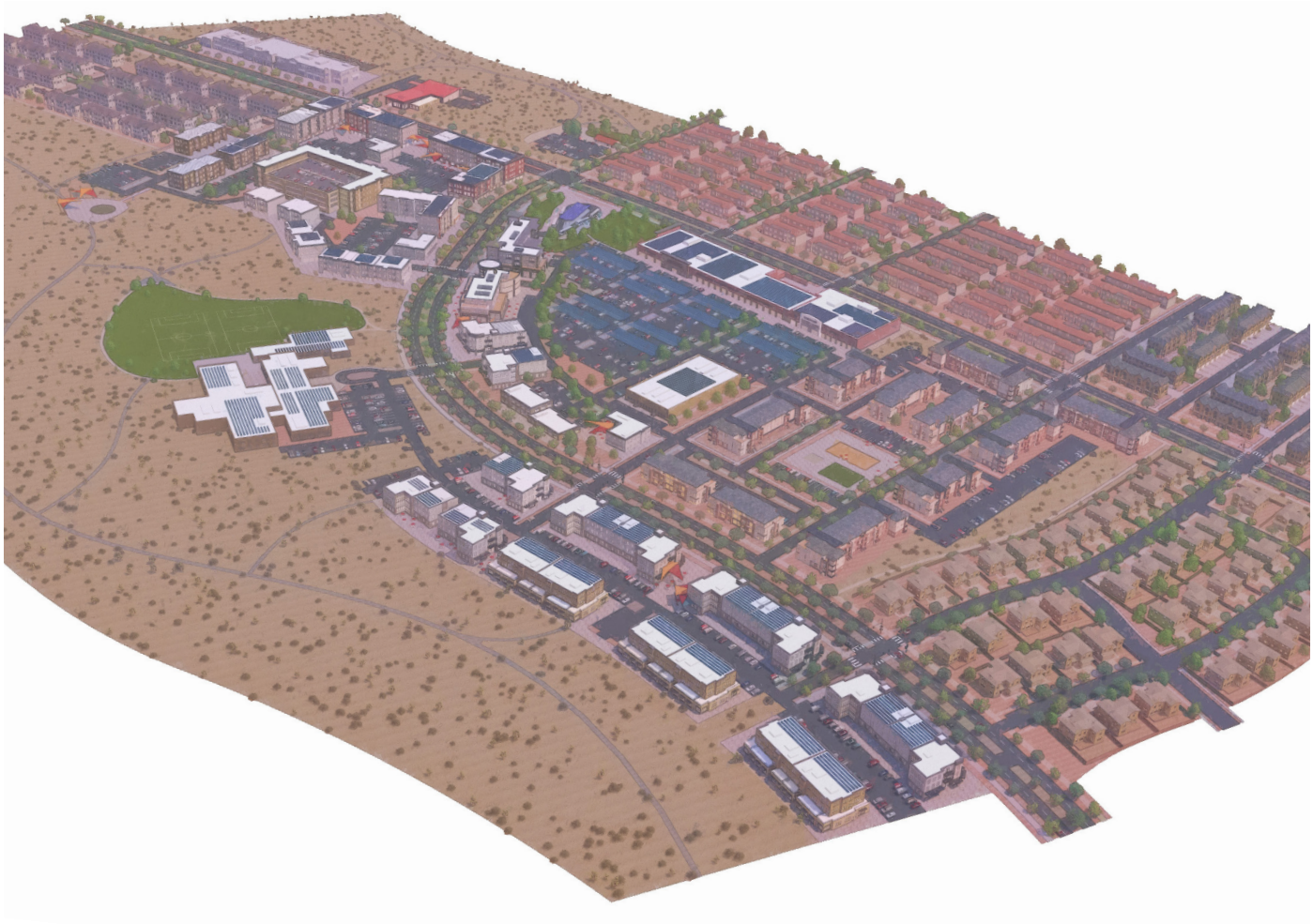
- Paved Multi-Modal Trail
- Unpaved Multi-Modal Trail
- Pedestrian Trail/Sidewalk
- Marked Trailhead
- Bike Lane
- Street Crossing

TRADITIONAL MIXED USE

This Development Type includes a modest mix of commercial services and retail nearby or interspersed with housing. Mixed uses may be horizontal (different uses in adjacent buildings) or vertical (multiple uses within one building – usually ground-floor commercial and residential above). Traditional Mixed Use settings may take on an urban main street feel or be more auto-oriented, depending on adjacent development contexts.

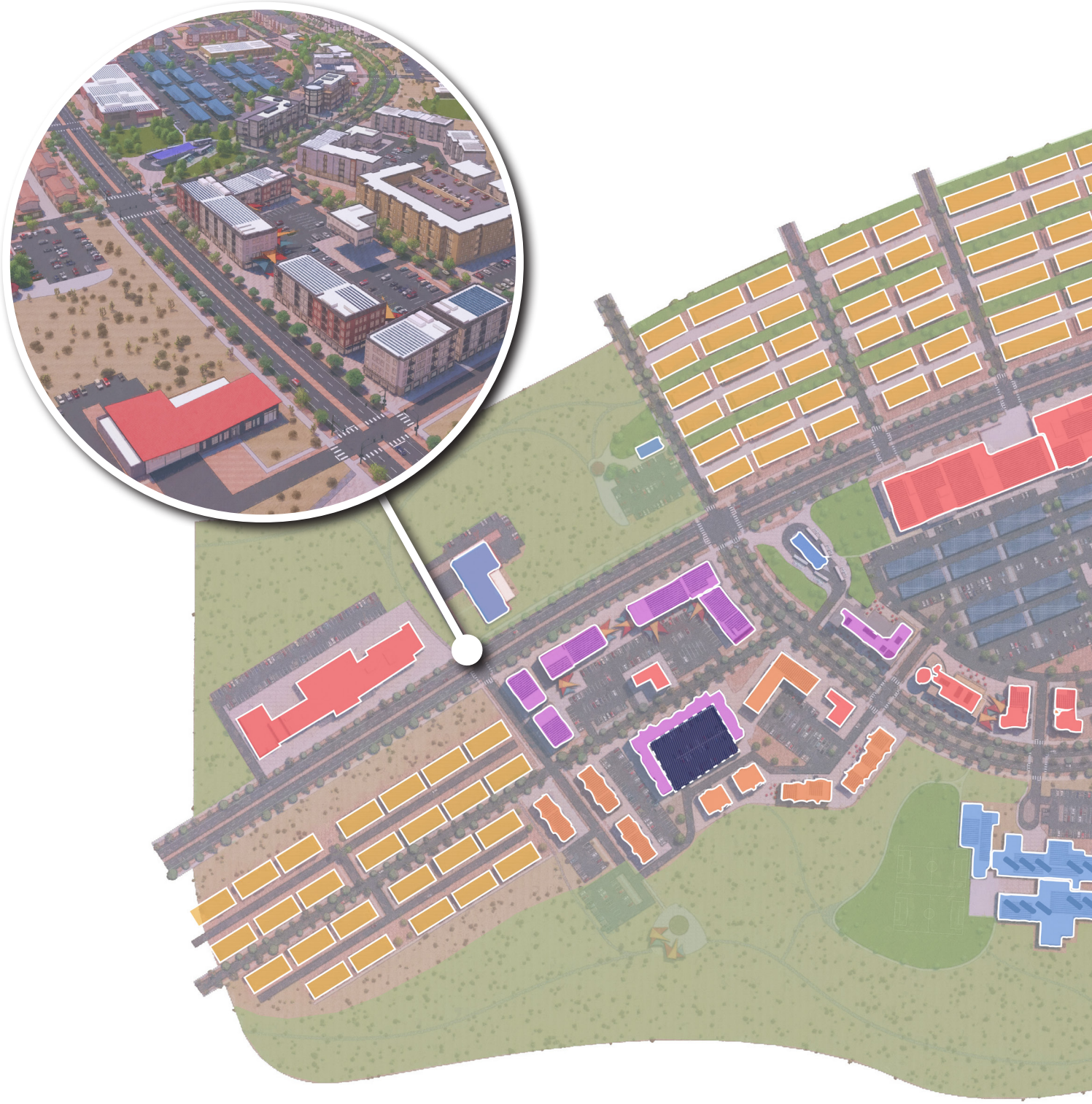
- 8+ dwelling units per acre
- 15+ jobs per acre
- Example jobs include: apartment community manager, outpatient nurse or nurse practitioner, restaurant server, retail clerk, consultant, lawyer, etc.

Mixed-Use Neighborhoods & Activity Nodes



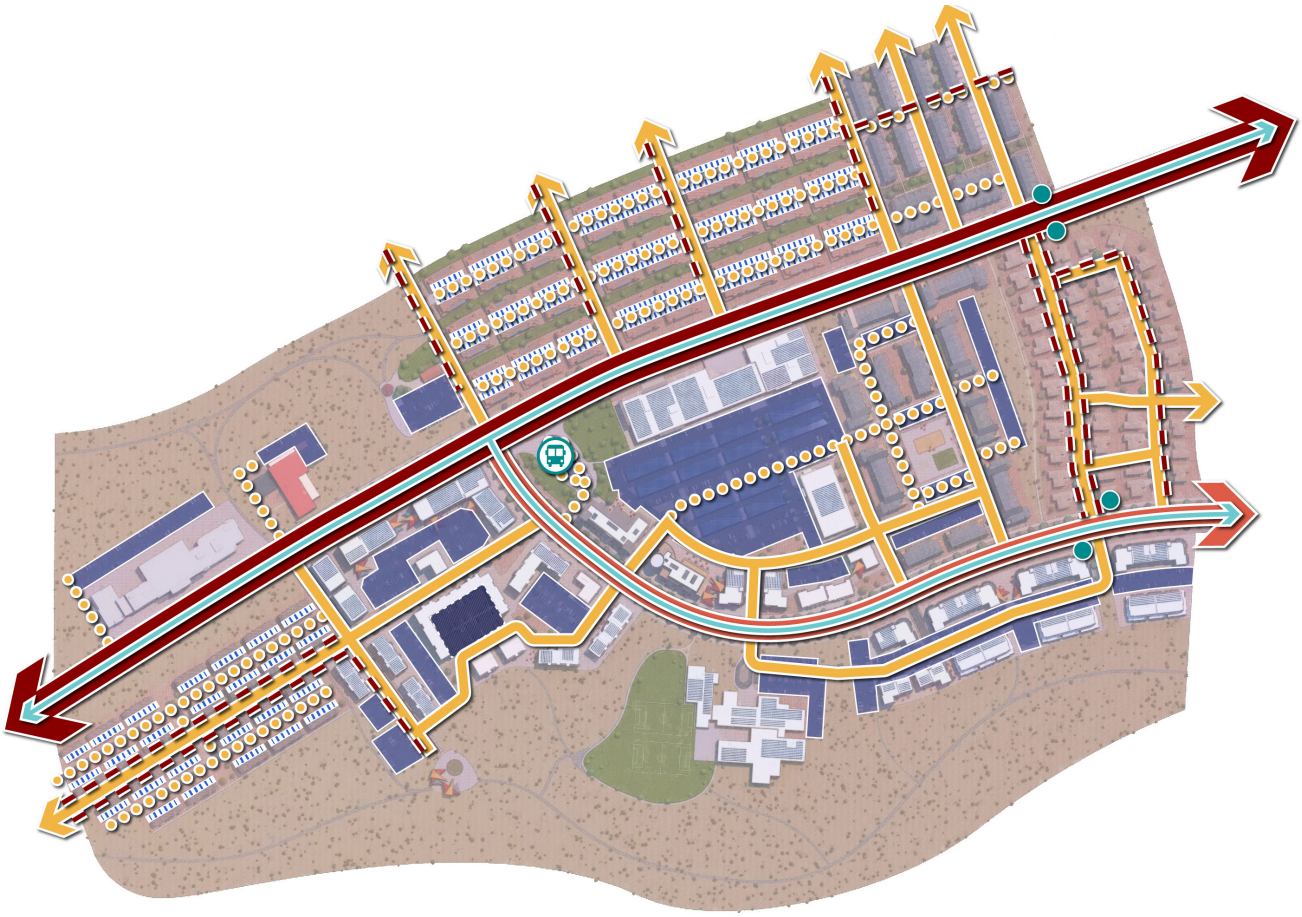
Traditional Mixed Use areas may include townhomes, small apartment complexes, duplexes, triplexes, or quads, single family homes, traditional ADUs (defined in Appendix A), live-work units, storefronts, office buildings, restaurants, and grocery stores. Parks, public facilities, and minor supporting uses are integrated components of these areas, including multi-generational playgrounds that provide a range of activities, sports fields, open spaces, picnic areas, libraries, recreation and community centers, schools , childcare centers, post offices, and public safety facilities. All households should have access to recreational amenities within a 10-minute walk or half-mile, per national best practices. These areas are meant to provide daily needs and areas of activity for local residents as well as employees and visitors.

Figure 20: **Traditional Mixed Use - Land Use**




LEGEND
Single Family Residential
Townhome Residential
Multi-family Residential
Retail/Commercial
General Mixed Use
Community/Civic
Park/Plaza
Structured Parking

Figure 21: **Traditional Mixed Use - Roadway Network**

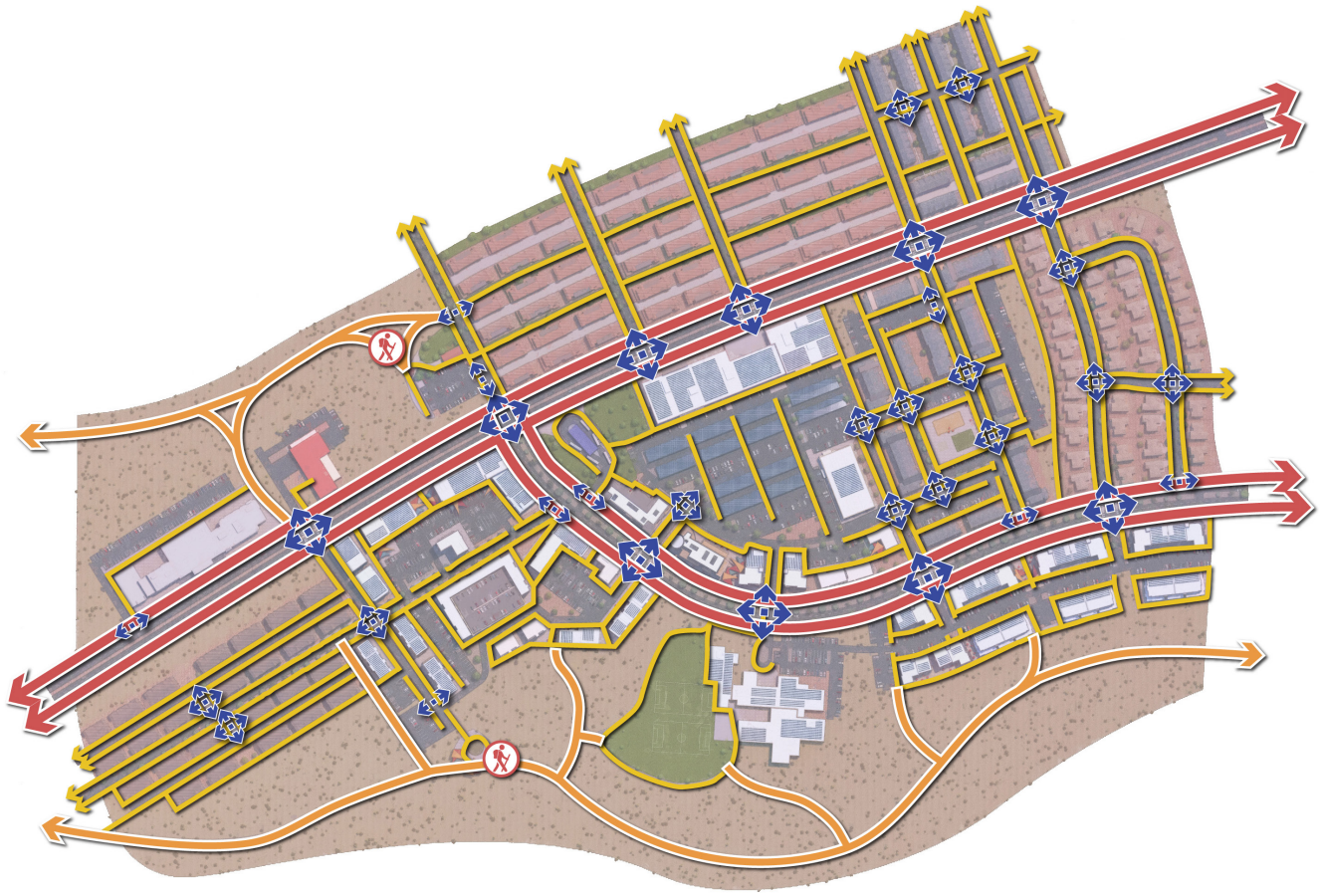


LEGEND

- Arterial Road
- Collector Road
- Local Road
- Access Road
- Bus Route
- Transit Hub
- Surface Parking Lot
- Transit Stop
- Structured Parking
- Tuck-Under Parking*
- Street Parking

* Definition provided in Appendix A

Figure 22: **Traditional Mixed Use - Trails & Bikeways**



LEGEND

- Paved Multi-Modal Trail
- Unpaved Multi-Modal Trail
- Pedestrian Trail/Sidewalk
- Marked Trailhead
- Street Crossing

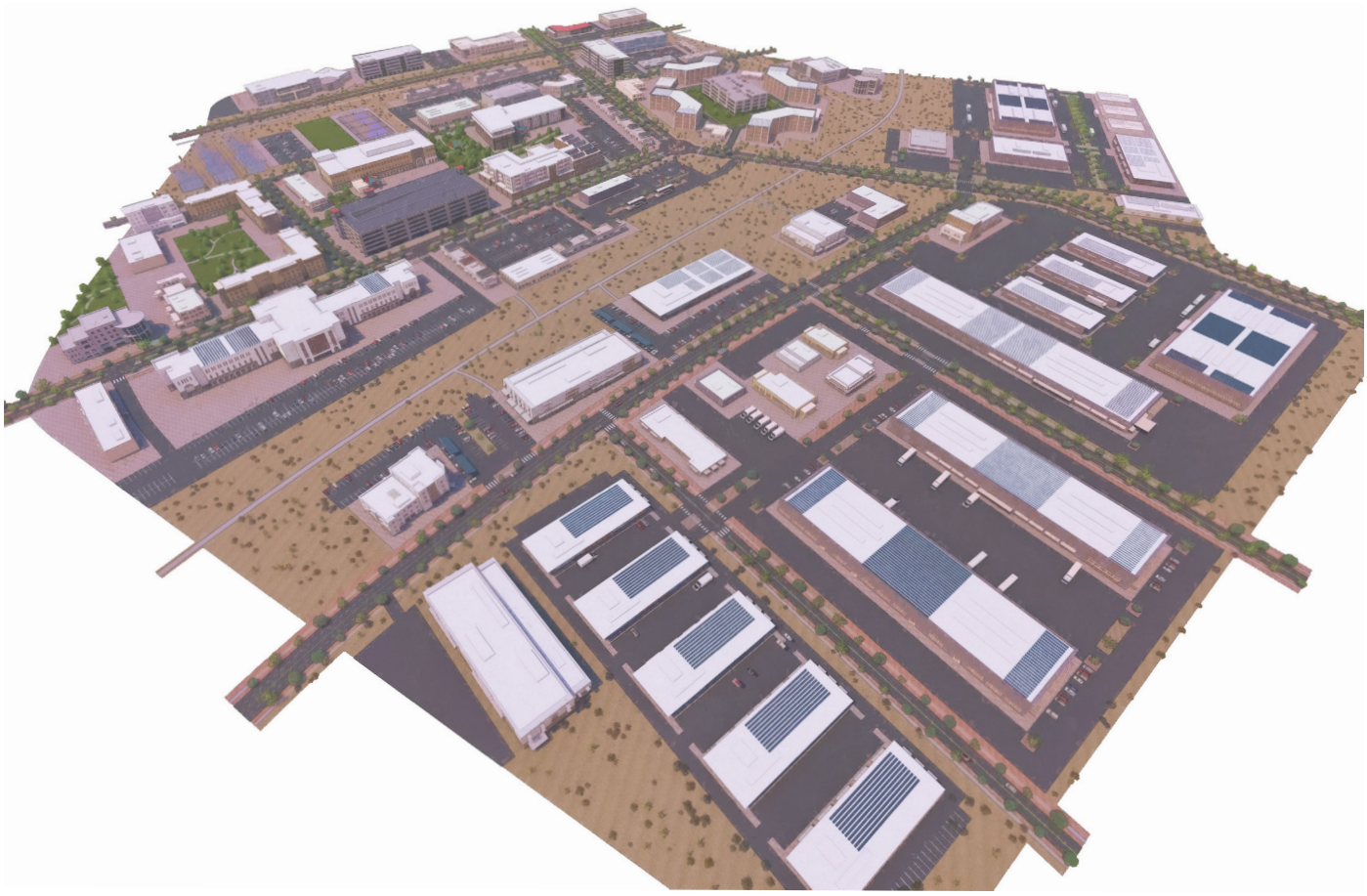
The road network in Traditional Mixed Use areas may be a mix of local roads, collectors, and arterials, mostly following a predictable grid and small block sizes to promote walkability. Sidewalks, crosswalks, trails, bike lanes, and multi-use paths are also amply provided to support walkability. Parking is accommodated through small surface lots, parking structures, and/or on-street parking and transit connections are integrated. Buildings should generally be sited along roadways to provide pedestrian-scaled and visually appealing streetscapes.

MIXED EMPLOYMENT

This Development Type is meant to accommodate the majority of economic industry growth and jobs in the Study Area. This Type is comprised of larger employment centers, with a particular focus on advanced manufacturing, logistics, transloading, and warehousing. Multiple stakeholders expressed interest in the promotion of an "inland port," i.e., a concentrated industrial area where truck and rail freight – primarily arriving from southern California – could be offloaded and distributed around the Las Vegas area, or transloaded on trucks to other parts of the country.[54] Access routes, large parcels, and adjacency to I-15 and the rail trackage were considered in the creation of this Development Type to support a possible inland port. Office parks and business headquarters or campuses may also be located here. Because of the higher intensity uses intended for these areas, residential uses are generally considered incompatible.

- 0 dwelling units per acre
- 25+ jobs per acre
- Example jobs include: mechanist, precision assembler, accountant, marketing manager, commercial truck driver, etc.

Job Centers



As illustrated above, the Mixed Employment Development Type is characterized by larger lots and large-footprint buildings to accommodate manufacturing and distribution activities, as well as larger office complexes and business headquarters. Adjacency to retail and commercial use as well as open spaces and parks – or their direct incorporation within developments – are meant to serve local employees and nearby visitors to the area. This integration of uses will support the creation of complete communities* and a diverse economy while still prioritizing significant portions of land for production-focused activities.

*See definition in Appendix A

Figure 23: **Mixed Employment - Land Use**

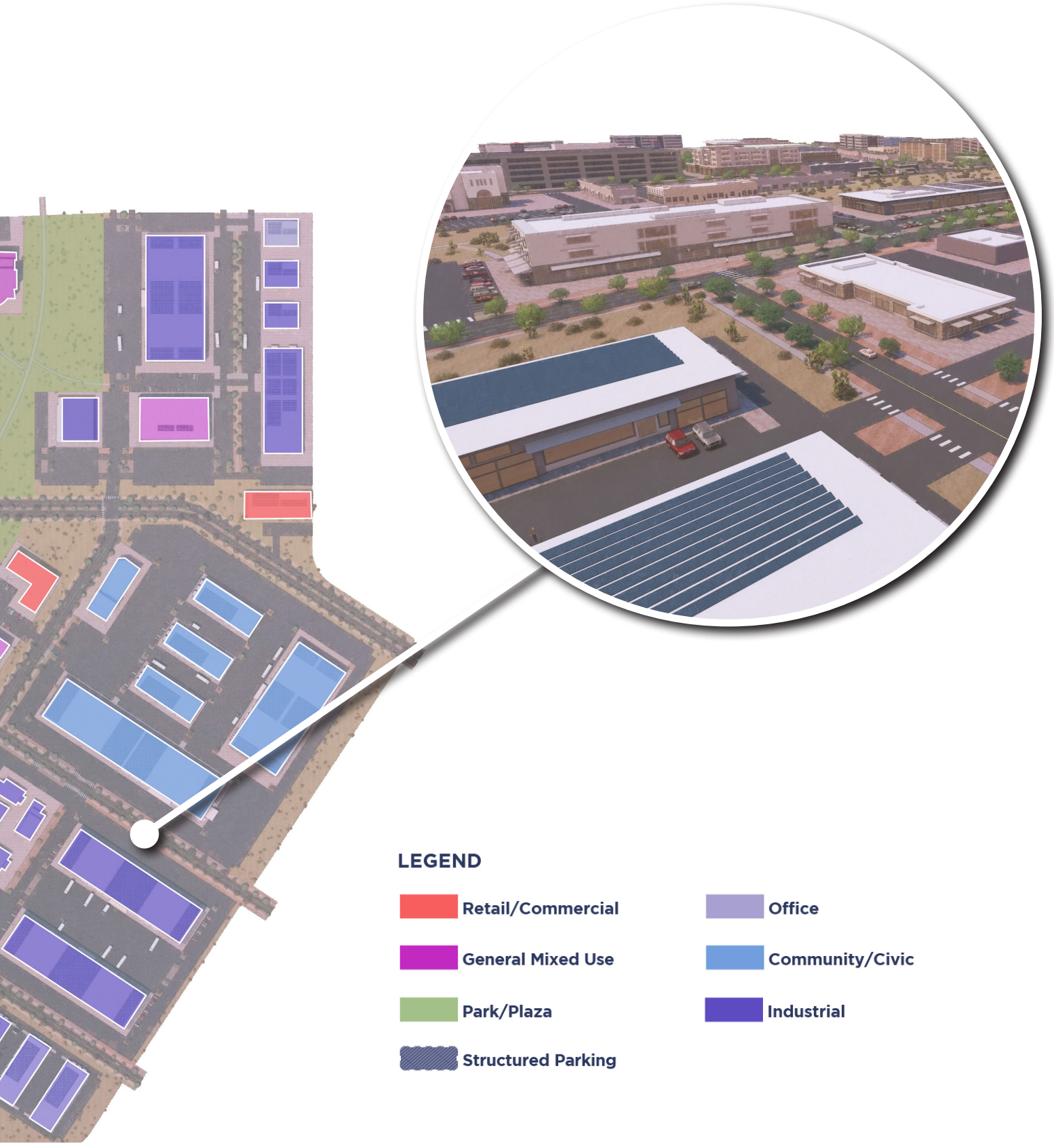
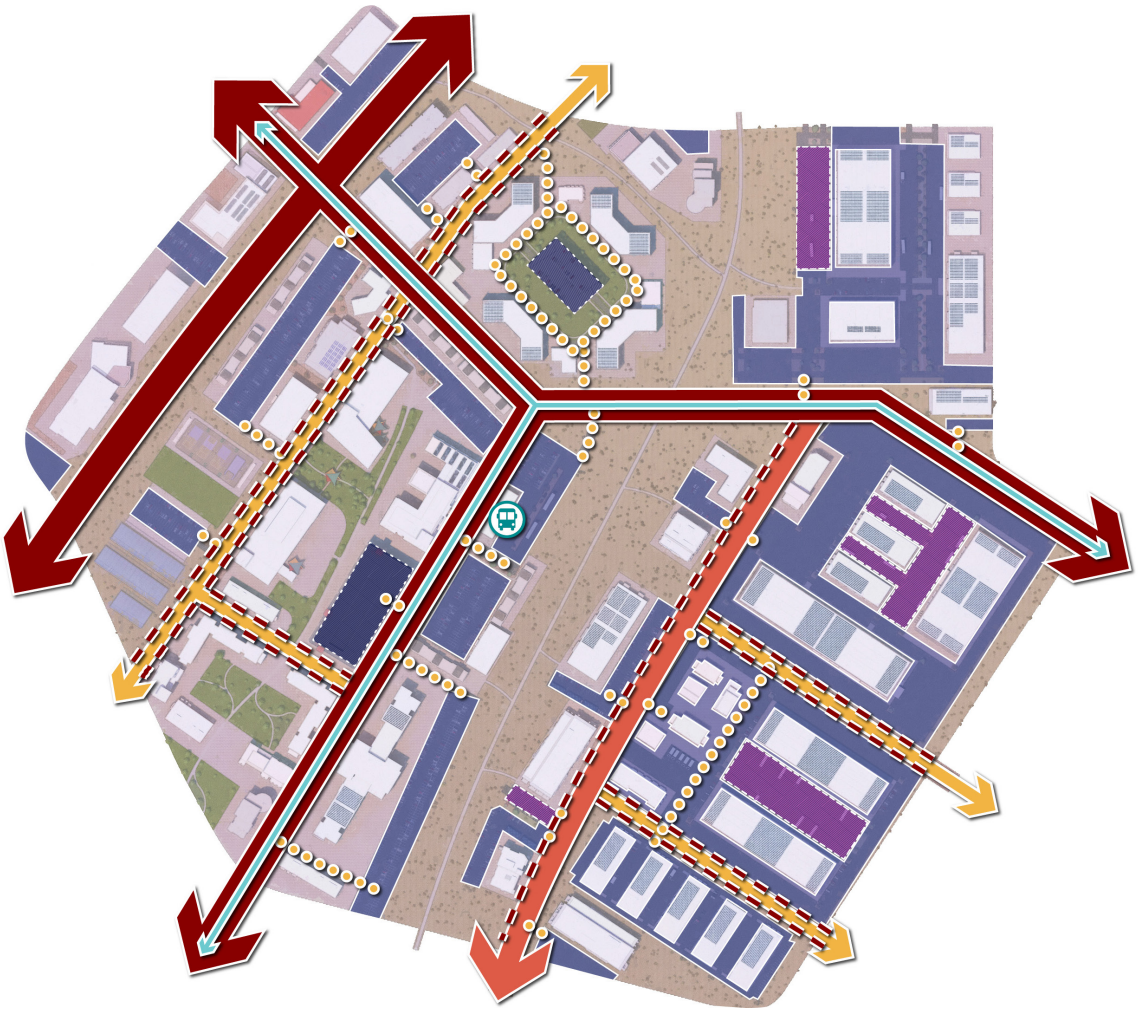

LEGEND
Retail/Commercial
Office
General Mixed Use
Community/Civic
Park/Plaza
Industrial
Structured Parking

Figure 24: **Mixed Employment - Roadway Network**

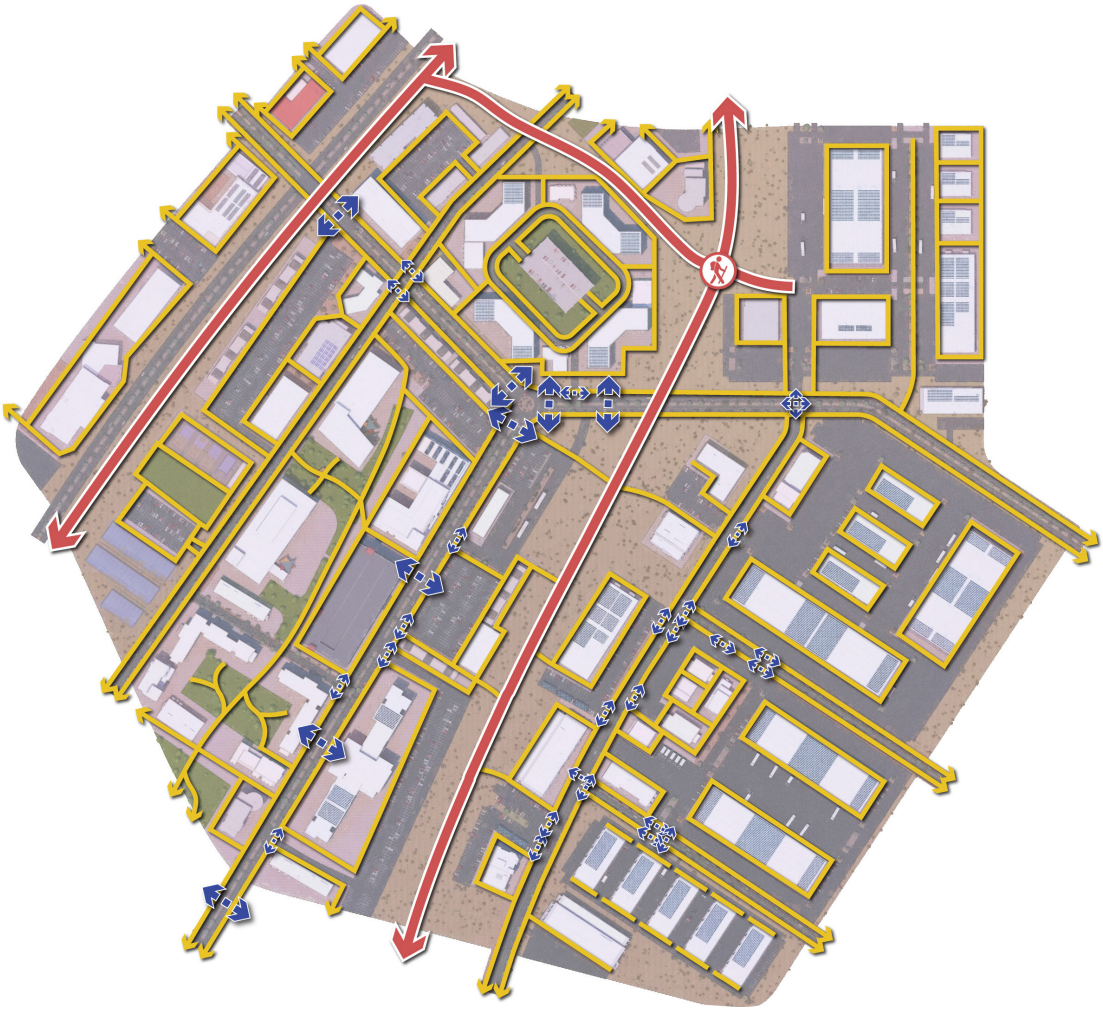


LEGEND

- Arterial Road
- Collector Road
- Local Road
- Access Road
- Bus Route
- Transit Hub
- Surface Parking Lot
- Structured Parking
- Loading Area
- Street Parking

To accommodate the specific industry needs in this area, the road network must be designed for higher levels of traffic and large vehicles. Thus, roadways may be a combination of major arterials, collectors, and local roads.

Figure 25: **Mixed Employment - Trails & Bikeways**



LEGEND

- Paved Multi-Modal Trail
- Pedestrian Trail/Sidewalk
- Marked Trailhead
- Street Crossing

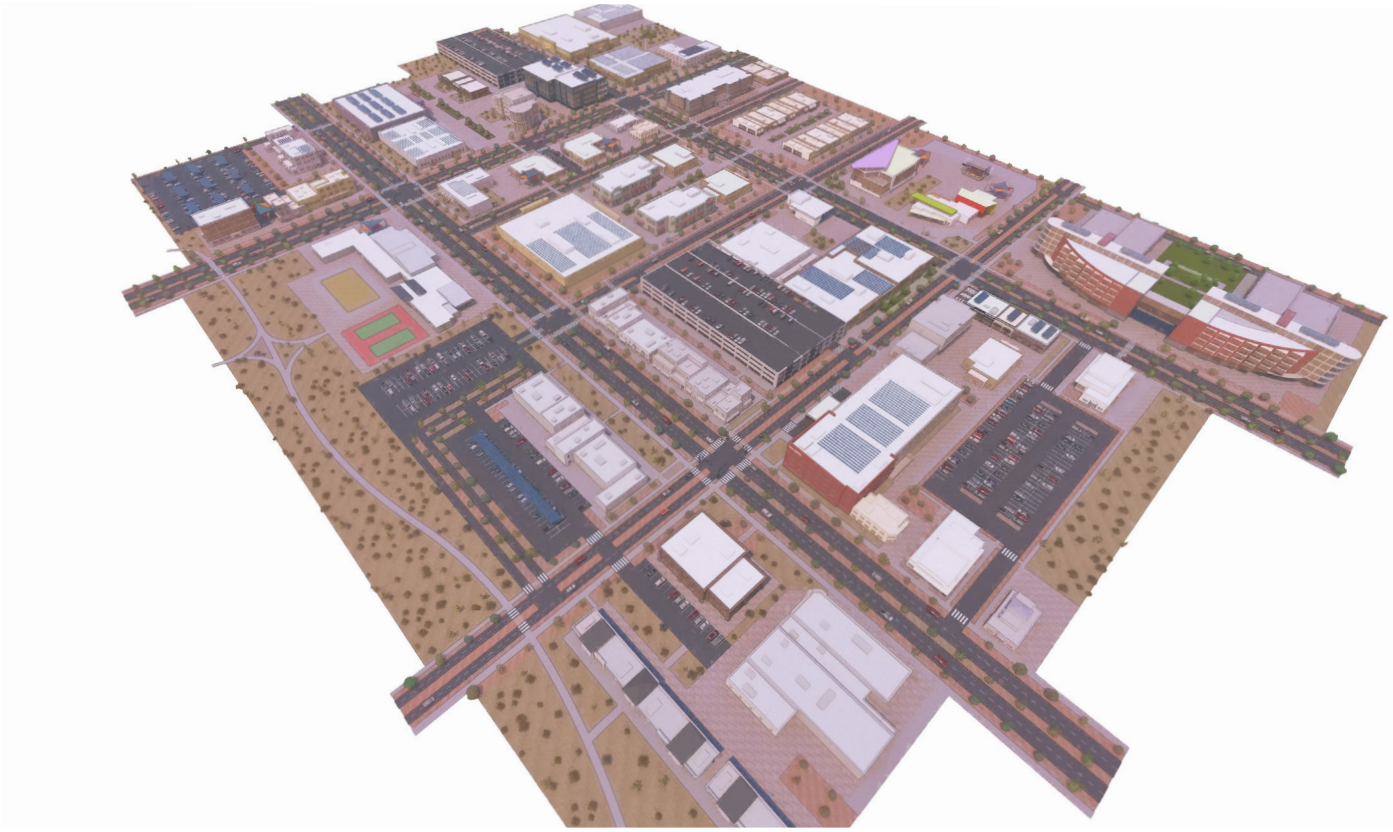
Blocks are generally larger to accommodate necessary parcel size and building mass, while pedestrian infrastructure, such as sidewalks and pathways, are still integrated to allow for walkable connectivity to nearby amenities. This Development Type is strategically located close to I-15 and its interchange access points.

RETAIL, HOSPITALITY & ENTERTAINMENT

This Development Type provides areas with higher-intensity mixed-uses and activities that serve both local neighborhoods and the region. This Type is comprised of commercial retail and service centers; entertainment and performance venues (although not specifically geared towards gaming); and accommodations that serve tourists and visitors. These centers provide distinguished destinations with experiential activities, dining, music, art, and shopping. In addition to hotels and resorts, higher density housing may also be incorporated in these areas.

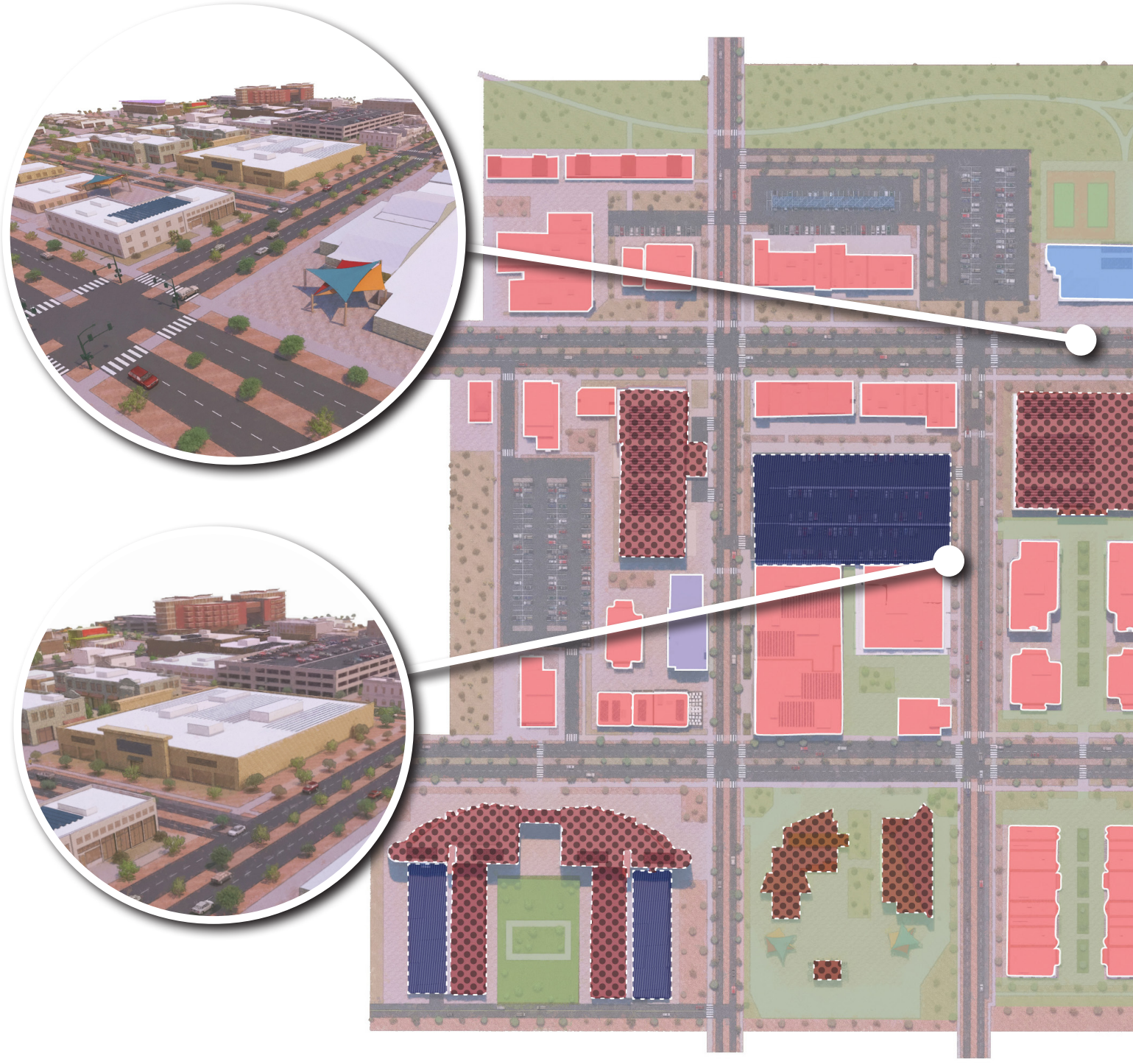
- 15+ dwelling units per acre
- 30+ jobs per acre
- Example jobs include: hotel manager, storage and venue operator, retail store manager, chef, etc.

Activity Centers & Destinations



This Development Type is characterized by a wide range of uses, with a focus on activity and vibrancy. In addition to performance venues, restaurants, shopping, hotels, and apartments or condo communities, regionally serving uses such as hospitals and health care facilities, higher education campuses, and public facilities may be good matches to complement the primary uses included in this Development Type. Parks, public facilities, and minor supporting uses are integrated components of this Development Type, including multi-generational playgrounds that provide a range of activities, public plazas, sports fields, open spaces, picnic areas, libraries, recreation and community centers, schools, childcare centers, post offices, and public safety facilities. All households should have access to recreational amenities within a 10-minute walk or half-mile, per national best practices. These areas are meant to provide daily needs and leisure activities for residents and employees as well as key attractions for visitors.

Figure 26: **Retail, Hospitality & Entertainment - Land Use**



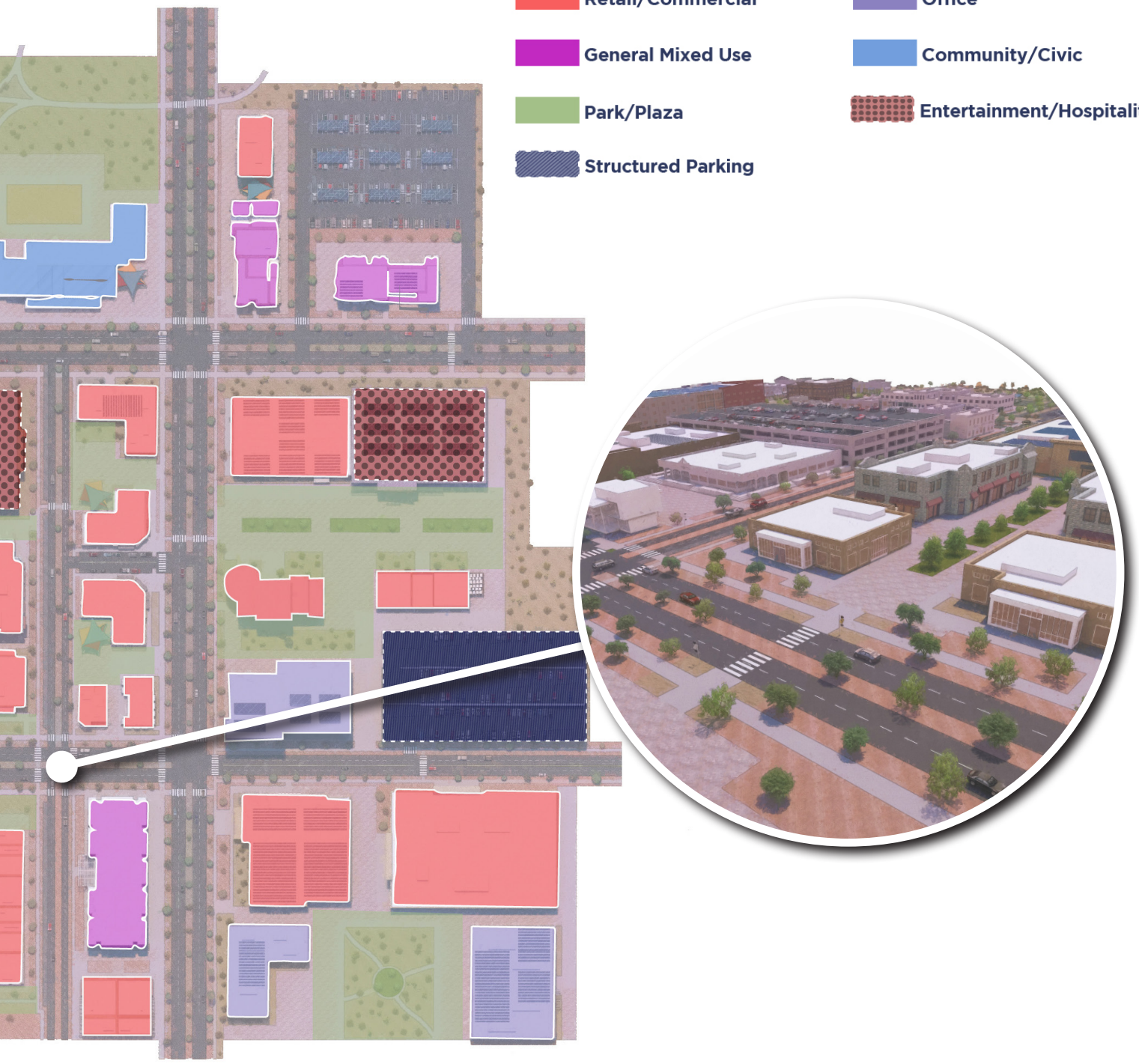
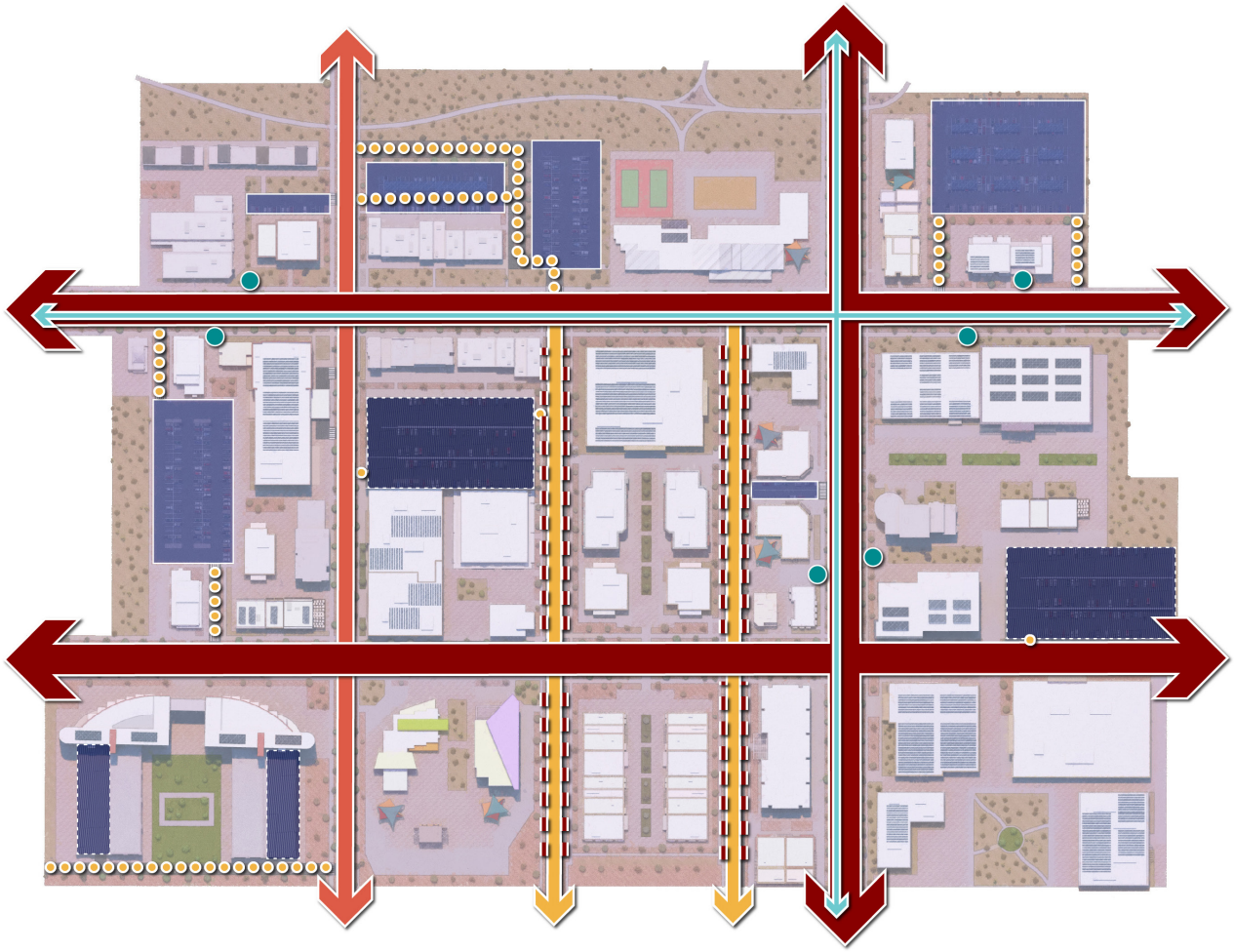

LEGEND
Retail/Commercial
General Mixed Use
Park/Plaza
Structured Parking
Office
Community/Civic
Entertainment/Hospitality

Figure 27: Retail, Hospitality & Entertainment - Roadway Network

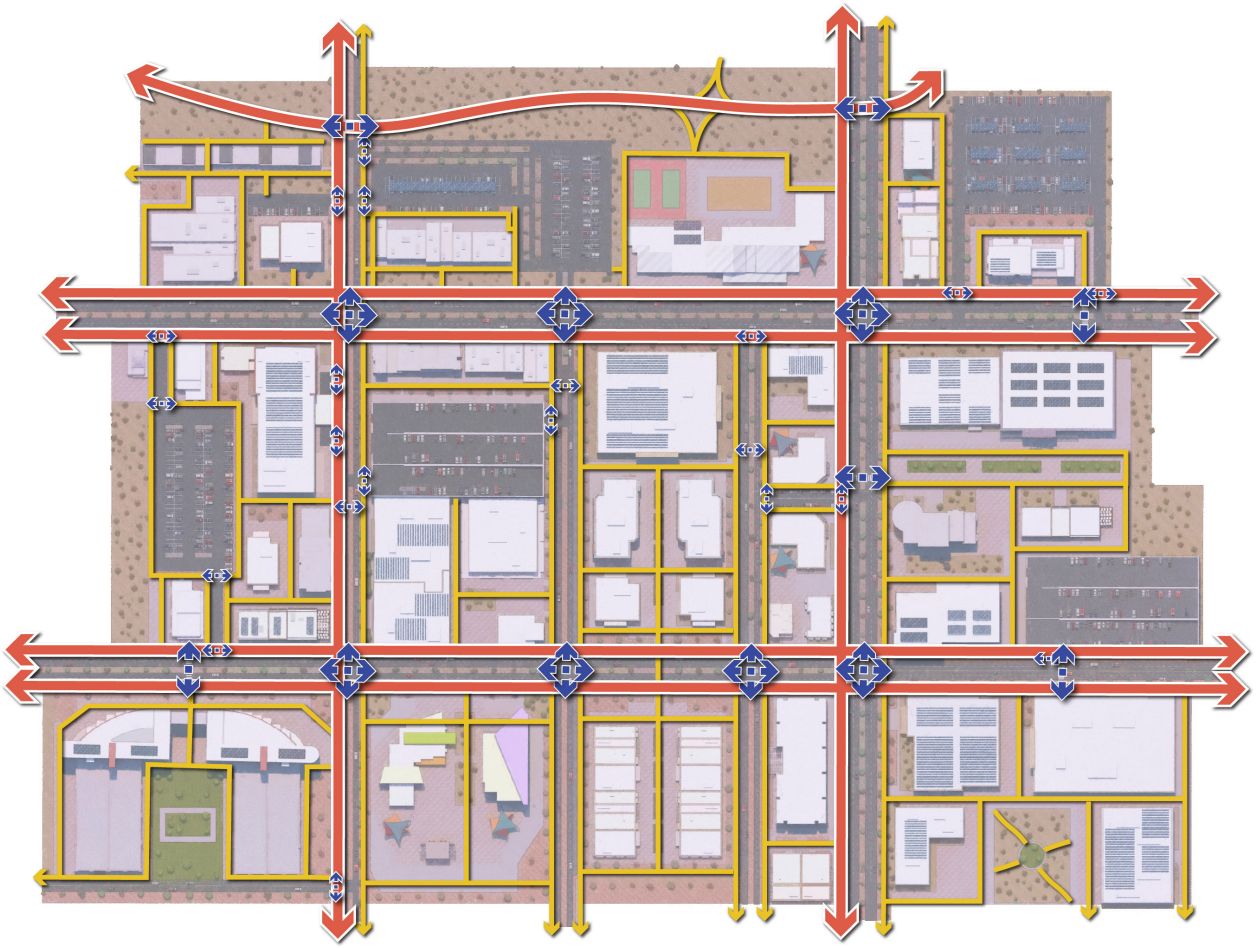


LEGEND

- Arterial Road
- Collector Road
- Local Road
- Access Road
- Bus Route
- Transit Stop
- Surface Parking Lot
- Structured Parking
- Street Parking

The road network within this Development Type may be a mix of local roads, collectors, and arterials, mostly following a predictable grid and small block sizes to promote walkability. Due to the level of activity in these areas, the street network should be well connected to other parts of the Study Area and region, following robust Complete Streets best practices.

Figure 28: **Retail, Hospitality & Entertainment - Trails & Bikeways**



LEGEND

Paved Multi-Modal Trail

Pedestrian Trail

Street Crossing

Sidewalks, crosswalks, trails, bike lanes, and multi-use paths are also amply provided to support walkability. Parking is accommodated through parking structures and on-street parking, and transit hubs are integrated. Buildings should generally be sited along roadways to provide pedestrian-scaled and visually appealing streetscapes.

FLEX & TRANSITION AREAS

The last two Development Types are areas where two Development Types are combined to allow for flexibility as future planning and development occurs and to encourage thoughtful transitions between different Development Types. These flex and transition areas include:

- Traditional Mixed Use + Mixed Employment
- Retail, Hospitality & Entertainment + Mixed Employment

Mixed Employment + Traditional Mixed Use

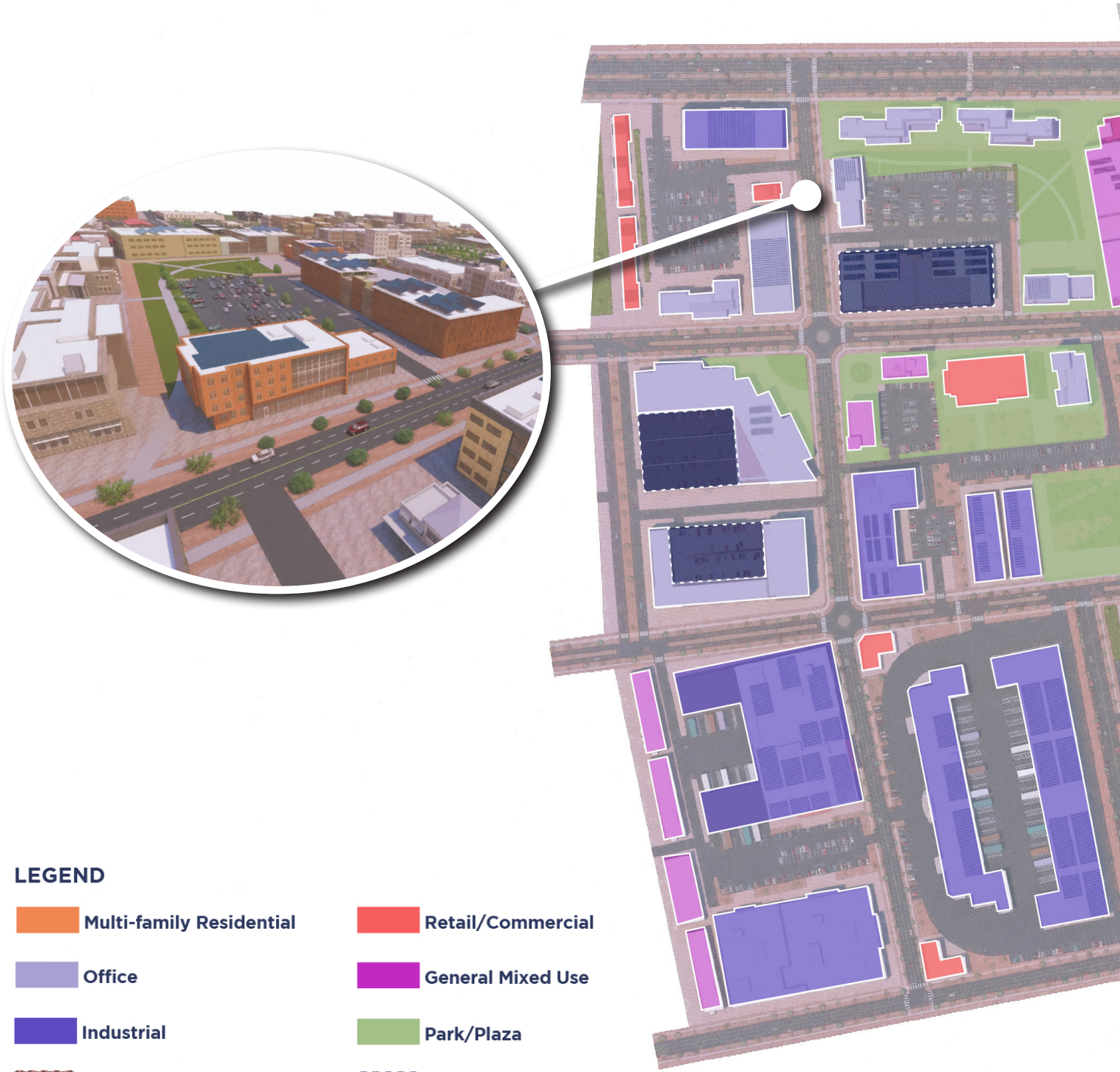
This Development Type combines elements of both Traditional Mixed Use and Mixed Employment. Vertical mixed use may be more geared towards offices above ground floor commercial and more intensive business and industrial development should be responsive to the neighboring or integrated lower intensity uses, including residences. Business headquarters, campuses, and lite manufacturing may be better suited in these areas than warehousing or industrial manufacturing. Transportation connections for multiple modes (drivers, transit riders, pedestrians, and bicyclists) and their associated infrastructure are included.

- 8+ dwelling units per acre
- 15+ jobs per acre
- Example jobs include: accountant, marketing manager, commercial truck driver, apartment community manager, outpatient nurse or nurse practitioner, restaurant server, consultant, retail clerk, etc.

Mixed Employment + Traditional Mixed Use

This Development Type includes a combination of moderate-intensity production activities or business complexes and lower intensity operations, such as small office buildings and retail complexes, including grocery stores. Public facilities and supporting amenity uses, such as schools, libraries, community and recreation centers, post offices, childcare centers, and public safety facilities are also appropriate to serve daily needs in these areas. Mid-density housing may also be integrated as appropriate, such as apartments and condo communities or townhomes. Community-serving parks and open spaces should also be included, with all households having access to recreational amenities within a 10 minute walk or half-mile, per national best practices. Parcels and buildings are generally mid- to- large-scale and may slowly transition in massing between adjacent uses to serve as a buffer.

Figure 29: Mixed Employment + Traditional Mixed Use - Land Use



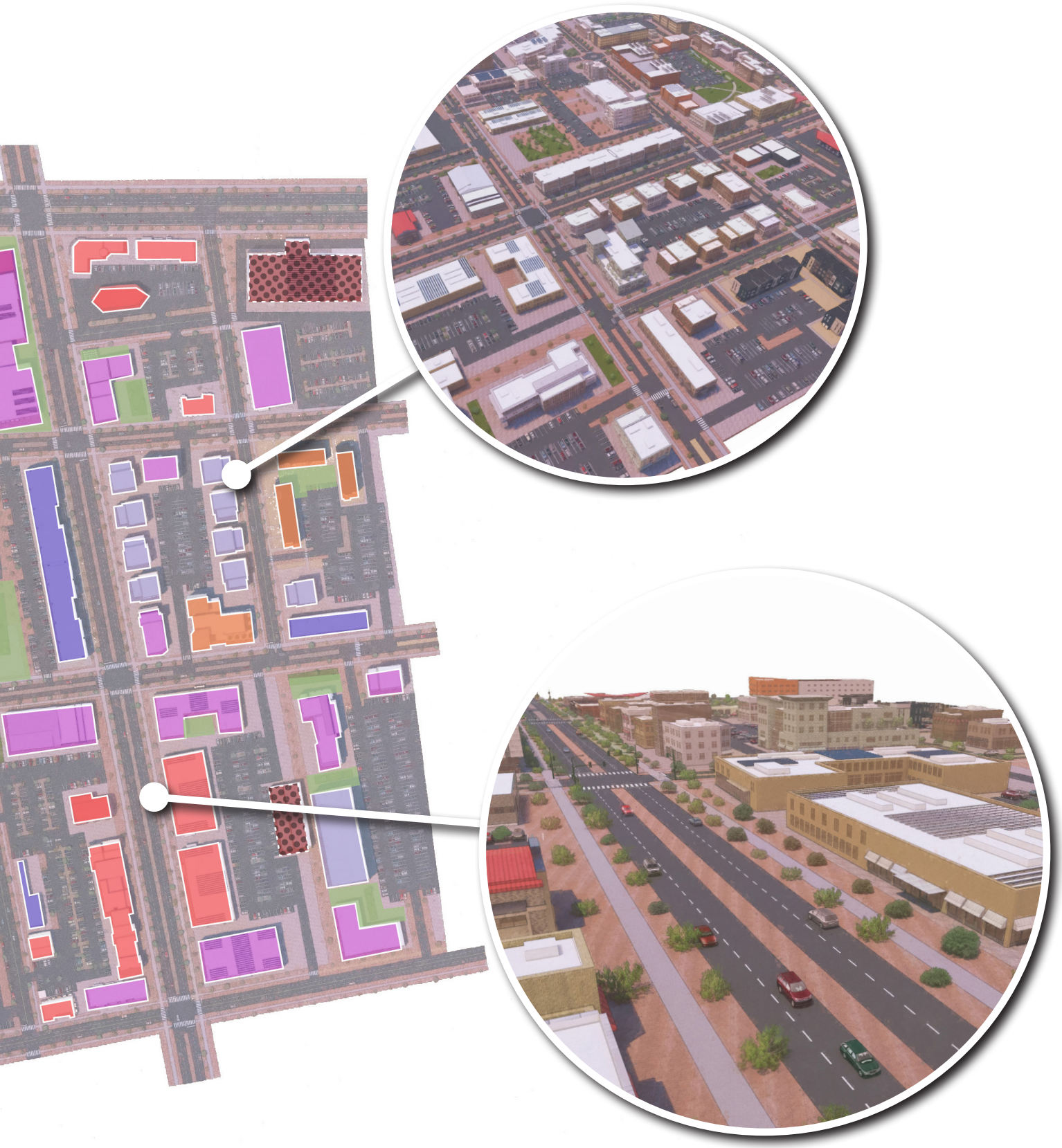
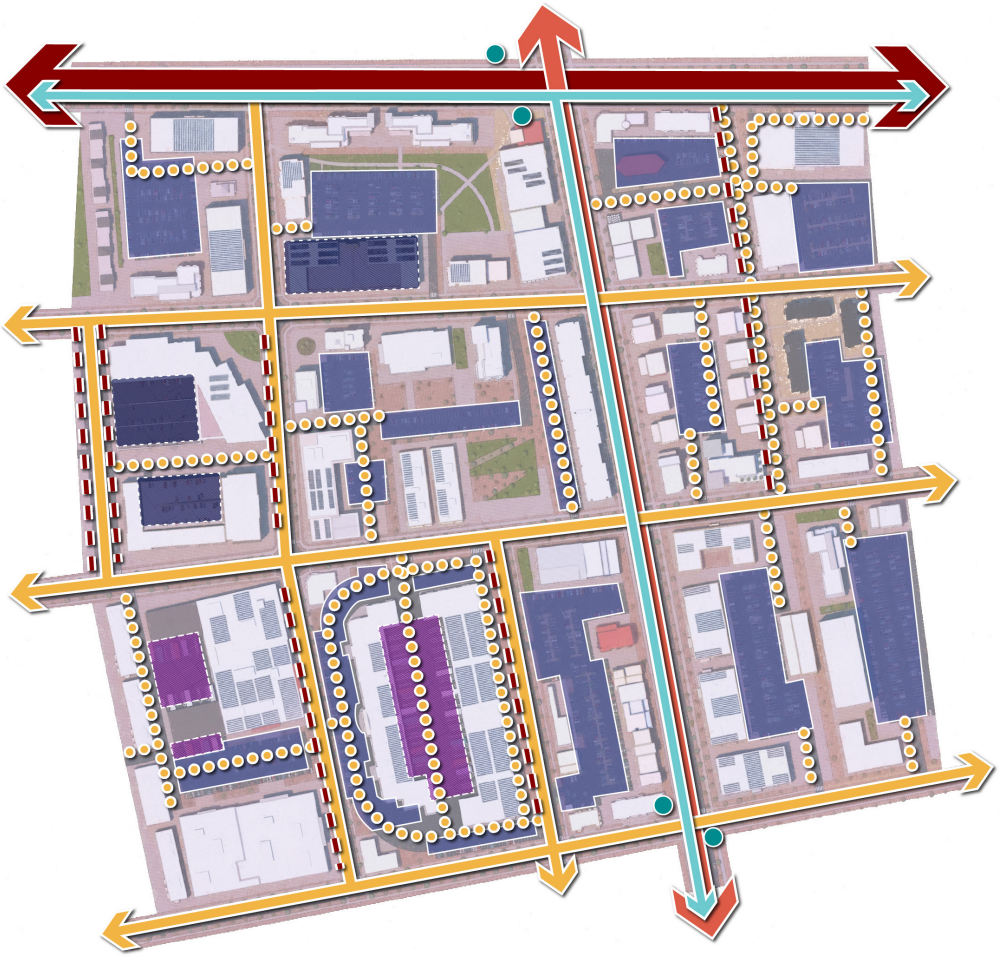


Figure 30: Mixed Employment + Traditional Mixed Use - Roadway Network

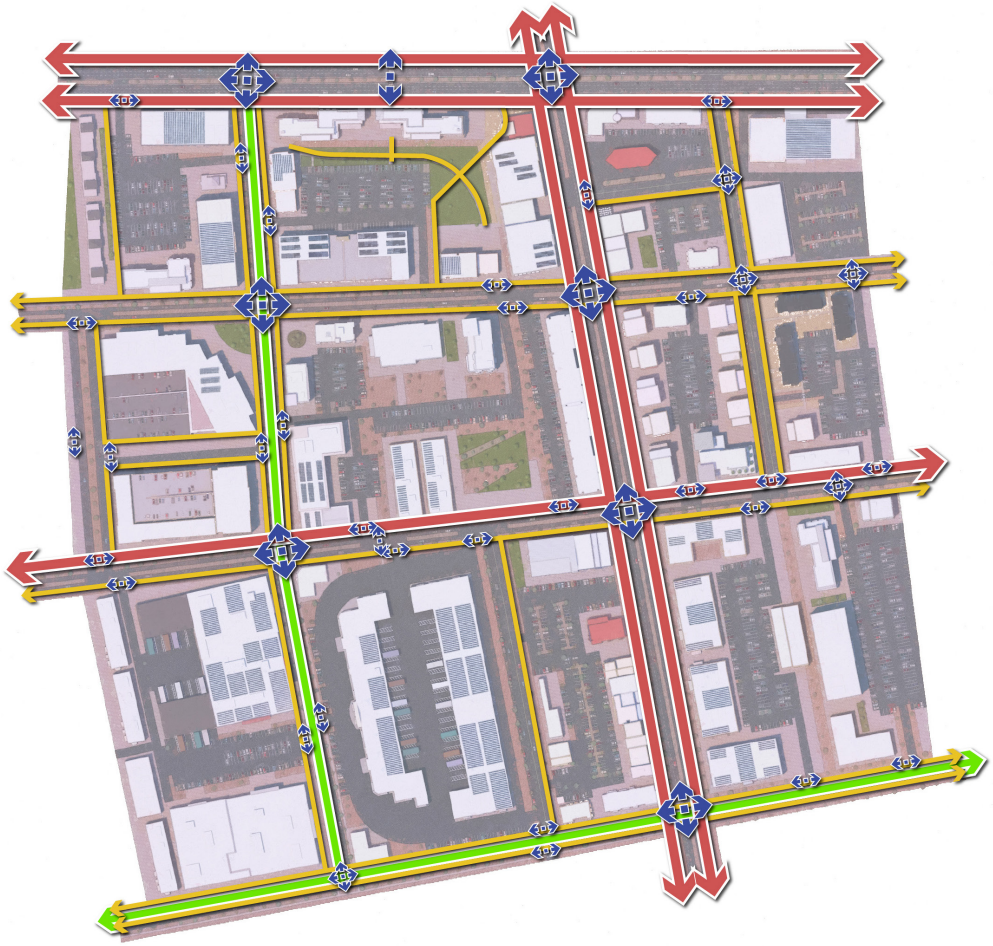


LEGEND

- Arterial Road
- Collector Road
- Local Road
- Access Road
- Bus Route
- Transit Stop
- Surface Parking Lot
- Loading Area
- Structured Parking
- Street Parking

Roadways in these areas are a mix of arterials, collectors, and local roads, providing ample connectivity to and between different areas of activity and neighborhoods. Roads and blocks may follow a grid pattern or be more irregular based on topography and surrounding context. Blocks and parcels should allow for flexibility and transition to accommodate both larger-scale business development and allow for walkability and human-scaled design.

Figure 31: **Mixed Employment + Traditional Mixed Use - Trails & Bikeways**



LEGEND

- Paved Multi-Modal Trail
- Pedestrian Trail/Sidewalk
- Bike Lane
- Street Crossing

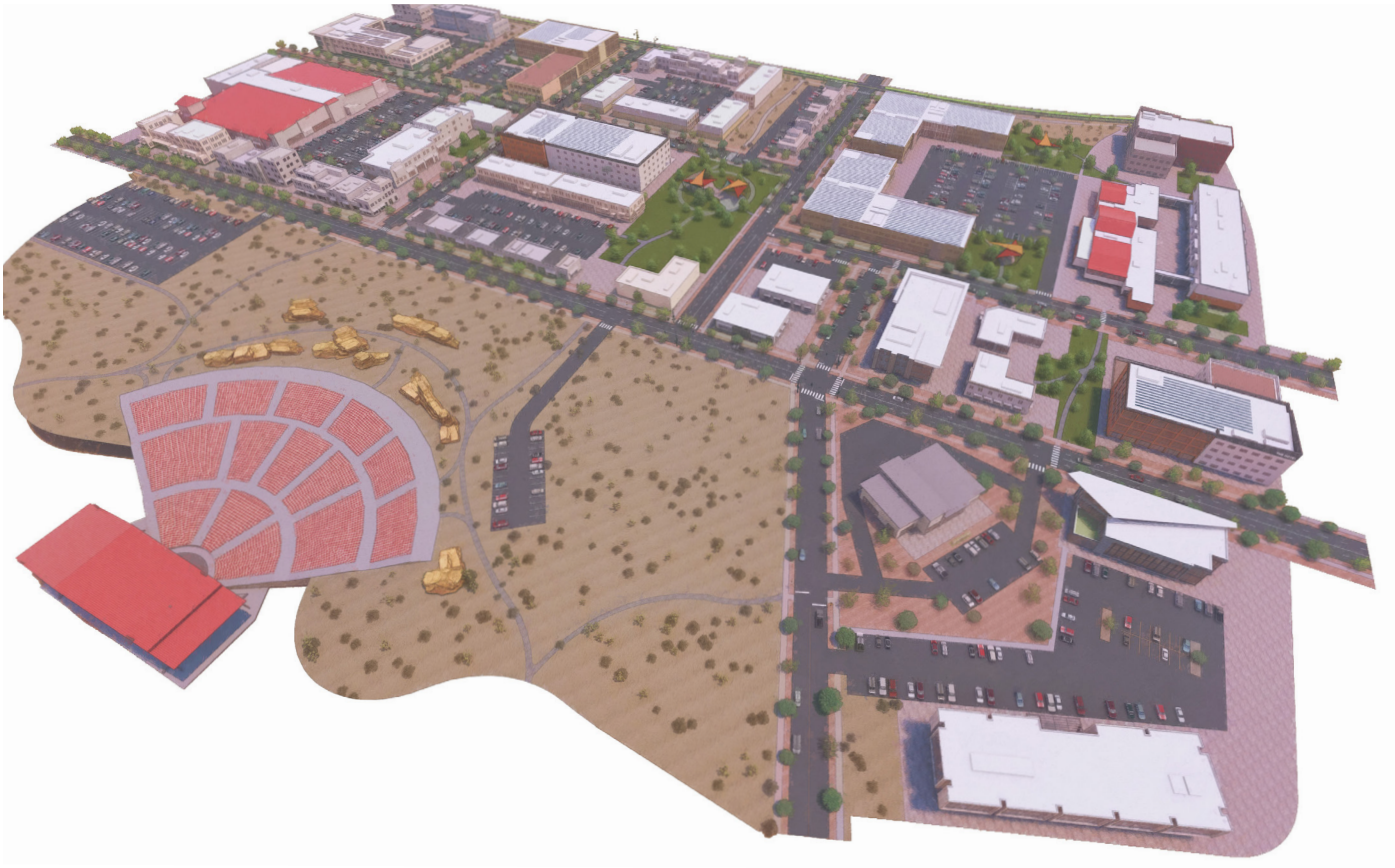
Sidewalks, crosswalks, trails, bike lanes, and multi-use paths are also amply provided to support walkability. Parking is accommodated mostly in small structured parking facilities, with some on-street parking or small surface lots, and transit connections are integrated. Setbacks and building orientation should be flexible to allow for variability.

Mixed Employment + Retail, Hospitality & Entertainment

This Development Type combines elements of both Retail, Hospitality & Entertainment and Mixed Employment. Industrial development in these areas should be responsive to the neighboring or integrated uses that draw visitors and residents for leisure and enjoyment. Business headquarters and campuses or low intensity, small-scale manufacturing may be better suited to these areas than warehousing or large-scale manufacturing. As with the Mixed Employment Development Type, direct incorporation of locally serving retail and commercial uses would serve workers and visitors. Transportation connections for multiple modes (drivers, transit riders, pedestrians, and bicyclists) and their associated infrastructure are included.

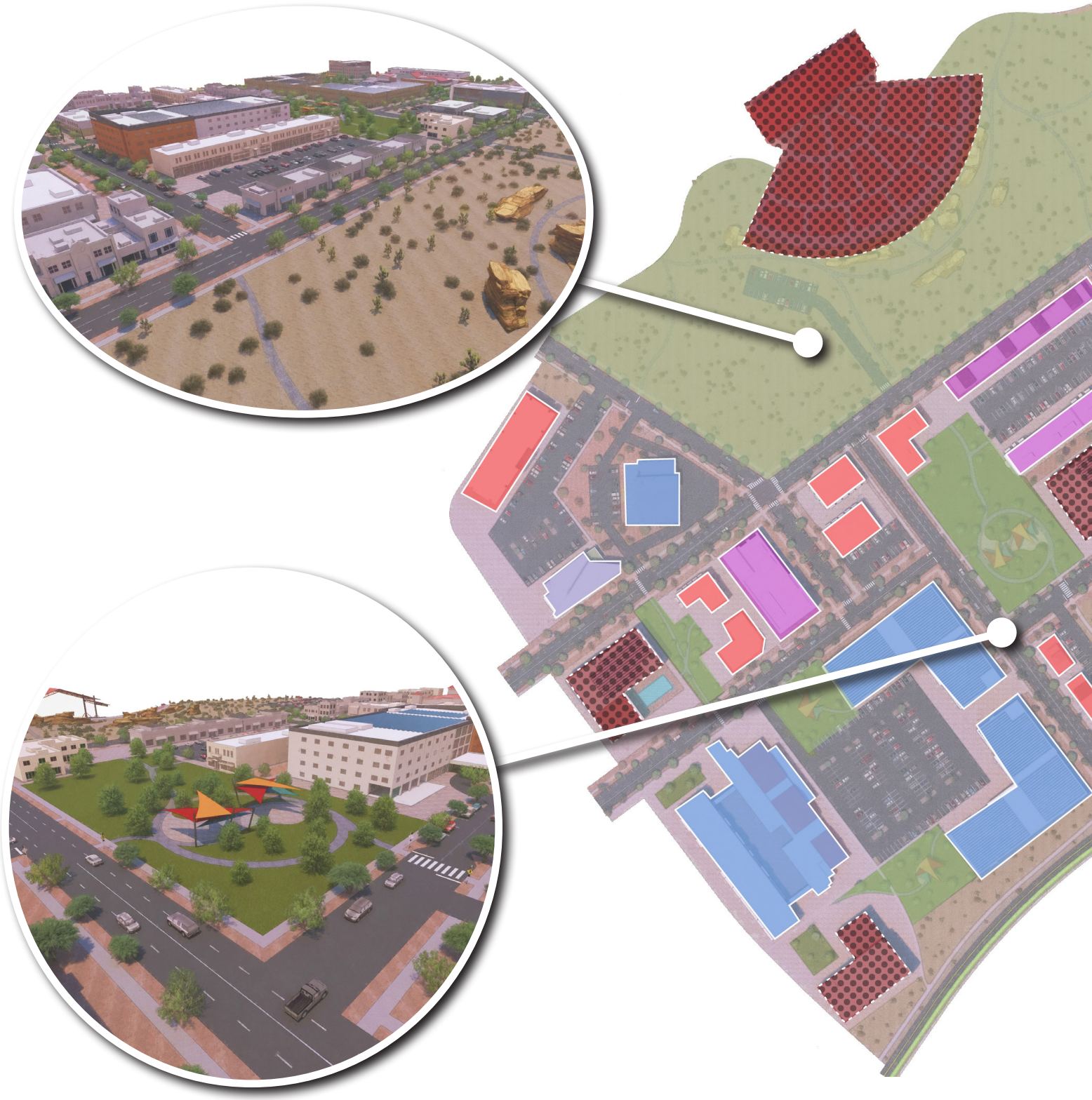
- 15+ dwelling units per acre
- 30+ jobs per acre
- Example jobs include: mechanist, precision assembler, accountant, marketing manager, commercial truck driver, hotel manager, storage and venue operator, retail store manager, chef, etc.

Mixed Employment + Retail, Hospitality & Entertainment



This Development Type includes a combination of moderate-intensity production facilities or business and office complexes and hotels, entertainment operations, apartment or condo communities, and townhome residences. Other regionally serving uses may also be included, such as hospitals and health care facilities and higher education campuses, as well as other public facilities and supporting uses, such as schools, libraries, community and recreation centers, post offices, and public safety facilities. Regionally serving public space amenities are also a critical component of this Development Type, including public plazas, sports fields, open spaces, and picnic areas. All households should have access to recreational amenities within a 10-minute walk or half-mile, per national best practices.

Figure 32: **Mixed Employment + Retail, Hospitality & Entertainment - Land Use**



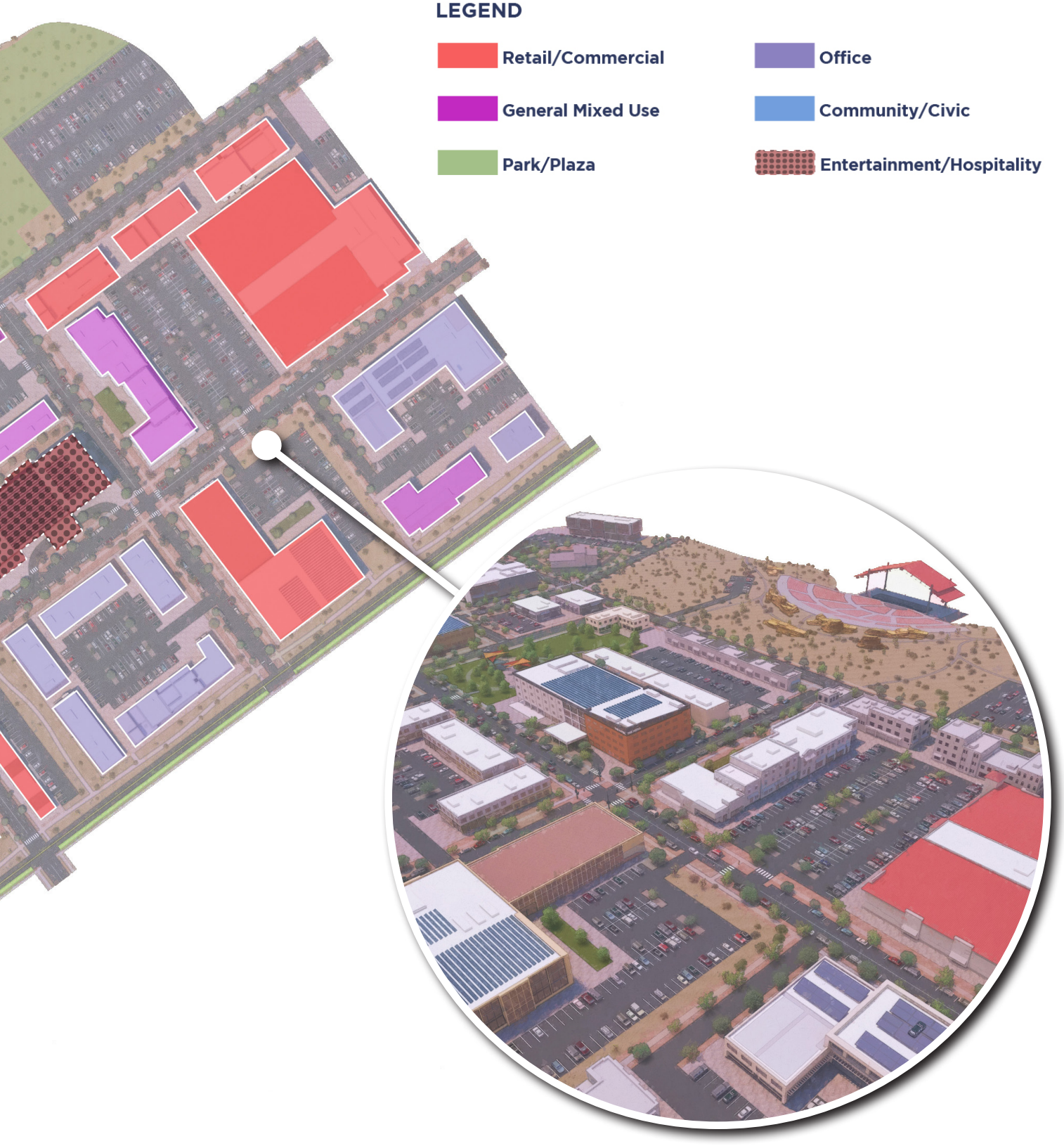
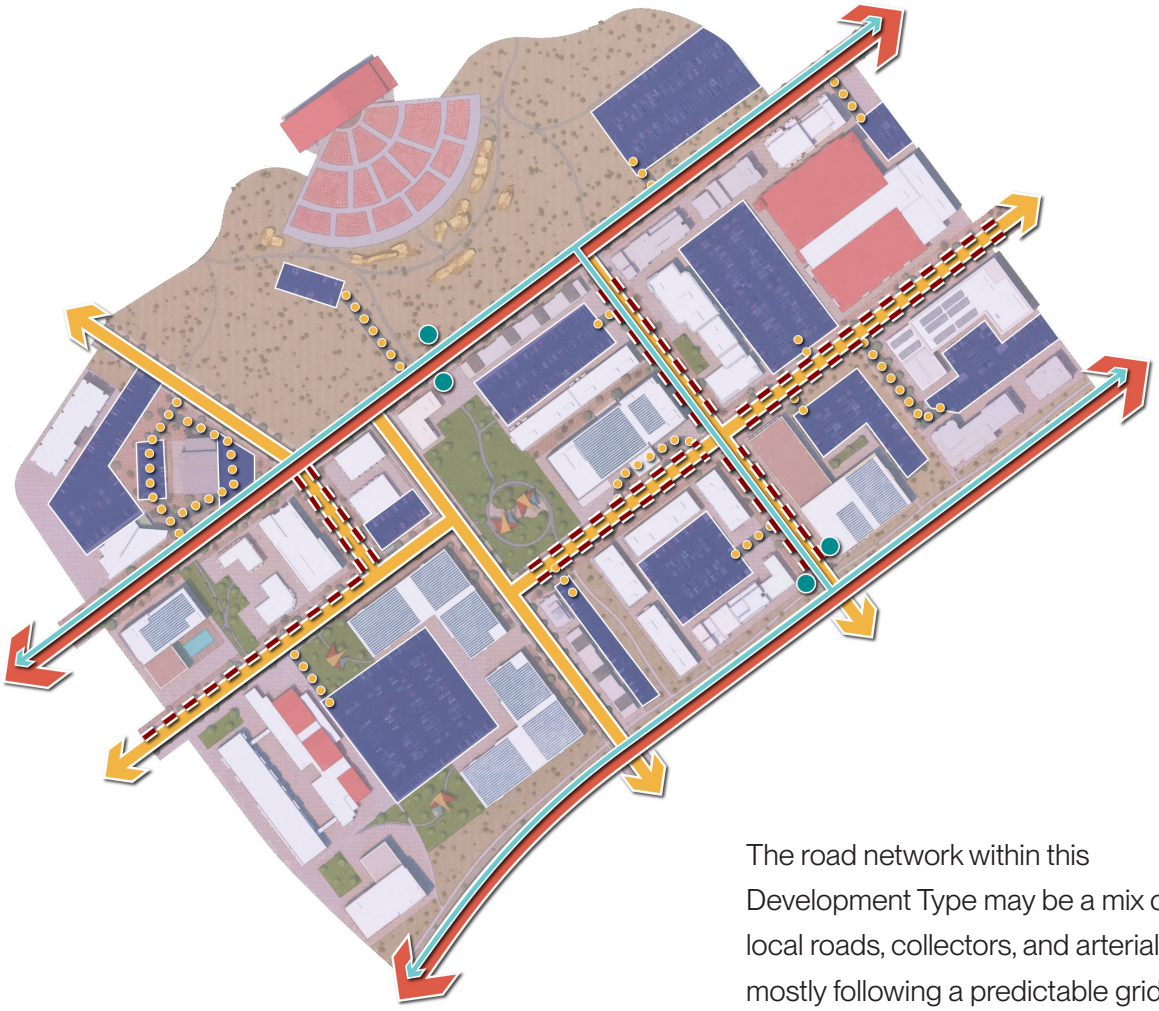

LEGEND
Retail/Commercial
Office
General Mixed Use
Community/Civic
Park/Plaza
Entertainment/Hospitality

Figure 33: Mixed Employment + Retail, Hospitality & Entertainment - Roadway Network



LEGEND

- Local Road
- Collector Road
- Bus Route
- Access Road
- Surface Parking Lot
- Transit Stop
- Street Parking

The road network within this Development Type may be a mix of local roads, collectors, and arterials, mostly following a predictable grid and small-to-medium block sizes to promote walkability. Due to the level of activity in these areas, the street network should be well connected to other parts of the Study Area and region, following robust Complete Streets best practices. Sidewalks, crosswalks, trails, bike lanes, and multi-use paths are also amply provided to support walkability. Parking is accommodated through surface lots, parking structures, and on-street parking, and transit hubs are integrated.

Figure 34: **Mixed Employment + Retail, Hospitality & Entertainment - Trails & Bikeways**

LEGEND

- Paved Multi-Modal Trail
- Unpaved Multi-Modal Trail
- Pedestrian Trail/Sidewalk
- Marked Trailhead
- Bike Lane
- Street Crossing

Buildings should generally be sited along roadways to provide pedestrian-scaled and visually appealing streetscapes, although flexibility in these conditions may be appropriate.

SUPPORTING INFRASTRUCTURE & FACILITIES

Infrastructure & Capital Improvements

Significant investment in infrastructure and facilities will be required to allow for new development in this area. Major roads and utilities infrastructure, such as water and sewer and high voltage power, as well as stormwater and drainage systems comprise the big-ticket investments that will be necessary to establish this land as development-ready. As noted earlier, per the 2002 Clark County Conservation of Public Land and Natural Resources Act, BLM has designated a 2,640-foot-wide Transportation and Utilities Corridor (TUC) along the eastern side of I-15 between Jean and Sloan. BLM manages the corridor for the non-exclusive placement of transportation and utilities infrastructure.

The information below provides a high-level discussion of key considerations for transportation and utilities infrastructure, including a conceptual network for major roads and trails. Additional assessment and planning for utilities, transportation infrastructure, and transit services will be necessary at later stages, should the Disposal Boundary expansion be approved and more is known about how management of the area will be divided between Clark County and the City of Henderson.

Transportation Network

This Traffic Analysis is a high-level assessment of the transportation anticipated implications of the proposed land use framework. The study estimates vehicle trips based on current trends and standards to determine capacity needs for major intersections and corridors. Further, the study identifies and proposes a set of multimodal recommendations that address safety, capacity, connectivity, and efficiency.

Existing Roadway Conditions

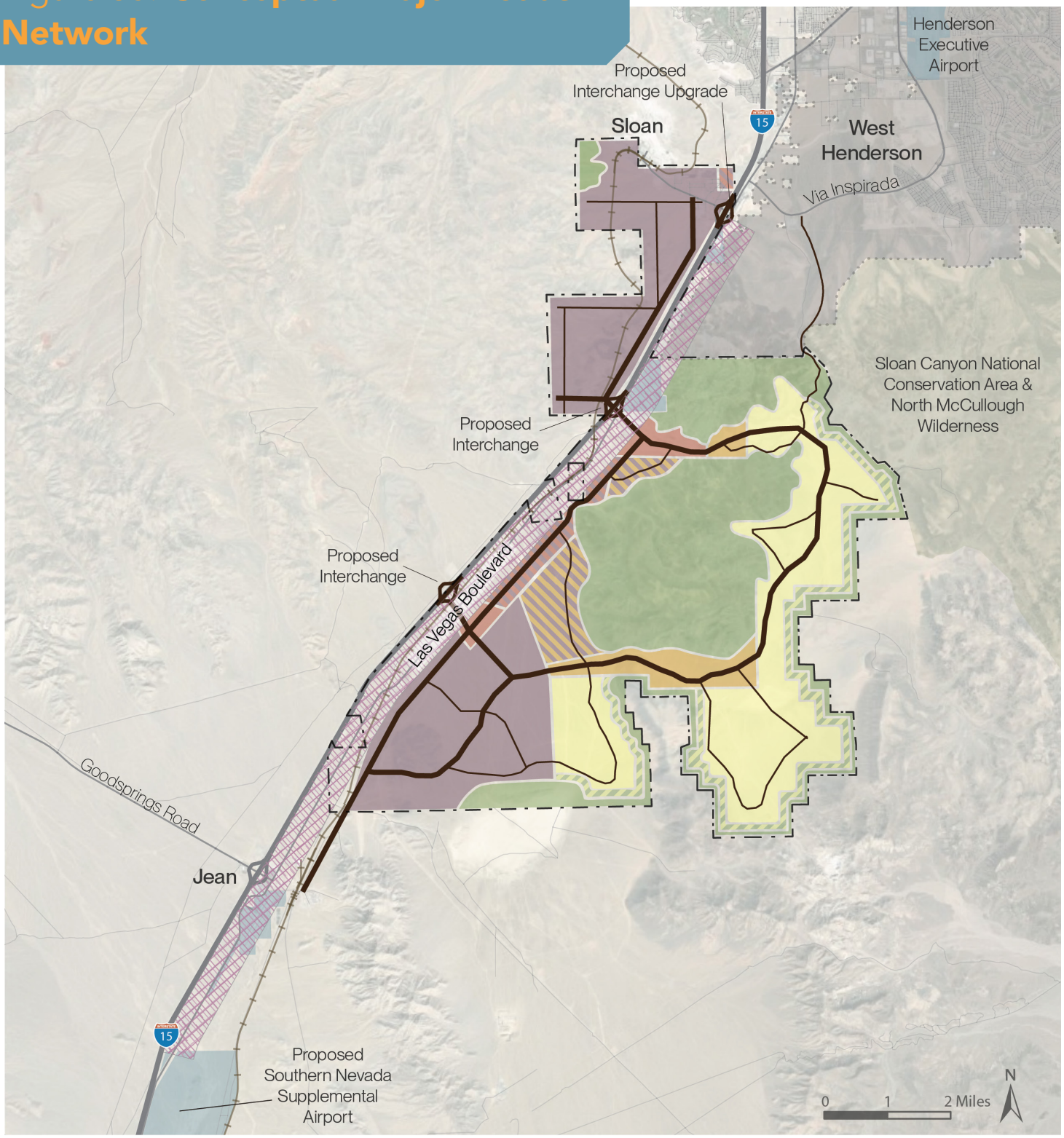
Most of the Study Area is undeveloped with few existing roadways. Primary access is provided via I-15, which bisects and borders the JLUS boundary. Las Vegas Boulevard South runs parallel to I-15 and connects the Study Area to the City of Henderson to the north and the Town of Jean to the south. There is an I-15 interchange at Highway 161 in Jean south of the Study Area and a partial interchange with slip ramps at Sloan Road to the north. Via Inspirada is another existing arterial that connects I-15 to the City of Henderson to the north of the Study Area.

Proposed Roadway Network - Connectivity

In developing a proposed mobility network, the traffic team took inspiration from the existing landscape and social trails. This conceptual network is presented in Figure 35. The following key components and considerations shape the proposed network:

- The central open space area affects the placement of future roadways, with arterials proposed around it to provide primary access throughout the area. One arterial runs parallel and to the east of I-15 and passes through retail and employment land uses. The second one runs along the eastern portion of the area, through mixed-use and residential land uses to join with Casa del Sol Drive – a planned north-south collector that will extend south from Henderson to the Study Area. The industrial and mixed-use area west of I-15 will also require an arterial roadway to accommodate local traffic to and from I-15.

Figure 35: **Conceptual Major Roads Network**



LEGEND

- Study Area
- Railroad
- Existing Roads
- Utility Corridor
- Clark County Department of Aviation Property
- City of Henderson
- Retail/Hospitality/Entertainment
- Traditional Mixed Use
- Mixed Employment
- Residential
- Open Space
- Transition Areas (mix of two land use types)
- Proposed Arterials
- Proposed Collectors

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- Two new interchanges are already proposed along the I-15 corridor. If demand criteria are met to necessitate their implementation, these interchanges would accommodate the increase in traffic associated with proposed development. These interchanges will provide critical access points to and from the Study Area.
- The existing interchange at Sloan Road will need to be upgraded to a full interchange in order to accommodate anticipated traffic increases in this area, should development occur.
- The existing Las Vegas Boulevard can also provide essential access and circulation for the area but would need to be expanded (as planned) to accommodate potential future traffic increases.
- In the south, the Study Area would connect to I-15 at Jean via Prison Road and the existing interchange there.
- The proposed road network would also be supported by major collectors that provide additional access to and through different use areas and connect to primary arterials. For the purposes of this Study, smaller collectors and local roads have not been identified. These configurations will be determined through subsequent site planning.
- An extensive trail network is proposed within the Study Area, largely along existing trail alignments and proposed roadways (see Figure 36). This network would promote the movement of pedestrians and cyclists within the Study Area, providing connectivity and recreation opportunities throughout.

Roadway Classifications

Per the City of Henderson's Transportation & Mobility Plan, this study uses the following roadway classification definitions:

Collectors = 2-4 lane road (10,000 – 30,000 vehicles per day)
Arterials = 6-8 lane road (25,000 – 60,000 vehicles per day)

Proposed Roadway Network - Safety

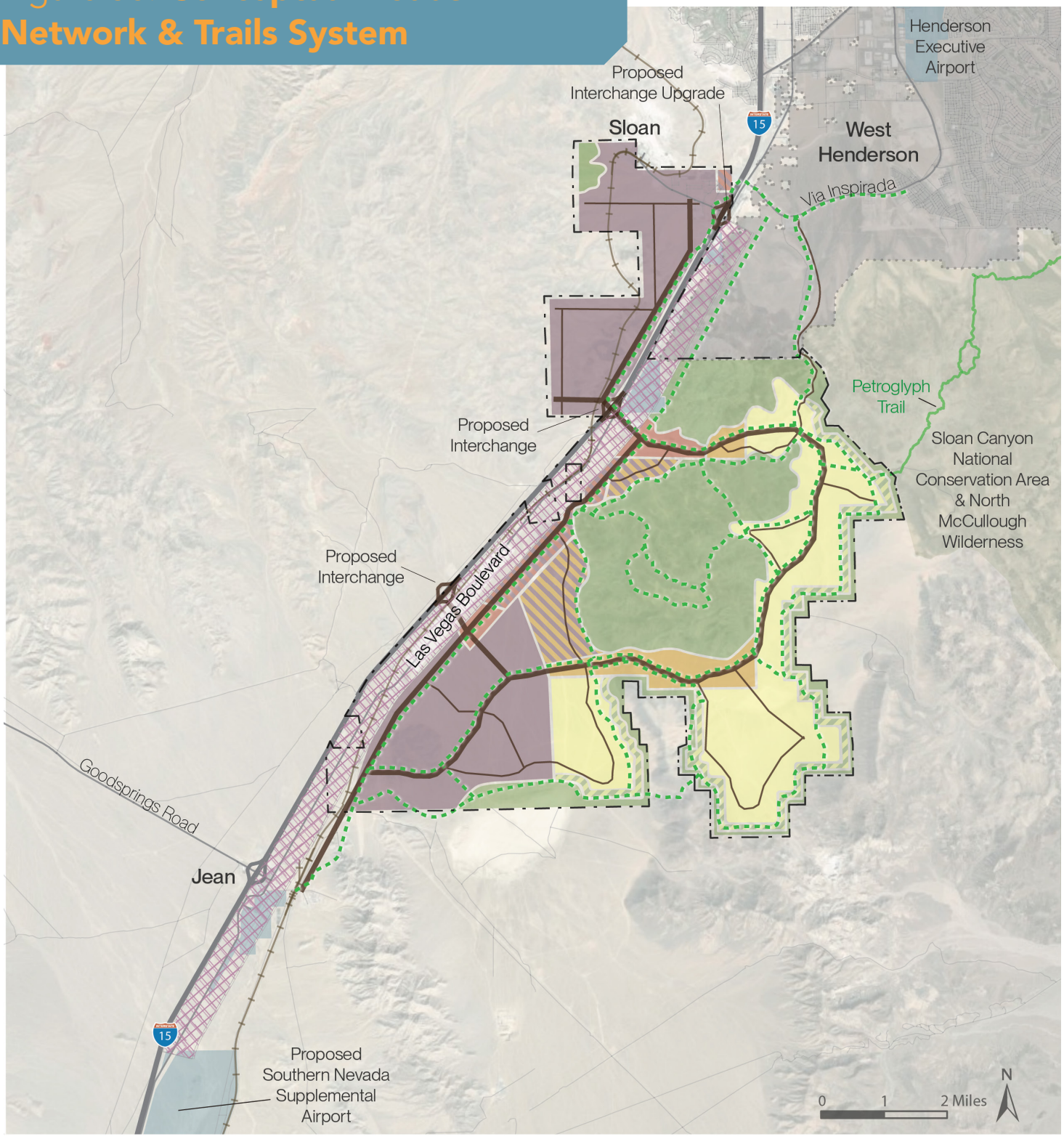
As planning and design for the Study Area move forward from a high-level conceptual design into a more detailed construction design, the traffic team propose a series of recommendations to promote safety within the Study Area. These recommendations include:

Intersection Design: Major signalized intersections should be spaced adequately to accommodate anticipated traffic volumes and sized appropriately for the planned development. Pedestrian infrastructure, such as signalization and crosswalks should be prioritized at most, if not all intersections.

Arterial Design: Ensure adequate sight distances are met at intersections and along roadways. Design roadways to accommodate traffic volumes without encouraging excessive speeds and ensuring overall safety. Major roadways will need to be four to six lanes to accommodate the anticipated traffic.

Interchanges: Ensure efficient access to and from the Study Area and I-15 with new planned interchanges. Alternative intersection designs or flyovers should be considered, and right-of-way should be set aside

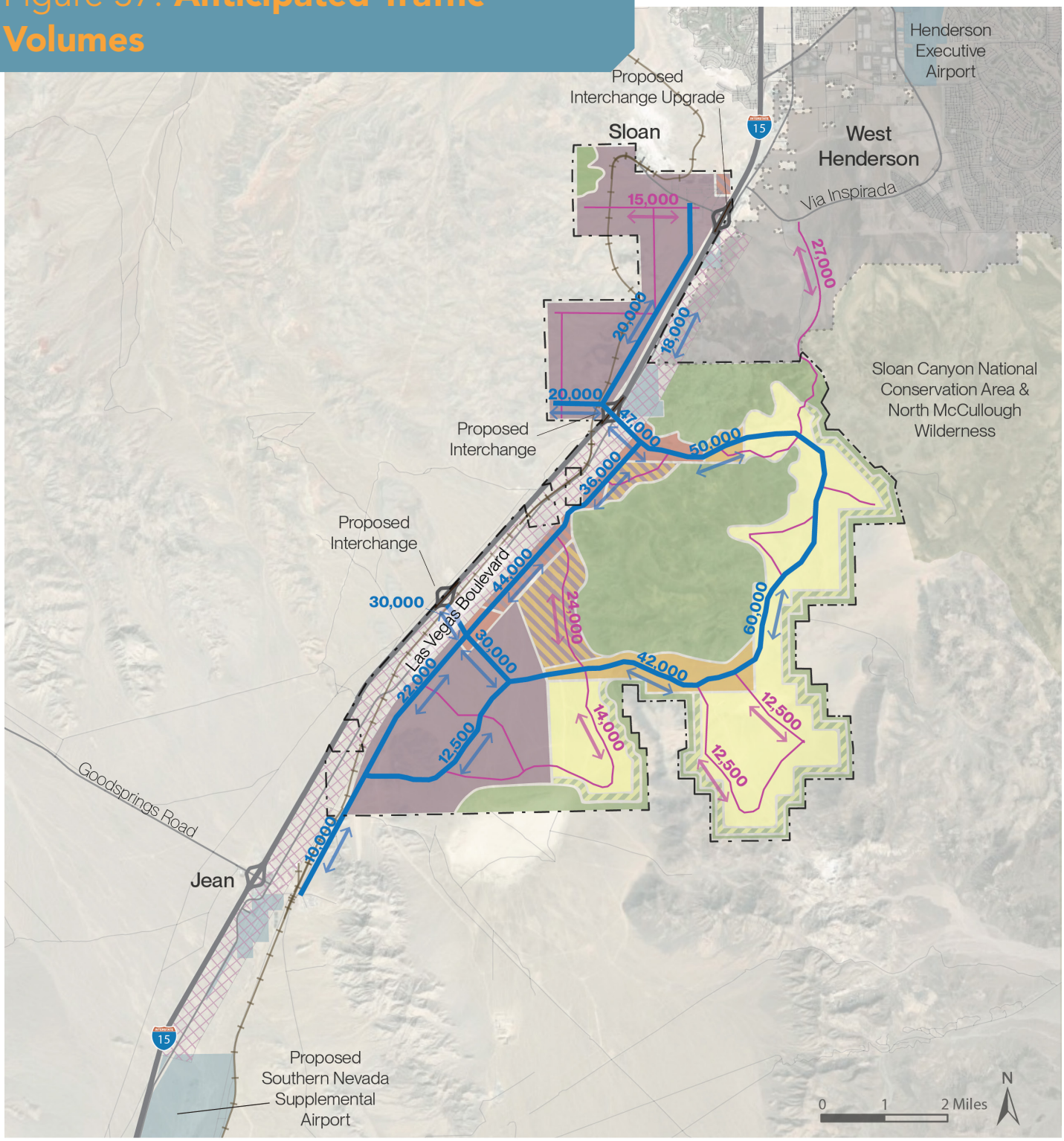
Figure 36: **Conceptual Roads Network & Trails System**



LEGEND

- Study Area
- Railroad
- Existing Roads
- Utility Corridor
- Clark County Department of Aviation Property
- City of Henderson
- Retail/Hospitality/Entertainment
- Traditional Mixed Use
- Mixed Employment
- Residential
- Open Space
- Transition Areas (mix of two land use types)
- Proposed Arterials
- Proposed Collectors
- Proposed Trail Network
- Existing Trails

Figure 37: **Anticipated Traffic Volumes**



LEGEND

- Study Area
- Railroad
- Existing Roads
- Utility Corridor
- Clark County Department of Aviation Property
- City of Henderson
- Retail/Hospitality/Entertainment
- Traditional Mixed Use
- Mixed Employment
- Residential
- Open Space
- Transition Areas (mix of two land use types)
- Proposed Arterials
- Proposed Collectors

to ensure adequate future operations. Existing interchanges should be upgraded to accommodate planned development. Acceleration and deceleration lane improvements may be required along I-15 adjacent to the Study Area.

Pedestrian and Cyclist Facilities: All of the roadways within the Study Area should feature sidewalks, adequate shade cover and lighting, and high-comfort protected bike paths or lanes, as possible. Trail Connectivity should be encouraged and prioritized wherever possible. Due to the possibility of high traffic volumes on the proposed arterials, grade-separated crossings or pedestrian-oriented intersection design should be prioritized.

Right of Way Widths for Multi-Mobility: Ensure that roadways have ample right-of-way width to accommodate multiple users as appropriate, such as bike lanes, vehicular travel lanes, turn pockets and bus stops.

Railroad Grade Separation: Consider grade separation with the existing railroad tracks along major roadways.

Proposed Roadway Network - Traffic Demand & Capacity

The traffic team conducted an assessment of proposed land use densities and types to estimate the traffic generation and vehicle trip distribution associated with proposed development. This analysis relies on current trends and standards for vehicle trip generation, which may evolve over time ad multimobility becomes more popular. Thus, updated traffic analysis, more detailed traffic modeling, and multimodal travel demand assessments are recommended for continued planning in the Study Area.

Figure 37 illustrates the assessed trip generation for individual road segments in the conceptual road network. It is estimated that the proposed land use will generate an additional 130,000 daily trips for the existing roadway network that will provide access into the Study Area (I-15, Las Vegas Blvd, and Casa Del Sol). Within the Study Area, major arterials and collectors are estimated to carry between 12,500 and 44,000 trips, depending on the segment. These estimated traffic flows can be used at a high level to understand the necessary capacity for major roads within the Study Area. Further details about the trip generation analysis can be found in Appendix D.

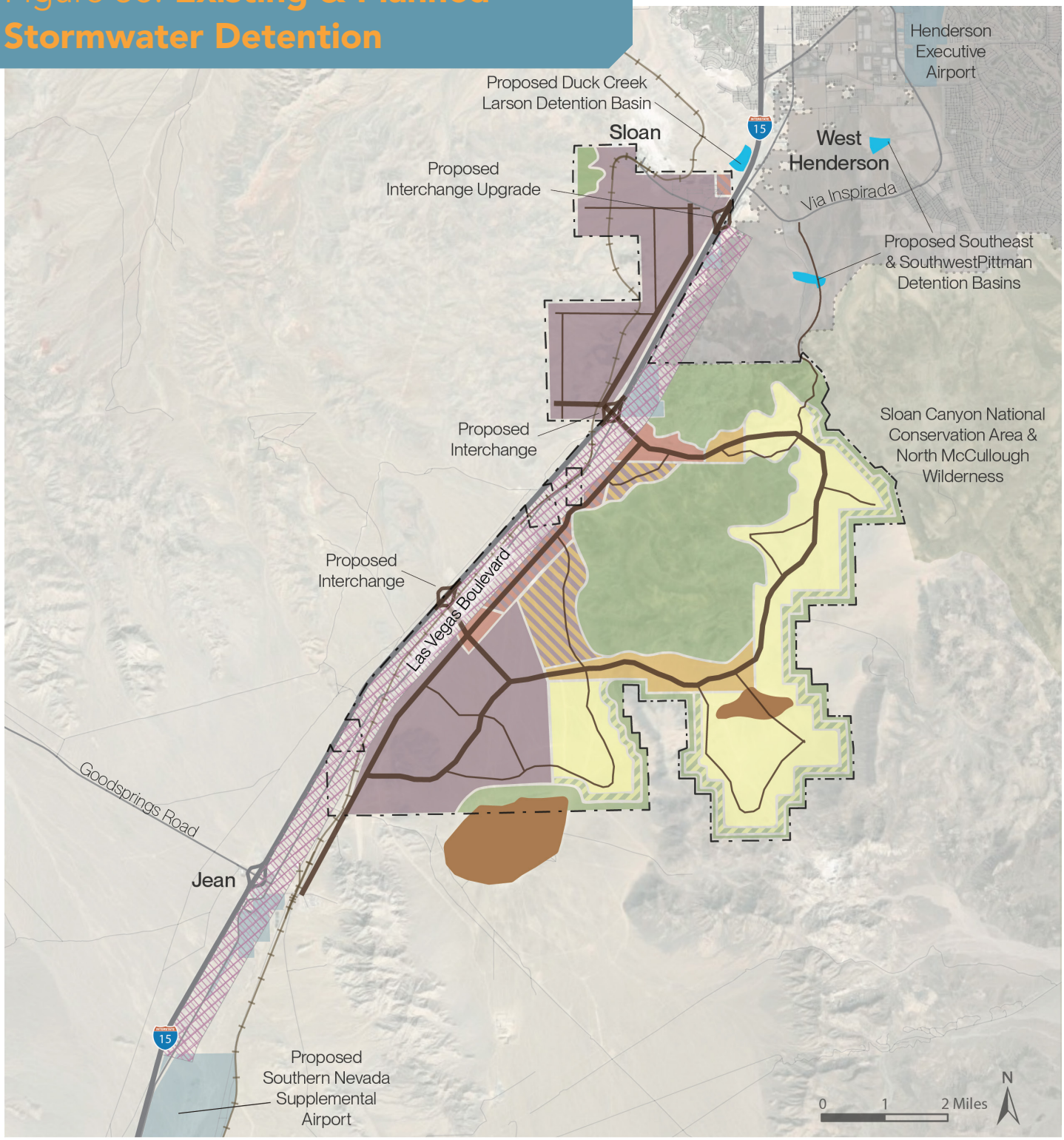
Utilities

Stormwater

The north portion of the Study Area drains to the Las Vegas Valley. This area is addressed in the 2023 Las Vegas Valley Flood Control Master Plan (LVVMPU). The LVVMPU outlines the proposed stormwater facility network to contain the 100-year ultimate condition flows – assuming a full “build-out” based on current zoning and entity-controlled land. Proposed land use and development for the Study Area were not included in the LVVMPU analysis as planning was still in progress. Potential impacts from the proposed land use framework for the Study Area will need to be analyzed and amended in the LVVMPU in the future.

Additional stormwater management in this area could include natural lined berms to concentrate flows into channels in the mountain foothills and riprap, concrete lined channels, or underground Reinforced Concrete Pipes (RCPs)/Reinforced Concrete Boxes (RCBs) within developed areas. Small debris basins may be required for larger natural drainage areas. Two natural low points (dry lake beds) within the Study Area may

Figure 38: **Existing & Planned Stormwater Detention**



LEGEND

- Study Area
- Railroad
- Existing Roads
- Utility Corridor
- Clark County Department of Aviation Property
- City of Henderson
- Retail/Hospitality/Entertainment
- Traditional Mixed Use
- Mixed Employment
- Residential
- Open Space
- Transition Areas (mix of two land use types)
- Proposed Arterials
- Proposed Collectors
- Clark County Regional Flood Control District Proposed Detention Basins
- Existing Dry Lakebeds

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be reserved for water detention. It is expected that stormwater and local drainage facilities, including curb and gutter, will exist within all developed portions of the Study Area but additional analysis and planning will be necessary in the future to determine flows, routing, and facility sizing. Impacts from the proposed development should be assessed for the three planned detention basins north of the Study Area.

Sanitary Sewer

The Clark County Water Reclamation District (CCWRD) is currently preparing the 22101 Ivanpah Valley Wastewater Master Plan that will guide the orderly development of wastewater facilities from the California state line to Sloan, encompassing the Study Area. Once complete, this document can be used to guide the siting, design, and construction of wastewater improvements necessary to serve new development within the Study Area. Such infrastructure will need to comply with approved standards and service rules. As planning continues in the Study Area, land portions will need to be reserved for utilities infrastructure at appropriate elevations.

Potable Water Demand

Based on the proposed land use framework, a high-level daily and maximum water demand was developed to assist with discussions regarding water needs for the Study Area. The daily and maximum demands are based on complete build-out of the Study Area – where all land proposed for potential development is fully developed. It is uncertain when this condition may be reached, if ever, but provides useful information about the *potential* water demand that this area could generate.

Extrapolating 2025-2045 projections for employment and population capture (see page 19) and associated net land demand (see page 30), at full build-out, the Study Area is expected to generate a water demand of approximately 24 million gallons per day. The maximum daily demand is expected to be 49 million gallons per day at full build-out. As planning continues and more specifics are clarified, updated water demand assessments will be necesary. Additional details and methodologies for potable water estimates are provided in Appendix D.

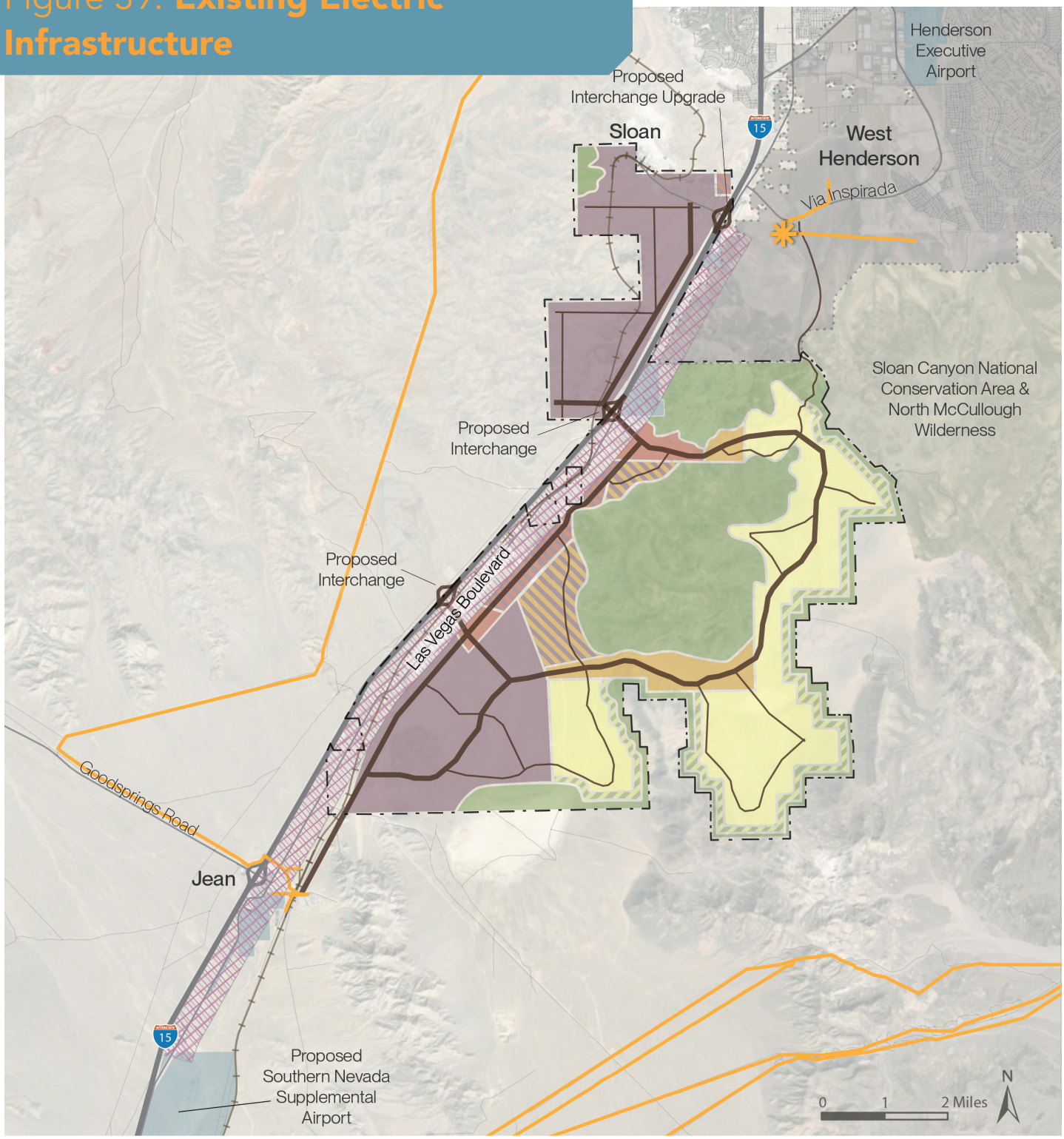
Electrical Utilities

There are a series of local electric power stations in close proximity to the Study Area which could be used to provide power for potential future development (Figure 39). These plants and substations are located north of the Study Area off Via Inspirada, to the east (Eldorado Solar Power Plant) and to the south (Primm). Existing high voltage electric lines exist south of the Study Area between the Eldorado Solar Power Plant and the power plants at Primm, and to the west of the Study Area between Jean and south Henderson. Additional assessment of power needs, including electrification trends for both homes and vehicles, and planning for new electrical infrastructure will be necessary as a future step in this process. Any extension of electricity lines must comply with 14 Code of Federal Regulations Part 77, as applicable.

Natural Gas

The notion of electrification – fulfilling all heating and energy demand through electric power and removing the option for natural gas – has emerged recently as a possible strategy to combat climate change.[55] Because of the uncertainties of whether and when the Study Area may become open for development, the potential need for natural gas service is not yet known.

Figure 39: **Existing Electric Infrastructure**



LEGEND

- Study Area
- Railroad
- Existing Roads
- Utility Corridor
- Clark County Department of Aviation Property
- City of Henderson
- Retail/Hospitality/Entertainment
- Traditional Mixed Use
- Mixed Employment
- Residential
- Open Space
- Transition Areas (mix of two land use types)
- Proposed Arterials
- Proposed Collectors
- Existing High Voltage Electric Lines
- Existing Power Substation

Broadband

The Nevada Office of Broadband, within the Nevada Governor's Office of Science, Innovation & Technology (OSIT), has set a goal to add high-speed broadband infrastructure to all communities across the state that do not currently have it.[56] The Study Area is within OSIT RFP Regions 9 and 10, indicating that middle-mile and last-mile broadband connections may be added here at different times and by different vendors.[57]

The present condition shows only limited portions of the Study Area – in the Roark Estates area and surrounding industrial properties – have a single carrier that offers fixed broadband service.[58] This means that the northwestern corner is classified by OSIT as an underserved location, and the remainder of the Study Area is classified as unserved. As the Study Area develops, this gap would need to be filled to ensure businesses can operate and that residents have an internet access option beyond relying on satellite-provided or mobile cellular devices.

This can be a challenging addition to make. Because of the distance from Henderson and the rest of the Las Vegas metro area, the estimated cost of buried fiber installation could be $22-37 per mile, which is higher than the national average range of $15-20 per mile.[59] To facilitate eventual fiber deployment, OSIT vendors should be encouraged to use the I-15 Utility Corridor established by SNPLMA as well as other NDOT rights-of-way, local road rights-of-way, and the utility poles of NV Energy as each of these assets currently extend into the Study Area. Coordination by Clark County may allow for reduced costs and help broadband providers understand the potential customer base that is anticipated to move into this area.

Public Services & Facilities

The anticipated public service and facility needs for the Study Area, should development occur, are of three categories: permanent site facilities (schools, fire stations, police substations, parks and recreation, utility maintenance yards, water reservoirs, etc.), networks that reach all properties (water and wastewater networks, trash collection, etc.), and services that move around as needed (transit service, call-based responders like code enforcement, etc.). The key concept is that both the County and the City of Henderson have minimum service requirements (e.g., fire/police use a target response time and/or specify a maximum radius from each occupied address, while parks and recreation providers may use a park space ratio by number of households).

Today, fire protection and emergency medical services for the area come from County Fire Station 87 at 20400 South Las Vegas Blvd. in Jean, a full-time emergency medical station with two personnel. The southern edges of Henderson are served by the Henderson Fire Department's Station 91 on Democracy Drive.[60] Today, this service is sufficient due to the current lack of residential development in the area.

The first and overall recommendation is to directly provide services in newly developed areas in the same manner that Clark County and the City of Henderson do currently. For example, Clark County Parks and Recreation has set a minimum level-of-service rule of 6 acres of park space per 1,000 residents in rural areas.[61] Should the Disposal Boundary be expanded, and land transferred to local control, each jurisdiction should apply similar standards and tools to inform the siting and operations of public health, safety, and quality of life facilities and services.

The second recommendation is to disperse public facilities within areas of private development. Creating separate "public service hubs" is neither necessary nor efficient. Instead, this recommendation seeks to meet residents' needs more conveniently by integrating public facilities within their neighborhoods as they are established. This development pattern already occurs in both urban and suburban parts of Clark County. Buffering of some facilities will be necessary to mitigate selected impacts, like noise of emergency response vehicles from fire stations and noise and emissions from transit hubs and motor pools.

The third recommendation is to develop at a density that would support public transit – a goal that is reflected in the land use framework outlined in this study. However, reaching this critical density may take time. The more concentrated development areas, like job centers and community hubs, would be most likely to establish a customer base dense enough for proposed RTC bus line(s) to begin servicing the area. To determine service provision and/or expansion, RTC currently uses On Board Mobility Plan transit service thresholds combined with funding availability and evaluation of competing regional needs.

DESIGN STANDARDS & GUIDELINES

This section provides guidance for new structures and improvements within the Study Area, with the intent of matching the physical character of development to the overall recommendations in this document. The basic tenets that should be fulfilled by all developments include those that the County and City codes already require (promoting high-quality design, sensitivity to the natural environment, and providing safe, habitable structures for people). In addition, desirable

characteristics include: sensitivity to natural systems (habitats) and natural unifying elements; protection of hillsides; achieving cohesiveness and compatibility with surroundings; and a high level of convenience with amenities, services, and areas of activity located near homes.

To achieve these goals, this section aligns with the existing Henderson Strong Comprehensive Plan, Clark County Master Plan, and the relevant development codes. By doing so, these guidelines offer the private sector greater certainty on what will comprise a desirable proposed improvement within the Study Area. Finally, these guidelines are illustrated in the 3D Development Type models and should be considered together.

Buildings & Structures

The intended objectives of this section are to promote the desirable characteristics above as they apply to these elements:

- Massing
- Lot coverage
- Building materials
- Attached outdoor spaces, i.e., patios, built-out rooftops, etc.
- Lighting
- Service areas (parking lots, loading docks)

Hub Concepts

Keeping low building profiles and similar densities as other portions of Clark County and the City of Henderson is desirable, with exceptions for areas identified to develop as more intensive "hubs" that can support a vertical mix of uses, office headquarters, and/or manufacturing facilities. This plan recommends two hub types, which may be implemented separately at different locations or in conjunction with each other at the same location. See additional details about the proposed "Community Hubs" and "Building Performance Hubs" on the following page.

Building Performance

While this study is at a conceptual level, selected recommendations for maximizing the performance of any new development are included. As a baseline, this document assumes the 2021 International Energy Conservation Code (IECC) or its successor as the state's model code will be followed for all improvements at the time of any proposed development.[62] Adoption of updated model codes is handled by the Governor's Office of Energy, and local governments will be tasked to implement new versions of adopted codes over time – currently on a triennial basis.

Targeting more aggressive building performance standards than the model code is advisable. The primary benefit is less energy input per square foot of development – both for construction and operations once built. This strategy also promotes operational cost-savings in the long-term. To pilot or focus these higher standards (which can lead to higher construction costs), the County and City may designate portions of the Study Area as a Building Performance Hub before development begins. Features of the Building Performance Hubs could include strategies such as:

- Setting an annual benchmark for individual site energy use intensity (EUI) and incentivize building owners and operators to meet or exceed those benchmarks.[63]
- Meeting ASHRAE standards and guidelines for decarbonization,[64] and meet or exceed the Greenhouse Gas Emission Intensity standard of the U.S. Environmental Protection Agency using the agency's Building Emissions Calculator.
- Taking a district-wide approach to stand up efforts that would be too large and/or too costly for a single building to undertake. This may include generating parts of on-site power needs through community solar structures,[65] district-wide HVAC systems, and other initiatives.

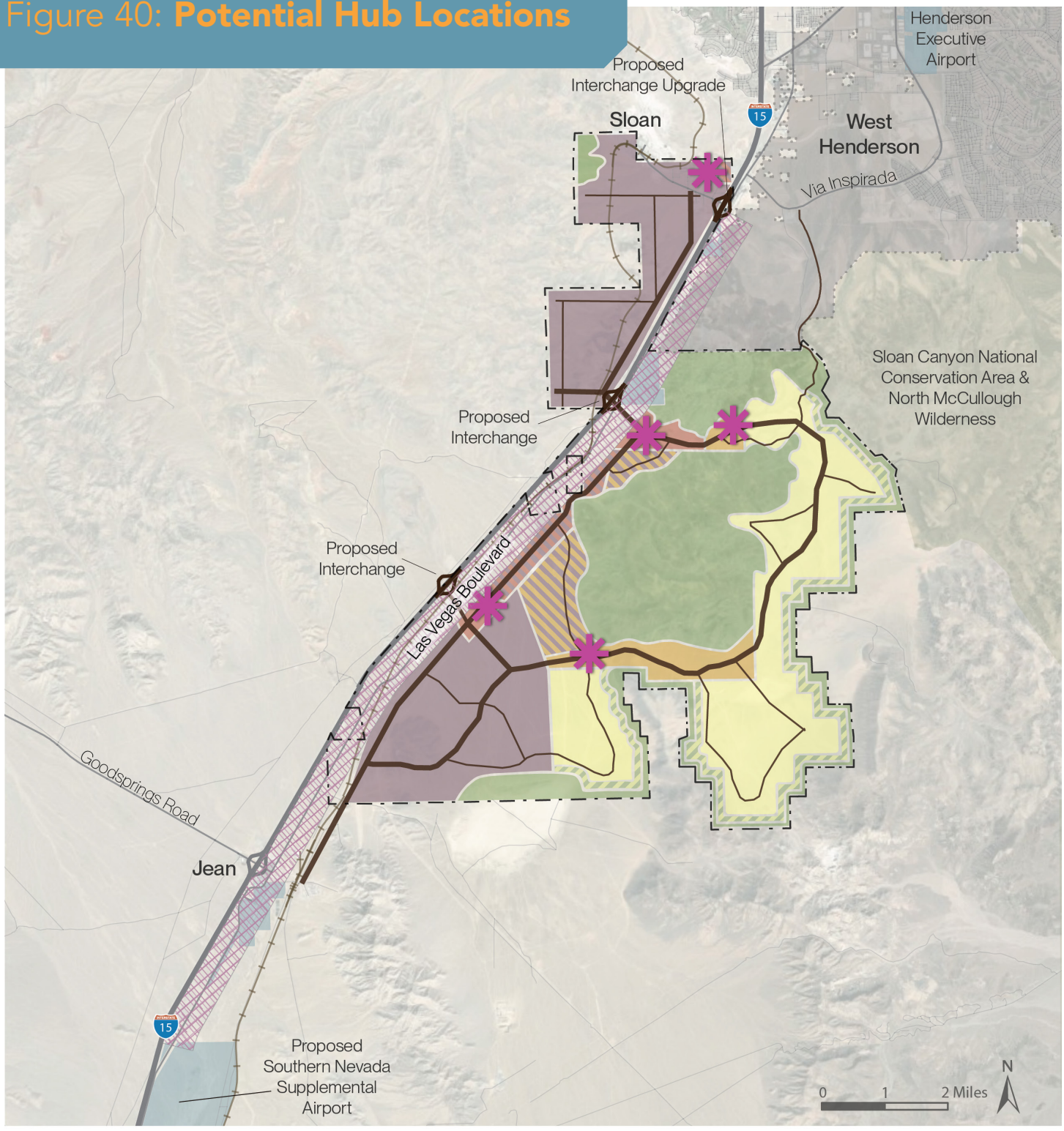
Community Hubs

Community Hubs are intended as the most intensively developed areas of Ivanpah Valley to provide focal centers of activity. These hubs are designed proactively as multiple adjoining parcels that allow for a mix of activities, plazas, and open spaces, and offer convenient access for both residents and visitors. These areas will require higher capacity utilities and ample access via multiple modes of transportation, including heightened parking needs and key public transit stations. While Figure 40 illustrates potential locations for community hubs, their exact location will need to be determined in the future. The following factors will influence siting: 1) ease of access (more than one connection to the local transportation network, along or near to I-15 or an arterial), 2) relative ease to develop early (utilities already in place or imminently planned with non-challenging terrain), and 3) relationship to other planned development, with more intensive uses nearby but still within reasonable distance to residential neighborhoods.

Building Performance Hubs

Building Performance Hubs are areas that promote ambitious, leading-edge energy efficiency and building performance goals. These goals may be met with the use of features including water-wise and context sensitive rooftop gardens or "green" roofs, solar and co-generation facilities, or district-wide energy systems. While the features of such a Hub are desirable for all new construction, the commercial-only and single-family detached residential areas may struggle to meet the standards in practice; as a result, the most feasible Development Type with such a Hub is Traditional Mixed Use. Property owners and operators could be incentivized to build within a Building Performance Hub in exchange for expedited development review and/or permit approvals, simplified impact fees, or other incentives as deemed appropriate by the County and/or the City.[66] Whatever incentives are chosen, they should be designed to measurably reduce an owner or operator's construction time, financial investment, or both, and thus be attractive enough to pursue.

Figure 40: **Potential Hub Locations**



LEGEND

- Study Area
- Railroad
- Existing Roads
- Utility Corridor
- Clark County Department of Aviation Property
- City of Henderson
- Retail/Hospitality/Entertainment
- Traditional Mixed Use
- Mixed Employment
- Residential
- Open Space
- Transition Areas (mix of two land use types)
- Proposed Arterials
- Proposed Collectors
- Potential Hub Locations

Site Planning Guidelines

When considering the siting regulations for specific developments, the following priorities and strategies should be followed:

- Promote sites on the most level topography to minimize grading and encourage siting and design to be compatible with the topography and landscape. Development should generally not occur on slopes greater than 15% and should be prioritized for areas less than 12%. Where appropriate, development on slopes should be consistent with the City's and County's hillside development regulations.
- Activate streetscapes through building siting and design. This may include orienting buildings and entrances to face the primary street, minimizing or varying setbacks, and encouraging transparency and fenestration. Provide alternate entrances at the side or back of buildings for access from parking areas. In commercial areas, consider uses that will be open throughout the day and evening, and site less interactive uses (offices, meeting rooms, production facilities) on upper floors or within building interiors.
- Include "bonus" transition spaces, such as dedicated space for delivery and rideshare vehicles, plazas, parklets, or small playgrounds - especially in multifamily residential and mixed-use areas.
- Include robust signage and other wayfinding features on trails for pedestrians and bicyclists. Use the standard signage for vehicles on streets but ensure visual continuity whenever possible.
- Where possible, orient development to reduce sun and heat exposure.

Landscaping & Open Space Treatments

Landscaping is the installation and maintenance of plant material, and supporting soil, stone, and other items that keep plants alive. Open space treatments are the changes – or lack thereof – made to existing plants, soil, stone, and other ground cover in an outdoor location.

The general recommendations for improved areas are to 1) limit irrigated grass areas to schools, community parks, and athletic/recreation fields, 2) promote xeriscaping to conserve water, 3) generally promote context-appropriate plantings, and 4) use landscaping to strategically provide shade cover and reduce urban heat island effect. For all other open space areas, this study recommends retaining the existing natural conditions of the soil and plants. The only exception in such areas would be to modify or remove natural elements that may impede access or cause a safety concern (e.g. loose rocks or boulders on steep slopes that could increase the risk of rockslides).

When considering landscaping regulations for specific developments and open or public space areas, the following priorities and strategies should be followed:

- Encourage plants that are regionally native and climate-adaptive, drought-tolerant, water wise, and appropriate for soils in this region.
- Promote aesthetic desirability while balancing water conservation goals
- Provide ecological function for water retention, wildlife, and pollinators (for larger improved areas)
- Intentionally design and landscape “bonus” or in-between spaces to ensure a cohesive look for developed areas. This would include front and side setbacks, undeveloped portions of parking lots and driveways, tree boxes, rights of way, and alleyway-facing spaces.
- Ensure equitable distribution of landscaping and tree canopy across all neighborhoods and districts in the Ivanpah Valley. Prioritize more concentrated canopies along high-activity public transit corridors and along busy roads in general.

IMPLEMENTATION

5

PHASING

If the SNPLMA Disposal Boundary is expanded, it is anticipated that the Study Area's growth over time will roughly occur from west to east, beginning in the northwestern corner of the Study Area and in the vicinity of I-15. These areas already include some development, including industrial facilities (quarries and concrete plants), and about two dozen residences.

This section addresses how phasing may inform the Study Area's future. While informed growth and demand forecasting must be grounded in a specific timeframe (projections provided in Chapter 2), this study recognizes that the disposal process and subsequent timing for development within the Study Area is uncertain. Thus, a conceptual phased timeline is provided, with initiation based upon expansion of the SNPLMA Disposal Boundary to include the Study Area - i.e., the clock would not begin until the Bureau of Land Management has the ability to dispose of the land within the Study Area through the SNPLMA auction process. This timeline is segmented into three key phases: short-term, mid-term, and long-term (see Table 5). This approach allows us to estimate a more realistic progression of growth, based on typical development trends and our understanding of the progressive actions necessary to implement the proposed land use framework for this area.

Development would be slow at first, requiring the application of zoning regulations, site planning, and infrastructure investments. By the end of the short-term timeframe, it is expected that just a small portion of housing units and/or industry development may be constructed. During the mid-term timeframe, development will start to pick up and the area could experience more significant growth. Finally, after 20 years of development activity, the Study Area is expected to have significant portions of development complete and to have reached the forecasted 20-year growth. However, it is not expected that the area will be at a "built out" condition by this time, allowing for additional growth and development into the future.

Table 5: Implementation Timeframe & Phasing

Phase	Timeframe	What Happens
Short-term	Up to 3 years	Initial public investments, incl. roads, utilities, public facilities, etc.; limited private development begins
Mid-term	3-10 years	Private development continues in earnest; continued evaluation of future/ongoing demand
Long-term	11-20+ years	Significant portions of development complete; maintenance of public facilities

Demand Forecast

As outlined in Chapter 4, within the 20-year planning horizon, it is anticipated that the Study Area will require a total of 6,155 acres of land for residential development, and between 3,173 and 1,552 acres of land for employment-based development. Combined, this is a total of 9,328 to 7,707 acres of land - or 466 to 385 acres annually over 20 years. These estimates are based on current forecasts between 2025 and 2045.

However, knowing that the timing for the SNPMLA disposal process is uncertain, development demand may change as time progresses. Additionally, as illustrated in the discussion above regarding phasing,

private development is not expected to occur at an even rate over the 20-year implementation timeline. Thus, in the mid- and long-term phases, land development may occur at a higher annual rate - closer to 450 to 550 acres per year.

Dependent Infrastructure & Utility Extensions

These factors are of utmost importance because developers may not be as attracted to the area until infrastructure resources become available.[67] Utilities, some roads, and infrastructure systems are already in place in the far western portion of the Study Area (especially in the northwest), but do not yet exist farther east or south.

NDOT intends to expand access to the area by adding two new interchanges along I-15 within the current 13-mile gap between the Via Inspirada and Jean interchanges.[68] The approximate locations of these interchanges are illustrated on several maps throughout this document. Clark County also intends to widen Las Vegas Boulevard from its current two-lane configuration to improve access. The widened boulevard will feature two traffic lanes in each direction. At the time of writing this Plan, no timeframes have been announced for either project.

While the expansion of Las Vegas Boulevard will help to increase access to the Study Area, development along Las Vegas Boulevard itself will be limited due to the utility corridor easement. As shown in Figure 35 on page 95, additional major roadways will need to be constructed – including an arterial parallel to and east of Las Vegas Boulevard – to allow for new development to occur.

Potential for Future Annexation

At this time, it is uncertain how land within the Study Area will ultimately be governed. While the land currently lies within unincorporated Clark County, the City of Henderson may likely pursue annexation of some portion of the Study Area. This formal process would legally transfer selected lands into the City's jurisdiction.

The City of Henderson considers annexations on a case-by-case basis. Annexations may be initiated by the City itself or by an individual or group of property owners through a formal application process.

The City Council typically bases annexation decisions on meeting each of the following conditions:

- Reasonable ability to provide public services to current and future residents of the area.
- Net increase or stability in City revenue and fiscal impact.
- Reasonable opportunity to meet identified needs and goals, such as economic growth, community amenities, or housing development.
- Contiguity with the existing City footprint.

The JLUS Study Area and associated recommendations within this document provide an opportunity to meet identified needs and overarching goals for trending growth. Determining reasonable provision of public service needs and fiscal stability will require additional assessment and collaborative planning over the next several years as conditions change and the intentions of this project approach potential implementation.

It is unclear at this time exactly how utility infrastructure will be extended into the Study Area and which agencies will take responsibility for utility provision. Wherever possible, system efficiencies and collaboration should be prioritized.

Responsibility and structure for other infrastructure and service provision may depend more on the phased sequencing of decisions (such as annexations), available funding, and variable opportunities (such as public-private partnerships from interested developers). The City and County will need to work collaboratively to determine the most efficient, cost-effective, opportunistic, and appropriate path forward.

COLLABORATION

Incentives and Partnerships to Drive Action

The vision, intentions, and recommendations of this study cannot be realized by the City of Henderson and Clark County alone. As referenced throughout this document, many other stakeholders, including individuals, businesses, organizations, and units of government are crucial to the successful implementation of the recommendations in this study. Furthermore, these stakeholders have an interest in following the guidance of this study, should development occur. As leaders for this work and convenors of conversations on Ivanpah Valley's long-term future, the City and County can strategically foster partnerships and build momentum to capitalize on collective capacity.

Strategic Partners & How They Will Contribute to Implementation

The following list captures entities who should be consulted, convened, and leveraged. This is not intended as an exhaustive list, but provides a starting list of those will provide robust contributions because of shared interests in coordinated development of the Study Area.

Existing and future private property owners

Any existing property owners within or adjacent to the Study Area should be involved in future steps to implement the land use framework in this study as they have personal experience and vested interest in the area. Some property owners may be interested in acquiring new property within the area. As development occurs, new property owners and residents will serve as critical stakeholders in shaping the future of the area.

Indigenous Tribes of Southern Nevada

Representatives and community members of the Pipa Aha Macav and Nuwuvi Tribes should be consulted and invited to participate as stakeholders as planning continues for otential future development in the Ivanpah Valley. The histories, cultural significance, and current priorities of these constituents should be given intentional voice and representation as the evolution of these lands continues to unfold under human influence.

Developers

The private development community will play a significant and critical role as this area evolves. Key organizational entities, such as the Southern Nevada NAIOP and SNHBA have been and will continue to be important conduits for understanding developer perspectives and building partnerships.

Business owners and managers, particularly for target industries

In concert with development entities, business buy-in and partnerships will strengthen and catalyze investment and growth in this area. Efforts should engage both local, regional, and broader national or international businesses, driven and facilitated by the Clark County and City of Henderson Departments of Economic Development, Las Vegas Global Economic Development Alliance, and Nevada Governor's Office of Economic Development.

Clark County Department of Aviation and Federal Aviation Administration

As parallel planning efforts continue for the proposed SNSA project adjacent to the Study Area, CCDOA and the FAA will be critical partners.

Regional transportation planning, management, and operations agencies

NDOT and the RTC of Southern Nevada will be critical partners in coordinating and providing transportation infrastructure and mobility service, such as potential regional public transportation. As parallel planning efforts continue for I-15 improvements and the Brightline West light rail service, these entities can ensure coordinated and complementary development, including informed phasing, funding strategies for infrastructure improvements and economic growth, and right-of-way preservation. The City of Henderson and Clark County Public Works Departments as well as elected officials will need to collaborate with these entities to coordinate with these entities to strategize funding for construction, expanded service provision, and ongoing maintenance.

U.S. Bureau of Land Management

As the opportunity for any development within the Study Area hinges on the BLM expansion of the SNPLMA Disposal Boundary and BLM disposal process, coordination with BLM will be critical. Although anticipated to proceed, the exact timing and certainty of this process is unknown. Thus, it will be important for both the City of Henderson and Clark County to maintain a close and continuous line of communication with BLM to stay abreast of any developments or decisions.

Utility providers

Entities such as the Las Vegas Valley Water District, Southern Nevada Water Authority, Clark County Water Reclamation District, Nevada Energy, Southwest Gas Corp., Sempra Generation, PG&E, City of Henderson and Boulder City Utility Departments are important collaborators for understanding and implementing utility infrastructure and services. If any development were to move forward, close coordination with parallel planning efforts for the proposed Horizon Lateral water line would be critical to ensure service needs are met and new development can proceed in this part of Ivanpah Valley.

Outdoor recreation providers and managers

Recreation will likely be managed by either Clark County, the City of Henderson, or through a cooperative effort of both entities. Close collaboration between the Parks and Recreation Departments of these jurisdictions will be crucial to determining the

most appropriate and cost-effective provision of high-quality recreational amenities. Other organizations, such as Friends of Sloan Canyon, BLM, and Conserve Nevada (Nevada Department of Conservation and Natural Resources) may also play roles in funding, partnering, or managing recreational resources within the Study Area.

Framework for Future Collaborations

To ensure ongoing collaboration and momentum for this project, Clark County and the City of Henderson should each designate at least one department to serve as the responsible party and point of contact for this area and project. These liaisons should meet regularly to maintain open communication and coordinated efforts. These liaisons should regularly report to department and broader staff groups, as well as elected officials.

In addition, these departments could convene a stakeholder steering committee and/or smaller topical working groups to share updates on planning efforts, project implementation, and arising opportunities or challenges. As such, the occasion could be used to push implementation of this study's recommendations forward and ensure continual progress. If smaller working groups are the selected approach, the full group could meet as needed to allow for cross-sector coordination and information sharing.

As the recommendations of this study are implemented and development occurs, this structure for coordination may need to be adjusted to accommodate new players, such as major developers, property owners, or businesses. Broader community engagement will also be necessary as residents move into the area.

TRACKING & REPORTING PROGRESS

Below is an initial set of "next steps" to initiate implementation of this plan. As planning efforts continue and current day uncertainties are clarified, the City and County should consider creating a more detailed implementation matrix as a single, centralized location for tracking progress on the recommendations and goals included herein. Staff from the County, the City, or a combination of the two may update the matrix as time goes forward. The City and County may also consider making the implementation matrix publicly available to provide transparent reporting on progress, new studies and information, or formal decisions.

Next Steps

- Continue to monitor efforts to expand the SNPLMA Disposal Boundary, including SNEDCA.
- Determine the appropriate representatives from the City and County to take ownership and responsibility for driving this project forward.
- Establish a regular meeting schedule for these project leaders.
- Consider establishing a larger stakeholder task force that meets less frequently to coordinate across various challenges, efforts, and priorities for this region.
- If SNEDCA is approved, initiate additional technical assessment of the Study Area to update assumptions and projections used in

this study, and to more thoroughly investigate infrastructure needs. This could include:

- Updated population and market projections.
- Detailed assessment of housing demand and needs by type and price point.
- Detailed traffic demand and multimodal demand modeling, including conversion to electric vehicles (EV) and associated infrastructure needs.
- Detailed utilities assessments and planning, including updated water demand and availability assessment within the context of the broader region and ongoing needs of existing communities.
- Potential assessment of climate impact, carbon footprint, and risk vulnerability within the larger regional context and other development plans to inform collaborative and coordinated strategies to mitigate against these challenges at a region-wide scale.
- Detailed evaluation of potential impacts to natural and cultural resources.
- Determine priorities for jurisdictional management of specific lands within the Study Area between the City, County, and utility providers. Use this information to inform any annexation actions.
- Once jurisdictional priorities and likely utilities provisions are defined, conduct fiscal impact assessments to understand how potential development would impact the County's and City's financial sustainability as well as existing and future taxpayers.
- Establish a funding strategy for the provision of infrastructure, utilities, and services, including public transit.
- Work with BLM to align findings and priorities with the land disposal nomination process; Identify locations and work with BLM to reserve land for essential public facilities, such as utility sites, police and fire, schools, libraries, public parks, and affordable housing.*
- Given the regional impact of potential develpment in the Ivanpah Valley, conduct robust and inclusive region-wide community. engagement to refine concerns and priorities.

*See definitions in Appendix A

ENDNOTES

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[53] "NAAQS Table." U.S. Environmental Protection Agency. Accessed August 24, 2023 from https://www.epa.gov/criteria-air-pollutants/naaqs-table and "Clark County Lands Bill: FAQs."

[54] Verbal communication with stakeholder groups. Conducted in person in Las Vegas, NV on March 23, 2023 and August 24, 2023. Verbal communication with Shani Coleman, Director, Clark County Office of Community and Economic Development. Conducted via videoconference on September 27, 2022.

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[56] High-Speed Nevada Five-Year Action Plan. Pages 3, 13-16. September 2023. Nevada Office of Broadband, Nevada Governor's Office of Science, Innovation and Technology. Accessed January 23, 2024 from https://osit.nv.gov/uploadedFiles/ositnvgov/Content/Broadband/BEAD_Five%20Year%20Action%20Plan-V5C-9.14.23.pdf

[57] "Nevada Broadband Map." Nevada Governor's Office of Science, Innovation and Technology. Accessed January 23, 2024 from https://experience.arcgis.com/experience/ad24fc9e1b2b4dd09d38599149fbb2cd

[58] "FCC National Broadband Map." June 2023. Federal Communications Commission. Several Sloan addresses were mapped; the accuracy of this map is assumed based on recent challenges to FCC access maps initiated by the Nevada Office of Broadband. Federal Communications Commission. Accessed January 23, 2024 from https://broadbandmap.fcc.gov/location-summary/fixed?version=dec2022&lon=-115.209629&lat=35.939036&addr_full=Sloan%2C+Nevada%2C+United+States&zoom=15.00&vlon=-115.202527&vlat=35.936065&br=r&speed=25_3&tech=1_2_3_7

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[60] Transform Clark County Master Plan. "Appendix B: Supplemental Information (Area-Specific): South County," page 317. Accessed October 20, 2023 from https://www.clarkcountynv.gov/government/departments/ comprehensive_planning_department/comprehensive_master_plan_and_development_code_update.php

[61] Ibid., page 247.

[62] "Notice of Adoption of the 2021 International Energy Conservation Code (IECC)." Governor's Office of Energy. Accessed November 8, 2023 from https://energy.nv.gov/uploadedFiles/energynvgov/content/Programs/ TaskForces/2017/Notice%20of%20Adoption%202021%20IECC.pdf

[63] "The Difference Between Source and Site Energy." EnergyStar.gov. Accessed November 8, 2023 from https://www.energystar.gov/buildings/benchmark/understand_metrics/source_site_difference

[64] Grid Interactive Buildings for Decarbonization: Design and Operation Resource Guide. 2023. American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE).

[65] "Solar Success: How the IRA Will Help Community Solar Gardens Power Affordable Housing." November 13, 2023. Vesna Jaksic Lowe, Enterprise Community Partners blog. Accessed November 14, 2023 from https://www.enterprisecommunity.org/blog/solar-success-how-ira-will-help-community-solar-gardens-power-affordable-housing

[66] Simplified impact fees give a development applicant an upfront guarantee of the fee before the completion of site review, which may or may not be feasible to offer given development review requirements and budgetary needs. This is a conceptual list only, and the County and City should consider the most appropriate incentives if the disposal boundary is expanded.

[67] Verbal communication with members of NAIOP Southern Nevada. Conducted via videoconference on January 11, 2023.

[68] Verbal communication with Danja Petro, P.E., PTP, PTOE, Senior Project Manager, Nevada Department of Transportation. Conducted via videoconference on March 27, 2023.

APPENDICES

APPENDIX A

GLOSSARY OF TERMS & ABBREVIATIONS

Accessory Dwelling Unit (ADU)

ADUs are small residential units that nest within an existing single-family residential lot. These untis, which are sometimes called mother-in-law-apartments, can be built above a garage, in a basement, or as a standalone structure separate from the single-family home. ADUs provide new, context-sensitive, infill development within existing neighborhoods. ADUs also offer supplementary income for homeowners and/or multigenerational living opportunities.

Advanced Manufacturing

The production of goods that is distinguished from traditional manufacturing by the use of novel technologies, materials, or production techniques. This field covers a wide variety of processes, but the most common include 3D printing, robotics, or nano-technologies.

Attainable, Workforce & Affordable Housing

The U.S. Department of Housing and Urban Development defines housing affordability as a cost ratio, where housing costs should comprise 30% or less of a household's combined income. When households have to spend more than 30% of their income on housing costs, this constrains resources for other basic necesities and expenditures that create a high quality of life, such as healthcare, transportation, healthy food, childcare, fitness, savings for retirement, and others.

- **Attainable housing** refers to for-sale and rental housing options available within the free market that are affordable to most households living within the area (i.e. within 30% of incomes).
- **Workforce and Affordable Housing** refer to for-sale and rental housing options that are subsidized by governmental and/or non-profit entities to bring costs within the 30% threshhold for low income households (i.e. instances where the free market cannot produce housing at costs low enough to be affordable to some households).
- **Workforce Housing** generally refers to subsidized housing that is affordable to households making 60% and 120% of the Area Median Income (AMI), while
- **Affordable Housing** (or sometimes called as Deeply Affordable Housing) often refers to subsidized housing that is affordable to households making less than 60% AMI. Technically, the term "Affordable Housing" covers both of these types (i.e. all housing that is subsidized).

Area of Critical Environmental Concern (ACEC)

A portion of BLM land where the agency has deemed "special management attention is required to protect and prevent irreparable damage to important historic, cultural, or scenic values, fish and wildlife resources or other natural systems or processes."*

ASHRAE

The American Society of Heating, Refrigerating and Air-Conditioning Engineers. ASHRAE issues building standards for multiple types of development, covering construction, renovation, operations, and maintenance.

BLM

United States Bureau of Land Management, a bureau of the Department of the Interior.

Building Performance Hub

A designated portion of the study area where aggressive energy efficiency and building performance standards are promoted to property owners in exchange for incentives like expedited development review.

* Source: https://www.blm.gov/programs/planning-and-nepa/planning-101/special-planning-designations/acec

CCWRD
Clark County Water Reclamation District

CCDOA
Clark County Department of Aviation

Community Hub
A cluster of multiple adjoining parcels that house a mix of uses and share pieces of infrastructure such as access points for multiple transportation modes, parking, plazas, and open spaces.

Complete Community
Contrary to historically popular land use and zoning practices that segregated development into concentrated single-use areas (i.e. residential only, commercial and office only, industrial only, etc.) and depended on private vehicle transportation, the concept of Complete Communities promotes the thoughtful integration of appropriately mixed uses and multimodal transportation. This approach promotes a wider array of available opportunities within any given area – from housing types and price points, to mode of travel, to job opportunities, to recreation access, and much more. In general, this approach supports walkability, as daily needs are provided closer to residences, and also fosters more activity that is associated with a greater sense of community safety, resiliency, and vibrance.

Disposal Action
BLM's process for selling or exchanging land and/or subsurface mineral rights that are in the federal government's control. BLM initiates disposal when land is deemed not to be needed for a federal goal. Disposal is completed by selling at fair market value or conducting an exchange for other land of equivalent value. The recipient of the land or mineral rights is typically a unit of state or local government.

FLPMA
The Federal Land Policy and Management Act of 1976, as amended. Details the process for disposal of surplus federal lands and transfer to states and local governments across the nation. Numbered as Public Law 94-579.

GOED
Nevada Governor's Office of Economic Development

IECC
International Energy Conservation Code. This is a model code that state and local governments can adopt to ensure energy-efficient construction and renovation of structures within their jurisdictions.

ITE
Institute of Transportation Engineers

LVVWD
Las Vegas Valley Water District

Missing Middle Housing
Housing development typologies that provide a complete continuum of options inbetween single-family and large, multifamily aparments. Missing middle housing types include, but are not limited to: duplexes, triplexes, quads, townhomes, small apartment buildings, cottage clusters, and accessory dwelling units.

MSHCP
Multiple Species Habitat Conservation Plan

Playa
A desert basin that can fill with water after a heavy rain.

Site EUI

Site energy use intensity. This measures a building's energy usage relative to its size, purpose, and number of occupants. Site EUI is often expressed as energy per square foot per year (kBtu/ft2). Not to be confused with Source EUI, which measures production and transmission of the energy that a building uses.

SNEDCA

The Southern Nevada Economic Development and Conservation Act. This is a legislative bill pending before the 118th Congress that would expand the existing federal disposal boundary to include this plan's study area, among other portions of Clark County under federal control.

SNS

The Southern Nevada Strong (SNS) Regional Comprehensive Plan was created as a vision to successfully manage growth and plan for the future of Southern Nevada. The Plan is a blueprint that identifies strategies and priorities to create sustainable communities that promote a higher quality of life for all Southern Nevada residents. The plan was developed with extensive input from the public and adopted by Southern Nevada's local governments in 2015.

SNSA

Southern Nevada Supplemental Airport (also known as SNSA or the Ivanpah Airport). This planned facility would be the second large commercial airport in Clark County if built, providing relief for the existing Harry Reid International Airport. The SNSA is projected to begin operating in 2037 if construction goes forward.

SNPLMA

The Southern Nevada Public Lands Management Act of 1998, numbered as Public Law 105-263. Established a disposal boundary in the Las Vegas Valley to delineate where surplus federal land disposal can occur as detailed by FLPMA.

SNRPC

Southern Nevada Regional Planning Coalition

SNWA

Southern Nevada Water Authority

VMT

Vehicle miles traveled

APPENDIX B

SUMMARY OF PLANS GOVERNING THE AREA

Federal, State & Regional Plans & Private Industry Sudies

Southern Nevada Strong Regional Comprehensive Plan (2015)

This Plan was developed by the City of Henderson on behalf of the Southern Nevada Regional Planning Coalition (SNRPC). The Plan includes three vision components: 1) improve economic competitiveness and education, 2) invest in complete communities,* and 3) increase transportation choice. With this vision as a guidepost, the Plan aims to increase economic diversity, increase mixed-use development and proximity between homes and daily needs, increase housing diversity and affordability, provide a safe, multi-modal transportation system, and promote thoughtful resource use.

JLUS Implications: While the Plan's area, which matches the SNRPC geography, does not include the JLUS project area, the vision and content of this Plan refer broadly to that of the overall region, and have informed the JLUS process and outcomes.

Access 2050: Regional Transportation Plan for Southern Nevada (2021)

Access 2050 was developed by the Regional Transportation Commission of Southern Nevada (the region's Metropolitan Planning Organization) and fulfills the federally-required Regional Transportation Plan for the Southern Nevada region and the state-required Regional Plan for Transportation. The Plan is set in the wake of economic impacts caused by the Covid-19 pandemic but looks forward to the future with anticipated recovery and continued growth, with transportation investments as a critical component of meeting those expectations. The Plan identifies investments and strategies to diversify and expand regional travel opportunities meant to improve ease of access to work and daily needs.

*See definition in Appendix A

Access 2050 identifies five primary strategies: 1) improve safety; 2) manage congestion; 3) enhance multimodal connectivity; 4) maintain current infrastructure; and 5) promote economic development. In addition, the Plan identifies six secondary strategies: 1) improve access to essential services; 2) provide an accountable and transparent planning process, 3) enhance freight movement, 4) improve public health related to transportation; 5) conserve and protect natural resources; and 6) use innovative planning to address emerging technologies and trends.

JLUS Implications: The region covered by *Access 2050* does not currently extend into the JLUS project area. However, the Plan does recognize that growth and travel demand will likely increase most drastically at the periphery of current development and the MPO's current boundaries. The Plan's emphases on economic development and enhancing freight movement are particularly supportive of the intent of the JLUS project.

Vision 2025: A Comprehensive Economic Development Strategy for Southern Nevada (2021)

Vision 2025 was published by the Las Vegas Global Economic Alliance (LVGEA) and serves as the regional Comprehensive Economic Development Strategy (CEDS), which is stipulated and approved by the U.S. Economic Development Administration and "guides regional leaders across industry, government, nonprofit, and educational institutions ... [in their] ... activities that have strategic economic value for the region" (p.1). LVGEA is the region's economic development authority.

Vision 2025 identifies 5 goals: 1) promote a resilient and diverse economy; 2) connect people, businesses and ideas; 3) support the emergence and maturation of Southern Nevada's new target industries; 4) strengthen and reimagine regional collaboration; and 5) stimulate

a future-ready workforce. Identified target industries include general and advanced manufacturing, creative industries, information and communication technologies, transportation and logistics technologies, business and financial services, healthcare services, and clean technologies.

JLUS Implications: The objectives laid out in the *Vision 2025* CEDS are supportive of the intent of this JLUS project, particularly Objective 1.4: "Ensure sufficient land, infrastructure, and resources are available for new development in Southern Nevada" (p. 21). The industry clusters proposed in this JLUS Plan align with the target industries identified in the *Vision 2025* CEDS.

Nevada State Freight Plan: A strategic framework for freight mobility and economic competitiveness (2017)

The *Nevada State Freight Plan* was developed by the Nevada Department of Transportation (NDOT). The Plan outlines eight strategic goals that support an overarching vision to transition Nevada's freight system from providing "secondary service O&D points to [providing] regional hubs that are well positioned to serve regional, national, and international markets" (p. 1-4).

JLUS Implications: Among other influencing factors in the region, the *Nevada State Freight Plan* indicates a vision for new development and infrastructure investment in Southern Nevada that will provide strategic opportunities for growth and advancement in transportation, distribution, and logistics industries. The overall intent and strategic goals of the Freight Plan informed the outcomes of the JLUS Plan, particularly in land use and transportation infrastructure recommendations.

Sloan Canyon National Conservation Area Resource Management Plan (2006)

48,438 acres of Sloan Canyon was designated as a National Conservation Area in 2002 to "preserve and protect a portion of southern Nevada's Mojave Desert as a permanent asset for future generations" (p. 1). The Plan identifies recommendations to provide recreational access and educational interpretation to the public while protecting the valuable biological, ecological, and cultural resources that found its NCA designation.

JLUS Implications: The *Area Resources Management Plan*, along with subsequent planning documents (2018 *Implementation Management Strategy*, 2009 *Trails Master Plan*, etc.) provide essential information for understanding the NCA's purpose, intended uses, and anticipated projects, as well as points of access adjacent to the JLUS project area that will serve future residents, workers, and visitors.

Southern Nevada Housing Market & Land Use Availability Analysis (2022)

This study was published by the Southern Nevada Home Builders Association (SNHBA) to understand current market trends, long-range housing demand, and land availability to meet that demand within Clark County. The study establishes strong population and economic growth forecasts and identifies potential land availability challenges associated with significant federal ownership and management of undeveloped land.

JLUS Implications: This *Housing Market and Land Availability Analysis* is supportive of the intent of the JLUS project by identifying a need for more suitable land that is development-ready to accommodate projected housing needs in southern Nevada, including

homes at multiple price points. In turn, the outcomes of this JLUS Plan serve as one of the first actionable steps toward meeting the needs identified in the *Housing Market and Land Availability Analysis*.

Southern Nevada Industrial Land Analysis (2020)

This study provides an evaluation of employment-oriented land availability within Clark County in comparison with market trends and projected demand. The study determined that approximately 19,000 gross acres of developable employment land are available, just over 9,000 of which are most viable. Compared to a projected demand of just over 14,000 acres by 2035, the report indicates a potential need for additional development-ready employment-oriented land. In particular, the study indicates a need for parcels that can accommodate large-scale development, such as manufacturing and distribution logistics.

JLUS Implications: Similar to the *Housing Market and Land Availability Analysis* described previously, the findings of the *Industrial Land Analysis* inform and support the intent of the JLUS project by identifying a specific need for suitable land that is development-ready to accommodate projected growth in the industrial, manufacturing, and logistics and distribution industries. These documented anticipations and identified needs informed the land use recommendations of the JLUS Plan.

Clark County Plans

Master Plan (2021)

The County's Master Plan sets forth a vision and implementation plan for the next 30 years, in particular to accommodate anticipated growth pressures. The Plan is structured around six core values: 1) unique communities, neighborhoods, and lifestyles; 2) equitable access to programs, services, and amenities; 3) a healthy and sustainable natural and built environment; 4) a more connected Clark County; 5) a diverse and resilient economy; and 6) sustainable and resilient growth and development. As a Master Plan, this document outlines goals and strategies that cover a wide variety of topics and provides context for the community's long-term priorities and goals.

JLUS Implications: In addition to providing general context for how the County intends to evolve, Goal 1.3: "encourage the development of new neighborhoods that embody Clark County's core values" (p. 20) and Goal 6.1: "a coordinated pattern of development in unincorporated Clark County" (p. 61) – along with their associated policy recommendations – informed the JLUS project. Additionally, the Place Types described in **Chapter 4** of this Plan were informed by the land use categories identified in the County Master Plan (p. 71), as applicable.

"All In Clark County" Community Sustainability & Climate Action Plan (2023)

This planning initiative includes a regional greenhouse gas inventory and climate vulnerability assessment, which inform the *Community Plan* that lays out a roadmap for achieving defined targets across six focus areas: 1) clean and reliable energy; 2) connected and equitable mobility; 3) diverse and circular economy; 4) resilient and healthy community; 5) smart buildings and development; and 6) sustainable water systems. This effort was informed by the *2020 State Climate Strategy* which states greenhouse gas reduction targets of 28% by 2025, 45% by 2030, and net-zero by 2050.

JLUS Implications: The *All In Clark County* Plans set a clear and strong foundation for the region's expectations and commitment to reducing negative impacts of human-driven climate change. The goals and targets laid out in the Plan informed the outcomes of this JLUS Plan, particularly regarding

recommendations that support sustainable development practices and the creation of complete, healthy communities.* The *All In Clark County* Plans will continue to critically inform how the southern Nevada region evolves over time, including the JLUS area.

Multiple Species Habitat Conservation Plan (2000)

The MSHCP is administered by the Clark County Desert Conservation Program on behalf of seven permittees: NDOT, Clark County, the Cities of Las Vegas, North Las Vegas, Boulder City, Mesquite, and Henderson. The Plan was developed pursuant to Section 10(a) of the Endangered Species Act and is designed to balance the long-term conservation of 78 species and their habitat with land use and development to support regional population growth and a growing economy. Among the 78 species covered by this Plan are two species designated as endangered and two species designated as threatened under the Endangered Species Act. The Plan and its associated Section 10(a)(1)(B) incidental take permit allow for development of up to 167,650 acres of non-federal land, or land that becomes non-federal (i.e., BLM disposal) within Clark County, Nevada through February 2031. The Desert Conservation Program is currently working on a major amendment to the MSHCP that would cover up to 215,000 additional acres of non-federal development for a period of 50 years.

If the disposal boundary identified in this study is established, either by passage of the Southern Nevada Economic Development and Conservation Act, through administrative revision of the BLM's *Resource Management Plan*, or through other action, any non-federal development activities would be covered by the MSHCP or the proposed MSHCP Amendment and associated incidental take permit.

JLUS Implications: The MSHCP provides baseline support and legal allowance under the Endangered Species Act for development potential in the JLUS area, while also encouraging and ensuring that adequate habitat is preserved and new development decisions are sensitive to the preservation and health of southern Nevada's wildlife and natural ecosystems. The balance between development and habitat protection established in the MSHCP informed land use recommendations in this JLUS Plan.

City of Henderson Plans

Our Community Our Future: Henderson Strong Comprehensive Plan (2017)

Henderson's Comprehensive Plan sets forth a vision and implementation plan for the next 20 years, in particular to accommodate anticipated growth pressures. The Plan is structured around 3 visionary themes: 1) healthy, livable communities, 2) vibrant, resilient economy, and 3) active, complete transportation. As a Comprehensive Plan, this document outlines goals and strategies that cover multiple topics and provides context for the community's long-term priorities and goals.

JLUS Implications: *Henderson Strong*'s attention to supporting and growing target economic industries, building complete communities,* promoting sustainability and responsible natural resource use, and working collaboratively as a region were particularly inspirational components for the JLUS project. Additionally, the Place Types described in **Chapter 4** of this Plan were informed by the land use categories (p. 120-127) and zoning designations in use by the City of Henderson, as applicable.

*See definition in Appendix A

APPENDIX C

LAND DEMAND & MARKET ANALYSIS

Final Report

Joint Land Use Study Land Demand Market Analysis

The Economics of Land Use

Prepared for:
City of Henderson
Clark County

Prepared by:
Economic & Planning Systems, Inc.

June 18, 2024

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1. Introduction and Summary of Findings

Project Background

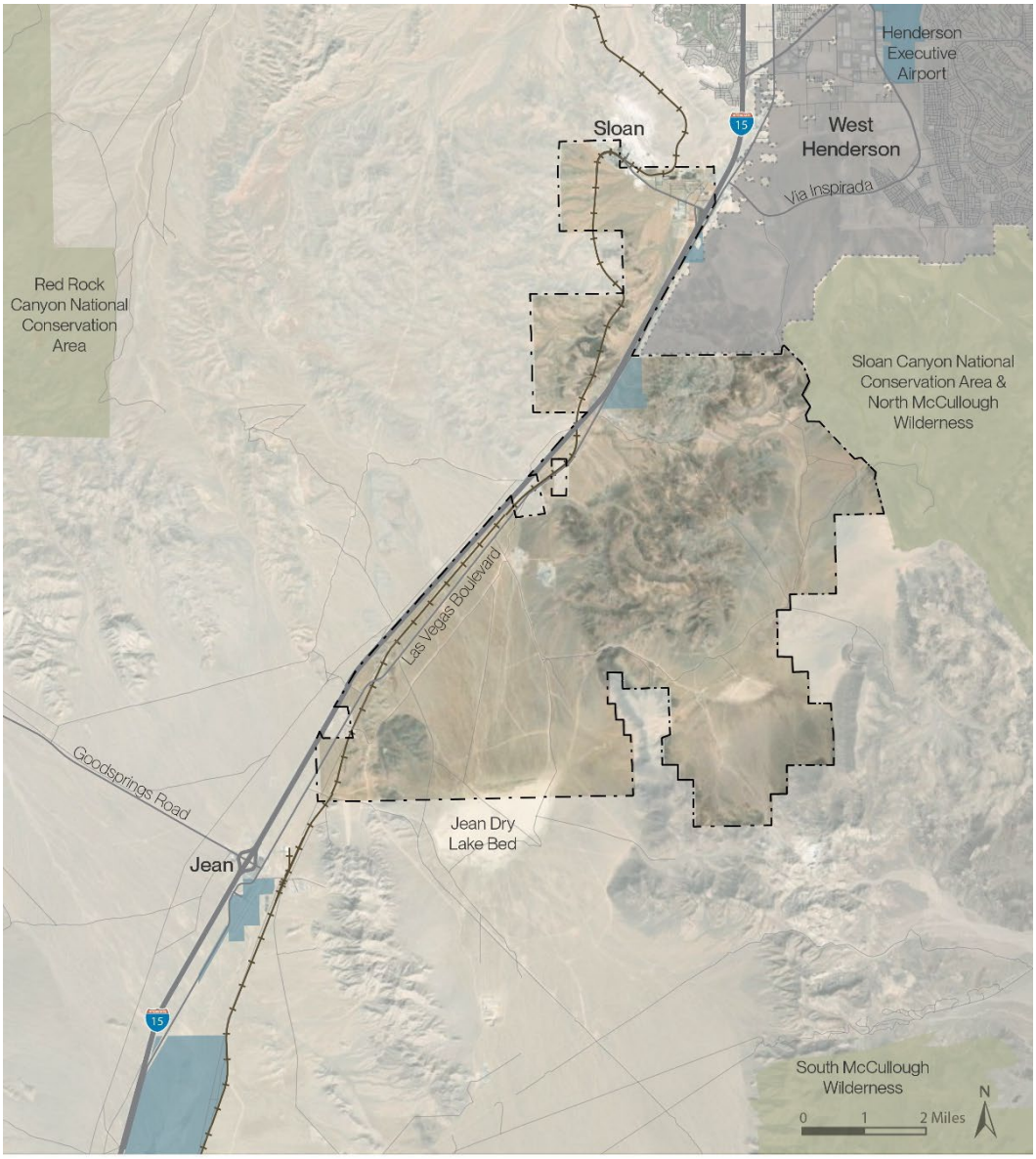
The City of Henderson and Clark County have conducted a Joint Land Use Study (JLUS) to create a land use plan for a large area in the southern portion of the County along I-15. The major impetus for the study is the potential for federal legislation that would expand the disposal boundary around Las Vegas, which would open public land for private development. The southern portion of the county has the potential to support additional growth. Specifically, there is potential to support industrial-oriented uses and affordable housing and become a major employment center for the city and county.

To support the development of the JLUS, this market analysis was commissioned to help guide the land use plan. The market analysis was desired to help address the following questions.

- What is the potential for employment capture in the study area?
- What barriers may exist that may limit employment growth in the study area?
- What is the potential for and potential rate of housing development capture in the study area?
- What geographic impacts are there on locations for housing in the study area?

To address these questions, Economic & Planning Systems completed a market study to understand the demand for new jobs and housing in the study area over the next 20 plus years. This report provides a summary of the analysis. The report contains four main sections: existing conditions and trends, national trends, regional development demand forecast, and study area development forecast. The study area defined for the project is shown in **Figure 1**.

Figure 1 JLUS Study Area



Summary of Findings

The following findings from the Market Analysis are organized by the major study questions.

1. ***What is the potential for employment capture in the Study Area?***

   The Study Area is well positioned to capture future employment growth in the county. The location along I-15 is attractive, and the area represents an un-utilized area for large format employment. The area is estimated to have the potential to capture nearly 30,000 jobs over the next 20 years, generating demand for over 23 million square feet of commercial and industrial space.

2. ***What barriers may exist that may limit employment growth in the Study Area?***

   The major barriers to employment growth include the lack of infrastructure availability to support new growth, especially major transportation improvements such as interstate interchanges and sufficient water service and wastewater treatment infrastructure. The distance of potential employment uses in the Study Area from available housing for workers of perspective employers may be a barrier, especially for the southern half of the Study Area. Lastly, regional economic growth needs to continue to realize the forecasts as the area will be supporting economic growth not generating new growth.

3. ***What is the potential for and rate of housing development capture in the Study Area and what geographic impacts are there on locations for housing?***

   Estimated demand for housing in the Study Area over the 20-year estimate period is 26,800 housing units, which is equivalent to 1,340 units per year, and will require over 6,100 acres of land to accommodate. Major barriers to housing development and realizing this capture estimate include:

   - The topography barriers present an opportunity for separating incompatible uses but also create risk of low demand/attraction of housing due to access barriers especially for development in the eastern portion of the Study Area, which is best suited for residential uses.
   - The proximity to a proposed supplemental airport and industrial uses should limit residential growth in portions of the Study Area.
   - Environmental conditions may impact the quality of some areas for residential uses (e.g. dust storms from dry lake beds).
   - New housing areas will need to be in close proximity to retail/commercial goods and services to attract development. Access to transportation routes and jobs will also impact demand. The interchange areas and access to I-15 are essential elements to facilitating demand.

2. Existing Conditions and Trends

This section provides a summary of the existing demographic, economic, and real estate trends impacting the study area. Conditions and trends are considered at the Las Vegas-Paradise-Henderson Metropolitan Statistical Area (Las Vegas MSA), Clark County, and Study Area geographies (note: the Las Vegas MSA and Clark County share the same geographic boundaries, the label used for each data point is based on the data source).

Regional Population and Household Trends

The population of Clark County grew by 341,207 residents from 2010 to 2021, which equates to an annual rate of 1.5 percent, as shown in **Table 1.** The number of households increased by a slightly higher rate, 1.6 percent annually. Notably, the number of housing units increased by only 1.0 percent annually. This is somewhat due to the shifts in housing vacancy that occurred from 2010 to 2021. The housing vacancy rate in 2010 was 17 percent and decreased to 9 percent in 2021.

Table 1 Clark County Population and Household, 2010-2021

Description	2010	2021	2010-2021 Total	2010-2021 Ann. #	2010-2021 Ann. %
Clark County					
Population	1,954,260	2,292,476	341,207	31,019	1.5%
Households	698,955	854,289	138,924	12,629	1.6%
Housing Units	841,949	934,911	94,568	8,597	1.0%

Source: US Census Bureau; Center for Business and Economic Research (CBER) UNLV; Economic & Planning Systems

Regional Economic Trends

Total non-farm employment (i.e. wage and salary employees plus sole proprietors) in the Las Vegas MSA grew by over 486,000 from 2001 to 2021, as shown in **Table 2**. The MSA experienced significant employment growth over the past two decades despite impacts of recessions (Great Recession, COVID-19 Recession) that have impacted major economic drivers such as tourism and gaming.

Table 2 Las Vegas MSA Total Non-Farm Employment, 2001-2021

Total Employment	2001	2011	2021	2001-2021 Total	2001-2021 Ann. #	2001-2021 Ann. %
Las Vegas MSA	882,073	1,076,766	1,368,492	486,419	24,321	2.2%

Source: BEA; Economic & Planning Systems

Since 2010, wage and salary employment in the MSA increased at an annual rate of 1.7 percent as the MSA increased employment by 167,210 jobs. Employment sectors with the largest increases in employment include Health Care, Transportation and Warehousing, Construction, and Administrative Services. Notably, Accommodation and Food Services decreased in employment by over 21,000 jobs, as shown in **Table 3**, as the sector was greatly impacted by the COVID-19 Pandemic.

Table 3 Las Vegas MSA Wage and Salary Employment by Sector, 2002-2021

	2002	2010	2021	2002-2021 Total	2002-2021 Ann. #	2002-2021 Ann. %	2010-2021 Total	2010-2021 Ann. #	2010-2021 Ann. %
Ag./Forestry/Fishing	218	107	2,024	1,806	95	12.4%	1,917	192	30.6%
Mining	370	271	387	17	1	0.2%	116	12	3.3%
Utilities	3,494	3,717	3,203	-292	-15	-0.5%	-515	-51	-1.3%
Construction	68,562	44,747	69,181	619	33	0.0%	24,434	2,443	4.0%
Manufacturing	20,947	19,456	26,420	5,473	288	1.2%	6,964	696	2.8%
Wholesale Trade	20,094	20,455	23,593	3,499	184	0.8%	3,138	314	1.3%
Retail Trade	81,414	92,930	107,934	26,520	1,396	1.5%	15,004	1,500	1.4%
Transport./Warehousing	28,327	34,209	62,490	34,163	1,798	4.3%	28,281	2,828	5.6%
Information	12,746	9,890	11,803	-944	-50	-0.4%	1,913	191	1.6%
Finance	25,086	23,015	30,416	5,330	281	1.0%	7,401	740	2.6%
Real Estate	16,291	16,834	19,869	3,578	188	1.1%	3,035	303	1.5%
Prof./Tech Services	26,792	33,343	45,907	19,115	1,006	2.9%	12,564	1,256	2.9%
Management	4,929	13,756	20,423	15,494	815	7.8%	6,667	667	3.7%
Admin. and Waste Services	48,983	52,762	75,906	26,923	1,417	2.3%	23,144	2,314	3.4%
Education	35,534	48,821	55,839	20,305	1,069	2.4%	7,018	702	1.2%
Health Care	49,869	69,730	105,744	55,875	2,941	4.0%	36,014	3,601	3.9%
Arts/Rec.	17,001	16,366	21,728	4,727	249	1.3%	5,362	536	2.6%
Accomm./Food Services	215,085	238,584	217,465	2,380	125	0.1%	-21,120	-2,112	-0.8%
Other (ex. Public Admin.)	16,485	19,130	23,703	7,218	380	1.9%	4,573	457	2.0%
Public Admin.	32,334	38,162	37,969	5,635	297	0.8%	-194	-19	0.0%
Total	**724,561**	**796,285**	**963,495**	**238,934**	**12,575**	**1.5%**	**167,210**	**16,721**	**1.7%**

Source: Bureau of Labor Statistics; Economic & Planning Systems

Regional Real Estate Trends

Commercial and Industrial Trends

Commercial and industrial development trends are summarized in **Table 4**. The rate of new retail, office, and hospitality development in Clark County was significantly slower than the rate of employment growth. The one real estate sector that did experience robust growth was industrial. The industrial inventory in the county increased at an annual rate of 3.0 percent per year and grew by 42 million square feet.

The locations of new commercial and industrial development in Clark County are shown in **Figure 2.** The I-15 corridor leading northeast out of the metro area captured a significant portion of the new industrial development over the past 10 years. Other areas with significant capture of new development include along the Bruce Woodbury Beltway in the southwest portion of the county, and along Boulder Highway in Henderson.

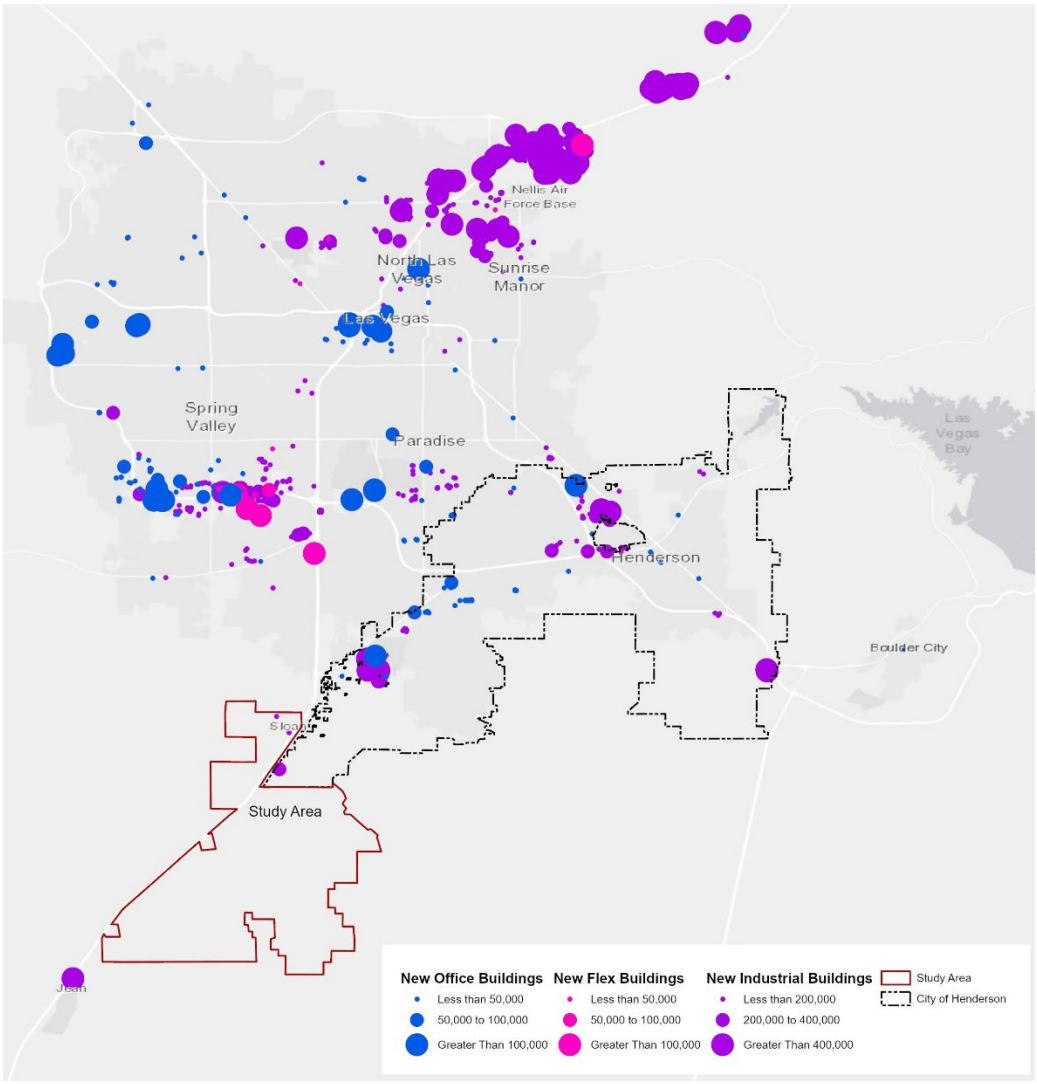
The City of Henderson outpaced the county rate of growth for retail, office, and industrial space. The City captured 17 percent of new retail space, 20 percent of new office space, and 18 percent of new industrial space built in the county since 2010. Areas in Henderson that have captured a significant amount of commercial and industrial space include along Boulder Highway (noted above) and near the Henderson Executive Airport along Raiders Way (Via Inspirada).

Table 4 Clark County Commercial and Industrial Inventory, 2022

	Retail	Hospitality (Rooms)	Office	Flex	Industrial
Clark County					
Total Inventory (sq ft)	119,431,332	163,602	68,011,275	22,695,641	141,253,089
Change 2010-2022 (sq ft)	9,196,039	5,323	5,055,702	1,514,884	41,775,381
Annual Change (sq ft)	766,337	444	421,309	126,240	3,481,282
Annual % Change	0.7%	0.3%	0.6%	0.6%	3.0%
City of Henderson					
Total Inventory (sq ft)	16,260,180	3,944	8,116,879	1,079,132	21,026,146
Change 2010-2022 (sq ft)	1,524,772	91	1,018,496	1,633	7,436,253
Annual Change (sq ft)	127,064	8	84,875	136	619,688
Annual % Change	0.8%	0.2%	1.1%	0.0%	3.7%
% Capture of County	17%	2%	20%	0.1%	18%

Source: CoStar; Economic & Planning Systems

Figure 2 Clark County New Commercial/Industrial Development, 2010-2022



Commercial and Industrial Development Pipeline

The southern portion of the Las Vegas MSA (defined as south of Harry Reid International Airport) was identified as the competitive subarea for the Study Area. The development pipeline (under construction, planned, and proposed projects) was inventoried in this area to understand what the potential capture of development in this area will represent of estimated demand. The pipeline projects are shown in **Figure 3**.

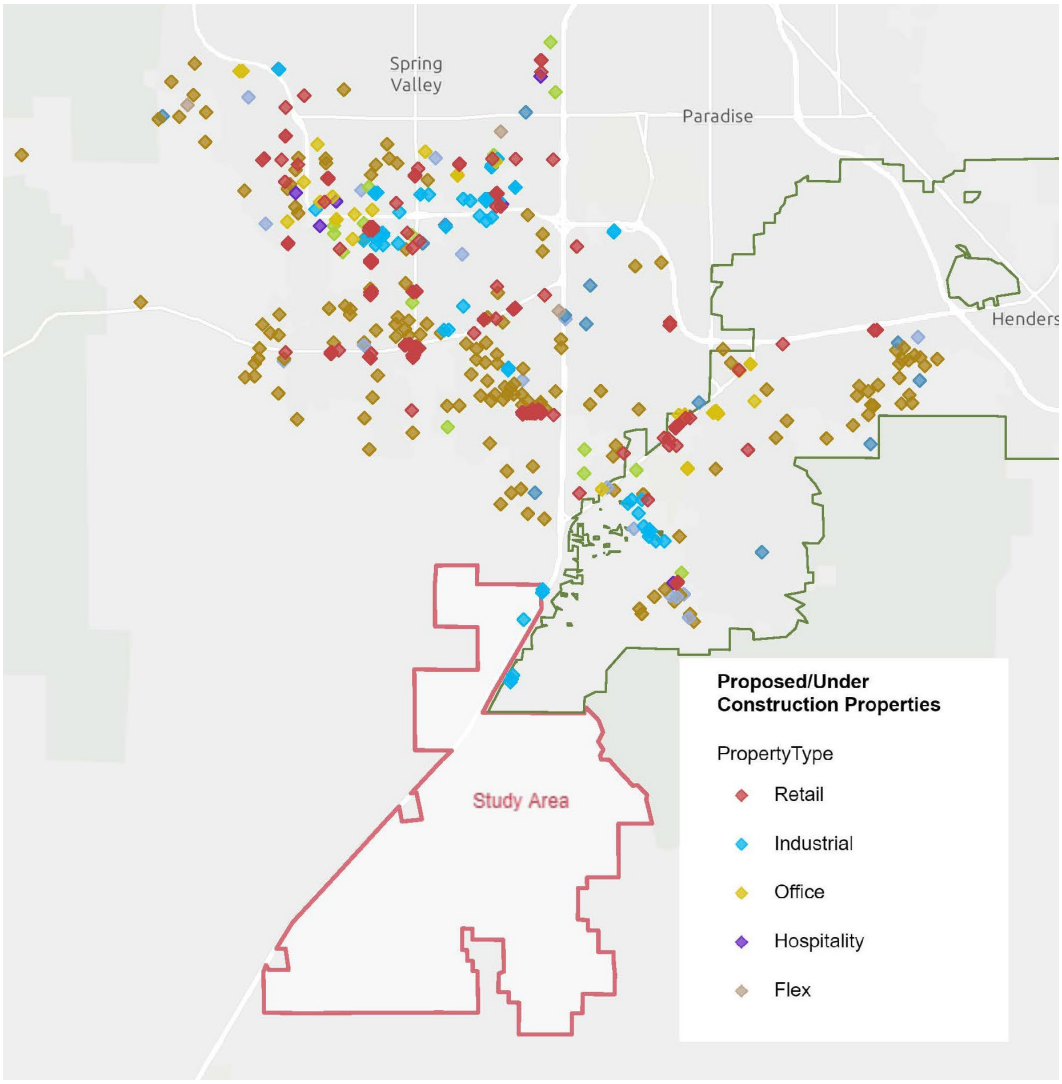
The southern portion of the MSA has nearly 6 million square feet of industrial space under construction or proposed, as shown in **Table 5**. This equates to 10 percent of the forecast demand for industrial space in the MSA over the next twenty years. The pipeline for office space is 1.7 million square feet which is 21 percent of estimated demand, and the pipeline for service and hospitality space is 2.4 million square feet which is 8 percent of estimated demand. These rates of capture are utilized to estimate potential demand for the Study Area.

Table 5 South Las Vegas MSA Commercial/Industrial Development Pipeline

Description	Under-Construction	Years of Demand	Proposed	Years of Demand	Total	% Capture of Demand
Industrial-Flex	3,008,046	1.0	2,968,488	1.0	5,976,535	10%
Office	377,020	1.0	1,290,430	3.3	1,667,451	21%
Service/Hopitality						
Retail	616,051		1,321,242		1,937,293	
Hotel	204,178		259,000		463,178	
Subtotal	**820,229**	**0.6**	**1,580,242**	**1.1**	**2,400,471**	8%

Source: CoStar; Economic & Planning Systems

Figure 3 South Las Vegas MSA Commercial/Industrial Development Pipeline



Residential Real Estate Trends

Recent development trends for for-rent multifamily apartments and for-sale housing units were inventoried to understand the rate of housing development in Clark County.

The inventory of for-rent apartments in Clark County increased by 30,224 units from 2010-2022, as shown in **Table 6**, which is an increase of 2,519 units per year. The rate of development in the county since 2015 has been significantly higher than before 2015, with 3,417 units per year built. The City of Henderson's apartment inventory has been increasing quickly as well. The city added over 8,500 new units since 2010, with almost 6,000 of those units being built since 2015. The city's increase in inventory since 2010 represents 28 percent of the total county-wide increase.

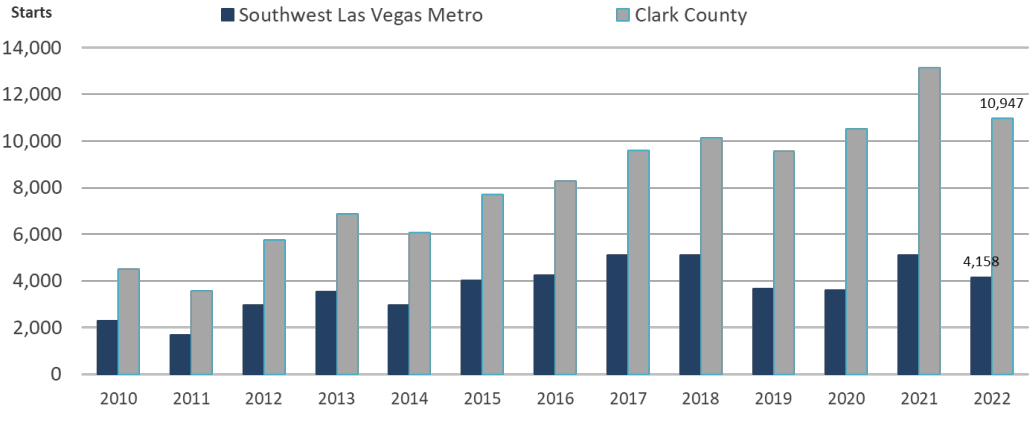
Table 6 Clark County Apartment Inventory, 2010 to 2022

Inventory (units)	2010	2015	2022	2010-2022 Total	2010-2022 Ann. #	2010-2022 Ann. %	2015-2022 Total	2015-2022 Ann. #	2015-2022 Ann. %
Clark County	206,165	212,470	236,389	30,224	2,519	1.1%	23,919	3,417	1.5%
City of Henderson	21,430	23,990	29,973	8,543	712	2.8%	5,983	855	3.2%

Source: CoStar; Economic & Planning Systems

There were an average of 8,900 new for-sale housing starts (i.e. approved and permitted new units) in Clark County from 2010 to 2022. Like apartment development, the rate of new for-sale housing development has increased since 2015, with a peak in 2022 of approximately 13,000 new starts, as shown in **Figure 4.** The southwest portion of the Las Vegas MSA has been capturing an average of 4,000 starts per year, which equates to 45 percent of the county-wide total.

Figure 4 Clark County Housing Starts, 2010 to 2022



Source: Zonda; Economic & Planning Systems

Residential Development Pipeline

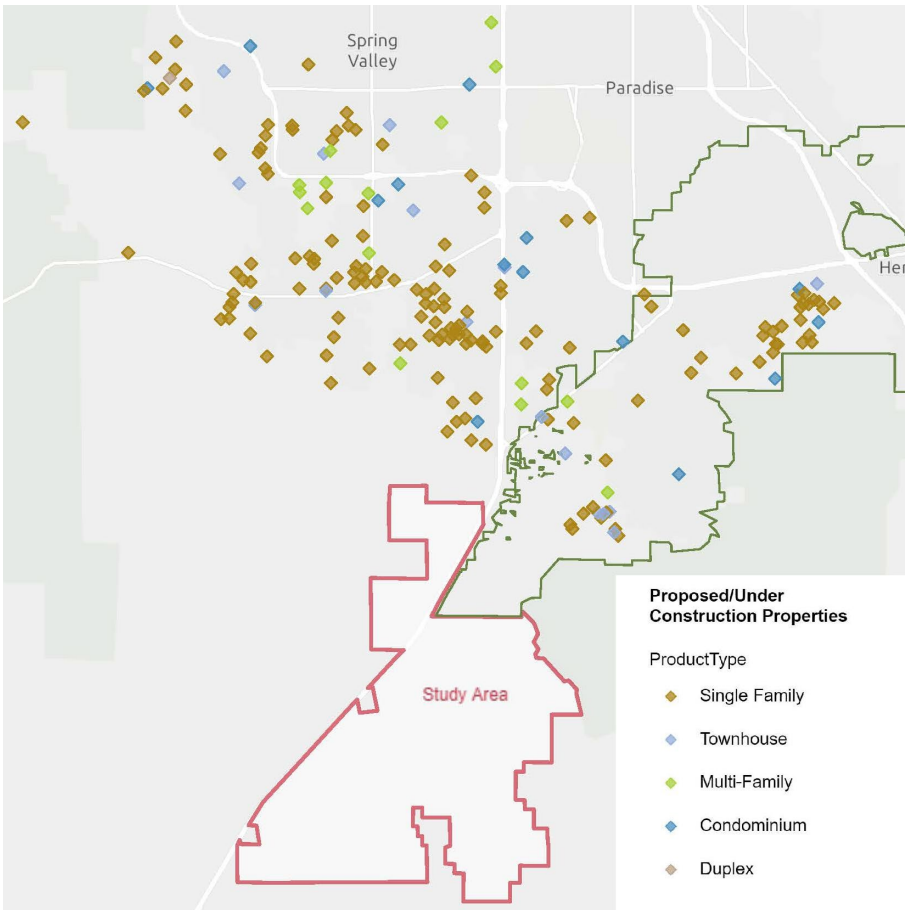
The total residential development pipeline in the southern part of the MSA totals over 34,000 housing units, as shown in **Table 7**. The locations of projects are shown in **Figure 5**. There are 25,766 single family and attached housing units in the pipeline which equates to 14 percent of the 20-year demand for housing in the MSA. The 8,284 multifamily units in the pipeline accounts for 10 percent of the county-wide total.

Table 7 South Las Vegas MSA Residential Development Pipeline

Description	Under-Construction	Years of Demand	Approved / Planned / Proposed	Years of Demand	Total	% Capture of Demand
Single Family/Attached	1,909	0.2	23,857	2.5	25,766	14%
Multifamily	4,484	1.1	3,800	0.9	8,284	10%
Total	**6,393**		**27,657**		**34,050**	

Source: Zonda; CoStar; Economic & Planning Systems

Figure 5 South Las Vegas MSA Residential Development Pipeline



3. National Development Trends

This section provides an overview of development trends nationally that could impact development opportunities for the Study Area.

National Development Trends

National Industrial Trends

Industrial space demand has grown dramatically over the last decade. The annual rate of construction has increased at a robust pace over the past decade as shown in **Table 8**. Coming out of the Great Recession, annual U.S. industrial construction increased from 45.1 million square feet in 2012 to over 640 million square feet in 2023, with 2022 representing the year with the greatest growth in space (649.1 million square feet).

Office construction has also grown steadily over the past 10 to 15 years. The rate of office construction in the U.S. was at its lowest in 2011 when nearly 51 million square feet were built. The annual rate increased until 2020 when it peaked at 161.6 million square feet. Since 2020, the rate has decreased with a 15 percent decline between 2022 and 2023 as the impacts of the COVID-19 Pandemic on remote and hybrid work schedules have greatly decreased office demand.

Table 8 U.S. Industrial and Office Space Construction 2010-2023

Year	Industrial Construction (Q2)	% Increase	Office Construction (Q2)	% Increase
2010	44,622,373	--	58,367,486	--
2011	45,099,843	1.1%	50,889,688	-12.8%
2012	73,876,496	63.8%	63,290,822	24.4%
2013	100,598,699	36.2%	79,013,697	24.8%
2014	147,382,007	46.5%	106,396,221	34.7%
2015	178,643,449	21.2%	127,580,198	19.9%
2016	240,619,369	34.7%	133,264,840	4.5%
2017	272,249,799	13.1%	137,779,910	3.4%
2018	288,946,966	6.1%	141,355,859	2.6%
2019	308,241,352	6.7%	160,807,492	13.8%
2020	344,286,653	11.7%	161,614,380	0.5%
2021	455,059,046	32.2%	148,415,726	-8.2%
2022	649,117,622	42.6%	140,497,326	-5.3%
2023	640,304,594	-1.4%	119,575,438	-14.9%

Source: CoStar; Economic & Planning Systems

The primary driver of industrial space growth has been fulfillment centers for e-commerce retailers. E-commerce sales have grown at double digit rates each year over the last decade as shown in **Table 9**.

Table 9 U.S. E-Commerce Retail Sales, 2010-2021

Year	Bricks and Mortar	E-Commerce Sales	Total Retail Sales	% E-Commerce	Ann. % Growth
2010	3,648,127	169,921	3,818,048	4.5%	--
2011	3,902,595	200,357	4,102,952	4.9%	18%
2012	4,070,084	232,145	4,302,229	5.4%	16%
2013	4,197,728	261,455	4,459,183	5.9%	13%
2014	4,342,699	297,862	4,640,561	6.4%	14%
2015	4,387,857	338,128	4,725,985	7.2%	14%
2016	4,464,153	384,269	4,848,422	7.9%	14%
2017	4,596,502	443,712	5,040,214	8.8%	15%
2018	4,744,026	507,622	5,251,648	9.7%	14%
2019	4,824,880	571,714	5,396,594	10.6%	13%
2020	4,754,835	817,195	5,572,030	14.7%	43%
2021	5,563,894	958,715	6,522,609	14.7%	17%

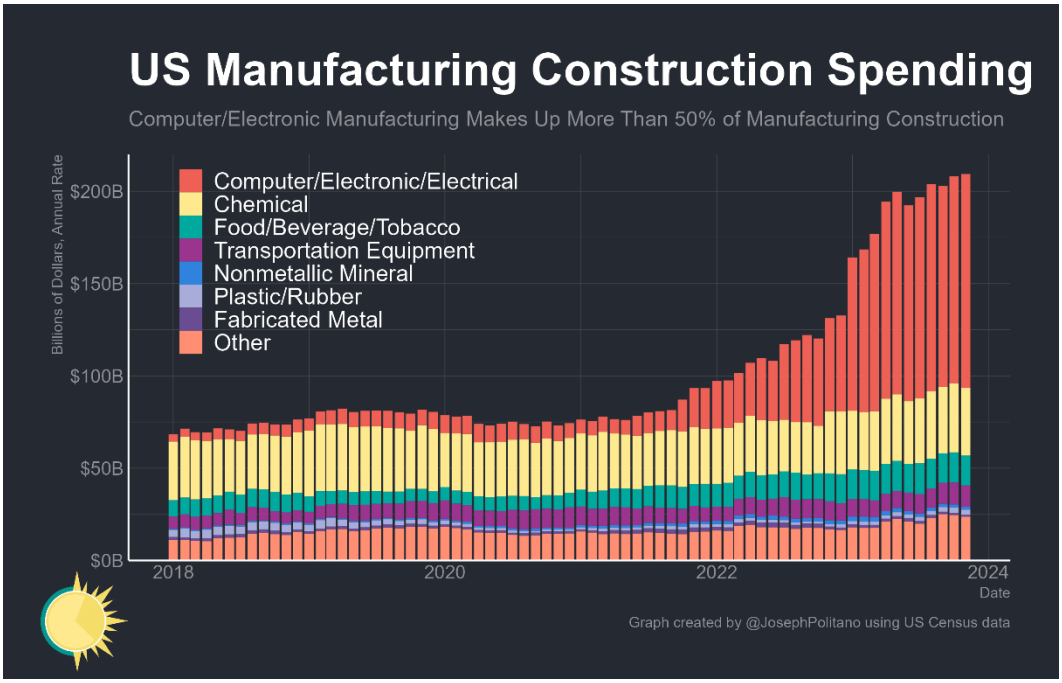
Source: US Census of Retail Trade

Industrial demand has experienced a new surge since the COVID-19 pandemic. E-commerce sales increased from $571.7 trillion in 2019 to $817.2 trillion in 2020, an increase of 43 percent in just one year as shown. This resulted in a near doubling of industrial space construction from 344.3 million square feet in 2020 to 649.1 million square feet in 2022 (**Table 8**) driven largely by shopping shifting to e-commerce. Fulfillment facilities for e-commerce retailers require three times the amount of industrial space of brick-and-mortar retail fulfillment. Additionally, e-commerce sales are more likely to result in return of products bought online, increasing space requirements by an additional 20 percent.

There is general agreement that e-commerce will continue to be the primary driver of industrial space, but that growth will return to pre-pandemic levels. A study titled *The Future of Industrial Real Estate Trends for 2022 and Beyond* by Newmark forecasts e-commerce sales to continue to experience double digit growth and account for 23.6 percent of total retail sales by 2025 and continue drive industrial space demand. A second study, the *National Industrial Report, 2023* by Commercial Edge indicates that logistics space demand will normalize as e-commerce sales growth returns to the pre-pandemic trendline. Even so, these pre-pandemic levels averaged 14 percent per year annual growth from 2013 to 2018 as shown above.

Manufacturing space has not been increasing over the last decade, but it is expected to see a surge in construction. This surge has already been seen in data tracking construction spending on manufacturing space for computers electronic/ electrical products, shown in **Figure 6**.

Figure 6 U.S. Manufacturing Construction Spending, 2018-2024



Going forward there are several positive factors that will fuel this surge.

- **Government Policies and Funding** – Three significant pieces of legislation enacted in 2021 and 2022—the Infrastructure Investment and Jobs Act (IIJA), the Creating Helpful Incentives to Produce Semiconductors (CHIPS), and the Inflation Reduction Act (IRA)—are all expected to increase funding for domestic manufacturing particularly in semiconductors, clean energy components, electric vehicles and batteries, and their related parts and raw materials.

- **Deglobalization and Domestic Reshoring** – Annualized construction spending on manufacturing facilities totaled $202 million as of July 2023, an increase of 70 percent over the previous year.[1] New electric vehicle facilities and battery plants and semiconductor chip factories are increasing the amount of manufacturing space constructed. Nearshoring of manufacturing is also driving demand, with markets close to Mexico, including El Paso and San Antonio, most likely to capitalize on this trade.
- **Machine Learning and Artificial Intelligence** – Improvements in digital technology, specifically machine learning (ML) and artificial intelligence (AI), are changing the way factories operate and function and the adoption of these technological breakthroughs is improving productivity and efficiency and addressing supply chain challenges.

National Office Trends

The COVID-19 pandemic has had the opposite effect on U.S. office construction. Office space construction more than doubled following the Great Recession from 63.3 million in 2012 to 127.6 in 2015. However, growth subsequently slowed to single digit levels leading into the pandemic, and subsequently declined from 160.8 million in 2019 to 119.6 million in 2023.

The most significant factor impacting office space demand is the growth of remote working, first as the result of the pandemic, and subsequently with the emergence of the hybrid work schedule. A recent report released by McKinsey & Company in April of 2023 on the pandemic's impact on real estate in nine major global cities (including New York City, Houston, and San Francisco in the U.S. and other major European and Asian markets) makes the case that remote working has been institutionalized in hybrid work schedules for office-based employment in most industries. This report, *Empty Spaces and Hybrid Places, The Pandemic's Lasting Impact on Real Estate*, released in July 2023, states that daily office attendance has stabilized at 30 percent below pre-pandemic levels, and that "the hybrid work schedule is here to stay."

[1] 2024 Manufacturing Industry Outlook, Deloitte Research Center.

Data for the major global cities shows that office workers are coming into the office an average of 3.5 days per week across all industries. The average varies by industry with Professional Services the lowest at 3.0 days per week on average, followed by Information at 3.2 days per week, and other industries ranging from 3.4 to 3.7 days a week as shown in **Table 10** below. The data also indicates that the largest firms have the fewest days in the office with companies with over 25,000 employees reporting an average of 3.1 days per week; firms with 1,000 to 25,000 employees averaging 3.3 days per week; and smaller firms ranging from 3.5 to 3.8 days per week on average (data is not shown in the table).

Table 10 Average Days in Office by Industry

Industry	Avg. Days
Professional Services	3.0
Information	3.2
Finance	3.4
Management	3.4
Health Care	3.4
Arts and Accommodations	3.5
Utilities	3.5
Real Estate	3.5
Manufacturing	3.6
Education	3.6
Construction	3.6
Government	3.6
Transportation	3.7
Average	3.5

Source: McKinsey & Company, 2023

The reduction in time in the office has had an impact on office construction. The study indicates the number of days in office has been stable since mid-2022, and forecasts that office demand is expected to be 13 percent lower in 2030 than at pre-pandemic levels in 2019.

National BLS employment data on teleworking by industry aligns with the McKinsey survey data. The BLS survey compares the percentage of workers by industry who can telecommute before the pandemic in February 2020 with the percentage of workers who are able to telecommute in August 2022. The increase across all sectors was 18 percent as shown in **Table 11** below. Information, Professional and Business Services, and Educational Services have the highest levels of teleworking participation at 67.4 percent, 49.0 percent, and 46.0 percent respectively.

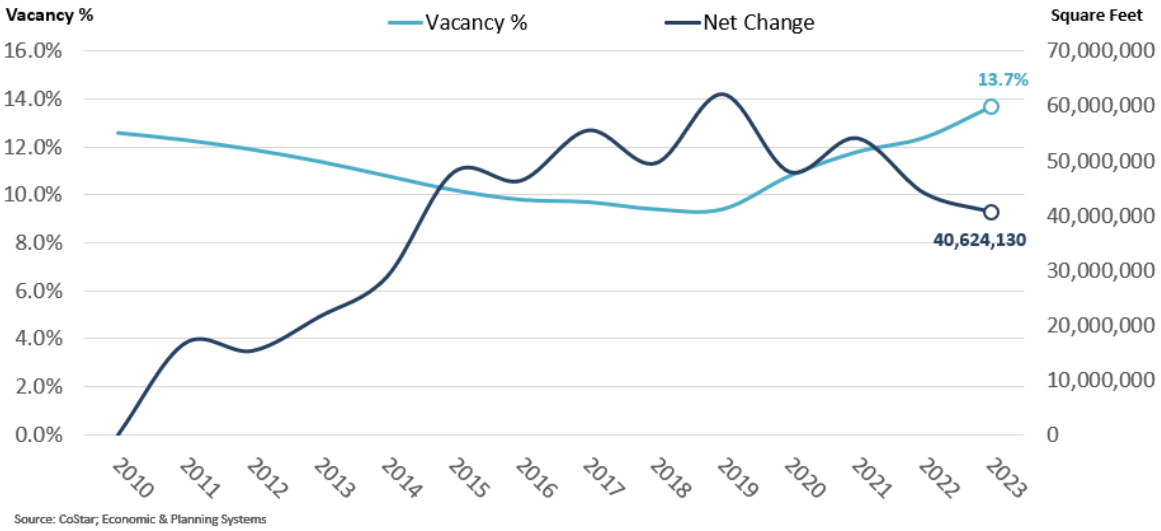
Table 11 Remote Telework by Industry, Pre and Post COVID Pandemic

Description	Pre COVID	Current			% Change
		Part-Time	Full-Time	Total	
Total Establishments					
Natural resources and mining	7.4%	2.1%	5.9%	8.0%	8.1%
Utilities	20.6%	8.0%	21.0%	29.0%	40.8%
Construction	9.8%	2.1%	8.4%	10.5%	7.1%
Manufacturing	20.4%	5.8%	18.3%	24.1%	18.1%
Wholesale trade	37.2%	17.2%	21.8%	39.0%	4.8%
Retail trade	8.3%	2.1%	8.9%	11.0%	32.5%
Transportation and warehousing	13.2%	4.4%	9.2%	13.6%	3.0%
Information	58.7%	42.2%	25.2%	67.4%	14.8%
Financial activities	28.7%	11.2%	22.0%	33.2%	15.7%
Professional and business services	41.1%	25.0%	24.0%	49.0%	19.2%
Educational services	38.5%	19.7%	26.3%	46.0%	19.5%
Health care and social assistance	16.3%	4.4%	18.5%	22.9%	40.5%
Arts, entertainment, and recreation	22.3%	7.9%	15.2%	23.1%	3.6%
Accommodation and food services	2.1%	0.0%	1.8%	1.8%	-13.8%
Other services, except public administration	16.7%	6.6%	13.7%	20.3%	21.6%
Total U.S. private sector	**23.3%**	**11.1%**	**16.4%**	**27.5%**	**18.0%**

Source: Bureau of Labor Statistics; Economic & Planning Systems

The impact of reduced office demand is reflected in the national office inventory data showing a declining amount of net inventory growth and increasing office vacancy rates since the start of the recession as shown in **Figure 7** below.

Figure 7 U.S. Office Space Inventory Change and Vacancy Rates, 2010-2023



Source: CoStar; Economic & Planning Systems

Retail Development

Changes in the retail development market have been changing at a rapid pace for well over a decade driven by the growth of e-commerce. E-commerce in the U.S. has experienced $66 billion in annual sales growth between 2011 and 2020 (U.S. Dept. of Commerce).

The emergence of e-commerce has accelerated a bifurcating of consumer spending. One side is a growth of retailers that offer convenience and low prices. This includes a shift to e-commerce for daily goods but also growth of sales to large discount stores and outlets in central locations. The other side is the growth of retailers that offer experience-oriented, quality/hand-made goods, and/or are local or mission-driven retailers. These retailers seek areas with a mixture of uses, central locations, and greater density of residents.

Lastly, food and beverage establishments are accounting for a growing share of retail space demand. Prepared foods sales outpaced sales of food for home consumption for the first time prior to the pandemic and this trend continued after the post early pandemic slowdown and economic shock.

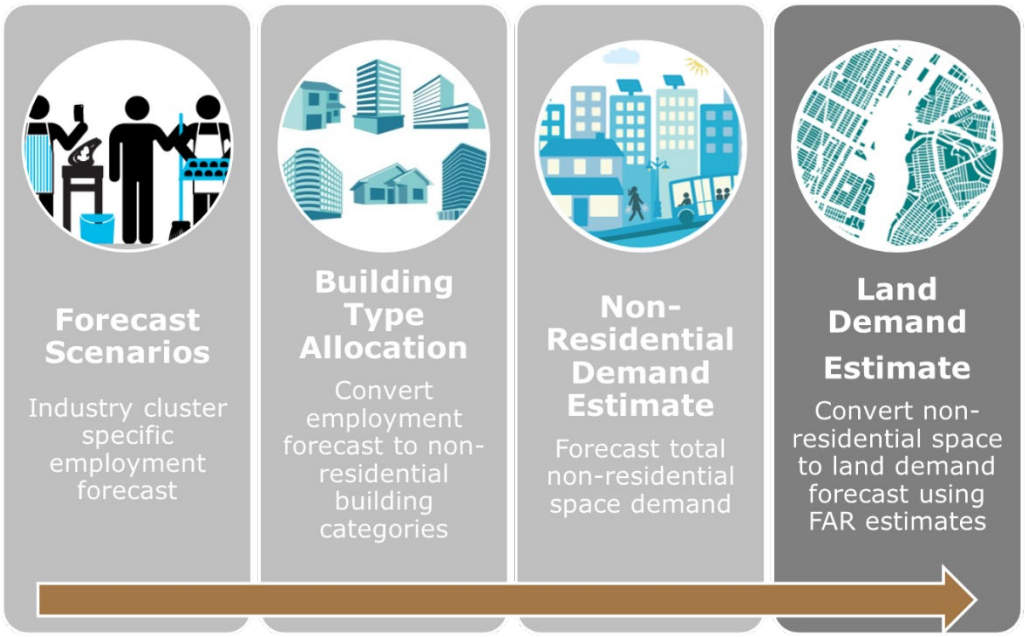
4. Regional Development Demand Forecast

This section provides the methodologies used to estimate development demand for the Las Vegas MSA over a 20-year horizon. The estimated demand for employment land and residential land area provided to help determine potentials for the Study Area.

Employment Land Demand

EPS uses historic trends and regional growth forecasts by industry to estimate demand for non-residential development. To estimate demand for development, regional growth forecasts (produced by CBER) are translated to growth forecasts by industry. New forecast jobs by industry are converted to demand for square feet using locally calibrated employee per square foot factors. Building square feet demand is then converted to demand for land (acres) using locally calibrated density factors (i.e., floor area ratio). The methodology is summarized in **Figure 8.**

Figure 8 Employment Development Demand Methodology



The regional forecast for population and employment growth in the Las Vegas MSA is produced annually by the UNLV Center for Business and Economic Research (CBER). The forecast is used to support land use and transportation planning the region by the Regional Transportation Commission of Southern Nevada and other governmental agencies.

The Las Vegas MSA is forecast to grow by 368,000 jobs from 2021 to 2040, which is an increase of 368,000 jobs or 19,368 jobs annually. The MSA is forecast to grow by an annual rate of 1.3 percent (shown in **Table 12**).

Table 12 Las Vegas MSA Total Employment Forecast, 2021-2040

Total Employment	2021	2031	2040	2021-2040 Total	2021-2040 Ann. #	2021-2040 Ann. %
Las Vegas MSA	1,312,000	1,603,000	1,680,000	368,000	19,368	1.3%

Source: UNLV CBER; Economic & Planning Systems

The historic growth rates and CBER forecast rates of growth for each 2-digit NAICS industry sector were used to estimate growth rates for jobs by sector over a 20-year period. The estimated rates used are shown in **Table 13**.

Table 13 Clark County Historic and Forecast Growth Rates by Sector

Sector	NAICS	QCEW 2002-2021	QCEW 2010-2021	CBER 2022-2030	CBER 2022-2040	Estimated Rates 2020-2030	Estimated Rates 2030-2040
Driving Industries							
Agriculture+Mining	11+21	7.7%	18.3%	2.9%	1.4%	2.9%	0.5%
Construction	23	0.0%	4.0%	4.0%	1.7%	4.0%	0.5%
Manufacturing	31-33	1.2%	2.8%	0.3%	0.5%	0.5%	0.3%
Education Services	61	2.4%	1.2%	2.2%	1.4%	1.4%	0.6%
Health Care and Social Services	62	4.0%	3.9%	2.3%	1.8%	2.3%	1.2%
Arts, Entertainment, and Recreation	71	1.3%	2.6%	2.6%	1.2%	2.6%	0.6%
Accommodation and Food Service	72	0.1%	-0.8%	2.2%	0.9%	1.0%	0.5%
Subtotal							
Business Support Industries							
Utilities	22	-0.5%	-1.3%	0.3%	-0.4%	0.0%	0.0%
Wholesale Trade	42	0.8%	1.3%	0.7%	0.5%	0.7%	0.3%
Transportation and Warehousing	48-49	4.3%	5.6%	2.5%	1.6%	2.5%	0.5%
Information	51	-0.4%	1.6%	0.5%	0.5%	0.2%	0.5%
Finance and Insurance	52	1.0%	2.6%	1.3%	1.0%	1.3%	0.8%
Real Estate	53	1.1%	1.5%	1.6%	1.0%	1.6%	0.8%
Professional Services	54	2.9%	2.9%	1.9%	1.3%	1.9%	0.8%
Management	55	7.8%	3.7%	0.7%	0.5%	0.7%	0.3%
Administrative and Waste Services	56	2.3%	3.4%	2.1%	1.5%	2.1%	1.0%
Subtotal							
Community Support Industries							
Retail Trade	44-45	1.5%	1.4%	0.4%	0.5%	0.5%	0.5%
Other Services	81	1.9%	2.0%	2.3%	1.0%	2.3%	0.5%
Public Administration	92	0.8%	0.0%	1.4%	0.9%	1.4%	0.5%
Subtotal							

Source: BLS QCEW; UNLV CBER; Economic & Planning Systems

The forecast rates by industry sector were applied to the employment base in Clark County in 2022 to forecast job growth by sector from 2022 to 2040. The sectors are organized into three categories:

- Driving Industries – Driving industries are sectors that primarily provide basic employment that generate goods and services that are either exported outside the region or bought/consumed by those visiting the region.
- Business Support Industries – Business support industries are sectors that primarily provide employment that support the economic growth generated by the driving industries.
- Community Support Industries – Community support industries are sectors where employment is generated by demand generated by residents of the region.

Table 14 Clark County Employment Change by Sector, 2022-2040

Sector	2022	2030	2040	Change 2022-2040 Total	Ann. #	Ann. %
Driving Industries						
Agriculture+Mining	2,411	3,031	3,186	775	43	1.6%
Construction	69,181	94,679	99,521	30,340	1,686	2.0%
Manufacturing	26,420	27,495	28,332	1,912	106	0.4%
Education Services	55,839	62,408	66,255	10,416	579	1.0%
Health Care and Social Services	105,744	126,841	142,911	37,167	2,065	1.7%
Arts, Entertainment, and Recreation	21,728	26,680	28,325	6,597	367	1.5%
Accommodation and Food Service	217,465	235,483	247,526	30,061	1,670	0.7%
Subtotal	**498,787**	**576,617**	**616,055**	**117,268**	**6,515**	**1.2%**
Business Support Industries						
Utilities	3,203	3,203	3,203	0	0	0.0%
Wholesale Trade	23,593	24,947	25,706	2,113	117	0.5%
Transportation and Warehousing	62,490	76,138	80,032	17,542	975	1.4%
Information	11,803	11,993	12,606	803	45	0.4%
Finance and Insurance	30,416	33,727	36,343	5,928	329	1.0%
Real Estate	19,869	22,559	24,309	4,440	247	1.1%
Professional Services	45,907	53,367	57,508	11,600	644	1.3%
Management	20,423	21,595	22,252	1,829	102	0.5%
Administrative and Waste Services	75,906	89,636	99,014	23,108	1,284	1.5%
Subtotal	**293,609**	**337,164**	**360,971**	**67,363**	**3,742**	**1.2%**
Community Support Industries						
Retail Trade	107,934	112,327	118,072	10,138	563	0.5%
Other Services	23,703	28,431	29,885	6,183	343	1.3%
Public Administration	37,969	42,435	44,605	6,637	369	0.9%
Subtotal	**169,605**	**183,194**	**192,563**	**22,958**	**1,275**	**0.7%**
Total	**962,000**	**1,096,975**	**1,169,588**	**207,588**	**11,533**	**1.1%**

Source: BLS QCEW; UNLV CBER; Economic & Planning Systems

The forecast growth of employment by each sector was allocated to five non-residential development types. These types include retail, service and hospitality, office and institutional, small format industrial, and large format industrial. National employee per square foot factors, which were then calibrated to the Las Vegas market, are used to translate employment growth to demand for building square feet for each development type.

The estimate demand for new buildings space from 2022 to 2040 is shown by type in **Table 15.** In total, the estimated demand for commercial and industrial space will generate demand for 12,900 acres of land from 2022 to 2040. Most of the space will be for industrial uses. The estimated demand for industrial space (small and large format) is 61 million square feet, which is estimated to generate demand for nearly 9,000 acres of land (shown in **Table 16**).

These demand forecasts are used to help determine potential demand for the Study Area by applying capture rates for the Study Area to these regional demand estimates.

Table 15 Clark County Commercial/Industrial Building Sq Ft Demand, 2022-2040

Sector	Retail	Service / Hospitality	Office / Institutional	Small Format Industrial	Large Format Industrial
Driving Industries	9,042,900	9,023,100	4,427,500	2,867,700	24,455,800
Business Support Industries	2,311,600	4,602,700	2,808,300	5,418,300	25,382,600
Community Support Industries	3,827,000	839,300	592,800	248,900	3,443,600
Total	**15,181,500**	**14,465,100**	**7,828,600**	**8,534,900**	**53,282,000**

Source: Economic & Planning Systems

Table 16 Clark County Commercial/Industrial Building Acres Demand, 2022-2040

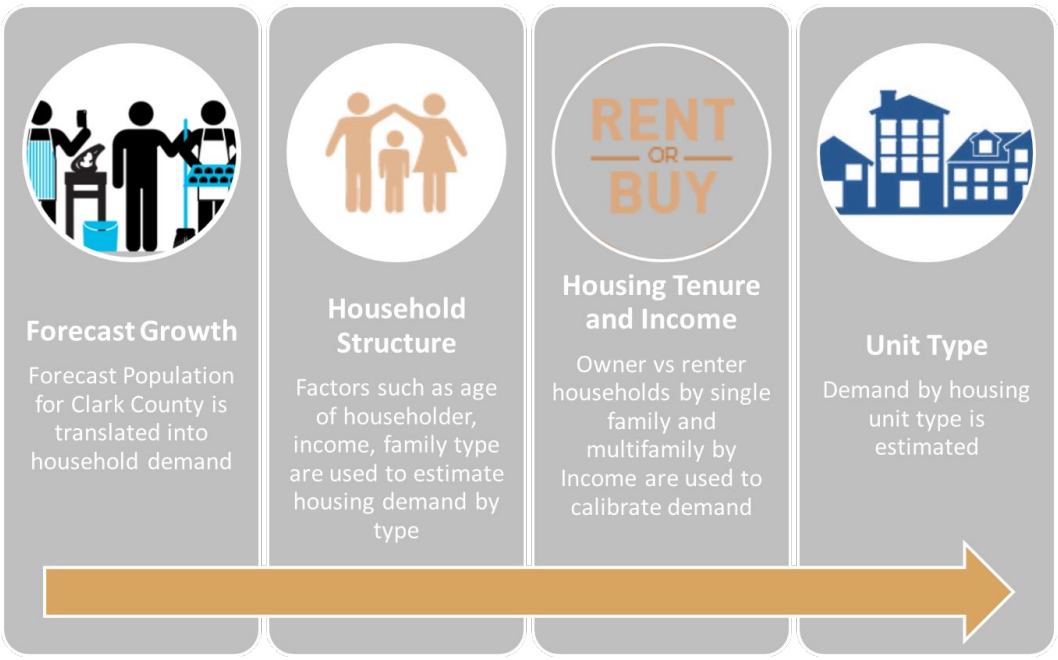
Sector	Retail	Service / Hospitality	Office / Institutional	Small Format Industrial	Large Format Industrial	Total
Driving Industries	1,038.0	828.6	508.2	263.3	3,742.9	6,380.9
Business Support Industries	265.3	422.7	322.3	497.5	3,884.7	5,392.6
Community Support Industries	439.3	77.1	68.0	22.9	527.0	1,134.3
Total	**1,742.6**	**1,328.3**	**898.6**	**783.7**	**8,154.6**	**12,907.8**
Ann. Average	**87.1**	**66.4**	**44.9**	**39.2**	**407.7**	**645.4**

Source: Economic & Planning Systems

Residential Land Demand

The demand for housing units and needed land to support development was estimated using the methodology summarized in **Figure 9**. The forecast for population growth in Clark County produced by CBER was translated into household demand. Trends in household structure (e.g. income, family type, age of householders) were used to estimate demand for housing units by tenure and then by housing unit type.

Figure 9 Residential Land Demand Forecast Methodology



Clark County is forecast to increase in population by 761,000 residents from 2020 to 2040, as shown in **Table 17.** The population growth is estimated to generate 283,700 new households and demand for 268,400 new housing units.

Table 17 Clark County Household Forecast, 2020-2040

Description	2010 *ACS*	2021 *ACS*	2020 *MPO*	2030 *MPO*	2040 *MPO*	2010-2021 Total	2010-2021 Ann. #	2010-2021 Ann. %	2020-2040 Total	2020-2040 Ann. #	2020-2040 Ann. %
Clark County											
Population	1,954,260	2,292,476	2,376,683	2,859,000	3,138,000	341,207	31,019	1.5%	761,317	38,066	1.4%
Households	698,955	854,289	845,888	1,025,623	1,129,592	138,924	12,629	1.6%	283,704	14,185	1.5%
Housing Units	841,949	934,911	917,656	1,076,904	1,186,072	94,568	8,597	1.0%	268,416	13,421	1.3%
Single Family	484,557	560,997	60%			76,440	6,949	1.3%			
Attached (1-2)	51,934	62,356	7%			10,422	947	1.7%			
Multifamily (3-4)	57,729	62,164	7%			4,435	403	0.7%			
Multifamily (5+)	247,729	249,394	27%			1,665	151	0.1%			

Source: US Census Bureau; Center for Business and Economic Research (CBER) UNLV; Economic & Planning Systems

The forecast for housing unit demand results in a demand for 13,421 new housing units per year in the county from 2020 to 2040. Based on existing development patterns and recent development trends, the forecast housing unit demand was split between single family housing units, attached/middle density units, and multifamily units, shown in **Table 18**.

Table 18 Clark County Estimated Housing Unit Demand, 2020-2040

Housing Types	Factor	2020-2030	2030-2040	Change 2020-2040 Total #	Change 2020-2040 Ann. #
Clark County					
New Housing Units		159,248	109,168	268,416	13,421
Units By Type					
Single Family	60%	95,557	65,506	161,064	8,053
Attached	10%	15,925	10,917	26,842	1,342
Multifamily	30%	47,774	32,750	80,525	4,026
Total	**100%**	**159,257**	**109,173**	**268,430**	**13,422**

Source: Economic & Planning Systems

5. Study Development Forecast

This section provides a summary of the development opportunities identified for the Study Area and the estimated development demand for the Study Area over the next 20 years.

Development Opportunities

The following development opportunities for non-residential and residential development were identified in the study process to inform the land use plan.

Non-Residential Development

The non-residential development opportunities by use are:

- Industrial - Industrial development will generate the greatest potential for supporting employment growth and will generate greatest demand for based on proximity to California. The Study Area is also an attractive location for regional distribution activity due to the location along I-15. The northern portion of the Study Area is most likely to attract this demand in the near term. Lastly, the large acreage of lands that can be identified for employment uses with significant buffers from residential uses will also make portions of the Study Area attractive locations for potential large format employers seeking large sites (i.e. greater than 100 acres) with access to infrastructure, utilities, and transportation.
- Retail – The retail demand in the Study Area will be driven by future population growth in the Study Area. The location along I-15 on the edge of the larger metro area may also present an opportunity for some regional/destination retail uses located near interstate interchanges.
- Office – Office demand will be largely for commercial office businesses (e.g., dentist, real estate office) with demand driven by the growth of employment and population in the Study Area.
- Hospitality – The demand for hotels and tourism activity will be mostly oriented towards the future employment base and will attract more limited-service hotel type products. The proximity of the Study Area to the California border and access to I-15 may result in demand for resort and gaming-oriented properties that are trying to capture interstate travelers.

Residential Development

The residential development opportunities identified include:

- The northern and central portions of the Study Area east of I-15 may provide an attractive location for housing development.
- Housing development has the potential to be the most land intensive use depending on the industrial demand that can be captured.
- Access to transportation routes, especially I-15, proximate access to interstate interchanges, and access to retail goods/services are essential elements to supporting housing growth in the Study Area, which may limit the potential for some of the eastern and southern portions of the Study Area.
- Developers of denser housing products (attached and multifamily) will place greater priority on transportation access and proximity to goods and services than single family detached development.
- There should be limited residential near the potential airport operations at any proposed increase of operations at the Jean airport and away from any environmental factors that impact quality of life such as dry lake beds.

20-Year Development Demand Capture

The demand for development over a twenty-year horizon (2025-2045) was estimated. Industrial development will achieve the greatest capture of regional demand driven in the first 10 to 15 years by existing regional demand within primarily the northern portions of the Study Area. The Study Area is estimated to capture 30 percent of regional industrial development demand resulting in 18.5 million square feet of space over 20 years, which will generate demand for 2,700 to 2,800 acres of land as shown in **Table 19**.

The estimated capture of retail demand is 10 percent resulting in demand for 1.5 million square feet of space and 175 acres of land. The hospitality demand is estimated to be for 1.4 million square feet of space and 133 acres of land. Lastly, the office demand is estimated to be 1.6 million square feet and 180 acres of land.

Table 19 Study Area Commercial/Industrial Capture, 2025-2045

	Retail	Hospitality	Office	Flex	Industrial
Clark County Demand (sq ft)	15,181,500	14,465,100	7,828,600	8,534,900	53,282,000
Study Area					
Estimated % Capture	10%	10%	10%	30%	30%
Estimated Demand (sq ft)	1,520,000	1,446,510	1,566,000	2,560,000	15,985,000
Estimated Demand (acres)	175	133	180	235	2,450

Source: Economic & Planning Systems

The Study Area is estimated to have the potential to capture 10 percent of the regional housing demand over the 20-year forecast period. The result is demand for 26,843 housing units or 1,342 units per year. The demand by housing types is estimated to mirror the regional distribution for housing, as shown in **Table 20.**

The estimated housing demand of 26,843 units will generate demand for 6,155 acres of land to accommodate demand. The annual demand is estimated to be 308 acres of land, as shown in **Table 21**.

Table 20 Study Area Estimated Housing Capture, 2025-2045

Housing Types	Factor	2025-2035	2035-2045	Change 2025-2045 Total #	Change 2025-2045 Ann. #
Clark County					
New Housing Units		159,248	109,168	268,416	13,421
Study Area	Capture Rate				
New Housing Units	**10.0%**	15,926	10,917	26,843	1,342
By Type	% of units				
Single Family	60%	9,555	6,550	16,106	805
Attached	10%	1,593	1,092	2,684	134
Multifamily	30%	4,778	3,275	8,053	403
Total		**15,926**	**10,917**	**26,843**	**1,342**

Source: Economic & Planning Systems

Table 21 Study Area Estimated Housing Land Demand, 2025-2045

Housing Types	Factor	2025-2035	2035-2045	Change 2025-2045 Total #	Change 2025-2045 Ann. #
New Housing Demand					
Housing Type					
Single Family		9,555	6,550	16,106	805
Attached		1,593	1,092	2,684	134
Multifamily		4,778	3,275	8,053	403
Total		**15,926**	**10,917**	**26,843**	**1,342**
Land Absorption (Acres)					
Housing Type	Gross Density				
Single Family	**3.0 DU/Acre**	3,185	2,183	5,369	268
Attached	**7.0 DU/Acre**	228	156	383	19
Multifamily	**20.0 DU/Acre**	239	164	403	20
Total		**3,652**	**2,503**	**6,155**	**308**

Source: Economic & Planning Systems

APPENDIX D

INFRASTRUCTURE & UTILITIES ANALYSIS & METHODOLOGY

AtkinsRéalis

Transportation and Utilities Document

Moore Iacofano Goltsman (MIG)

09 July 2024

IVANPAH VALLEY JOINT LAND USE STUDY

AtkinsRéalis - Baseline / Référence

Contents

Figures

1. Introduction

1.1 Background

The City of Henderson and Clark County, Nevada initiated a Joint Land Use Planning Study (JLUS) to provide a blueprint for future growth in a strategic portion of southern Clark County. Both the City of Henderson and Clark County staff recognize the need to collaborate to support equitable and orderly growth in the area, encourage future economic development opportunities, and maintain a commitment to the conservation of natural resources. The final JLUS report will guide the long-term development of the area.

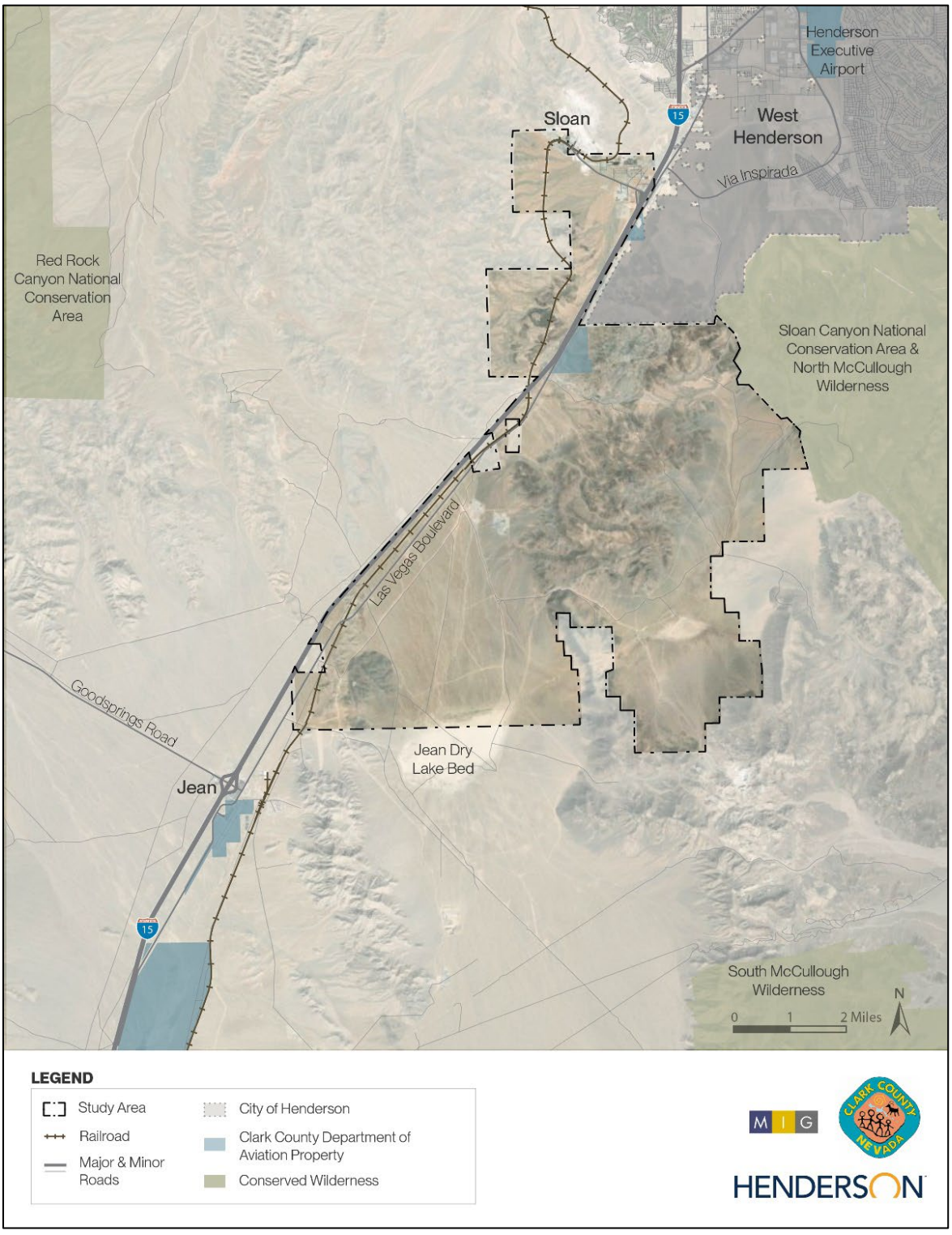
This document explores the conceptual road network based on the land use assumptions of the study, and discusses high-level estimates for trip generation, electric needs, and water utilities to be used for future planning efforts.

1.2 Study Area

The JLUS area covers over approximately 30,980 acres of unincorporated land in Clark County. The study area includes land east and west of Interstate 15 (I-15) and is adjacent to the southern city limits of Henderson. The area is under the federal land ownership of the Bureau of Land Management (BLM) but is being studied in anticipation of a Lands Bill approval that would expand BLM's disposal boundary. When the expansion of the disposal boundary occurs, Clark County & City of Henderson will work with BLM to assume jurisdictional management of the land.

Currently, the study area is mostly undeveloped land with scattered residences and businesses throughout the area. The Sloan Canyon National Conservation Area (NCA) borders the study area to the northeast, the Town of Jean and the Jean/Roach Dry Lakebeds are located to the south. The area is dominated by desert vegetation, gentle hills, and more mountainous terrain..

Figure 1-1 - JLUS Study Area



2. Existing Roadway Conditions

Most of the study area is undeveloped with few existing roadways. I-15, which connects the Los Angeles area to the Las Vegas metropolitan area, bisects the JLUS limits, and Las Vegas Boulevard South runs parallel to I-15, connecting the study area with the City of Henderson to the north and the Town of Jean and beyond to the south. There is an I-15 interchange at Highway 161 in Jean, south of the study area, and an I-15 partial interchange and slip ramps at Sloan Road to the north. Via Inspirada is an existing arterial just north of the JLUS area that connects I-15 to the City of Henderson.

3. Proposed JLUS Roadway Network

Based on the planned land uses, existing landscape, and existing trail networks, the team developed a preliminary conceptual road and trails network map. This network is intended to provide high-level estimates of the impacts that the proposed land uses will have on the transportation network within the JLUS area, and to estimate what impacts the area may have on the greater I-15 and Las Vegas areas. The trip generation estimates were calculated using Institute of Transportation Engineers (ITE) Trip Generation Manual rates for the anticipated land uses, and assumptions were made to account for reductions based on infrastructure needs, additional land uses not identified at this high-level, pass-by trips, and internal circulation. As planning in the study area progress going forward, it is recommended a Travel Demand Model (TDM) be developed to determine placement and sizing of roadways, interchanges, and infrastructure needs.

As part of the team's analysis, the traffic team made certain assumptions about the trip generation and trip distribution to better estimate the impact of the proposed lands on the existing and proposed road network. These assumptions are as follows:

- A 15% reduction to the land use acreages was applied to account for the presence of roadways, sidewalks, multi-use paths, utility right of ways, open space, parks, and other infrastructure that will be required throughout the JLUS area.
- A reduced independent variable was utilized for the residential land uses to account for the presence of schools, parks, and community centers that were not analyzed at this high-level of land use.
- A pass-by percentage was applied to commercial/retail land uses.
- An internal circulation percentage was applied to the proposed lands to denote the number of generated trips that stay within the proposed JLUS area.

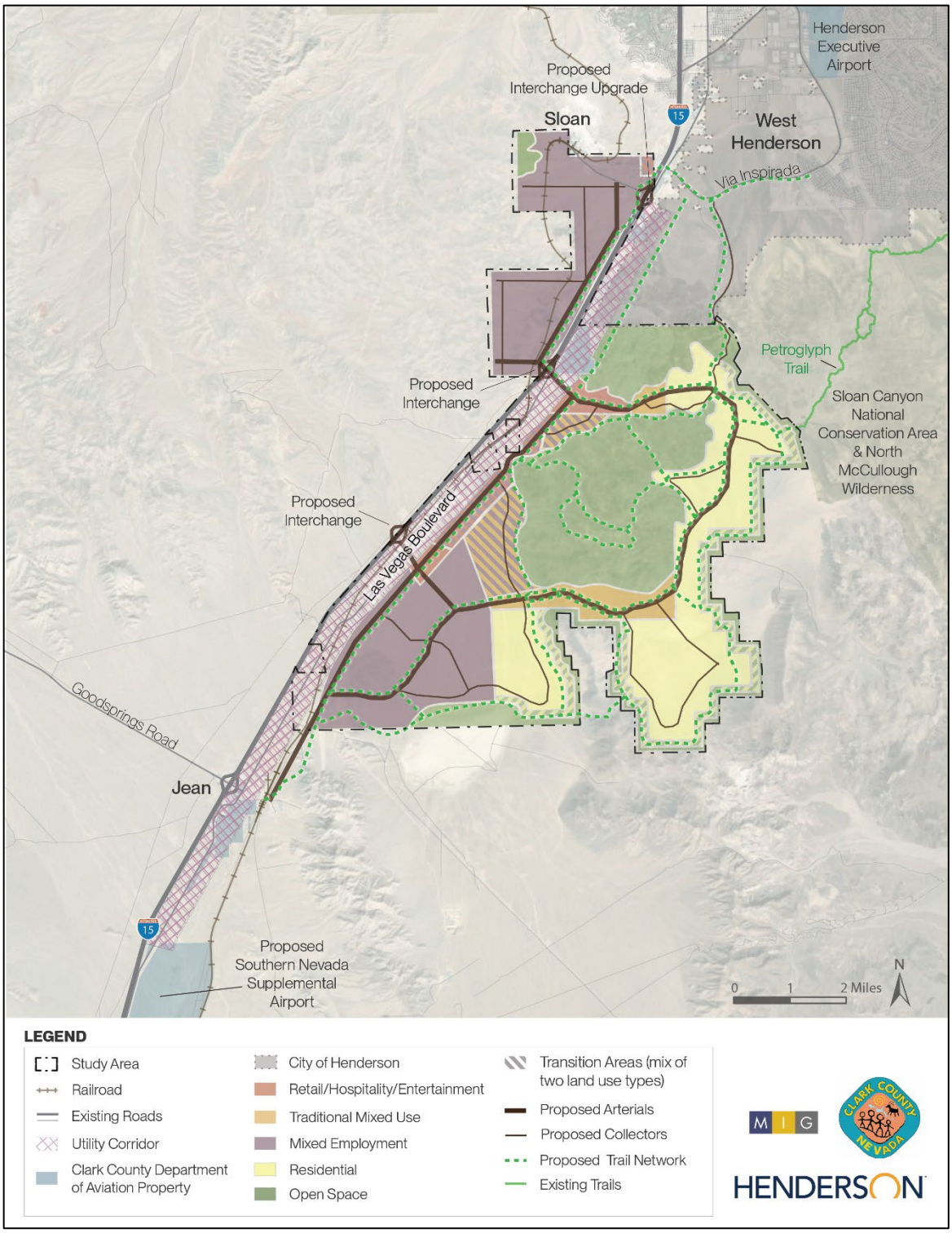
The Trip Generation table is included in **A.1**. This information was used to estimate the roadway infrastructure needs within the JLUS area. Based on the preliminary analysis, the following were noted:

- An extensive trail network is envisioned within the JLUS area, which will incorporate existing trails and help promote the movement of pedestrian and cyclists within the study area and among land use zones.
- The Seven Magic Mountains open space area will limit the placement of future roadways. Arterial roadways are proposed on either side of the open space; one runs parallel and to the east of I-15 and passes through the retail and employment land uses. The second arterial runs along the eastern portion of the development, through the mixed-use and residential land uses and joins the proposed Casa del Sol Drive to the north (see additional details below). The industrial and mixed-use area west of I-15 will also require an arterial roadway to accommodate local traffic between interchanges with I-15.

- Based on the initial trip generation estimates, two new interchanges will be required to accommodate the proposed development, as shown in **Figure 3-1** below. These previously proposed interchanges by NDOT will provide access from the JLUS area to I-15 and the surrounding network once necessary criteria for demand are met.
- The existing interchange with I-15 at Sloan Road will need to be upgraded to a full interchange to accommodate site traffic.
- In addition to I-15, two local roadways will connect the JLUS area to southern Henderson. Las Vegas Boulevard is currently two lanes within the JLUS area but will need to be widened to accommodate additional traffic between the study area and Henderson area (a project already proposed). Casa del Sol Drive is planned as a north-south collector and will connect the JLUS area to Henderson as outlined in the City of Henderson Master Transportation Plan.
- To the south of the development, the JLUS area will connect to I-15 at Jean via Prison Road and the existing interchange there.
- For this analysis, arterials are assumed to be six to eight lane facilities, and collectors are assumed to be two to four lane facilities, consistent with the City of Henderson's definitions. The arterials within JLUS area are anticipated to carry between 25,000 and 60,000 vehicles per day, and the collectors will carry between 10,000 and 30,000 vehicles per day. It's estimated that, based on development projections, approximately 130,000 daily trips will be added to the external roadway network, either via I-15, Las Vegas Boulevard, or Casa del Sol Drive. The estimated daily traffic volumes are shown for the arterial and collector roadways in **A.1**.
- At this level of conceptual planning, concepts for local collectors and local roads have not been developed.

Taking into consideration the information above, the traffic team created a Conceptual Roadway and Trails Plan as shown below in **Figure 3-1**.

Figure 3-1 – Conceptual Roadway and Trails Plan



As a high-level land use study, the following recommendations will promote safer circulation within the JLUS area.

- **Intersection Design:** Major signalized intersections should be spaced adequately to accommodate anticipated traffic volumes and sized appropriately for the planned development.
- **Arterial Design:** Ensure adequate sight distances are met at intersections and along the roadways, and design roadways that will accommodate traffic volumes without encouraging excessive speeds. Major arterials will need to be four to six lanes to accommodate the anticipated traffic.
- **Interchanges:** Ensure efficient access to and from the JLUS area and I-15 with new planned interchanges. Alternative intersection designs or flyovers should be considered, and right-of-way should be set aside to ensure adequate future operations. Existing interchanges should be upgraded to accommodate planned development. Acceleration and deceleration lane improvements may be required along I-15 adjacent to the JLUS area.
- **Pedestrian and cyclist facilities:** All of the roadways within the JLUS area should feature sidewalks and bike paths or lanes should be provided where possible. Trail connectivity should be encouraged. Due to the high volume of traffic anticipated on the arterial road network, underpasses should be considered at major trail crossings with the arterials.
- **Railroad Grade Separation:** Consider grade separation with the existing railroad tracks along major roadways.

4. Utilities

At this phase of land use planning, utility needs for the JLUS area were assessed at a very high level to understand potential set-asides required or implications due to the planned development of this area. There is a utility corridor set aside by the State of Nevada adjacent to and south of I-15 which is anticipated to be utilized for some utility needs within and leading to the JLUS area.

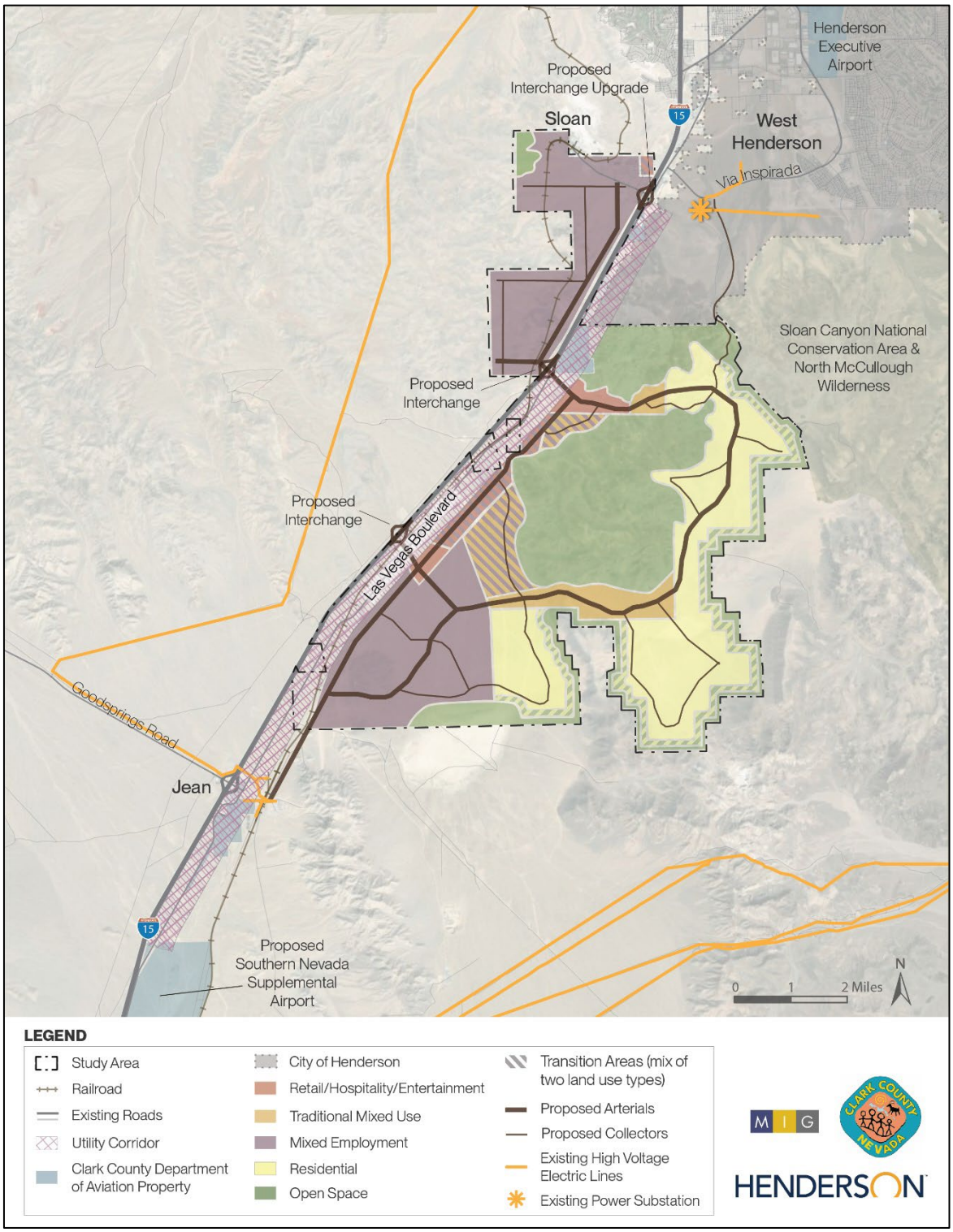
4.1 Electric Utilities

There are a series of local electric power stations in close proximity to the site which could be used to provide power to the JLUS area. These plants and substations are located north of the site, off of Via Inspirada, with the Eldorado Solar Power Plant to the east and Primm to the south.

There are existing high voltage electric lines south of the site between the Eldorado Solar Power Plant and the power plants at Primm and west of the site from Jean to south Henderson. Additional electric lines could provide connection between the existing infrastructure and JLUS area to provide power. Electricity line extensions must comply with Title 14 Code of Federal Regulations Part 77, as applicable.

Figure 4-1 details the existing high voltage lines and power substations in the vicinity of the JLUS area.

Figure 4-1 – Existing High Voltage Electric Lines



4.2 Water Utilities

The water utilities section is split into three elements: Stormwater Management, Potable Water Systems, and Sanitary Sewer Systems. Water utilities must be in compliance with standards set by the Las Vegas Valley Water District, Clark County Water Reclamation District, and other water provision and management agencies or local departments.

4.2.1 Stormwater Management

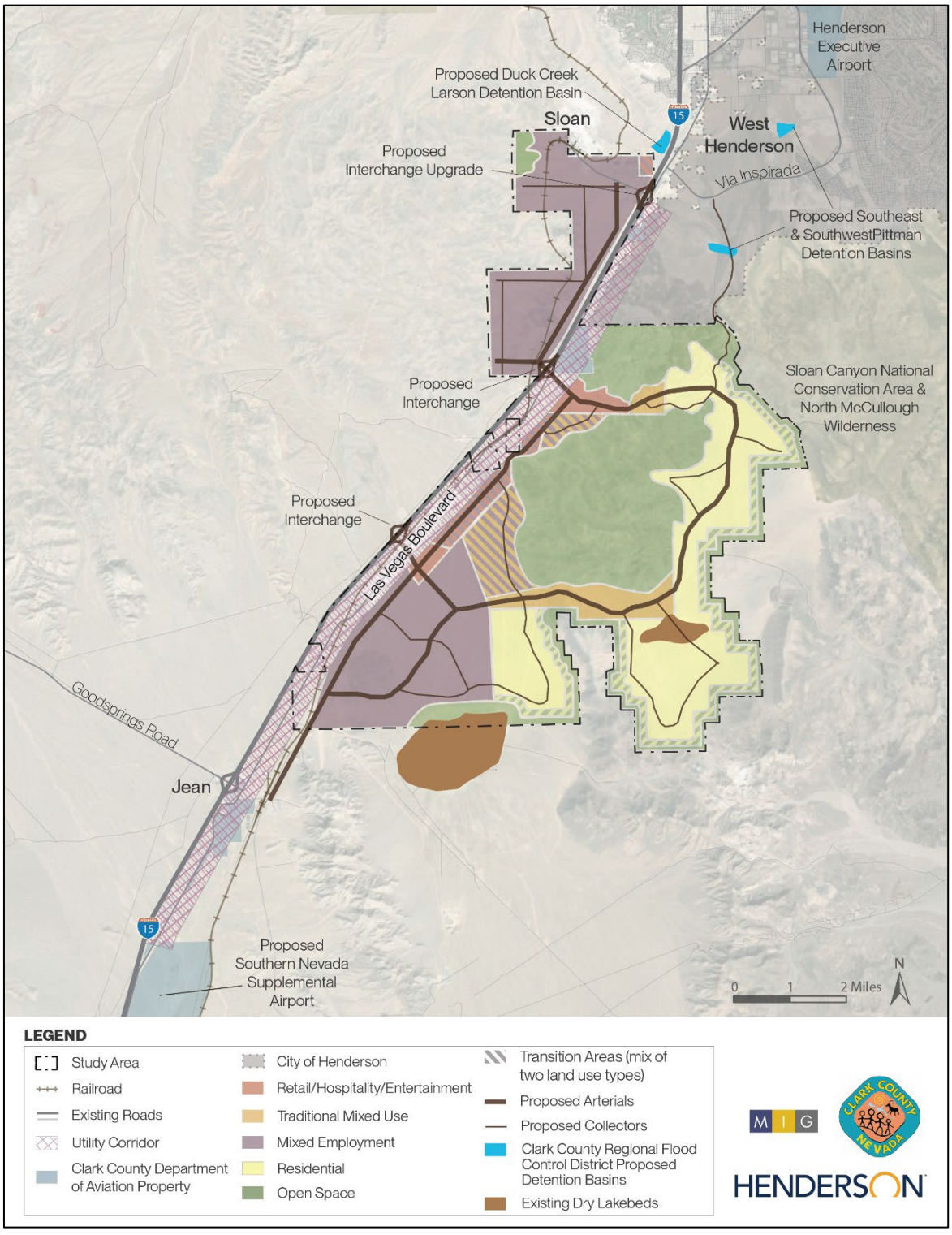
The north portion of the site drains to the Las Vegas Valley and falls within the 2023 Las Vegas Valley Flood Control Master Plan (LVVMPU) areas. The LVVMPU outlines the proposed stormwater facility network to contain the 100-year ultimate conditions flows. The ultimate condition assumes a full "build-out" condition based on current zoning and entity-controlled land. The JLUS area was not included in this analysis because it is still in the planning stages, so therefore potential impacts from this project will need to be analyzed and amended on the LVVMPU. The current flood control plan for this area is included in **A.2**.

Additional stormwater management in this area could include natural lined berms to concentrate the flows into channels in the foothills of the mountains. A small debris basin may be required for larger natural drainage areas. Within portions of the JLUS area proposed for development, conveyance facilities could consist of riprap, concrete lined channels, or underground Reinforced Concrete Pipe's (RCPs)/Reinforced Concrete Boxes (RCBs) as seen fit. It is expected that stormwater and local drainage facilities, including curb and gutter, are anticipated within the residential and industrial land use areas. Additional analysis is necessary to determine flows, routing, and facility sizing.

There are two natural low points on the site where water drains; each of these will require a portion of land set aside to allow for detention of storm flows. Two detention basin facilities are present in the LVVMPU on the north side of the study area and should be analyzed to determine impacts from proposed development.

Figure 4-2 below details the natural drainage low points on the site.

Figure 4-2 – Natural Drainage Low Points



4.2.2 Potable Water System

Due to current uncertainty for development and jurisdictional management in the JLUS area resulting in a high-level, preliminary analysis for the Land Use Study, a detailed potable water system assessment was not performed. However, a high-level daily and maximum water demand

assessment was conducted to understand general demand estimates. To be able to undertake a more thorough potable water assessment, the following will need to be determined:

- Specific development within the JLUS area.
- Whether potable water to the JLUS area will be supplied by the City of Henderson, Clark County, or a combination of both. Currently, there is no infrastructure in the immediate vicinity to connect in to either existing system.
- There is not currently sufficient capacity within either system to provide the necessary demand for the entirety of the JLUS area. As development plans progress, there will be a need for additional supply and infrastructure to meet the projected demand.

It is anticipated that the potable water system will be contained with the right of ways within the proposed development area.

4.2.3 Sanitary Sewer System

The Clark County Water Reclamation District (CCWRD) is overseeing the development of the CCWRD 22101 Ivanpah Wastewater Master Plan for the orderly development of wastewater facilities from the California State Line to Sloan, Nevada, which includes the JLUS area. At the time the JLUS study was completed, the Wastewater Master Plan was in progress and had not yet been finalized. When the plan is complete, it can be used to guide the design and construction of wastewater improvements necessary to serve any new development in the area. Design and construction will need to occur in compliance with approved design standards and service rules. As planning continues, land within the study area will need to be reserved for utilities infrastructure at appropriate elevations and all ongoing efforts will need to follow the final recommendations developed as part of the Ivanpah Wastewater Master Plan.

4.3 Water Demand

Based on the planned land uses and densities that have been identified as part of the JLUS study, a high-level daily and maximum water demand was developed to assist with discussions regarding water needs for the JLUS area. The daily and maximum demands are based on full-build-out of all development-based land uses within the JLUS area, with a 15% reduction applied for roads and utilities. Assumptions are discussed below.

EPS produced the “Joint Land Use Study Land Demand Market Analysis”, included in the Appendix of the JLUS report, which projects population and land use development for the entirety of Clark County through 2045. This projected population for Clark County in 2045 is 761,000 people and 268,400 housing units, 10% of which are forecasted to be within the JLUS area based on market demand assessments. Therefore, the projected population for the development area by 2045 is 76,100 people and 26,840 housing units, with an equivalent residential unit (ERU) population density of 2.835. However, this 2045 estimate will not utilize all developable land within the JLUS area, with additional development expected beyond 2045. Thus, the water demand at full build out was extrapolated from these 2045 estimates to extend to all developable land within the area. At full build-out, the population is estimated to be 101,998.

At full build-out, the JLUS area is expected to have a spectrum of housing types, from single-family to small, mid-scale, and large-scale to multifamily, along with retail, mixed use, office park, industrial, and warehousing uses. To calculate water demand, the land use development types identified for this plan (shown in Table 4 on page 101), were translated into traditional land use categories (**A.3, Tables 1 and 3**). Some development types, such as Traditional Mixed Use, include multiple land uses, such as residential and commercial. This process defined the total acreage for each individual land use within the Study Area. Tables in **A.3** provide further detail for the assumptions and

calculations utilized to develop the water demand values based on development type and specific land use acreages.

To develop a gallons per day per acre (GPD/Acre) estimate for each of the land use categories, the following processes were used:

- **Industrial:** Metcalf & Eddy Wastewater Engineering is a leading resource material in infrastructure design and provides specific gallons per capita per day (GPCD) rates for business types. For Industrial uses, the manual states that 20 GPCD per employee should be used. To estimate number of employees per acre, the Building Owners and Managers Association (BOMA) International rates were used, which equates to 92.88 employees per acre for a total of 1,858 GPCD/Acre (**A.3, Table 4**).
- **Commercial:** Metcalf & Eddy Wastewater Engineering's manual was utilized to estimate commercial usage also. The average size of several types of business were used to calculate the GPD per business type. Several businesses were compared and the highest rate was utilized, which was 1000 GPD/Acre (**A.3, Table 5**).
- **Residential:** Southern Nevada Water Authority's 2024 Water Resource Plan was referenced, using an estimated 92 GPCD for the full build-out year. The EPS/JLUS land use categories were mapped across to the City of Henderson Comprehensive Plan land use categories. The following are noted (**A.3, Table 6**).
    - City of Henderson Low Density Residential (LDR) up to 3.5 Units Per Acre.
        - EPS/JLUS Single Family Homes 3 Units Per Acre.
        - LDR 782 GPD/Acre.
    - City of Henderson Medium Density Residential (MDR) up to 16 Units Per Acre.
        - EPS/JLUS Single Family Homes 13.64 Units Per Acre.
        - MDR 3557 GPD/Acre

The combined process of the above steps produced the Project Land Use Water Demand Table (**A.3, Table 7**). Based on the assumptions listed above, it's anticipated that the JLUS area will require approximately 24.35 million gallons per day of potable water at full build-out. The Total Residential Project Land Use Water Demand Table can be seen at **A.3, Table 8**.

A maximum daily demand was calculated for each land use category based on the City of Henderson Future Maximum Day Demands table and was compared against the LVVWD Future Maximum Day Demand table, overall the Henderson Future Maximum Demand table uses the worst case (**A.3, Table 9). A.3, Table 10** calculates the Project Land Use Maximum Day Demand Data utilizing the City of Henderson Maximum Day Demand data. Based on the anticipated land uses, development densities, and assumptions detailed above, the maximum demand of the JLUS area is approximately 49 million gallons per day at full build-out.

APPENDICES

Appendices

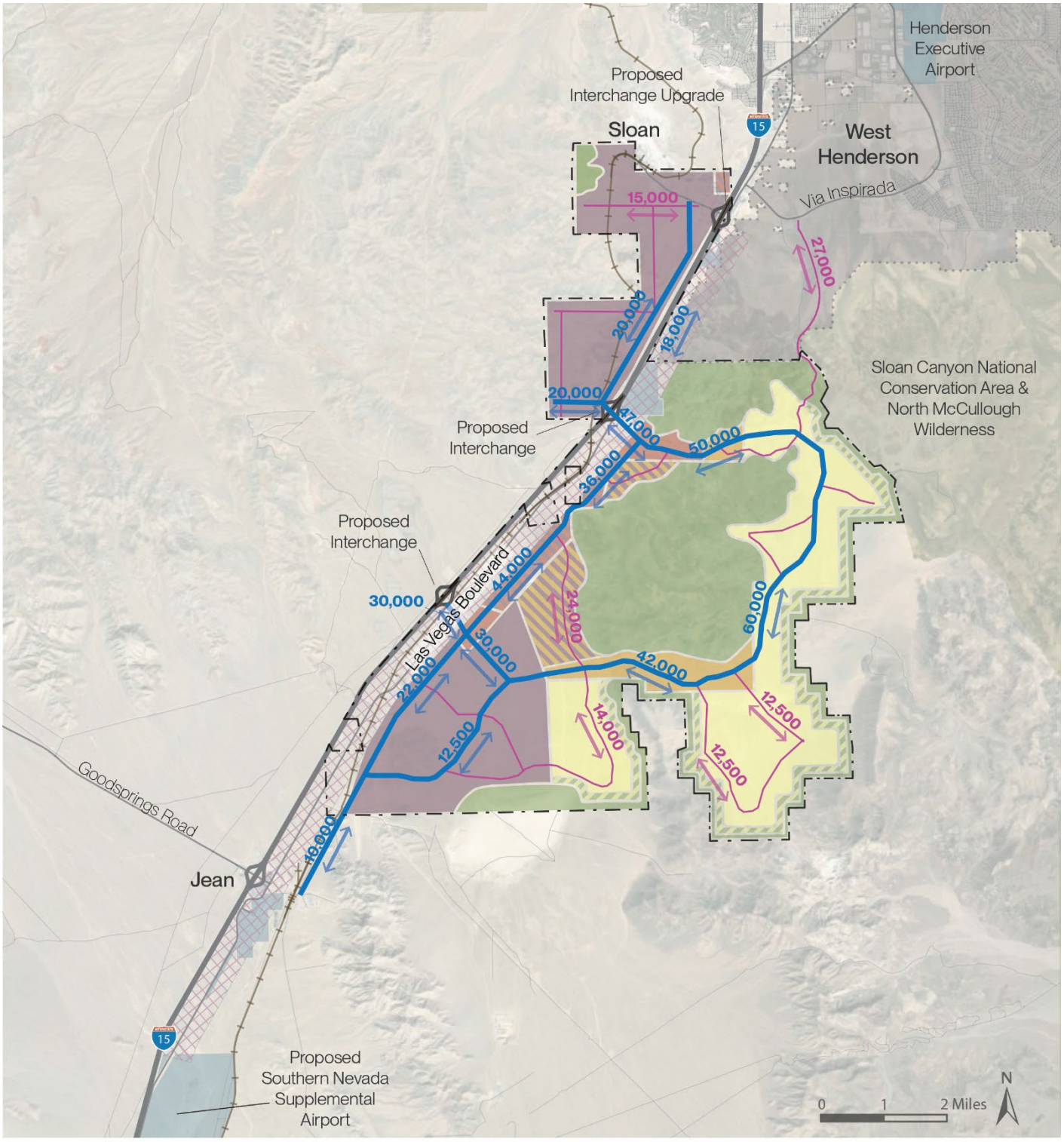
A.1 Trip Generation

Trip Generation

			Classification (Area %)						Classification (Acres)					
Land Use Category	**Land Use Acres**	**15% Reduction due to Roadways, Sidewalks, Utility Right of Way, Open Space, Parks, Bike Trails, etc.**	**Single Family Detached Housing**	**Low Rise Residential**	**Shopping Center (>150k)**	**General Office Building**	**Industrial Park**	**Ware House**	**Single Family Detached Housing**	**Low Rise Residential**	**Shopping Center (>150k)**	**General Office Building**	**Industrial Park**	**Ware House**
Open Space	8,713	8,713	-	-	-	-	-	-	-	-	-	-	-	-
Residential/Open Space Buffer	1,416	1,204	100%	-	-	-	-	-	1,204	-	-	-	-	-
Traditional Mixed Use	1,178	1,001	-	75%	13%	13%	-	-	-	751	125	125	-	-
Traditional Mixed Use/ Mixed Employment	1,162	988	-	50%	13%	13%	13%	13%	-	494	123	123	123	123
Retail/Hospitality/ Entertainment + Mixed Employment	626	532	-	-	33%	33%	33%	-	-	-	177	177	178	-
Retail/Hospitality/ Entertainment	514	437	-	-	50%	50%	-	-	-	-	218	218	-	-
Mixed Employment	8,162	6,938	-	-	-	-	-	100%	-	-	-	-		6,938
Residential	6,033	5,128	100%	-	-	-	-	-	5,128	-	-	-	-	-

Trip Generation Continued

	Independent Variables (IV)		IV Values						Daily Trips (Weekday) - from ITE Trip generation										
Land Use Category	**Dwelling Units (per acre)**	**GFA per acre**	**210 Single Family Detached Housing (DU)**	**230 Low Rise Residential (DU)**	**820 Shopping Center (>150k) (1000 Sq. Ft GLA)**	**770 General Office Building (1000 Sq. Ft GFA)**	**130 Industrial Park (1000 Sq. Ft GFA)**	**150 Ware House (1000 Sq. Ft GFA)**	**Single Family Detached Housing**	**Low Rise Residential**	**Shopping Center (>150k)**	**General Office Building**	**Industrial Park**	**Ware House**	**Gross Daily Trips Total**	**Passby %**	**Passby**	**Internal Circulation%**	**Trips Which Stay Within the Network**	**Trips Toward Vegas/Jean/California**
									9.43	**3.44**	**37.01**	**12.44**	**3.37**	**1.71**						
Open Space	-	-	-	-	-	-	-	-							0		0		0	0
Residential/Open Space Buffer	1.25	-	1,505	-	-	-	-	-	14,187						14,187		14,187	75%	10,641	3,547
Traditional Mixed Use	2.25	0.2	-	1,690	1,090	1,090	-	-		5,813	40,356	13,565			59,734	25%	44,800	75%	33,600	11,200
Traditional Mixed Use/ Mixed Employment	1.5	0.2	-	741	1,076	1,076	1,076	807		2,548	39,808	13,381	3,625	1,379	60,741	20%	48,593	75%	36,445	12,148
Retail/Hospitality/ Entertainment + Mixed Employment	-	0.2	-	-	1,544	1,544	1,548	-			57,131	19,203	5,218		81,552	20%	65,242	65%	42,407	22,835
Retail/Hospitality/ Entertainment	-	0.2	-	-	1,903	1,903	-	-			70,435	23,675			94,110	20%	75,288	65%	48,937	26,351
Mixed Employment	-	0.15	-	-	-	-	-	45,331						77,516	77,516	10%	69,764	65%	45,347	24,418
Residential	2.5	-	12,820	-	-	-	-	-	120,894						120,894		120,894	75%	90,670	30,223
															508,734		438,769		308,047	130,722



LEGEND

- Study Area
- Railroad
- Existing Roads
- Utility Corridor
- Clark County Department of Aviation Property
- City of Henderson
- Retail/Hospitality/Entertainment
- Traditional Mixed Use
- Mixed Employment
- Residential
- Open Space
- Transition Areas (mix of two land use types)
- Proposed Arterials
- Proposed Collectors

MIG

CLARK COUNTY NEVADA

HENDERSON

A.2 2023 Las Vegas Valley Flood Control Master Plan - Flood Control Facilities

ID / Mile	Status	Facility Description	Length (ft.)	Flow (cfs)	HEC-1 Node	HEC-1 Model	Tributary Area (sq.mi.)	Channel Slope (%) **
DCLA		**DUCK CREEK LARSON ST**						
0001	P	102,690 CFS PMF SPILLWAY		102690	CPITW-IN	DUCK5A	32.88	
0019	P	2,641 AC-FT DUCK CREEK LARSON DETENTION BASIN		10221	CPITW-IN	DUCK5A	32.88	
0020	P	2: 14' X 7' RCB	1000	3576	CPITWLEV	DUCK3A	3.74	1.00
0021	P	RIPRAP LEVEE 8'	1100	378	PWD350C	DUCK3A	0.19	1.00
0022	P	CONC CHNL 28'W 7'D 0:1 SS	700	3576	CPITWLEV	DUCK3A	3.74	1.60
0035	E	4: 12' X 5' RCBC @ VIA INSPIRADA	70	3576	CPITWLEV	DUCK3A	3.74	1.60
0037	P	CONC CHNL 28'W 7'D 0:1 SS	4205	3576	CPITWLEV	DUCK3A	3.74	1.60
DCLV		**DUCK CREEK - LAS VEGAS BOULEVARD**						
0172	E	15' X 8' RCB	1955	1013	CDLD340	DUCK3B	0.88	1.59
0211	E	16' X 8' RCB	260	594	CDLD335	DUCK3B	0.56	1.49
0216	E	18' X 8' RCB	297	594	CDLD335	DUCK3B	0.56	1.49
0221	E	22' X 8' RCB	500	594	CDLD335	DUCK3B	0.56	1.36
0230	E	TRANSITION STRUCTURE	89	594	CDLD335	DUCK3B	0.56	11.00
0232	E	4: 12' X 5' RCB	303	594	CDLD335	DUCK3B	0.56	0.61
0237	P	84" RCP	3890	594	CDLD335	DUCK3B	0.56	1.30
0316	P	66" RCP	3020	274	CDLD335A	DUCK5A	33.07	1.30
0373	E	4: 12' X 5' RCBC @ I-15	221	255	PITWEST	DUCK5A	32.88	1.60
0413	P	60" RCP W/ 36" ORIFICE OUTLET	1400	255	PITWEST	DUCK5A	32.88	1.39
DCN1		**DUCK CREEK NATURAL WASH 1**						
0000	E	NATURAL WASH (TO REMAIN)***	3620	1327	CPWD320	DUCK3A	0.96	1.90
DCW1		**DUCK CREEK WASH - TRIBUTARY 1**						
0251	E	113 AC-FT BRUNER DETENTION BASIN		1490	CDLD260	DUCK3A	1.20	
0252	E	11' X 7' RCAP	1457	577	DLD270	DUCK3A	0.44	1.58
PTGL		**PITTMAN GILESPIE**						
0000	E	66" RCP (REPLACE W/ PTGL0001)	600	679	CPND180X	DUCK3A	0.48	1.40
0001	P	7' X 6' RCB (REPLACES PTGL0000)	600	679	CPND180X	DUCK3A	0.48	1.40
PTGS		**PITTMAN GILLESPIE ST**						
0000	E	2: 18' X 8' RCBC	313	1829	CPND135X	DUCK3B	1.59	0.50
PTLB		**PITTMAN - LARSON BERMUDA**						
0000	P	2: 18' X 8' RCBC @ LARSON LN	150	3041	CPND190X	DUCK3A	7.43	1.48
PTLL		**PITTMAN LARSON LANE**						
0000	P	7' X 6' RCB	2716	679	CPND180X	DUCK3A	0.48	1.40
PTN2		**PITTMAN NATURAL WASH 2**						
0000	E	NATURAL WASH (TO REMAIN)***	3390	1777	CPND125A	DUCK3B	1.44	
0048	P	4: 12' X 6' RCBC @ GILESPIE	185	1777	CPND125A	DUCK3B	1.44	0.50
0055	E	NATURAL WASH (TO REMAIN)***	1230	1418	CPND002X	DUCK3B	1.16	
0078	P	2: 12' X 6' RCBC @ SENATE	400	1418	CPND002X	DUCK3B	1.16	1.50
0086	E	NATURAL WASH (TO REMAIN)***	3710	1418	CPND002X	DUCK3B	1.16	
0149	P	12' X 6' RCBC @ VIA INSPIRADA	410	605	CPSD000	DUCK3B	0.49	0.60
0150	E	NATURAL WASH (TO REMAIN)***	4480	605	PSD000	DUCK3A	0.49	
0167	P	UNLINED LEVEE 7' ***	2030	605	PSD000	DUCK3A	0.49	11.10
PTN5		**PITTMAN NATURAL WASH 5**						
0000	E	NATURAL WASH (TO REMAIN)***	4125	1323	CPSD055	DUCK3A	1.88	10.70
0020	P	UNLINED LEVEE 6' ***	1375	406	PSD001	DUCK3A	0.37	13.27
PTNO		**PITTMAN NORTH DETENTION BASIN AND OUTFALL SYSTEM**						
0182	E	1,553 AC-FT PITTMAN NORTH DETENTION BASIN		6155	PITN-IN	DUCK3B	5.37	
PTSD		**PITTMAN WASH - SOUTH**						
0000	P	CONC CHNL 30'W 8'D 0:1 SS	1112	4882	CPND003X	DUCK3B	4.32	1.80
0016	P	13' X 8' RCB	83	3041	CPND190X	DUCK3A	7.43	1.80
0017	P	CONC CHNL 30'W 8'D 0:1 SS	1225	3041	CPND190X	DUCK3A	7.43	1.48
0040	P	18' X 7' RCB	380	3041	CPND190X	DUCK3A	7.43	2.00
0070	P	25' X 6' RCB	340	2933	CPND185X	DUCK3B	2.59	1.48
0071	E	28' X 8' RCA	3491	2933	CPND185X	DUCK3B	2.59	1.00
0125	E	72" RCP	235	800	CPND000X	DUCK3A	0.56	2.00
0135	P	8' X 6' RCB	5480	800	CPND000X	DUCK3A	0.56	2.00
0231	E	4: 14' X 6' RCBC @ VIA INSPIRADA	85	420	PSDG10	DUCK3A	0.31	0.50
0234	P	452 AC-FT SOUTHWEST PITTMAN DETENTION BASIN		2411	SWPIT-IN	DUCK3A	4.58	
SLCA		**SLOAN - CAMERON ROAD**						
0001	E	NATURAL WASH	1360	4427	CPWD230	DUCK3A	4.54	1.76
0024	P	4: 10' x 8' RCBC @ CAMERON ROAD (REPLACES SLCA0025)	50	4427	CPWD230	DUCK3A	4.54	1.00
0025	E	3: 24" RCPC @ CAMERON ROAD (REPLACED W/ SLCA0024)	50	4427	CPWD230	DUCK3A	4.54	1.00

ID / Mile	Status	Facility Description	Length (ft.)	Flow (cfs)	HEC-1 Node	HEC-1 Model	Tributary Area (sq.mi.)	Channel Slope (%) **
SLCA		**SLOAN - CAMERON ROAD**						
0026	E	NATURAL WASH	1215	4427	CPWD230	DUCK3A	4.54	1.93
0048	P	3: 10' x 8' RCBC @ DECATUR BLVD (REPLACES SLCA0049)	70	4427	CPWD230	DUCK3A	4.54	2.10
0049	E	2: 24" RCPC @ DECATUR BLVD (REPLACED W/ SLCA0048)	70	4427	CPWD230	DUCK3A	4.54	2.10
0050	E	NATURAL WASH	2180	4427	CPWD230	DUCK3A	4.54	1.93
0091	E	NATURAL WASH	6800	3315	CPWD210	DUCK3A	3.61	2.94
SLO1		**SLOAN AREA 1**						
0000	E	NATURAL WASH	2143	9765	CPWD240	DUCK5A	29.69	1.58
0040	P	6: 10' X 8' RCB	1843	9765	CPWD240	DUCK5A	29.69	1.58
0075	P	10: 10' X 8' RCBC @ ARVILLE	50	9765	CPWD240	DUCK5A	29.69	1.00
0076	E	NATURAL WASH	500	8074	CPWD170	DUCK5A	24.73	1.43
0085	E	NATURAL WASH	4775	7158	CPWD120	DUCK5A	21.79	1.61
0176	E	NATURAL WASH	3830	2045	CPWD300*	DUCK3A	1.47	1.51
SLO2		**SLOAN AREA 2**						
0000	E	NATURAL WASH	5125	2097	CPWD200	DUCK3A	1.66	2.05
SLO3		**SLOAN AREA 3**						
0000	E	NATURAL WASH	11235	1839	CPWD160	DUCK3A	2.44	2.22
SLO4		**SLOAN AREA 4**						
0000	E	NATURAL WASH	4010	1049	PWD105	DUCK3A	0.90	2.32

*The HEC-1 node shown identifies the controlling concentration point for the associated facility and is located upstream of this facility due to decreasing peak flow with increasing tributary area caused by storm distribution transitions, depth area reduction factors, or attenuation of flow from routing.
**As-built or design slopes were used when available. All other slopes are based on existing topography. The user should verify the facility slope listed prior to performing any facility specific analysis.
***Refer to City of Henderson's "West Henderson Trail and Watershed Mapping Project."
^ For parallel facilities, the existing facility flow equals its normal depth capacity, and the proposed parallel facility flow equals the remaining flow (i.e. HEC-1 Node flow = existing facility normal depth capacity + proposed parallel facility flow).

REGIONAL FLOOD CONTROL DISTRICT

2023 LAS VEGAS VALLEY FLOOD CONTROL MASTER PLAN UPDATE

FACILITY INVENTORY FIGURE F-52

LEGEND

ID (Facility Identifier) AABB
Parent Stream Name
Stream Name
Mile 0000
Distance Above Confluence with Parent Stream (Miles)
Miles in Hundredths

Existing Facility……..E
Proposed or Modified Facility……P
Contingency Level
Category A……P
Category B……P0

Bottom Width……W
Depth……D
Side Slope, H:V……SS

Construction Features

Cast in Place Concrete Pipe……CIPCP
Corrugated Metal Arch Pipe Culvert……CMAP
Corrugated Metal Pipe Culvert……CMPC
High Density Polyethylene……HDPE
Horizontal Elliptical Reinforced Concrete Pipe……HERCP
Reinforced Concrete Arch Pipe……RCAP
Reinforced Concrete Arch Culvert……RCAC
Reinforced Concrete Box……RCB
Reinforced Concrete Box Culvert……RCBC
Reinforced Concrete Pipe……RCP
Reinforced Concrete Pipe Culvert……RCPC
Storm Sewer Pipe……SSP

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REGIONAL FLOOD CONTROL DISTRICT

2023
LAS VEGAS VALLEY
FLOOD CONTROL
MASTER PLAN UPDATE

FIGURE F-52

FLOOD CONTROL FACILITIES

LEGEND

- Ultimate Development Boundary
- Existing Facilities
- Category A Proposed Facilities
- Category B Proposed Facilities
- Local Existing Facilities
- Detention Basin
- Culvert or Bridge Crossing
- Stormdrain
- Lined Channel
- Unlined Channel
- Levee/Dike
- Natural Wash/Floodway
- ID-Mile Separator

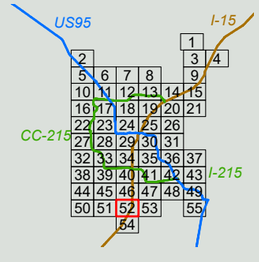
Remove & Replace/Parallel Facilities

Category A	Category B
Channel	Channel
Stormdrain	Stormdrain
Crossing	Crossing

N

0 500 1,000 2,000 3,000
Feet
Scale: 1 inch = 2,000 feet

Aerial Source: Nearmap Imagery 2023



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ID / Mile	Status	Facility Description	Length (ft.)	Flow (cfs)	HEC-1 Node	HEC-1 Model	Tributary Area (sq.mi.)	Channel Slope (%) **
DCN1		**DUCK CREEK NATURAL WASH 1**						
0000	E	NATURAL WASH (TO REMAIN)***	3620	1327	CPWD320	DUCK3A	0.96	1.90
PTN2		**PITTMAN NATURAL WASH 2**						
0150	E	NATURAL WASH (TO REMAIN)***	4480	605	PSD000	DUCK3A	0.49	
0167	P	UNLINED LEVEE 7' ***	2030	605	PSD000	DUCK3A	0.49	11.10
0175	E	NATURAL WASH (TO REMAIN)***	3910	2411	SWPIT-IN	DUCK3A	4.58	
0184	E	NATURAL WASH (TO REMAIN)***	880	2185	PSD010	DUCK3A	3.51	
0200	E	NATURAL WASH (TO REMAIN)***	2650	2185	PSD010	DUCK3A	3.51	
0251	E	NATURAL WASH (TO REMAIN)***	11050	2185	PSD010	DUCK3A	3.51	
PTN3		**PITTMAN NATURAL WASH 3**						
0000	E	NATURAL WASH (TO REMAIN)***	5000	2185	PSD010	DUCK3A	3.51	
PTN4		**PITTMAN NATURAL WASH 4**						
0000	E	NATURAL WASH (TO REMAIN)***	5000	2185	PSD010	DUCK3A	3.51	
PTN5		**PITTMAN NATURAL WASH 5**						
0000	E	NATURAL WASH (TO REMAIN)***	4125	1323	CPSD055	DUCK3A	1.88	10.70
PTSD		**PITTMAN WASH - SOUTH**						
0233	P	26,890 CFS PMF SPILLWAY		26890	SWPIT-IN	DUCK3A	4.58	
0234	P	452 AC-FT SOUTHWEST PITTMAN DETENTION BASIN		2411	SWPIT-IN	DUCK3A	4.58	
SLO1		**SLOAN AREA 1**						
0176	E	NATURAL WASH	3830	2045	CPWD300*	DUCK3A	1.47	1.51
0248	E	NATURAL WASH	3850	2045	CPWD300	DUCK3A	1.47	1.68
0338	E	NATURAL WASH	5050	5754	CPWD280	DUCK3A	7.00	1.72
0415	E	NATURAL WASH	6125	4088	CPWD270	DUCK3A	5.10	2.30
SLO5		**SLOAN AREA 5**						
0000	E	NATURAL WASH	4700	940	PWD090	DUCK3A	0.55	2.52
SLO6		**SLOAN AREA 6**						
0000	E	NATURAL WASH	6800	5105	CPWD070	DUCK4A	10.22	1.94
0129	E	NATURAL WASH	2865	4555	CPWD060G	DUCK3A	7.35	1.67
SLO7		**SLOAN AREA 7**						
0000	E	NATURAL WASH	2325	1696	CPWD060E	DUCK3A	2.33	2.40
SLO8		**SLOAN AREA 8**						
0000	E	NATURAL WASH	6276	809	PWD030	DUCK3A	0.59	3.14

**The HEC-1 node shown identifies the controlling concentration point for the associated facility and is located upstream of this facility due to decreasing peak flow with increasing tributary area caused by storm distribution transitions, depth area reduction factors, or attenuation of flow from routing.*
***As-built or design slopes were used when available. All other slopes are based on existing topography. The user should verify the facility slope listed prior to performing any facility specific analysis.*
****Refer to City of Henderson's "West Henderson Trail and Watershed Mapping Project."*
^ For parallel facilities, the existing facility flow equals its normal depth capacity, and the proposed parallel facility flow equals the remaining flow (i.e. HEC-1 Node flow = existing facility normal depth capacity + proposed parallel facility flow).

REGIONAL FLOOD CONTROL DISTRICT

2023 LAS VEGAS VALLEY FLOOD CONTROL MASTER PLAN UPDATE

FACILITY INVENTORY FIGURE F-54

LEGEND

ID (Facility Identifier) AABB
Parent Stream Name
Stream Name
Mile 0000
Distance Above Confluence with Parent Stream (Miles)
Miles in Hundredths

Existing Facility……..E
Proposed or Modified Facility……P
Contingency Level
Category A……..P
Category B……P0

Bottom Width…….. W
Depth……..…….. D
Side Slope, H:V…..... SS

Construction Features

Cast in Place Concrete Pipe…….....……..	CIPCP	Reinforced Concrete Arch Culvert……..	RCAC
Corrugated Metal Arch Pipe Culvert…….....……..	CMAP	Reinforced Concrete Box……..	RCB
Corrugated Metal Pipe Culvert…….....……..	CMPC	Reinforced Concrete Box Culvert……..	RCBC
High Density Polyethylene……..……..	HDPE	Reinforced Concrete Pipe……..	RCP
Horizontal Elliptical Reinforced Concrete Pipe.....	HERCP	Reinforced Concrete Pipe Culvert……..	RCPC
Reinforced Concrete Arch Pipe…….....……..	RCAP	Storm Sewer Pipe…….....……..	SSP

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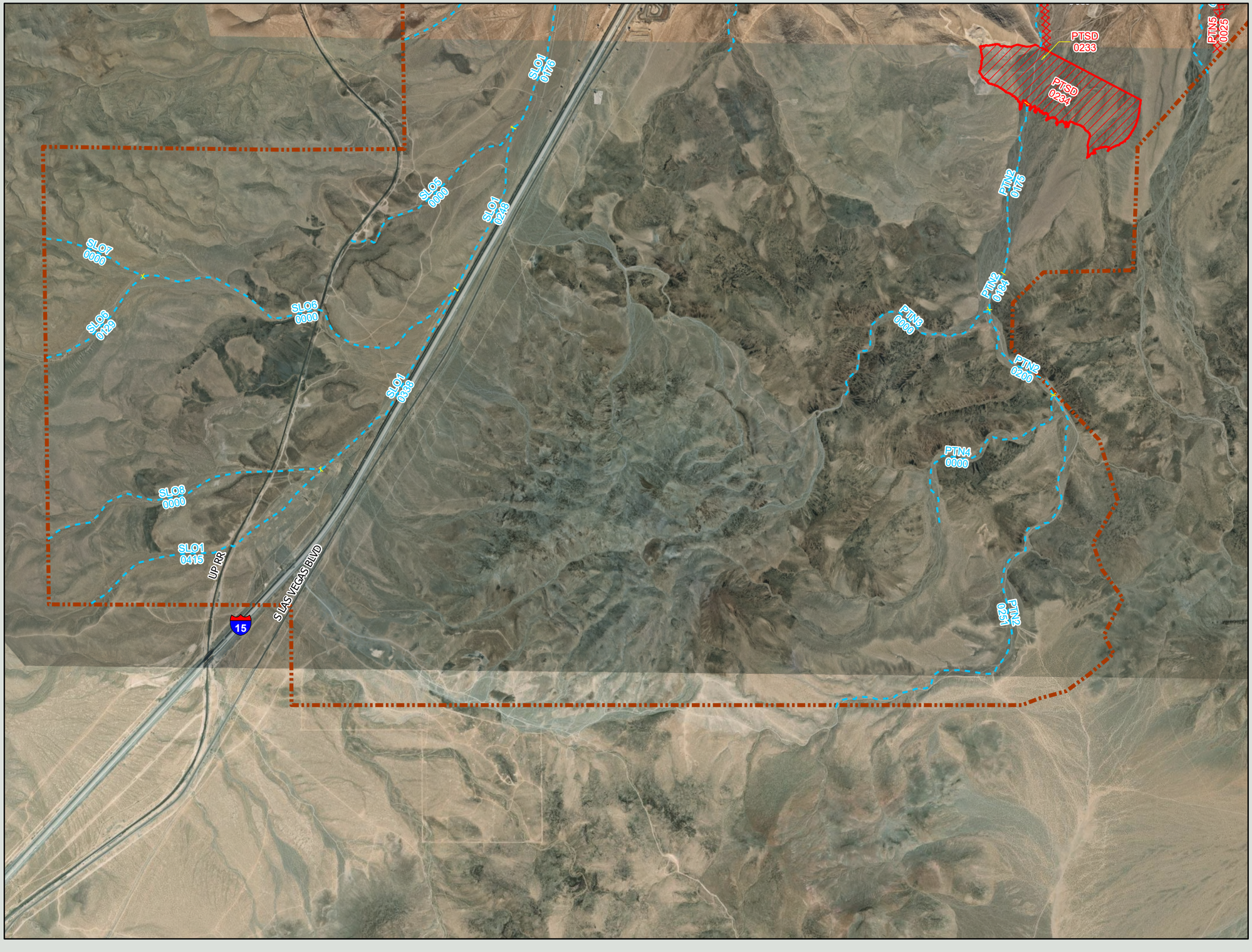


REGIONAL FLOOD CONTROL DISTRICT

2023
LAS VEGAS VALLEY
FLOOD CONTROL
MASTER PLAN UPDATE

FIGURE F-54

FLOOD CONTROL FACILITIES

LEGEND

- Ultimate Development Boundary
- Existing Facilities
- Category A Proposed Facilities
- Category B Proposed Facilities
- Local Existing Facilities
- Detention Basin
- Culvert or Bridge Crossing
- Stormdrain
- Lined Channel
- Unlined Channel
- Levee/Dike
- Natural Wash/Floodway
- ID-Mile Separator

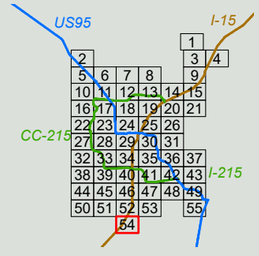
Remove & Replace/Parallel Facilities

Category A	Category B
Channel	Channel
Stormdrain	Stormdrain
Crossing	Crossing

N

0 500 1,000 2,000 3,000
Feet
Scale: 1 inch = 2,000 feet

Aerial Source: Nearmap Imagery 2023



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Westwood

A.3 Potable Water Demand Calculations

Table 1-Development Area Build Out Land Use								
Land Use Description	Land Use Area (Acre)	15% Reduction Applied (Acre)	Single Family Detached Housing	Low Rise Residential	Shopping Center (>150k)	General Office Building	Industrial Park	Warehouse
Residential/Open Space Buffer	1,416	1,204	1,204					
Traditional Mixed Use	1,178	1,001		751	125	125		
Traditional Mixed Use/ Mixed Employment	1,162	988		494	123	123	123	123
Retail/Hospitality/ Entertainment + Mixed Employment	626	532			177	177	178	
Retail/Hospitality/ Entertainment	514	437			218	218		
Mixed Employment	8,162	6,938						6,938
Residential	6,033	5128	5128					
Total	19,091	16,228	6,332	1,245	644	644	301	7,061

Table 2-Build Out Population	
Scenario	Acres
Build Out Total Residential Area	7576
EPS 2045 Total Residential Area	6155

	Residential ERU Per acre	Attached and Multi-family homes ERU per acre are combined to fit into land use table categories	Comments
EPS 2045 Land Use Make Up	3	(7+20)	n/a
Acres	5,369	787	Attached = 2,684 Units/383.4 Acres. Multi-Family = 8,053 Units/402.65 Acres
Units	16,107	10,737	
Units Per Acre	3	13.64	n/a
ERU Population Density	2.835	2.835	
Population	45,663	30,439	
Full Build Out	3 Residential ERU per acre	13.64 Residential ERU per acre	n/a
Residual acres	963	458	n/a
Unit	2,888	6,246	n/a
ERU Population Density	2.835	2.835	n/a
Population	8,187	17,708	n/a
Total Build Out Population	101,998		n/a

Table 3-Land Use Table Mapped to GPD/Acre	
Land Use	Water Resource Table
Single Family Detached Housing	LDR
Low Rise Residential	MDR
Shopping Center (>150k)	Commercial
General Office Building	Commercial
Industrial Park	Industrial
Warehouse	Industrial

Table 4- Industrial Land Use GPD/Acre			
Business Type	M&E GPCD per Employee	Employees Per Acre	GPCD Per Acre
Industrial	20	92.88	1,857.57

Table 5-Commerical Land Use GPD/Acre			
Business Type	Average Unit	GPCD Per Unit	Total GPD For All Units
Theater	300	3	900
Restaurant	100	10	1,000
Office	50	13	650

Table 6-Build Out Land Use Residential Land Use GPD/acre & Project population Check									
Land Use	Unit Density Per Acre	People Per Unit	GPCD	Average Daily Contribution (GPD/ERU)	Average Contribution (GPM/Unit)	Flow Rate (GPM/Acre)	GPD Per Acre	Acres	Population
LDR up to 8 - To match EPS Report and Build Out Projections of 3 ERU/Acre	3	2.835	92	260.82	0.18	0.54	782.46	6,331	53,845
MDR up to 16 - To match EPS Report and Build Out Projections of 13.64 ERU/Acre	13.64	2.835	92	260.82	0.18	2.45	3,557.56	1,245	48,143
Population Check									101,989

Table 7- JLUS Development Types Water Demand Table									
Land Use	Acres	Single Family Detached Housing	Low Rise Residential	Shopping Center (>150k)	General Office Building	Industrial Park	Ware-house	Gallons Per Day	MGD
Open Space		-	-	-	-	-	-	-	
Residential/ Open Space Buffer	1,204	100%	-	-	-	-	-		
GPD / Acre		783						942,082	0.94
Traditional Mixed Use	1,001	-	75%	13%	13%	-	-		
GPD / Acre			3,558	1,000	1,000			2,921,964	2.92
Traditional Mixed Use/ Mixed Employment	988	-	50%	13%	13%	13%	13%		
GPD / Acre			3,558	1,000	1,000	1,858	1,858	2,462,506	2.46
Retail, Hospitality, Entertainment + Mixed Employment	532	-	-	33%	33%	33%	-		
GPD / Acre				1,000	1,000	1,858		682,912	0.68
Retail, Hospitality, Entertainment	437	-	-	50%	50%	-	-		
GPD / Acre				1,000	1,000			436,900	0.44
Mixed Employment	6,938	-	-	-	-	-	100		
GPD / Acre							1,858	12,887,259	12.89
Residential	5,128	100%	-	-	-	-	-		
GPD / Acre		783						4,012,494	4.01
Total								24,346,116	24.35

Table 8-Total Residential Project Land Use Water Demand Table					
Land Use	Acres	Single Family Detached Housing	Low Rise Residential	Gallons per day	MGD
Residential/Open Space Buffer	1,204	100%	-		
Gallons Per Day / Acre		783		942,082	0.94
Traditional Mixed Use	1,001	-	75%		
Gallons Per Day / Acre			3,521	2,644,236	2.64
Traditional Mixed Use/ Mixed Employment	988	-	50%		
Gallons Per Day / Acre			3,521	1,738,880	1.74
Residential	5,128	100%	-		
Gallons Per Day / Acre		783		4,012,494	4.01
Totals				9,337,692	9.34

Table 9-Comparison of Maximum Day Demands							
Rate Classification	Single Family Detached Housing	Low Rise Residential	Multi-family home	Shopping Center (>150k)	General Office Building	Industrial Park	Ware-house
Henderson Future Maximum Day Demands GPM/acre	2.17	3.38	3.38	2.44	2.44	1.74	1.74
Henderson Future Maximum Day Demands GPD/acre	3,124.8	4,867.2	4,867.2	3,513.6	3,513.6	2,505.6	2,505.6
LVVWD Future Maximum Day Demands GPM/acre	1.81	3.61	3.78	1.67	1.67	1.04	1.04
LVVWD Future Maximum Day Demands GPD/acre	2,606.4	5,198.4	5,443.2	2,404.8	2,404.8	1,497.6	1,497.6
An average rate for Industrial Park and Warehouse was used (2.44+0.76)22=1.74. As the future land use is unknown.							

Table 10- JLUS Development Types Maximum Day Demands									
Land Use	Acres	Single Family Detached Housing	Low Rise Residential	Shopping Center (>150k)	General Office Building	Industrial Park	Ware-house	Gallons Per Day	Demand MGD
Open Space		-	-	-	-	-	-		
Residential/Open Space Buffer	1,204	100%	-	-	-	-	-		
Gallons Per Day / Acre		3,125						3,762,259	3.76
Traditional Mixed Use	1,001	-	75%	13%	13%	-	-		
Gallons Per Day / Acre			4867	3514	3514			4,534,687	4.53
Traditional Mixed Use/ Mixed Employment	988	-	50%	13%	13%	13%	13%		
Gallons Per Day / Acre			4867	3514	3514	2506	2506	3,889,958	3.89
Retail/Hospitality/ Entertainment + Mixed Employment	532	-	-	33%	33%	33%	-		
Gallons Per Day / Acre				3514	3514	2506		1,684,835	1.68
Retail/Hospitality/ Entertainment	437	-	-	50%	50%	-	-		
Gallons Per Day / Acre				3514	3514			1,535,092	1.54
Mixed Employment	6,938	-	-	-	-	-	100%		
Gallons Per Day / Acre							2506	17,383,101	17.38
Residential	5,128	100%	-	-	-	-	-		0.00
Gallons Per Day / Acre		3125						16,024,131	16.02
Total MGD									48.81

City of Henderson Future Maximum Design Rates:

Table 2-2: Summary of Future Maximum Day Demand Factors

Land Use Type	Adopted Demand Factor (gpm / acre)	Alternate Demand Factor (gpm / acre)
Single Family – VLD (RS1, RS2)	4.68	3.24
Single Family – LD (RS4)	3.76	2.17
Single Family – LD / MD (RS6, RS8, RMH, RM10)	7.8	3.38
Multi-Family – MD (RM16)	8.0	2.04
Multi-Family – HD (RH24, RH 36)	12.96	3.16
Commercial	4.0	2.44
Industrial	5.12	2.44
School	5.0	1.12
Park / Common Element / Irrigated Turf	13.39	4.12
Public / Semi-public	4.0	2.44

Light Industrial / Warehousing / Distribution is 0.76 gpm/acre

LVVWD Future Maximum Design Rates:

LVVWD GIS Factors Gallons Per Minute Per Acre/Day

Land use	GPM-MD
Apartment	3.61
Artificial Lakes	8.07
Commercial	1.67
Condo	3.78
Duplex	2.32
Hospital	4.67
Hotel	4.23
Industrial	1.04
Medical Facilities	1.82
MIX USE	2.19
Mobile Homes	1.08
Motel	4.33
Park	3.09
Public	1.28
Religious	1.21
Resorts	11.18
School	2.01
Single Family	1.81

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