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# **MODELING AFFORDABLE HOUSING IN MOAB AND SPANISH VALLEY**

**MASTERS OF LANDSCAPE ARCHITECTURE THESIS PROJECT**

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**DECEMBER 1, 2018**

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State University for their willingness to advise and critique.

# ABSTRACT

The Colorado Plateau region of southeastern Utah is geographically unique. Iconic sandstone geological formations, such as the famous Delicate Arch, which adorns Utah license plates, dot the landscape. This beautiful environment has inspired the formation of national and state parks, as well as a multitude of diverse recreation areas.

Affordable housing in Moab and Spanish Valley is a key issue for the development of the valley. This has been well documented by the Moab Area Housing Task Force (MAHTF) in its 2017 Moab Area Affordable Housing Plan. This Plan

B Thesis Project builds on the work of the task force, by documenting efforts to address where and how affordable housing might be located in the valley.

In order to develop consensus around the location of affordable housing, a geodesign workshop was sponsored and hosted by the task force, and prepared and facilitated by Barty Warren-Kretzschmar and Matthew Starley. In the scope of the following thesis, using Geodesignhub software, stakeholders in the area gathered to identified areas where housing might be located.

Workshop results were analyzed in order to identify a priority focus area for locating affordable housing, and from those results, a priority focus area for locating affordable housing was identified by the MAHTF. Three design concepts for this area have been created that integrate the results of the workshop as well as the results of a study of design strategies and housing typologies appropriate for Moab and Spanish Valley.



# METHODOLOGY

## BACKGROUND

### USU BIOREGIONAL PLANNING STUDIOS 2016/2017

This project began with a review of the results of the student project from the Utah State University Bioregional Planning Studios held in the 2016/2017 fall and spring semesters that focused on the future development of Moab, UT, and the surrounding areas. This review provided background information about the key issues in the area related to planning and development.

In the process of these studios the project group traveled to Moab to tour the area. During their travel, they visited areas that are expected to play a significant role in the development of Spanish Valley. They also interacted with national, state, and local officials, nonprofit and private organizations, concerned citizens, and key stakeholders in the area currently shaping the future of the community of Moab and the surrounding areas. Based on these meetings and site visits, the project group identified biophysical and socio-cultural issues relevant for the region.

### MOAB WORKSHOP 2017 — MOAB FUTURES

As part of the 2016/2017 Bioregional Planning Studios previously mentioned, a Geodesignhub planning workshop was held in Moab on January 18/19, 2017 at the Utah State University Moab Campus. This workshop was prepared by the bioregional studio participants, and facilitated by Carl Steinitz. The workshop employed

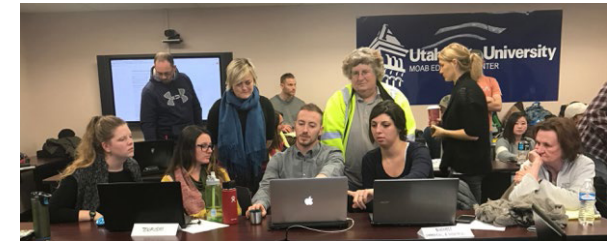
the Geodesignhub software that has been developed by Prof. Steinitz and Dr. Hrish Ballal.

The purpose of the workshop was to develop future planning alternatives for the area surrounding Moab, UT. The area included in the study and workshop begins with the highway corridor just north of the superfund site as a northern border. It included the community of Castle Valley as the eastern extent. Stretched just south of Ken's Lake to the south, and approached the potash drying ponds to the west. The projected timeline for the planning workshop and the work completed during the studios was set at 2040.

In preparation for this workshop, bioregional planning students identified bio-physical and socio-cultural systems that were relevant for the future development of the study area. The students used GIS data to model either the suitability or vulnerability of each system. For instance, a map describing a recreation system might include information on the best places to develop new trails, parks, and recreation centers. The resulting maps were used in the workshop to identify suitable areas for future development.

An important outcome of the workshop was a consensus among the participants about the development of the study area through the negotiation of one future plan/design. Central to the future vision for Moab were solutions for affordable housing in the area.

Participants of the workshop who were on the Affordable Housing Task Force sponsored/promoted a second workshop that focused on affordable housing solutions for the study area. The Moab Affordable Housing Geodesign workshop forms the basis of this thesis, which was conceived, organized and facilitated as part of my master thesis.



*Photo Credit : Dr. Barty Warren-Kretzschmar*

## ANALYSIS

### HISTORY OF HOUSING IN MOAB AND SPANISH VALLEY

Historical research was completed in order to provide context for current housing issues in Moab and Spanish Valley. Attention was given to the regions major economic drivers. These economic drivers influenced the development of housing currently available in Spanish Valley. This history of development informs an understanding of current housing issues in Moab.

## **EFFECTS OF MOAB'S ROLE AS A GATEWAY COMMUNITY ON AFFORDABLE HOUSING**

An analysis of Moab's current economic driver was conducted, in order to understand how the demands of serving as a seasonal gateway community to outdoor recreationalists are effecting the demand for affordable housing in the area. This analysis describes how the transitions from an extraction based economy to a tourism based economy has altered housing demand, as well as community members' ability to afford existing housing in the area.

## **IDENTIFYING AFFORDABLE HOUSING NEEDS**

The current demand for affordable housing within the study area was approximated using statistics gathered from the 2017 Moab Area Affordable Housing Plan as well as EJSREEN ACS Summary Report provided by the United States Environmental Protection Agency. Based on this data, it was found that the current need for affordable housing is 1,504 units. This is based on ratio of 1.3 housing units per cost-burdened household found within the study area. This ratio reflects the percentage of affordable housing units that are currently vacant due to nightly vacation rentals or second homes.

## **UNDERSTANDING SPANISH VALLEY'S URBAN STRUCTURE**

Land ownership parcels within the valley were divided into general use categories of; higher-density housing, lower-density housing, commercial/industrial, and public facilities. Transportation/gray infrastructure, open space/green infrastructure and large undeveloped areas were also identified. Land use patterns were analyzed to inform strategies for development within the valley.

## **STRATEGIES FOR INTEGRATING AFFORDABLE HOUSING IN SPANISH VALLEY**

General development strategies for introducing affordable housing in the study area were identified. These were informed by a study of relevant literature on the subject of land planning and integrating affordable housing into existing neighborhoods. The information collected was used to inform conceptual designs for a specific priority focus area identified for the introduction of affordable housing.

## **HOUSING TYPOLOGIES APPROPRIATE FOR INTRODUCING AFFORDABILITY**

Housing types at a variety of densities were identified through a study of planning documents produced for neighborhoods of a similar urban scale to that of Moab City, as well as literature on planning and increasing housing densities. These housing types were selected because of their potential to diversify the available housing options in Moab and Spanish Valley, as well as offer a variety of units that might better meet the economic profile of the community, creating a greater affordability for valley residents.

## **BUILDING CONSENSUS AMONG COMMUNITY STAKEHOLDERS**

### **MOAB AREA AFFORDABLE HOUSING WORKSHOP 2018**

A second Geodesignhub planning workshop was held on January 9 and 10, 2018 at the USU Moab Campus in Moab, UT. The workshop was hosted by the MAHTF and run by Barty Warren-Kretzschmar and Matthew Starley.

Geodesignhub software, which facilitates the workshop work flow, and can accommodate input from the variety of stakeholders who

live, work, and play in the area, was used. Geodesignhub also accommodates the input of design professionals and scientific experts in fields relevant to the objectives of any given project.

Seven GIS maps were created that described important bio-physical and cultural systems in the study area. These systems included:

- Higher-Density Housing
- Lower-Density Housing
- Public Facilities
- Water
- Open Space/Green Infrastructure
- Commercial/Industrial
- Transportation/Gray Infrastructure

Prior to the workshop, developers, private citizens, individuals involved in non-profit organizations, Grand County and Moab City employees were interviewed about the projects and policies that they considered important for the future development of the study area.

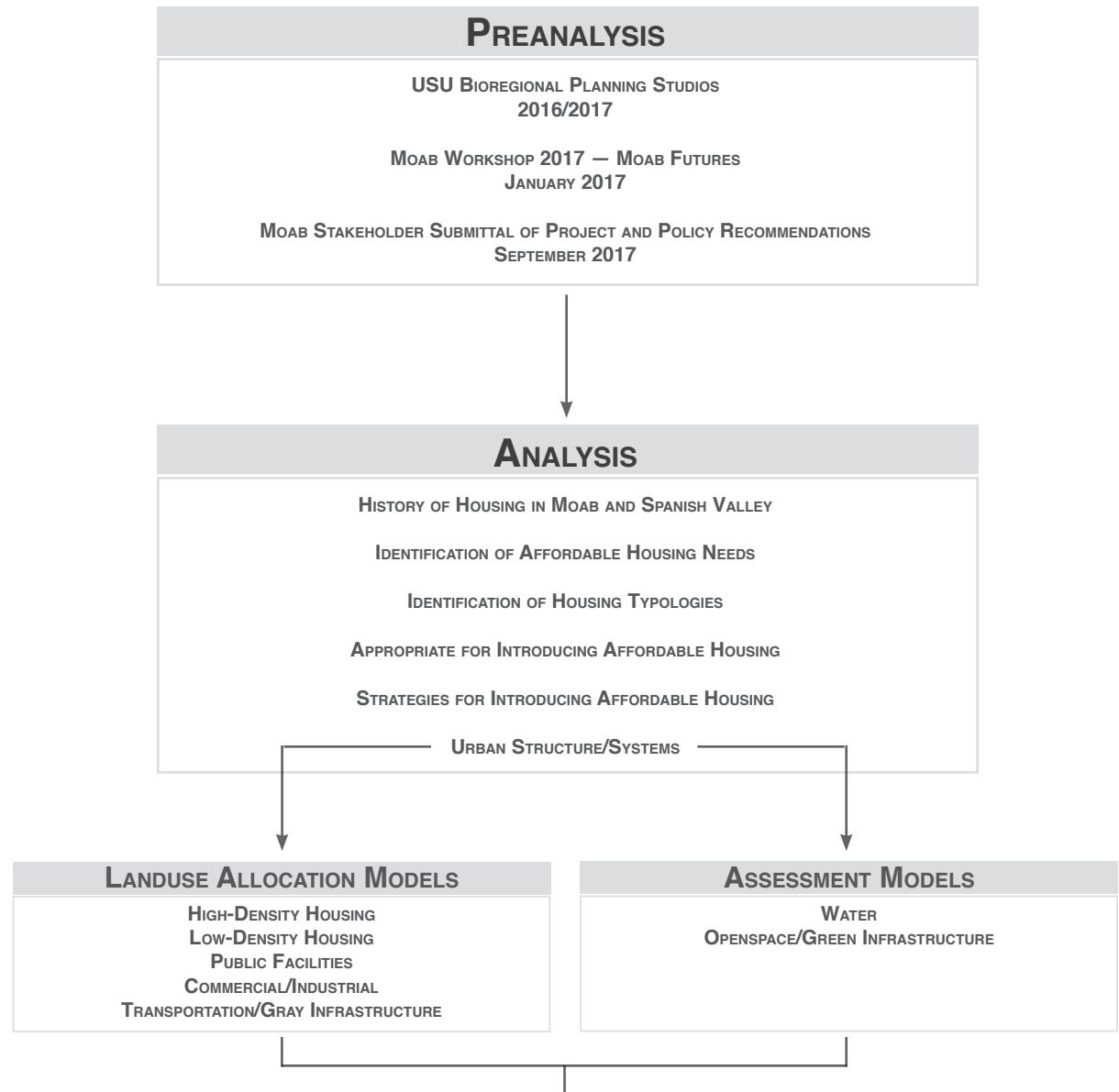
## **FINAL WORKSHOP DESIGN**

Participants reviewed projects and policies collected during the interviews with community members. A total of 353 projects and 59 policies had been inputted into the geodesign software. In stakeholder groups, workshop participants used these diagrams to develop designs for the study area that considered all seven systems. The negotiation between the different stakeholder groups resulted in one design that represented the consensus of the participants about future development in Moab and the surrounding area.

## CONCEPTUAL DESIGNS FOR THE PRIORITY FOCUS AREA

An analysis of the distribution of projects in the final workshop proposal helped to identify districts and focus areas suitable for affordable housing. Five Spanish Valley housing districts were identified. Within each district one focus area was located for affordable housing. These findings were presented to the MAHTF, who selected one priority focus area for introducing affordable housing. This thesis develops three scenarios for the development of this site. The conceptual design scenarios will be informed by background research on the history of housing in the valley, the current urban structure of the valley, and desired approaches for developing affordable housing in Moab and Spanish Valley.

## METHODOLOGY DIAGRAM



## MOAB AREA AFFORDABLE HOUSING WORKSHOP 2018

IDENTIFY OBJECTIVES

IDENTIFY PRIORITY FOCUS AREA FOR INTRODUCING AFFORDABLE  
HOUSING



## SCENERIO DEVELOPMENT AND CONCEPTUAL DESIGNS FOR THE PRIORITY FOCUS AREA

Scenario 1

**Conservation Focus Concept**

Scenario 2

**Housing Density Focus Concept**

Scenario 3

**Gradated Density Neighborhood Focus  
Concept**

# BACKGROUND

## USU BIOREGIONAL PLANNING STUDIOS 2016/2017 MOAB FUTURES

### INTRODUCTION

In the context of the Utah State University Bioregional Planning Studio (2016/2017), students studied the socio-cultural and bio-physical systems of Moab and the surroundings and identified the following issues as important for the future development of the study area:

### AFFORDABLE HOUSING

The price of land and housing in Moab has continued to rise as the popularity of the region as a tourist destination has increased. Nightly rentals and second homes impact the availability of housing for the local population. Local wages have not kept pace with these rising costs, creating affordability issues for local residents. Seasonal employees, vital to the success of the tourism service industry, are especially affected by the price of housing. This puts strain on local businesses that are struggling to attract and maintain the workforce they need to keep up with seasonal demands of tourism.

### WATER

The projected growth of the area will place increased demand on water resources. Adequate planning is needed to protect aquifers and water quality, as well as to increase the efficiency of existing water uses to reduce

the quantity of water used by Spanish Valley residents. The United States Geological Survey (USGS) is conducting a study to analyze the water quantity of local aquifers. The results of this study should indicate the amount of growth that Spanish Valley can support.

### TOURISM

Tourism is an important revenue generator for the area and is central to the Moab economy. However, the seasonal nature of Moab's tourism-based economy and the impact of the tourists on the infrastructure and resources are issues that must be addressed. This includes solid waste disposal, water supply, sewage, road and sidewalk maintenance, among other issues.

### PARKS / BUREAU OF LAND MANAGEMENT

Much of the recreational use is concentrated within Arches and Canyonlands National Parks, as well as the Bureau of Land Management (BLM) land immediately surrounding Spanish Valley. The increased visitation to the region has caused overcrowding and heavy use in these areas. This has left detrimental impacts on the landscape and infrastructure. The parks and BLM are not adequately funded to hire the personnel required to assist crowds at these numbers.

### SOUTH CORRIDOR

The southern corridor out of Moab is dominated by sprawling, sometimes unsightly land uses. There is no sense of entry into or exit out of Moab. The current development on this

land detracts from the scenic quality of the surrounding landscape.

### TRAFFIC

The increase in visitation to Arches National Park has led to seasonal traffic jams, not only at the park entrance but also within the city. The traffic impacts visitor experience, while idling cars produce air pollution.

### MINING AND ENERGY EXTRACTION

Mining has historically been an important part of the regional economy. How can Moab pursue the extraction of natural resources while creating the least amount of visual impact on the area? Can renewable energy development also play a role?

### AGRICULTURE AND LOCAL FOODS

Traditionally, agriculture has been an important cog in the wheel of the local economy. Presently, alfalfa is a major crop; however, it uses large quantities of water. Agricultural land is facing pressure from expanding housing developments, especially in the Spanish Valley. How can agricultural land be preserved? Can a shift to more sustainable agriculture and an economy of locally grown fruits and vegetables be made?



## ECONOMY

Moab's economy is heavily dependent on tourism. A more diversified economy would provide economic stability for the region. Moab has participated in an Area Sector Analysis Process lead by the Western Rural Development Center and the Governor's Office of Economic Development, and has identified ways to expand its spectrum of businesses and industries in the local economy. Locations for these opportunities need to be identified.

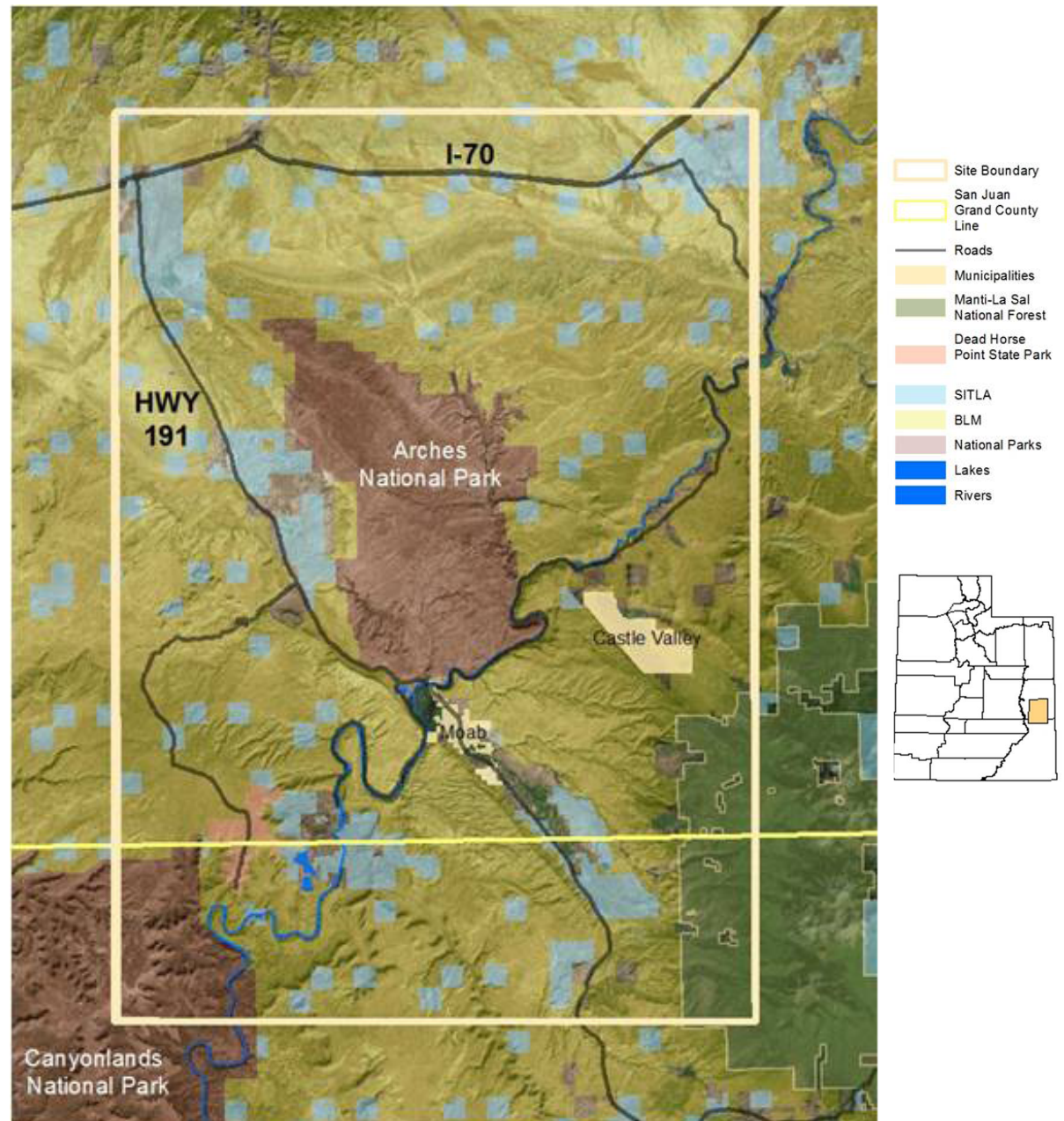


Figure 1. USU Bioregional Planning Studio Fall 2016 study area boundary. Extracted from Moab Futures Bioregional Planning Studio Project



# ANALYSIS

## HISTORY OF HOUSING IN MOAB AND SPANISH VALLEY

### NATIVE AMERICAN HISTORY 8,000 BCE – PRESENT DAY

The Moab and Spanish Valley area has had a long history of settlement and housing, dating back to the earliest native American peoples living in the area.

### HUNTER-GATHERERS: 8,000 BCE – 500 BCE

These earliest inhabitants of the Spanish Valley were nomadic people living off the resources provided by the natural landscape. Early hunter-gatherer(s) left little to no evidence of their housing, as they would typically construct simple shelters of sticks and grass. Typical housing structures may have resembled the structures pictured below created by the descendants of these hunter-gatherer(s) tribes.



[www.ilovehistory.utah.gov/people/first\\_peoples/tribes/paiute.html](http://www.ilovehistory.utah.gov/people/first_peoples/tribes/paiute.html)

### ANCESTRAL PUEBLOANS AND FREMONT: CE 1 – CE 1300

The region's next known inhabitants are the Puebloan and Fremont cultures. Around 1 EC, the first communities of these cultures were formed, constructing adobe dwellings in the sandstone cliffs. These dwellings have become emblematic of the greater four corners region. Some of these dwellings have proven remarkably resilient, remaining intact thousands of years after having been abandoned. Simple sandstone structures, like the one pictured below, were constructed in Spanish Valley. These are similar in their construction technique to the more elaborate structures preserved in the Mesa Verde National Park and other areas of the Southwest.

It is believed that these cliff dwellers were successful agriculturalists, who cultivated maize, beans, and squash, as well as relying on domesticated animals, such as turkey and dogs, until changes in the climatic conditions made it impossible to sustain their agricultural lifestyle, forcing these agrarian inhabitants to migrate south.



[www.nps.gov/cany/learn/historyculture/nativeamericans.html](http://www.nps.gov/cany/learn/historyculture/nativeamericans.html)

### UTES, PAIUTES, AND NAVAJOS: CE 800 – PRESENT DAY

Ute, Paiute, and Navajo cultures were the next to settle the region. During the early years, these cultures lived much like their hunter-gatherer ancestors. These cultures gradually evolved to include the cultivation of crops like corn, beans, and squash. Interactions with European settlers introduced horses and firearms, creating rapid cultural changes. The photo below depicts a group of Navajo standing beside their temporary housing structure, constructed of logs and animal hides (Paiute Indian Tribe of Utah, n.d.).



[www.grandcanyontrust.org/ute](http://www.grandcanyontrust.org/ute)

### NATIVE AMERICAN RELOCATION: EARLY 1800s – CURRENT

As European and American settlers progressively occupied the western territories, conflict with the existing native cultures often resulted. This led to the United States government to adopt a general policy of internment, isolating native tribes to reservation lands identified by the government, often far from

traditional homelands of tribes. Later policies aimed at assimilation of native cultures, such as Public Law 762 passed on September 1, 1954, displaced natives once again. Presently, legal actions concerning sovereignty of native land, restoration of tribal lands, and historic properties are heard in courts all across the United States (nps, n.d.).

## EARLY EUROPEAN SETTLEMENT Mid 1800s – Early 1900s

Attempts to establish trading posts along the Colorado River and Historic Santa Fe Trail brought the valley's earliest European settlers. These early settlers lived primarily in simple dugouts and cabins constructed of the limited wood resources found in the area. The early Europeans found this area and its previous inhabitants quite inhospitable and were forced to abandon the attempts to settle the area on a number of occasions. Early cabins probably resembled the log cabin pictured below, photographed in the early 1950s.



*Home of Mrs. Nora Johnson McConkie at Spanish Flats, just outside Moab. Where Mrs. McConkie is standing is the living quarters. The other half of the home was a blacksmith shop.*

[www.collections.lib.utah.edu/details?id=453180](http://www.collections.lib.utah.edu/details?id=453180)

## AGRICULTURAL COMMUNITY

### EARLY 1900s – 1950s

In the late 1800s, a settlement was established that proved permanent. Moab City was incorporated in 1902 and grew to be an agricultural community of about 1,000 people.



*Early agricultural lands in Spanish Valley*

[www.collections.lib.utah.edu/details?id=449417](http://www.collections.lib.utah.edu/details?id=449417)

Housing in this area ranged from log cabins to stately brick homes and commercial buildings, a few of which are preserved in the urban fabric today as historic landmarks. The Maxwell Hotel, pictured to the right, was constructed in 1892 and was a prominent feature of Main Street during this period, until it was destroyed by fire in 1937.



*The Maxwell Hotel*

[www.collections.lib.utah.edu/details?id=453169](http://www.collections.lib.utah.edu/details?id=453169)

During this period, Main Street had developed into an important commercial center but had yet to be paved, as depicted in the photo below from the early 1950s.



*Moab, Utah's Main Street in the 1950s, was home to a variety of businesses, including the Moab Barber Shop, Peterson Mercantile Company, and the 66 Club.*

[www.collections.lib.utah.edu/details?id=453179](http://www.collections.lib.utah.edu/details?id=453179)

## URANIUM BOOM AND BUST

### MID 1950s — MID 1980s

The discovery of uranium in the area, early in the 1950s, coincided with a spike in demand for the mineral. The graph to the right demonstrates the price of uranium per pound, in US dollars, between the years 1945 and 1995. The price of uranium in US dollars per pound reached a new high in 1955 at \$80 per pound. Driven by the Cold War era obsession with nuclear armament, uranium prices per pound reached an all-time high in 1980 at \$115 per pound, before quickly falling to the lowest ever price during the late 1980s and early 1990s.

The period of higher uranium prices, between the mid 1950s and mid 1980s, created an economic boom that thrust the community into postwar modernity. During this era, small-lot, single-family housing began to fill out the Plat of Zion blocks laid out years before, spilling out into adjacent formerly agricultural land. More than half of the valley's currently occupied housing was constructed during this period.

The plummet in the price of uranium starting in the mid-1980s brought stark changes to Moab and Spanish Valley. Mining and extraction industry jobs, which had previously sustained a community of around 6,000 permanent residents, became scarce. This caused a decrease in the population of nearly 50 percent. Property values plummeted, and large numbers of homes were abandoned to sit vacant.

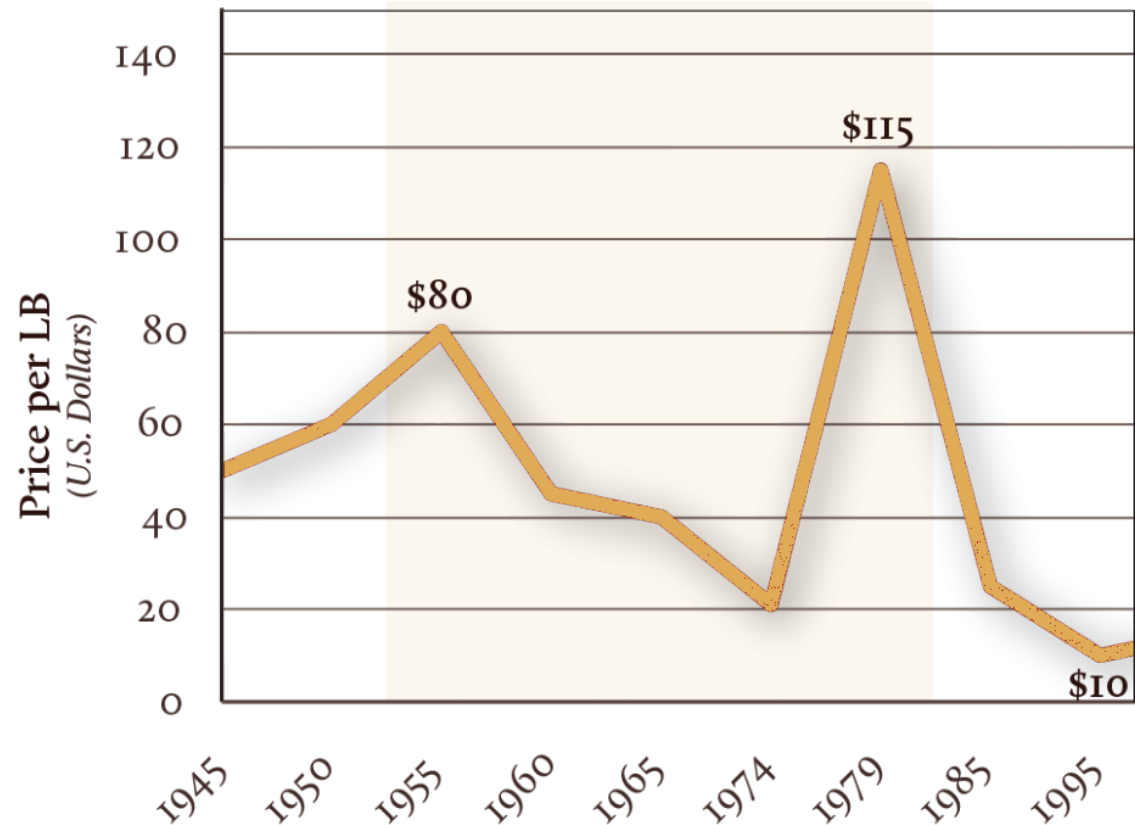


Figure 2. Price of uranium per pound in US dollars annually 1945–1995

[www.grandcanyontrust.org/colorado-plateau-uranium](http://www.grandcanyontrust.org/colorado-plateau-uranium)

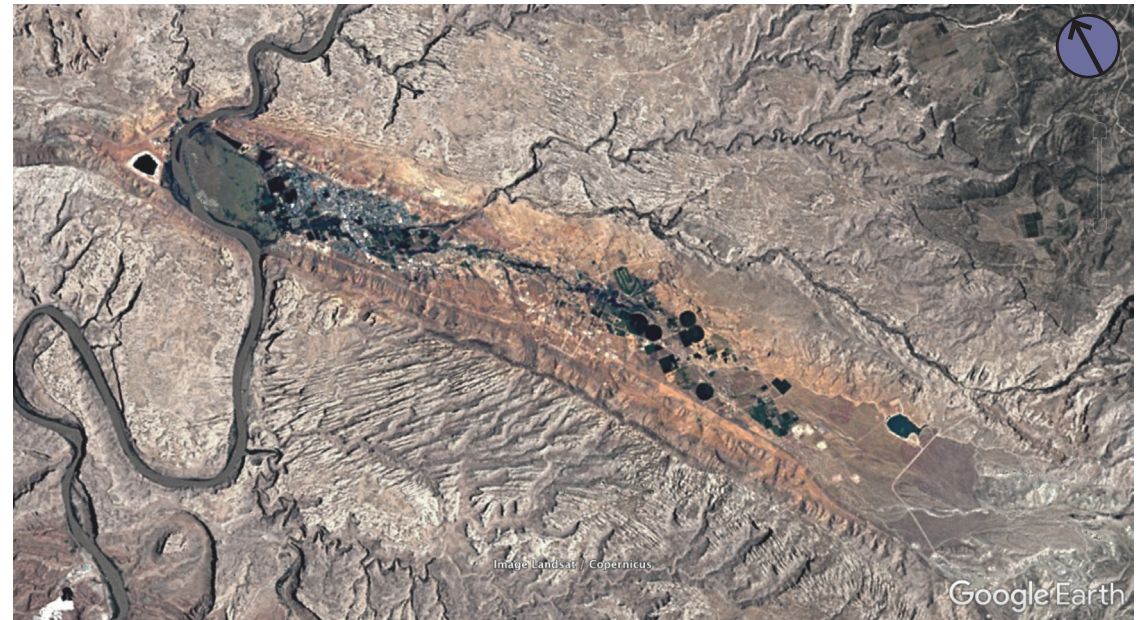


## POST URANIUM

### SPANISH VALLEY FROM 1984—2014

By the time Moab and Spanish Valley had suffered the worst of the uranium crash, the population had fallen to around 3,000. Over the next 20 years, the population recovered, as the tourist economy grew to take the place of the extraction industry as the dominant economic driver of the region. The image at the top right, is an aerial photo of the valley taken in 1984. The image below is an aerial image of the valley taken in 2014. Southern Spanish Valley shows scattered growth around plots of irrigated agricultural land. Development is also visible along the western and eastern shelves of the valley. The growth patterns apparent in these aerial images demonstrate the effects of large-lot, detached single-family housing. This pattern has likely contributed to the lack of affordable housing in the valley.

### MOAB AND SPANISH VALLEY 1984



### MOAB AND SPANISH VALLEY 2014

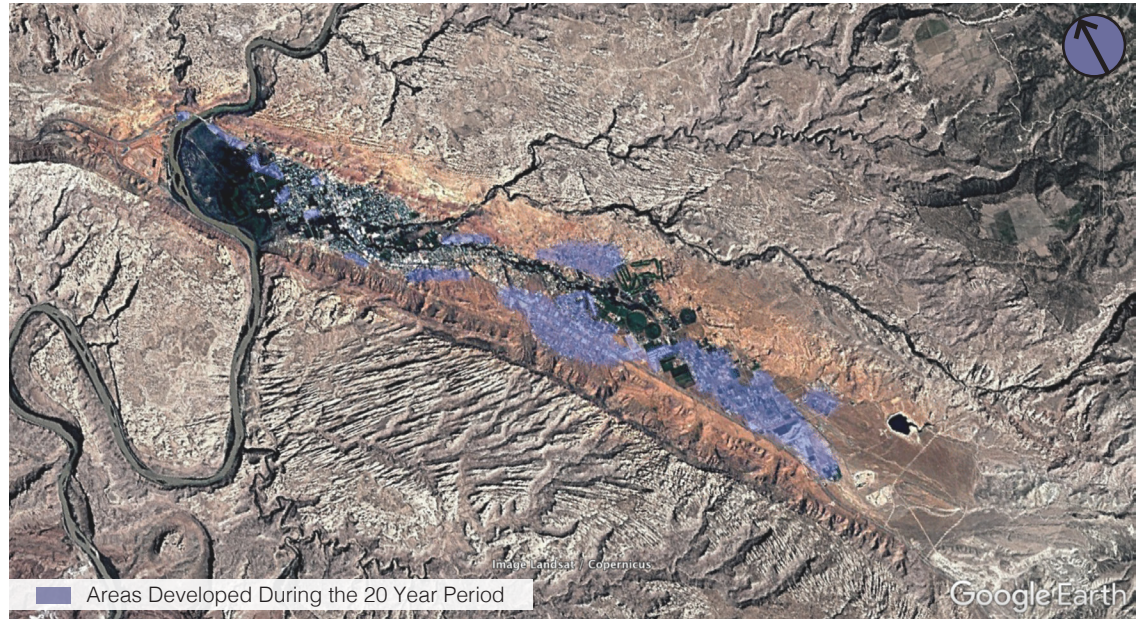


Figure 3. Urban expansion in Spanish Valley between the years 1984–2014

## MOAB AS A GATEWAY COMMUNITY

### SEASONAL TOURISM

The region surrounding Moab is dry, stark, red, and strikingly beautiful. Red rock outcroppings surrounding the city have become a playground for hikers, mountain bikers, climbers, off-roaders, and ATV enthusiasts. Neighboring Arches and Canyonlands National Parks, along with Dead Horse Point State Park, are destinations with global reach. And the Colorado River hosts rafters, kayakers, and fly fishers. The unique geography provides an otherworldly character that attracts millions of tourists annually.

All of these uses and users have become essential to Moab's economy. After the failure of the extraction industry in the early eighties, seasonal tourism gradually replaced mining as the dominant economic driver in the region. Currently in Grand County, tourism related industries—retail trade; real estate and rental and leasing; arts, entertainment, recreation; and accommodation and food services—make up 46.3% of total employment (IHTF, 2016/2009).

### POPULATION

Moab City Population 2016 – 5,242  
Grand County Population 2016 – 9,933 (US Census Bureau, 2016)

### VISITATION

Arches National Park Visitation 2016 – 1,585,718 (NPS, n.d.b)  
Moab City Estimated Visitation 2016 – 2,000,000 (Worby, 2017)

### SEASONAL TOURISM ECONOMY PATTERNS OF FLUCTUATION

A seasonal tourist economy presents communities with the challenge of housing seasonal workers. Moab's seasonal workers fill essential leisure and hospitality jobs that are typically only available during peak tourist seasons. Figure 4 below displays the quarterly fluctuation of private-sector leisure and hospitality jobs between the years 2012 and 2016.

Moab area leaders are attempting to address this issue by emulating successful programs instituted in other communities with seasonal tourist economies, such as Park City, Utah. An Assured Housing Ordinance is being drafted by

Grand County officials that would require area businesses to provide housing for percentages of their seasonal employees (Gale 2016b).

Seasonal employees are a segment of the population that the housing market struggles to accommodate because of the combination of low wages and seasonal need. Requiring employers to provide housing raises operation costs for area businesses, but may however save essential workers in the area from “car camping”, the common practice of living out of one's car for a series of months while employment opportunities are available. Such a housing requirement would also provide an opportunity for the area's seasonal employees access to services available to the valley's more permanent residents.

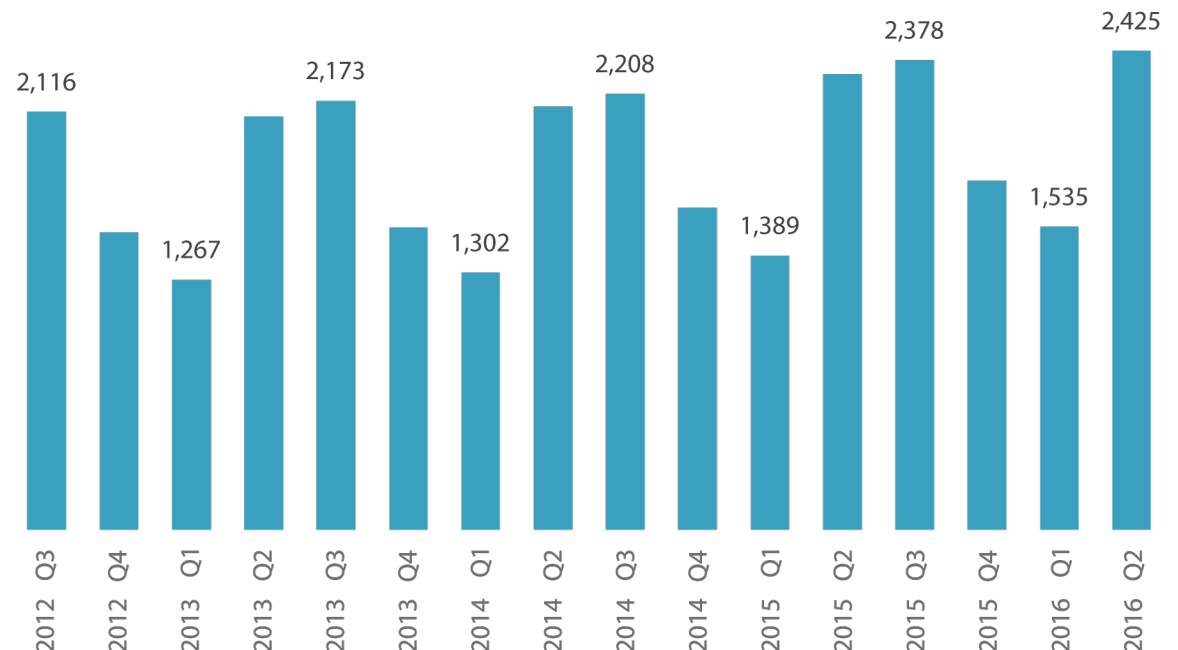


Figure 4. Grand County: Average private leisure and hospitality jobs by quarter

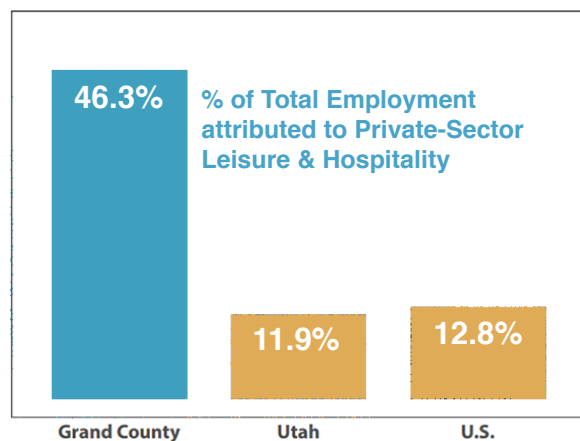
Source: Utah Department of Workforce Services



## PRIVATE-SECTOR LEISURE AND HOSPITALITY EMPLOYMENT

Private-sector leisure and hospitality (PSL&H) includes the industry sectors of retail and trade; real estate and rental leasing; arts, entertainment, and recreation; and accommodation and food services. In Grand County, employees the PSL&H sector are the lowest earners by average annual wage (MOCO 2015).

In 2016, the share of PSL&H jobs in Grand County was 46.3% of total employment. The graph below compares the percent of PSL&H workers in Grand with Utah and the United States. The average wage for these employees is \$21,112 annually (Utah Travel and Tourism).



**Figure 5. Private leisure and hospitality sector jobs as a percent of total private employment, 2015**

Source: Utah Travel & Tourism Profile State and Counties 2015—2016

## VACANT HOUSING UNITS: SECOND-HOME OWNERS AND NIGHTLY RENTALS

Desirability of a place as a vacation destination creates a market for second homes. For example, “in Vail, Colorado, three out of every four dwellings are now second homes occupied only a few weeks or months a year” (Howe, McMahon, and Propst, 1997, p. 3). Moab has not yet reached these extremes, but an increasing number of second homes are still problematic for the region.

In 2010, there were 927 vacant housing units, the majority of which are likely being used as second homes and nightly rentals, in Grand County. This represents 19.2% of total housing units in the area. Just three years later in 2013, the number of vacant housing units had increased to 1,371, representing 27.4% of total housing units (IHTF, 2016/2009).

During this same three-year period, the population increased by 137 persons with the county average of 2.35 persons per unit, 59 units would have been required to house this growth. In total, 188 new housing units were constructed, but during that same period, the total number of vacant housing units increased by 444 units (IHTF, 2016/2009).

This suggests that, even if every family unit that had moved into the valley had occupied a newly constructed home, at least 129 new units were constructed and were never permanently occupied. Likely, these units were constructed to serve as vacation homes and nightly rentals.

Interestingly enough, this would account for only 29% of the total increase in vacant housing units in the county during this three-year period. This suggests that not only are second homes and nightly rentals likely consuming the majority of

newly constructed units, they are also out pacing the purchase of existing housing by residents of the county by more than double.

This will have long-term consequences for residents of the valley. Second homes often consume community resources without contributing equivalently to the economy. Also, they remove available housing units from the market, which inflates home and property values. This creates a barrier of entry to homeownership that is difficult to overcome for service industry and community workers who are essential to the success of the city and the tourist industry.

Second homes can also promote unsustainable development strategies. Sudden increases in property value may motivate landowners to sell property to developers, who may be motivated by the high returns from more expensive vacation homes and nightly rental units. As the supply of new housing tailors to the second-home market, low-income housing opportunities become scarcer, driving up prices and decreasing opportunity.

In order to prevent this type of development, deed requirements are currently being proposed by Community Rebuilds' Executive Director, and Moab City Mayor Emily Niehaus (Moab Sun News, 2014), that would require all new developments in Grand County to include a low-income housing component.

This ordinance would be very impactful on the future growth of Moab, as it would ensure the construction of low-income housing for permanent residents. It may, however, fail to address the problem of housing Moab's seasonal workers.



## **AGING HOUSING AND INFRASTRUCTURE**

### **CREATING HIGHER HOUSING COSTS**

Sixty-one percent of owner-occupied and 51 percent of renter-occupied housing units in Moab and Spanish Valley's housing stock were constructed before 1980 (IHTF, 2016/2009).

The repercussions of an aging housing stock are well articulated in the Moab Area Affordable Housing Plan 2017:

As housing conditions decrease over time, maintenance costs increase. Owners must choose to expend additional money or defer maintenance, increasing costs in later years.

Renters tend to experience increased rents over time as property owners account for maintenance costs by increasing rents (2017)

The city's aging infrastructure is another issue affecting the housing market. On the 8th of November 2016, Moab City adopted a moratorium on future sewer connections until the city can ensure that it is in compliance with the Utah Department of Environmental Quality and finish construction of a new sewage treatment plant. The new regulations will not affect developments that have been approved prior to the passing of the law but remain unconstructed. Also, an exception will be made for the construction of primary residences. Applicants who apply for the primary residence exemption will be required to swear an affidavit affirming that they plan to remain in the valley for a number of years. This articulates the importance of coordinating the maintenance, repair, and development of the valleys infrastructure system (Gale, 2016a).

## **COST OF HOUSING**

### **OWNERS, RENTERS, AND WAGES**

As Moab becomes an increasingly popular tourist destination, the market for second homes and nightly rentals increases, driving up the price of real estate in the area. Unfortunately for service sector and other employees, wages in the area have not nearly kept pace with the housing market. This means the financial burden of housing is much greater on valley residents today than it was ten years ago.

Between 2003 and 2015 the average monthly payroll wage increased by 34%, while the average housing sale price increased by 51%. As a result, the hourly wage needed to afford an average priced home in Grand County rose nearly 84%. In other words, the number of average wage earning members of a household who are needed to afford an average priced home in Grand County increased from 1.93 household wage earners, to 2.35. For a household with two average wage earners, this means taking in a renter, working increased hours or a second job, or living with cost-burdened housing (IHTF, 2016/2009).

In 2015, Grand County's average list price for rented housing was \$850, \$1,100 with utilities. The average selling price of a housing unit was \$277,549. The median sale price was \$269,000 (IHTF, 2016/2009). The housing unit listing price average was \$351,700, while the median price was \$290,00 (IHTF, 2016/2009). This large difference in average and median listing price suggests that there are some more expensive housing outliers that failed to sell within the year. This suggests that the market for more expensive homes, are not being traded as actively as are more affordable housing options. The suggestion here is that developers creating more affordable housing types might expect higher demand for

their product.

An American Community Survey of the 2018 workshop study areas, provided by the United States Environmental Protection Agency (EPA 2018), suggests there are a total of 3,531 households within the study area, 1,169 of which are occupied by renters. The average wage required to afford three- or four-bedroom housing is just under \$22 dollars an hour. This requires the renter to receive an annual wage of nearly \$45,000. Two-bedroom housing requires an hourly wage of \$15.63, or an annual wage of \$32,520. One-bedroom or studio housing will require just under \$12 an hour, or an annual wage of around \$25,000. (NLIHC, 2018).

The estimated mean renter wage in the county is \$9.35 an hour. The estimated median household income for renters is \$27,696. An affordable estimated rent at this income level is \$692 a month. The housing wage—the hourly wage a full-time worker must earn to afford a modest apartment while spending no more than 30% of his or her income on rent and utilities (NLIHC, 2017)—for a studio apartment in Grand County is \$10.35. This means that the average wage for renters in the study area is insufficient to afford even the most inexpensive average housing option.

Fair market rent in Grand County, not including utilities, beginning with studio apartments is \$538 a month, \$623 for one-bedroom, \$813 for two-bedroom, and just under \$1,150 for three- or four-bedroom housing. Given the affordable rent for the average wage of the county, \$692, this means that any housing larger than a one-bedroom apartment will force the renter to accept living with cost-burdened housing.

## GRAND COUNTY WAGE DISTRIBUTION

A Gini coefficient is a measure of statistical dispersion intended to represent the equality of distribution and is used to analyze income inequality. The closest comparable wage Gini for Grand County, Utah is from Southeast Utah and Uintah Basin Region PUMA, Utah (datausa.io/profile/geo/grand-county-ut/#economy). Annual Salary distribution for this area is projected in the graph below.

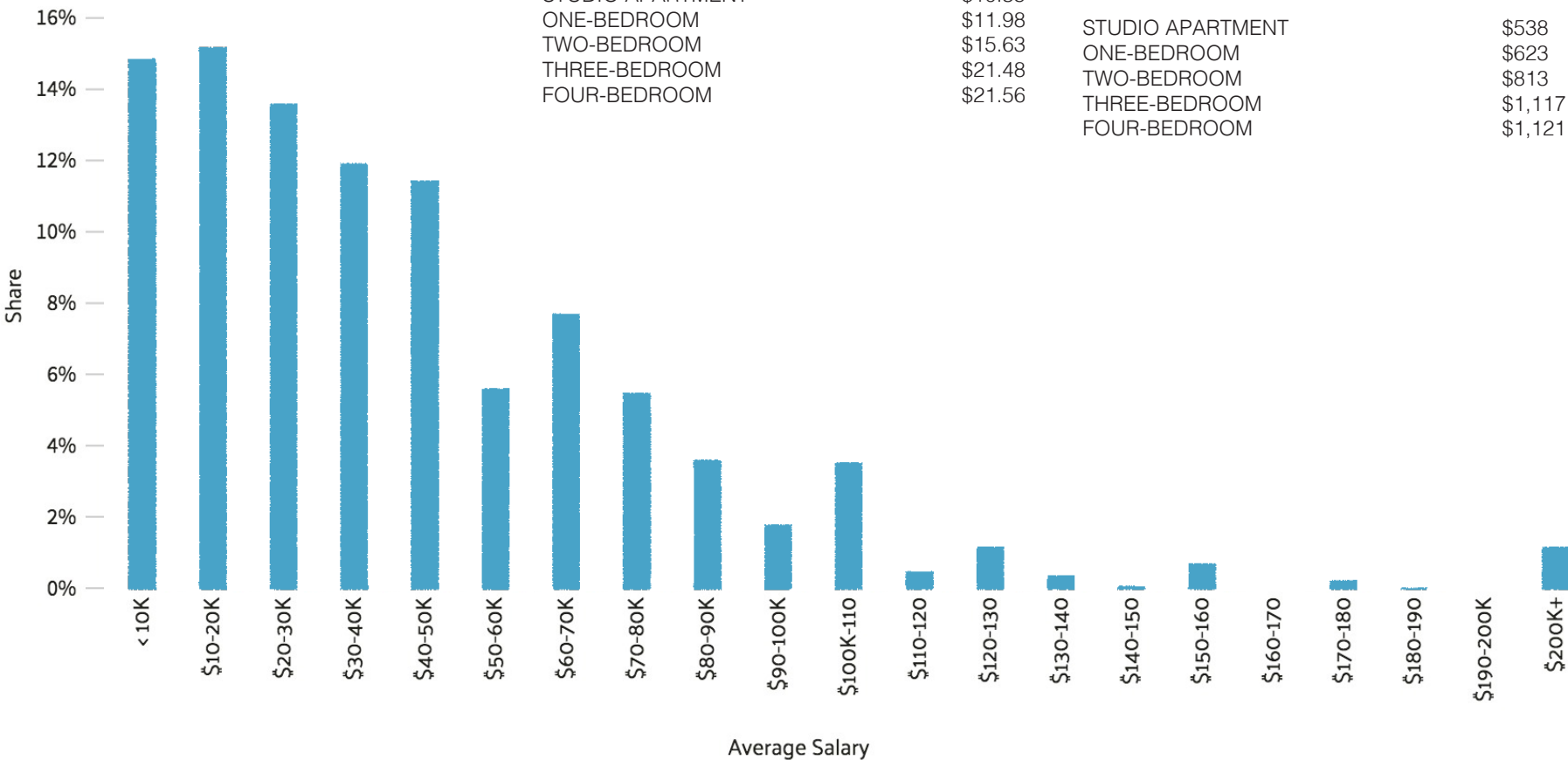


Figure 6. Grand County wage distribution

## GRAND COUNTY HOUSING COST

### ANNUAL INCOME NEEDED TO AFFORD AFFORDABLE HOUSING

STUDIO APARTMENT	\$21,520
ONE-BEDROOM	\$24,920
TWO-BEDROOM	\$32,520
THREE-BEDROOM	\$44,680
FOUR-BEDROOM	\$44,840

### HOUSING WAGE

The hourly wage a renter needs to earn in order to afford a rental home of a particular size at the Fair Market Rent. To be affordable, the cost of rent and utilities must not exceed 30% of household income.

STUDIO APARTMENT	\$10.35
ONE-BEDROOM	\$11.98
TWO-BEDROOM	\$15.63
THREE-BEDROOM	\$21.48
FOUR-BEDROOM	\$21.56

## GRAND COUNTY RENTERS

TOTAL Renter Households	1,206
PERCENT OF TOTAL HOUSEHOLDS	32%
ESTIMATED MEDIAN RENTER HOUSEHOLD INCOME	\$27,696
ESTIMATED MEDIAN AFFORDABLE RENT	\$695
ESTIMATED MEAN RENTER WAGE	\$9.35
ESTIMATED MEAN AFFORDABLE RENT	\$486

### FAIR MARKET RENT

The Fair Market Rent is HUD's best estimate of what a household seeking a modest rental home in a short amount of time can expect to pay for rent and utilities in the current market.

STUDIO APARTMENT	\$538
ONE-BEDROOM	\$623
TWO-BEDROOM	\$813
THREE-BEDROOM	\$1,117
FOUR-BEDROOM	\$1,121

## IDENTIFYING AFFORDABLE HOUSING NEED

### AFFORDABILITY GAP HOUSING AND WAGES

The 2014 average adjusted gross income (AGI) for households in Grand County was \$52,997, the lowest across all counties in Utah. The 2014 median AGI in Grand County was \$34,295. Understanding this nearly \$20,000 gap between the median and average incomes helps to explain the affordability gap confronting wage earners in the area.

An affordability gap occurs when an individual or household income is insufficient to meet the cost of housing. The gap left between available resources and housing cost is referred to as the affordability gap. If a family of four with the 2015 HUD area median annual income of \$55,300 attempted to purchase a home valued at the average selling price in Grand County \$277,295 utilizing a conventional loan, they would find that they are \$84,037 short.

### TOURISM INDUSTRY WORKERS

Although the tourism industry has created a great number of jobs, the average annual wage for this industry sector is \$24,750. Because this sector employs such a large percentage of wage earners in the area, 29.2% of households in the area have an adjusted gross income of less than \$20,000 annually (IHTEF, 2016/2009).

With this affordability gap, average wage earners from tourism industry sectors seeking to rent an apartment for \$1000 (including utilities) would find themselves on average \$531 dollars short every month. If the same tourism industry workers were to attempt to purchase a home at

the county's average housing unit selling price of \$277,549, they would find themselves \$231,844 short.

### COST-BURDENED HOUSEHOLDS AFFORDABLE HOUSING NEED

In order to cover this affordability gap, many households in Moab and Spanish Valley spend greater than 30 percent of their total income on housing costs, including mortgage or rent, taxes, insurance, utilities, and HOA fees where applicable (IHTEF, 2016/2009). Any household that is currently cost-burdened represents a household in need of affordable housing.

In order to calculate the actual need for housing in Spanish Valley, the current number of households by household income was identified using a EJSscreen ACS Summary Report from the United States Environmental Protection Agency (EPA 2018). Dividing the number of households in the valley by the percent of cost-burdened households by household income, as identified in MAHTF in the Moab Area Affordable Housing Plan 2017 (measured by percentage of Grand County AMI for 2015), the number of homes in a given income level were multiplied by the percent of cost-burdened households for a similar income level. The result identified that likely, 1,161 households in the study are currently living in cost-burdened housing.

### FUTURE COST-BURDENED HOUSEHOLDS HOUSEHOLDS EARNING < 80% AVERAGE MONTHLY INCOME

Projected demand for housing units by income level for Grand County has been identified in the Moab Affordable Housing Plan 2017. In order to identify projected demand for affordable housing, all new housing unit demands for households with an income level of 80% or

less for 2020, 2030, 2040, and 2050 were aggregated. Results predicted a total demand for affordable housing by 2050 of 1,294 units.

### PROJECTED HOUSING NEED FOR MOAB AND SPANISH VALLEY BY 2050

- Number of Currently Cost-Burdened Households - 1,161
- Projected Demand for Affordable Housing by 2050 - 1,294 units
- Total demand for Affordable Housing Units in Moab and Spanish Valley by 2050 - 2,455 units

# SPANISH VALLEY'S URBAN STRUCTURE

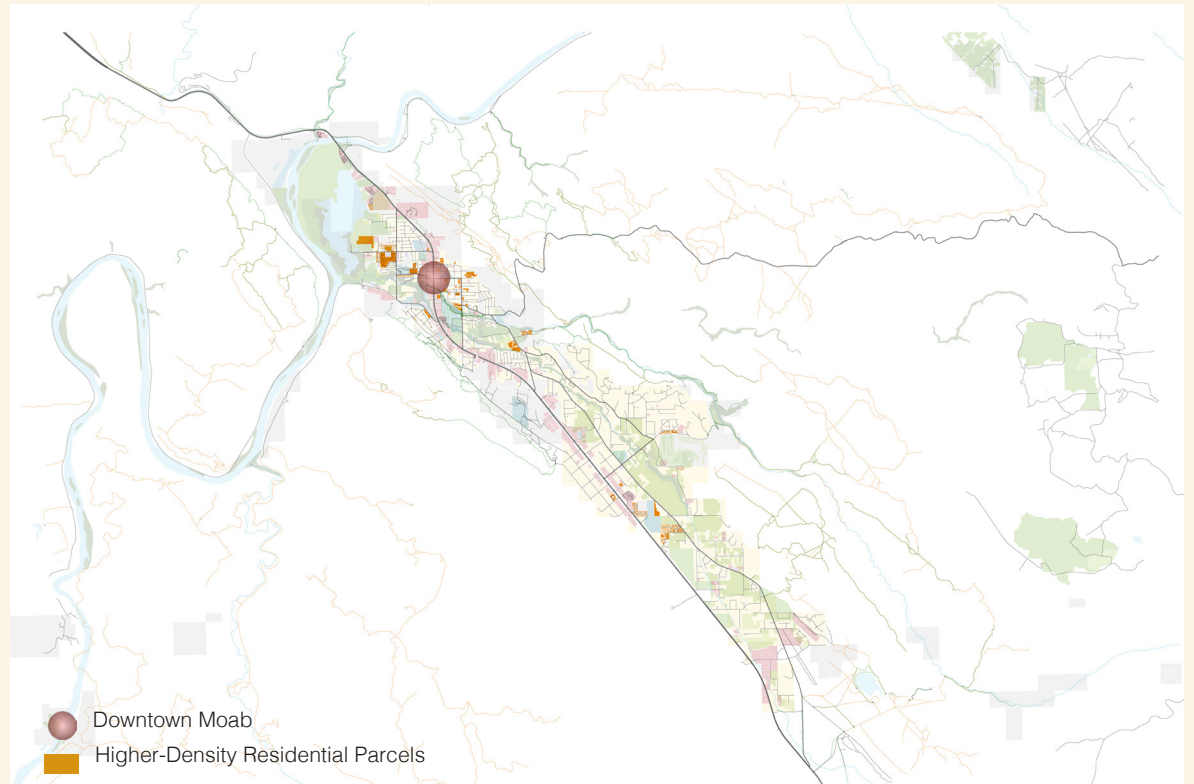
## EXISTING CONDITIONS AND OPPORTUNITIES FOR DEVELOPMENT OF AFFORDABLE HOUSING

The following series of maps is intended to describe the current land use of the valley that are relevant for future development. Downtown Moab is delineated with a red circle for orientation.

## HIGHER-DENSITY HOUSING

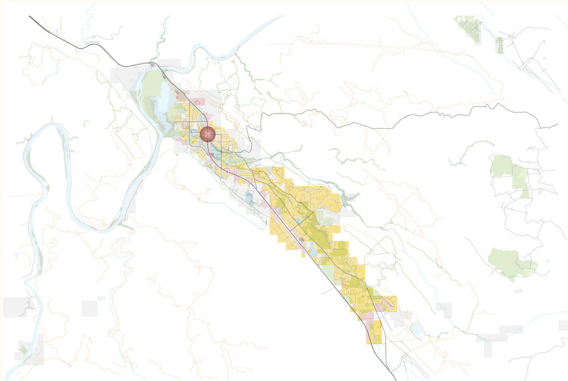
The higher-density housing map shows infill of higher-density units. Currently, there are no consistently higher-density neighborhoods. High density housing may be key to accommodating the anticipated growth in the Valley. It should be sited in a walkable and

community oriented context. Agricultural land and open spaces dominate the south end of the valley. This land could be protected from sprawling development through high density housing.



## LOWER-DENSITY HOUSING

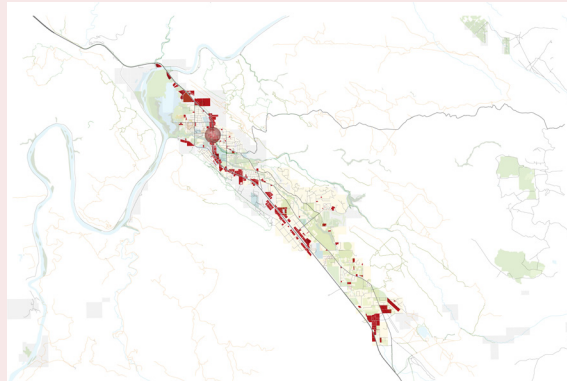
The lower-density housing map identifies all of the lots holding detached, single-family housing in the valley. This demonstrates just how much of the valley is dedicated to this housing typology, a typology that struggles to provide affordable housing options to valley residents.



- Downtown Moab
- Lower Density Residential Parcels

## COMMERCIAL/INDUSTRIAL

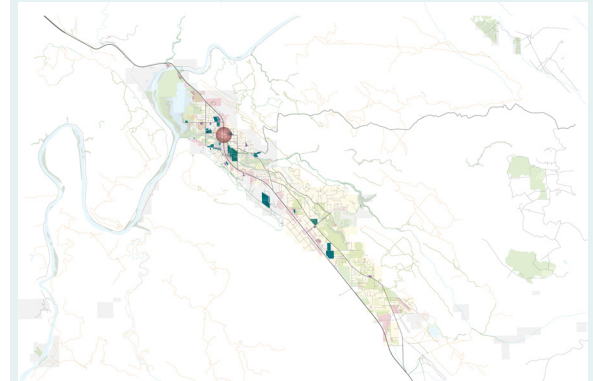
The commercial map demonstrates how the commercial infrastructure has been strung along Highway 191. This pattern makes walkability challenging and reinforces the use of the automobile for typical daily errands for valley residents. Stringing hotels along the northern corridor of the highway removes tourists from downtown restaurants and shops, detracting from the energy and sense of place of the downtown environment.



- Downtown Moab
- Commercial Parcels

## PUBLIC FACILITIES

The social facilities map shows a concentration of facilities around Downtown Moab and the Pack and Mill Creek systems. It also shows the new Utah State University campus as a parcel of blue on the western slope south of Downtown Moab. Affordable housing development will be key to the success of the university. Recreation resources and setting make Moab a dream location for any student interested in its outdoor recreation and natural resources, but the cost of housing could be severely prohibitive.

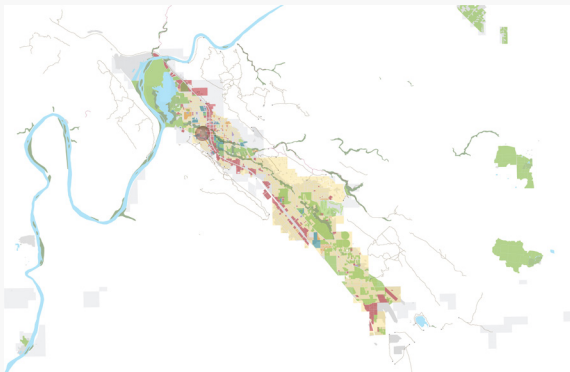


- Downtown Moab
- Social Institutions
- Religious Institutions



## TRANSPORTATION/GRAY INFRASTRUCTURE

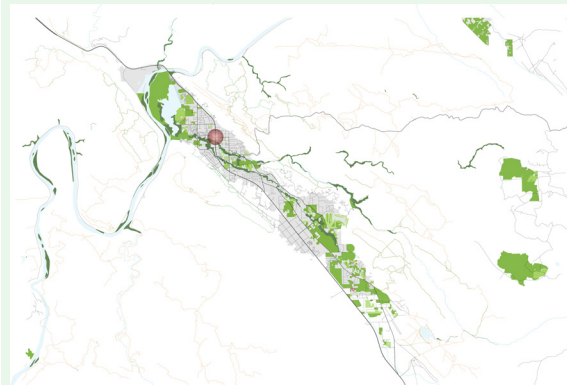
This transportation/gray infrastructure map shows developed areas in gray, serviced by the paved road network in black. The developed areas are fringed by an impressive network of green hiking and biking trails and orange off-road vehicle trails. Just south of Downtown Moab, the Mill Creek Trail crosses the valley. Extending the reach of this great urban trail will help to relieve traffic along the overburdened highway corridor.



- Downtown Moab
- Roads
- Hike/Bike Trails
- Dirt Roads/ATV
- Urban Areas

## OPEN SPACE/GREEN INFRASTRUCTURE

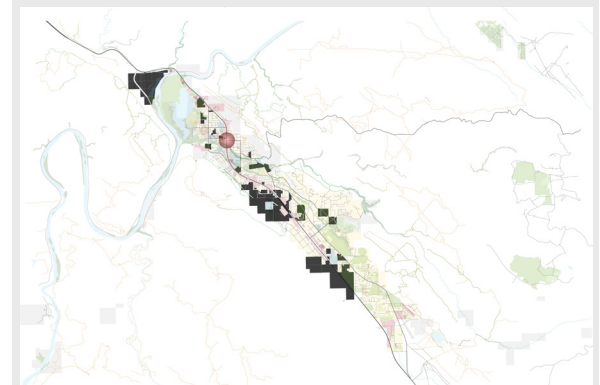
The green infrastructure map illustrates the opportunity of Pack and Mill Creek as an east to west connection across the valley and a via connecting the northern and southern half of the valley.



- Downtown Moab
- Riparian Area
- Alfalfa
- Pasture Land
- Vineyard
- Orchard

## LARGE UNDEVELOPED AREAS

The undeveloped lands map identifies large undeveloped parcels of land that bear a relationship to the urban framework. These areas may be suitable for higher-density development. Connecting these areas with green infrastructure means commercial opportunities that decrease reliance on Highway 191 as the valley's sole commercial vein.



- Downtown Moab
- Empty Lots



## ZONING, DENSITY, AND AVAILABLE HOUSING TYPOLOGIES

### LACK OF DIVERSITY

Current zoning in Moab and Spanish Valley allows primarily for one-unit detached single family housing that tend to utilize the most land and community resources per housing unit.

Mobile homes and RVs, account for nearly 20% of all occupied housing in Grand County. The number of mobile home lots has decreased in Grand County due to closures of some mobile home communities. Roughly 80% of the 491 mobile home lots in Grand County are occupied. City and county officials are reviewing zoning laws in an effort to accommodate higher housing densities and to find creative solutions to increase the affordable housing stock available in Moab and Spanish Valley. New developments, such as the Valley View subdivision, are a response to more recent zoning changes, diversifying housing options and providing models for more sustainable neighborhoods (Gale, 2016c).

The graphics on the following pages display zoning in Moab City and Grand County. Selected residential and mixed-use zoning areas are examined in order to identify the affordable housing typologies that might be introduced into these zones, as well as the maximum net density allowed by these area requirements. These zoning areas are then matched with a section of the rural-to-urban transect developed by new urbanist Andres Duany (Duany, Speck, & Lydon, 2010). The transect is used to visualize the potential housing typologies and densities legislated through zoning in the valley.

### PERCENTAGE OF EXISTING HOUSING UNITS COLORED WITH CORRESPONDING ALLOWED ZONING

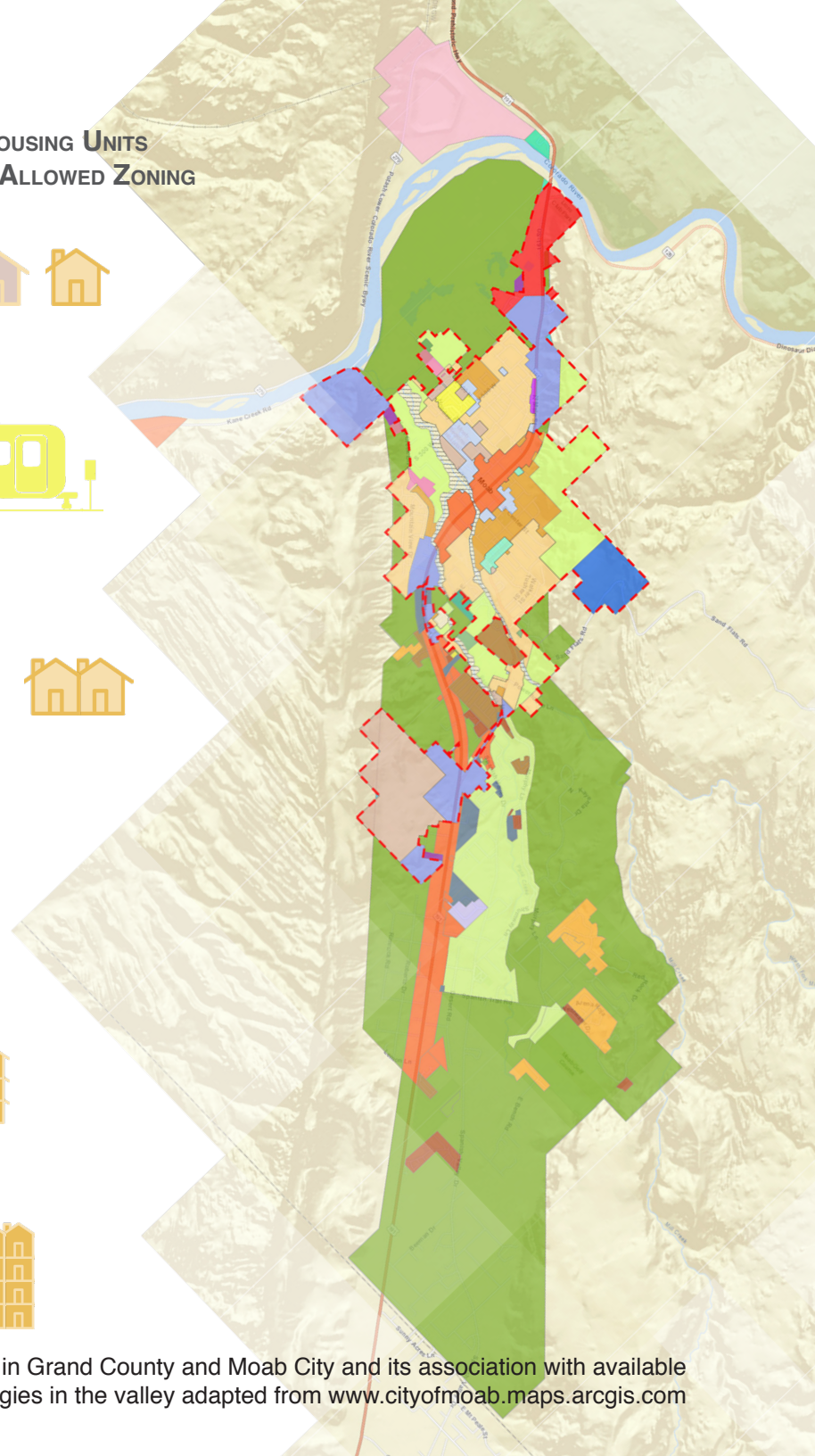


Figure 7. Zoning in Grand County and Moab City and its association with available housing typologies in the valley adapted from [www.cityofmoab.maps.arcgis.com](http://www.cityofmoab.maps.arcgis.com)

## RESIDENTIAL-AGRICULTURAL ZONE



### AFFORDABLE HOUSING TYPOLOGIES

Secondary Dwelling Units  
Nontraditional Housing

### AREA REQUIREMENTS

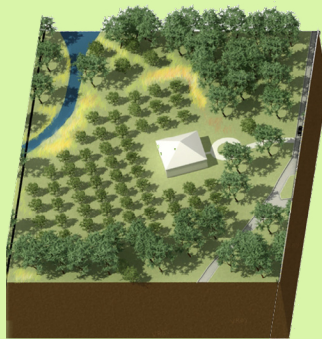
The minimum building site area shall be one recorded lot or parcel of land not less than one acre in area for each one-family dwelling, day care nursery, or rest home and not less than five acres for each planned unit development. The maximum density in a planned unit development shall not exceed five units per acre contained in the development.

### MAXIMUM NET DENSITY

One-Family Dwelling 1 Unit per Acre  
Planned Unit Development 5 Units per Acre

### RURAL TO URBAN TRANSECT ZONE

T2 Rural Zone



[www.urbanplacesandspaces.blogspot.com/2015/01/prince-georges-county-embarks-on-zoning.html](http://www.urbanplacesandspaces.blogspot.com/2015/01/prince-georges-county-embarks-on-zoning.html)

## SINGLE-FAMILY RESIDENTIAL ZONE



### AFFORDABLE HOUSING TYPOLOGIES

Secondary Dwelling Units  
Nontraditional Housing

### AREA REQUIREMENTS

An area of not less than ten thousand square feet shall be provided and maintained for each one-family dwelling and uses accessory thereto and at least twenty thousand square feet for all other buildings.

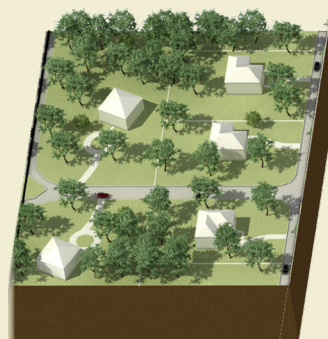
An area of not less than five acres shall be provided and maintained for each planned unit development, except that there shall be no area requirements for additions to an approved planned unit development.

### MAXIMUM NET DENSITY

One-Family Dwelling 4.35 Units per Acre

### RURAL TO URBAN TRANSECT ZONE

T3 Suburban Zone



[www.urbanplacesandspaces.blogspot.com/2015/01/prince-georges-county-embarks-on-zoning.html](http://www.urbanplacesandspaces.blogspot.com/2015/01/prince-georges-county-embarks-on-zoning.html)

## SINGLE-FAMILY AND TWO-FAMILY RESIDENTIAL ZONE



### AFFORDABLE HOUSING TYPOLOGIES

Secondary Dwelling Units  
Duplex, Side-by-Side  
Duplex, Stacked  
Bungalow Court

### AREA REQUIREMENTS

An area of not less than five thousand square feet shall be provided and maintained for each one-family dwelling and uses thereto. For two-family dwellings the lot size shall consist of a minimum of three thousand square feet per dwelling. An area of not less than five acres shall be provided and maintained for each planned unit development.

### MAXIMUM NET DENSITY

One-Family Dwelling 8.71 Units per Acre  
Two-Family Dwelling 14.52 Units per Acre

### RURAL TO URBAN TRANSECT ZONE

T4 General Urban Zone



[www.urbanplacesandspaces.blogspot.com/2015/01/prince-georges-county-embarks-on-zoning.html](http://www.urbanplacesandspaces.blogspot.com/2015/01/prince-georges-county-embarks-on-zoning.html)



## MANUFACTURED HOUSING RESIDENTIAL ZONE



### AFFORDABLE HOUSING TYPOLOGIES

Prefabricated and Manufactured Housing

### AREA REQUIREMENTS

An area of not less than five thousand square feet shall be provided and maintained for each one-family dwelling. Two thousand five hundred square feet shall be provided for each unit of a duplex or two-family dwelling and one thousand eight hundred square feet shall be provided for each unit in a triplex or three-family or more dwelling. An area of not less than three acres shall be provided and maintained for each planned unit development.

### MAXIMUM NET DENSITY

One-Family Dwelling	8.71 Units per Acre
Duplexes	17.42 Units per Acre
Two-Family Dwelling	17.42 Units per Acre
Triplex	24.4 Units per Acre
Three-Family Dwelling	24.4 Units per Acre

### RURAL TO URBAN TRANSECT ZONE

T4 General Urban Zone



[www.urbanplacesandspaces.blogspot.com/2015/01/prince-georges-county-embarks-on-zoning.html](http://www.urbanplacesandspaces.blogspot.com/2015/01/prince-georges-county-embarks-on-zoning.html)

## MULTI-FAMILY RESIDENTIAL ZONE



### AFFORDABLE HOUSING TYPOLOGIES

Fourplex                      Courtyard Apartments  
Townhomes                  Small Multiplex

### AREA REQUIREMENTS

An area of not less than five thousand square feet shall be provided and maintained for each one-family dwelling and duplexes or two-family dwellings. All other multi-family development shall provide a minimum of two thousand square feet per unit for three-family dwellings and above. An area of not less than three acres shall be provided and maintained for each planned unit development.

### MAXIMUM NET DENSITY

One-Family Dwelling	8.71 Units per Acre
Duplexes	17.42 Units per Acre
Two-Family Dwelling	17.42 Units per Acre
Multi-Family Development	65.34 Units per Acre

### RURAL TO URBAN TRANSECT ZONE

T5 Urban Center Zone



[www.urbanplacesandspaces.blogspot.com/2015/01/prince-georges-county-embarks-on-zoning.html](http://www.urbanplacesandspaces.blogspot.com/2015/01/prince-georges-county-embarks-on-zoning.html)

## COMMERCIAL MIXED-USE ZONES



### AFFORDABLE HOUSING TYPOLOGIES

Live/Work                      Mixed Use

### AREA REQUIREMENTS

All buildings and structures in the C-2, commercial-residential zone, shall be set back at least twenty-five feet from any public street. Area width and location requirements for buildings intended or designed primarily for residential use, shall be setback from the front property line a distance of at least twenty-five feet. Minimum side yards shall be at least eight feet or less by conditional use permit, with a minimum rear yard setback of fifteen feet. Street-side setbacks for corner lots shall be no less than twenty feet in width. No area and width requirements shall apply to dwellings located above the ground floor when the ground floor is devoted exclusively to a commercial use permitted in the zone.

### RURAL TO URBAN TRANSECT ZONE

T5 Urban Center Zone



[www.urbanplacesandspaces.blogspot.com/2015/01/prince-georges-county-embarks-on-zoning.html](http://www.urbanplacesandspaces.blogspot.com/2015/01/prince-georges-county-embarks-on-zoning.html)

## INTEGRATING AFFORDABLE HOUSING IN SPANISH VALLEY

### PHYSICAL CONSTRAINTS TO GROWTH

As noted in the previous sections, the current and projected need for affordable housing in Moab and Spanish Valley is 2,455 by 2050.

A number of constraints may impede efforts of planners and developers to create efficient housing to meet this need. The geography of the valley imposes physical constraints to growth. The narrow valley is bordered on both sides by steep sandstone cliffs, which provide the beautiful setting that makes Moab and Spanish Valley such a desirable place to live and visit, but also set very clear growth boundaries, as the image below illustrates.

Proposals to develop the benches above the valley floor have been met with a great deal of resistance from environmentalists, hydrologists, engineers, and local area residents. Drawing traffic through residential neighborhoods and up steep embankments creates a number of engineering challenges and safety concerns. Environmental concerns and public response on developments such as the Lionsback Resort have been well documented in the local news (Herndon. 2016).

Water availability also presents a physical constraint on growth. Past land use and human activities have been primarily focused on agricultural irrigation and cattle grazing. These activities have been accompanied by the diversion of surface water into reservoirs, the construction of irrigation ditches, the removal of selective vegetation, and the drilling of

primarily domestic wells. Current land use and human activity are primarily associated with developing tourist facilities and subdividing agricultural and natural land for housing development. These activities have resulted in localized changes in ground water levels and reduction of groundwater flow due to reduction of surface water flow (Kolm & van der Heijde, 2018, p. 67). Dr. Kenneth Kolm and Paul K. M. van der Heijde warn that, "If additional water is needed by urban or agricultural development, or water is displaced by urban and recreational activities, for example, the compound effect on the groundwater system could be more significant in the future, resulting in a possible lowering of the water table, changes in flow direction, decreasing discharge to streams or increasing stream loss to groundwater, draining of wetlands, or even depletion of local aquifers" (Kolm & van der Heijde, 2018, p. 68).



[www.upload.wikimedia.org/wikipedia/commons/thumb/7/7c/A\\_Little\\_Town\\_Named\\_Moab.jpg/1280px-A\\_Little\\_Town\\_Named\\_Moab.jpg](http://www.upload.wikimedia.org/wikipedia/commons/thumb/7/7c/A_Little_Town_Named_Moab.jpg/1280px-A_Little_Town_Named_Moab.jpg)



## **AVOIDING QUARTER-ACRE LOTS AND HIGHWAY COMMERCIAL DEVELOPMENT**

If the trend of developing small-lot, detached single-family housing is continued and growth in the valley is continued, then agricultural land may be at risk of being lost. Assuming that the city can deliver the infrastructure necessary such as water and sewer to these outlying areas, dispersing the community's population over a large area will limit the walkability of the community, increasing infrastructure costs and traffic, while decreasing the potential effectiveness of public transportation.

Potentially, such a development would coincide with a commercial development along the H191 corridor, increasing the entrances/exits to the highway for businesses and arterial roads. This will slow traffic and increase congestion along the highway. Highway commercial development will divert commerce from historic Downtown Moab and existing businesses there.

If the valley is allowed to develop with a pattern of single-family homes placed on individual quarter- and eighth-acre lots, and commercial development along the H191 corridor, the resident dependence on the car will be reinforced. This kind of development does not promote walkable communities, in which commercial and service opportunities are within a quarter mile, nor is there an integration of housing and commercial land use.

Single family home development does not incorporate the advantages of decreased dependence on the automobile, such as lower automobile-related costs for the individuals, as well as reduced infrastructure and maintenance costs for the city and county. Such savings could be used to fund bikeable and walkable community open spaces. These developments

will improve the quality of life for residents, validate Moab's reputation as a biking and recreation hub, beautify the city, and create both a walkable commercial hub, and opportunities for stormwater management.

## **THE IMPORTANCE OF FOSTERING COMMUNITY**

When considering affordable housing it is important to promote community. Walkability is an important aspect of fostering community, especially when it provides access to commercial hubs, recreation, and open space run the risk of becoming ghettoized, or separated from the community and stigmatized as "low-income housing."

Housing that is well connected in a walkable context encourages interaction between residents, bringing new development into the community by providing the pedestrian thoroughfare as a platform for interaction and introduction.

This is especially important in the context of Moab's migrant service community. Temporary workers often travel to Moab alone. Creating an environment that embraces these workers will benefit the valley with return workers, a pattern that often leads to residency, as well as evangelists for the lifestyle available in Moab for long term residence .

## **DEVELOPING WITH MIXED DENSITIES**

Moab and Spanish Valley can increase walkability, decrease reliance on the automobile, and avoid creating low-income "ghettos" by developing with mixed densities, rather than allowing lower-density development to extend from the fringes of currently developed areas, as has been done in the past.

Figures 8 and 9 on page 31 are adapted from Rural by Design, a development guide written by Randall Arendt (Arendt, Brabec, Dodson, Reid, & Yaro, 1994) aimed at helping smaller towns and cities organize development in a way that preserves open space, while improving the quality of life for residents. These figures serve to illustrate the advantages of developing with mixed densities, as compared with detached single-family residential developments.

Mixed-density developments concentrate residential development around mixed-use commercial cores. Figure 9 creates opportunities for open space preservation, as suggested by the darker green space surrounding the blue water feature. In the detached single-family residential development, demonstrated in figure 8, access to this open space resource is limited to those whose property boundary is adjacent to the lake. In the mixed-density development, figure 9, the pond has been developed into a naturalized community recreation resource. The naturalized area is buffered from denser development by a rural residential zone. This demonstrates how the space preserved by densifying development allows for the preservation of landscape character, as well as the scenic quality of the community. This allows for more equitable access to community resources and a higher quality of life for the community's residents.



Developing with mixed densities also supports walkability and public transportation by creating centralized destination points with commercial activity. These commercial nodes are supported by gradated densities of housing positioned within a walkable distance. This allows residents to run errands and seek out restaurants and entertainment without relying on the use of a personal automobile, by supporting walkability and creating clear nodes for public transportation stops. This can result in requiring fewer parking spaces for businesses, allowing for greater space preservation, and improving the pedestrian environment.

Developing with mixed densities can also create a greater diversity of housing units, with a greater range of affordability. Figure 8 offers very limited diversity of housing options. Introducing greater numbers of multi-family units offers more affordable options than the ubiquitous, detached single-family housing. This allows owners and renters to tailor their housing to their unique needs and lifestyles. It also create opportunities for community members to remain within the neighborhood, even as their housing needs evolve with time, as family sizes change and income opportunities shift.

### DETACHED SINGLE-FAMILY RESIDENTIAL DEVELOPMENT

- Detached Single-Family Residential
- Water Feature



Figure 8. Detached single-family housing (Arendt, Brabec, Dodson, Reid, & Yaro, 1994)

### MIXED-DENSITY DEVELOPMENT

- Mixed-Use Commercial
- Multi-Family Residential
- Single and Two-Family Residential
- Detached Single-Family Residential
- Residential / Agricultural
- Open Space Preservation
- Water Feature



Figure 9. Mixed-density development (Arendt, Brabec, Dodson, Reid, & Yaro, 1994)

# AFFORDABLE HOUSING TYPOLOGIES

## INTRODUCING MISSING MIDDLE HOUSING TYPOLOGIES IN SPANISH VALLEY

The term “missing middle housing,” coined by Daniel Parolek (Parolek, 2018), founder of the urban design firm Opticos Design, refers to “a range of multi-unit or clustered housing types compatible in scale with single-family homes that help meet the growing demand for walkable urban living” (Opticos Design, Inc. 2018). This strategy for housing development, espouses mixing housing densities within the urban framework to blend the advantages of urban and suburban life. “Missing Middle Housing” models a development pattern that provides greater diversity in available housing types and offers greater opportunity for affordable units.

These denser housing types have a footprint that is similar in size and height to traditional detached, single-family homes. This way, it is possible to increase density by introducing new housing typologies into existing neighborhoods without radically altering existing relationships

between the street and existing structures. This is referred to as a lower perceived density (Opticos Design, Inc. 2018).

Missing middle housing advocates suggest that a density of 16 dwelling units per acre is “the threshold needed to create a supportive environment for transit and neighborhood-serving main streets” (Opticos Design, Inc. 2018). This allows neighborhoods to host a mix of units, serving households of diverse socioeconomic backgrounds. Doing so provides all housing units in the area, regardless of typology and price, equal access to community resources.

This can be accomplished by creating housing units with a variety of square footage options. These can range from 500 square foot micro-units to larger three- and four-bedroom homes of around 2,400 square feet. Missing middle housing advocates argue that what is lost in square footage is made up for in access to quality community space and walkable access to commercial and recreation opportunities extending the living room into the public sphere. Smaller square footage and simple construction

styles make these denser housing typologies attractive to developers who can avoid the risk and costs of constructing supporting infrastructure and complicated building styles (Opticos Design, Inc. 2018).

These smaller units are proving to be very marketable (Opticos Design, Inc. 2018), as they match well with shifting demographics. Arranging units around common courtyards and public park and open space networks reduces the need for exterior upkeep for residents. This has proven to be a desirable characteristic for retiring baby boomers looking to reduce the upkeep required by larger detached units, as well as busy millennials looking for affordable starter homes and a more urban quality of life. With the amazing recreation opportunities in Moab and Spanish Valley, there will be less need for a personal yard and garden.

The next section overviews various affordable housing typologies that may work for the Moab area.



Figure 10. Missing middle housing types  
[placemaking.me/archives/20739](https://placemaking.me/archives/20739)



## STRAW BALE HOMES COMMUNITY REBUILDS AS A MODEL

Cost of construction is a common constraint to affordability. Community Rebuilds is a very successful nonprofit organization in the Moab area that works with qualified applicants to construct straw bale homes. Potential homeowners work with student interns at the organization to construct the homes themselves. Community Rebuilds has recently joined the USDA Rural Development's Mutual Self-Help Program, which provides grants to nonprofits to help fund low-income housing projects. By participating in the construction process and making use of available grants, families are receiving homes that would typically cost about \$260,000 to \$270,000 to build, at a cost of about \$170,000 apiece including the costs to buy the land. (Herdon, 2016b).

The success of this program can help build support for the development of building codes that support the use of nontraditional construction typologies to address the affordable housing crisis and provide low-income housing to community residents.

The success of alternative design styles in reducing cost and providing needed affordable housing has been well documented. An article published in the *Journal of Cleaner Production* entitled "Analysis and comparison of environmental impacts and cost of bio-based house versus concrete house," found that

straw bale construction outperformed concrete construction styles in its compliance with energy efficiency, while contributing less to climate change and reducing cost (Krasny, Klaric, & Korjenic, 2017).

The identity of Moab and Spanish Valley as a hub for nontraditional affordable housing typologies fits well with Moab's outdoor recreation ethos, and may provide affordable options for nontraditional seasonal housing needs. Showcasing local natural materials demonstrates the community's close connection to the natural environment. Millions of tourists visit every year. They are drawn by the beautiful scenery that surrounds the valley. The unique character of the redrock cliffs could be reflected through the choice of building materials. Doing so would lower costs, create jobs locally, and connect visitors to the beauty and character of Arches and Canyonlands National Parks, uniting that impression with community who plays host to these natural wonders.



*This home constructed by Community Rebuilds models affordability, as well as an aesthetic that reflects the environmental context.*

[jeffreynaturalbuilder.com/portfolio/community\\_rebuilds#jp-carousel-7](http://jeffreynaturalbuilder.com/portfolio/community_rebuilds#jp-carousel-7)



*Community Rebuilds works with homeowners and teams of interns to reduce the cost of labor to the homeowner. Straw bale is used as the primary construction material, creating thick thermally isolated walls at reduced costs.*

[www.Communityrebuilds.com](http://www.Communityrebuilds.com)





## EARTHSHIPS HOMES

In an abstract for a piece on earthship homes, Adelle King (2017) described the philosophy and the upcycling construction techniques embraced by the Earthships movement. "The ultimate in green building design, Earthships are zero waste, self-sufficient homes constructed using recycled and natural materials for affordable housing alternatives."

Earthships were developed by architect Michael

Reynolds. His designs address the issues of pollution, climate change, and resource depletion by the provision of self-sufficient, off-the-grid, ecological housing constructed substantially from "waste," such as used car tires and beverage containers. Passive heating and cooling, food production, water catchments, renewable energy, solar hot water, gray-water recycling, and sewage treatment are all integrated (Freney, n.d.).

Building on the success of Community Rebuilds, Moab might look to partner with promoters of

Earthships as a second model for affordable alternative housing models. Like straw bale homes, earthships look to the surrounding environment for their material. Earthships' reliance on efficient design and emphasis on rainwater collection and water recycling might be used to raise awareness about water quantity and quality issues confronting valley residents and visitors. Plus, Earthships offer an opportunity to build consciousness, housing, and environmental solutions from the valley's unwanted trash piles.



Earthship home constructed in Taos, New Mexico

[www.youtube.com/watch?v=zWefO9iCZdg](http://www.youtube.com/watch?v=zWefO9iCZdg)

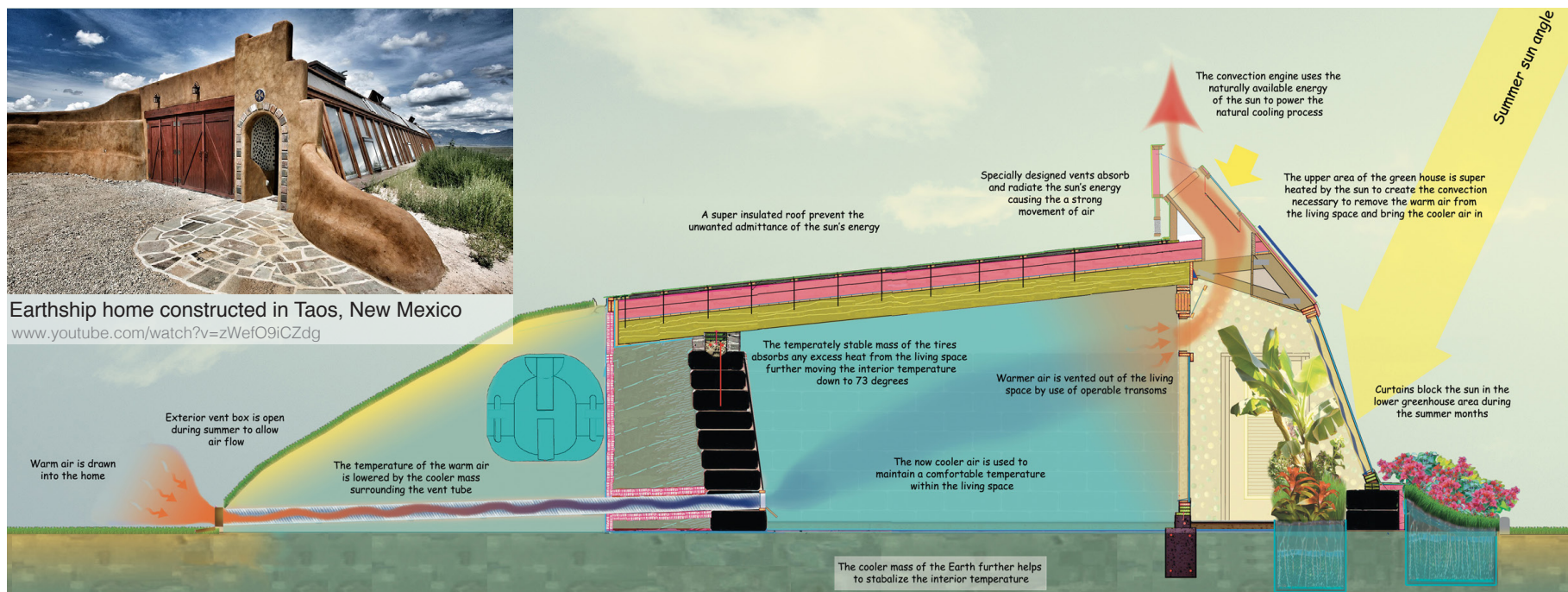


Figure 11. Bioclimatic advantages offered by the Earthship designs [commons.wikimedia.org/wiki/File:Convection\\_banner\\_1.jpg](https://commons.wikimedia.org/wiki/File:Convection_banner_1.jpg)





## MANUFACTURED HOUSING

The authors of the article “Not a Trailer Anymore: Perceptions of Manufactured Housing” (Beamish, Goss, Atilas, and Kim, 2010) looked at these units as effective affordable housing for many low- and moderate-income households. Having surveyed a great number of persons living in manufactured housing units, the authors

found that larger square footage of the unit was an indicator of ownership, as well as higher education level of the homeowner. The greatest impediment of the introduction of manufactured housing is a negative stigma associated with trailer park homes. In their interviews with community members, the authors found “consistently negative opinions about the impact

of manufactured housing on their community.” They suggest that, if community planners are to overcome this negative stigma and take full advantage of this opportunity to provide much needed affordable housing, they should seek to develop new manufactured developments that focus on quality design, like the open airy design pictured below and on community integration.



[liversal.com/19O9R9j\\_84ay999/](https://liversal.com/19O9R9j_84ay999/)



Advances in design and manufacturing have shifted the conversation on manufactured housing and opened new solutions for affordable housing (Hanson 2017). Scaled manufacturing of high-quality affordable housing units is a potentially popular option for affordable housing in the future. In Germany and Sweden government officials are coordinating with manufacturers and developers to develop strategies to reintroduce manufactured housing. Modern manufacturing reduces the cost per unit as production increases, but this requires a large

demand and a legislative structure that allows the introduction of this housing type into urban areas.

Smaller footprints and the potential for walkability, such as a stackable prefabricated housing development in London (see photo), make it possible to introduce unit groupings at a variety of densities to existing neighborhoods or as accessory dwellings on larger lots. Tiny home communities have become a popular alternative housing option. Smartly designed manufactured

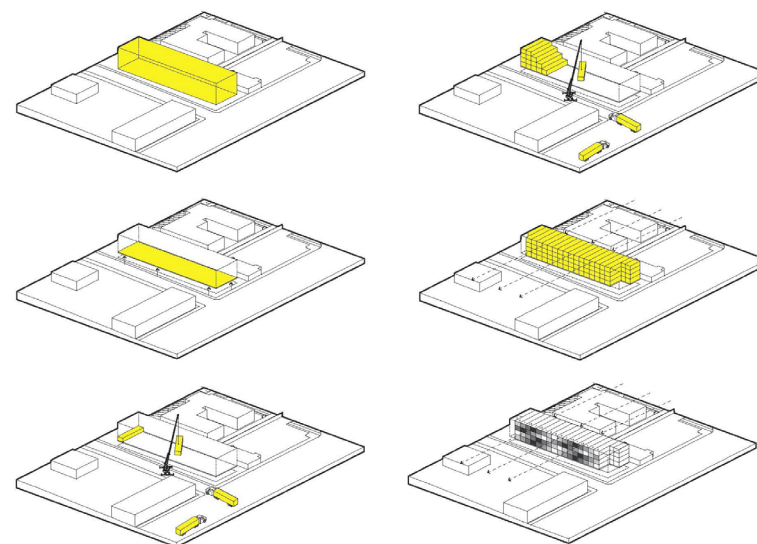
housing units can tap into that same design and provide more consistent design standards, which help to shape expectation.

The theme for this very affordable housing option in the context of Moab and Spanish Valley is to take advantage of evolving design and development technology and help the community adjust its perceptions of affordable manufactured housing,



Stackable prefabricated housing development in London, England, that allows residence to customize their home prior to construction.

[inhabitat.com/tag/prefab-homes/](http://inhabitat.com/tag/prefab-homes/)



**Figure 12.** Stackable prefabricated housing creating larger apartment style housing

[www.midcoastrecord.com/3435main/](http://www.midcoastrecord.com/3435main/)





## CARRIAGE HOUSE

A carriage house is an accessory structure, typically located at the rear of a lot that provides space for a small residential unit, home office, or other small commercial or service use. This unit could be above a garage or at ground level.



[mjsteen.com/2017/03/22/portlands-new-housing-stock-tilting-accessory-dwelling-units](http://mjsteen.com/2017/03/22/portlands-new-housing-stock-tilting-accessory-dwelling-units)



[www.architecturaldesigns.com/house-plans/modern-carriage-house-plan-with-sun-deck-68461vr](http://www.architecturaldesigns.com/house-plans/modern-carriage-house-plan-with-sun-deck-68461vr)



## Bungalow Court

### BUNGALOW COURT

This building type consists of a series of small, detached structures, providing multiple units arranged to define a shared court that is typically perpendicular to the street. The shared court takes the place of a private rear yard and is an important community-enhancing element.

Lot	Front-loaded	Rear-Loaded
Width	N/A	100–150 feet
Depth	N/A	100–150 feet
Area	N/A	10,000–22,500 sq. ft. 0.23–0.52 acres
Units		
Number of Units		5–10
Typical Unit Size		500–800 sq. ft.
Density		
Net Density		19–35 du/acre
Gross Density		8–31 du/acre
Parking		
On-street Spaces		5–7
Off-street Spaces		0–1 per unit
Setbacks		
Front		10–25 feet
Side		5–15 feet
Rear (main building)		5–15 feet
Between Main and Accessory Buildings		5–10 feet
Building		
Width		18–24 feet max.
Depth		24–36 feet max.
Height (to eave)*		12–14 feet max.



Source: Missing Middle Housing



[buildabetterburb.org/haskett-court/](http://buildabetterburb.org/haskett-court/)



A design created by The Congress of New Urbanism, which illustrates housing targeted at households making \$45,000 annually.

[www.cnu.org/publicsquare/2017/11/29/missing-middle-close-bungalow-courts](http://www.cnu.org/publicsquare/2017/11/29/missing-middle-close-bungalow-courts)

**Figure 13.** Bungalow Court example adapted from missing middle housing concepts developed by Opticos Design Inc. (Opticos Design Inc., 2018)





## MIRRORED GREEN

Density Pictured – 12 units per acre.

This bungalow court variation demonstrates six ownership units (900–1,200 sq.ft each, not including lofts) on separate lots arranged around a common green. These detached, 1½ story units are designed to blend with landscape intensive neighborhoods, with large front lawns, like those found west of Main Street in Moab, Utah. Mutual easements provide for 10' wide side yards between houses.

The design is intended to allow the units to develop over time, as shown in neighborhood context. This allows the development to fill in over time as demand dictates.

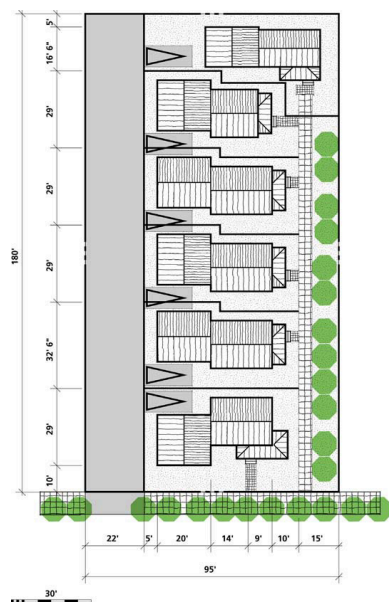


Figure 14. Mirrored green housing example adapted from *Solutions for Achieving Density and Neighborhood Friendly Design* (CPBP. 2008.)



## Duplex: Side-by-Side

### DUPLEX: SIDE-BY-SIDE

A small- to medium-sized structure that consists of two dwelling units, one next to the other, both of which face and are entered from the street

Lot	Front-loaded	Rear-Loaded
Width*	55–75 feet	40–70 feet
Depth*	100–150 feet	100–150 feet
Area*	5,000–11,250 sq. ft. 0.11–0.26 acres	4,500–10,500 sq. ft. 0.10–0.24 acres
Units		
Number of Units	2 units	2 units
Typical Unit Size	600–2,400 sq. ft.	600–2,400 sq. ft.
Density		
Net Density	8–17 du/acre	8–19 du/acre
Gross Density	6–13 du/acre	7–14 du/acre
Parking		
On-street Spaces	2–3	2–3
Off-street Spaces	1 per unit max.	1 per unit max.
Setbacks		
Front*		10–25 feet
Side*		5–12 feet
Rear (main building)*		30–60 feet
Between Main and Accessory Buildings 1		0–20 feet
Building		
Width		28–55 feet
Depth		28–60 feet
Height (to eave)*		20–24 feet



Source: Missing Middle Housing



[www.metricon.com.au/new-home-designs/unavailable#m60xq5ym-V5xtrw08.97](http://www.metricon.com.au/new-home-designs/unavailable#m60xq5ym-V5xtrw08.97)



[www.codepublishing.com/UT/Moab/#1/moab17/Moab1751.html#17.51.010](http://www.codepublishing.com/UT/Moab/#1/moab17/Moab1751.html#17.51.010)

Figure 15. Duplex. Side-by-side example adapted from missing middle housing concepts developed by Opticos Design Inc. (Opticos Design Inc., 2018)



## COTTAGE CLUSTER

Density Pictured – 16 units per acre

This side-by-side duplex example demonstrates four units (1,500–1,950 sq.ft each) arranged around a common green. These units can be either attached or detached, with the common green held as a common tract. The massing of front units reflects neighborhood patterns of houses on 50'-wide lots. Slightly smaller than typical lots in Moab and Spanish Valley, but near enough to blend with existing lot sizes.

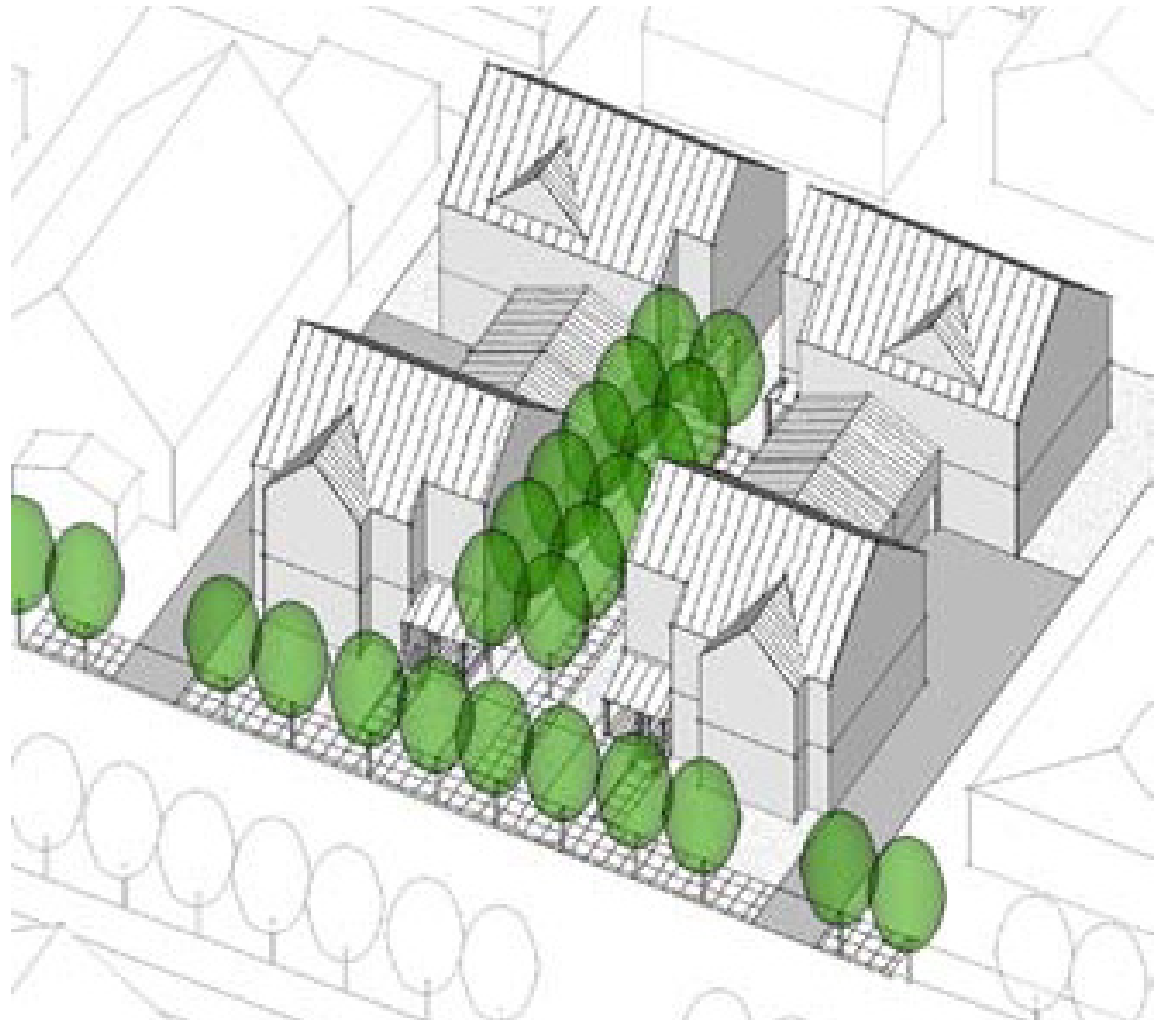
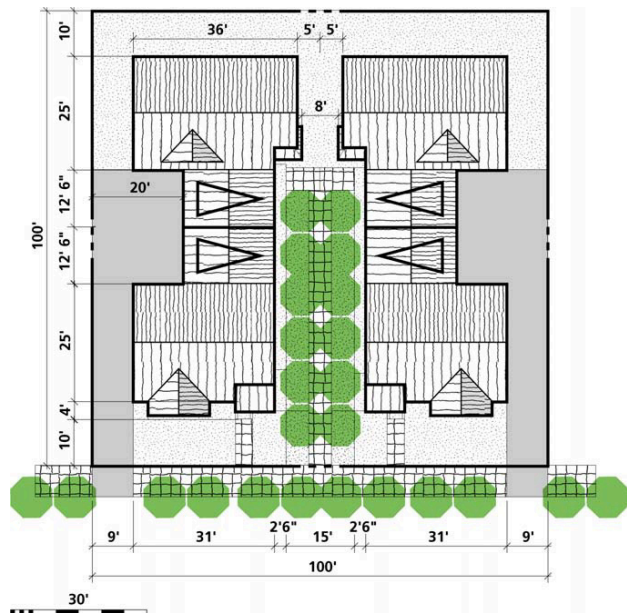


Figure 16. Cottage cluster housing example adapted from *Solutions for Achieving Density and Neighborhood Friendly Design* (CPBP, 2008)





## CONTEXTUAL ROWHOUSE VARIANT

Density Pictured – 16 units per acre

This side-by-side duplex example demonstrates four rowhouse units (1,300–1,600 sq.ft each). These units are grouped in pairs, providing building forms reflective of typical neighborhood patterns. This also avoids the wall-like effect of four attached units. A double-loaded rear alley makes efficient use of site area. This allows for larger backyards than with conventional rear parking. It is also possible to locate garages closer to each other, further reducing impervious surface area.

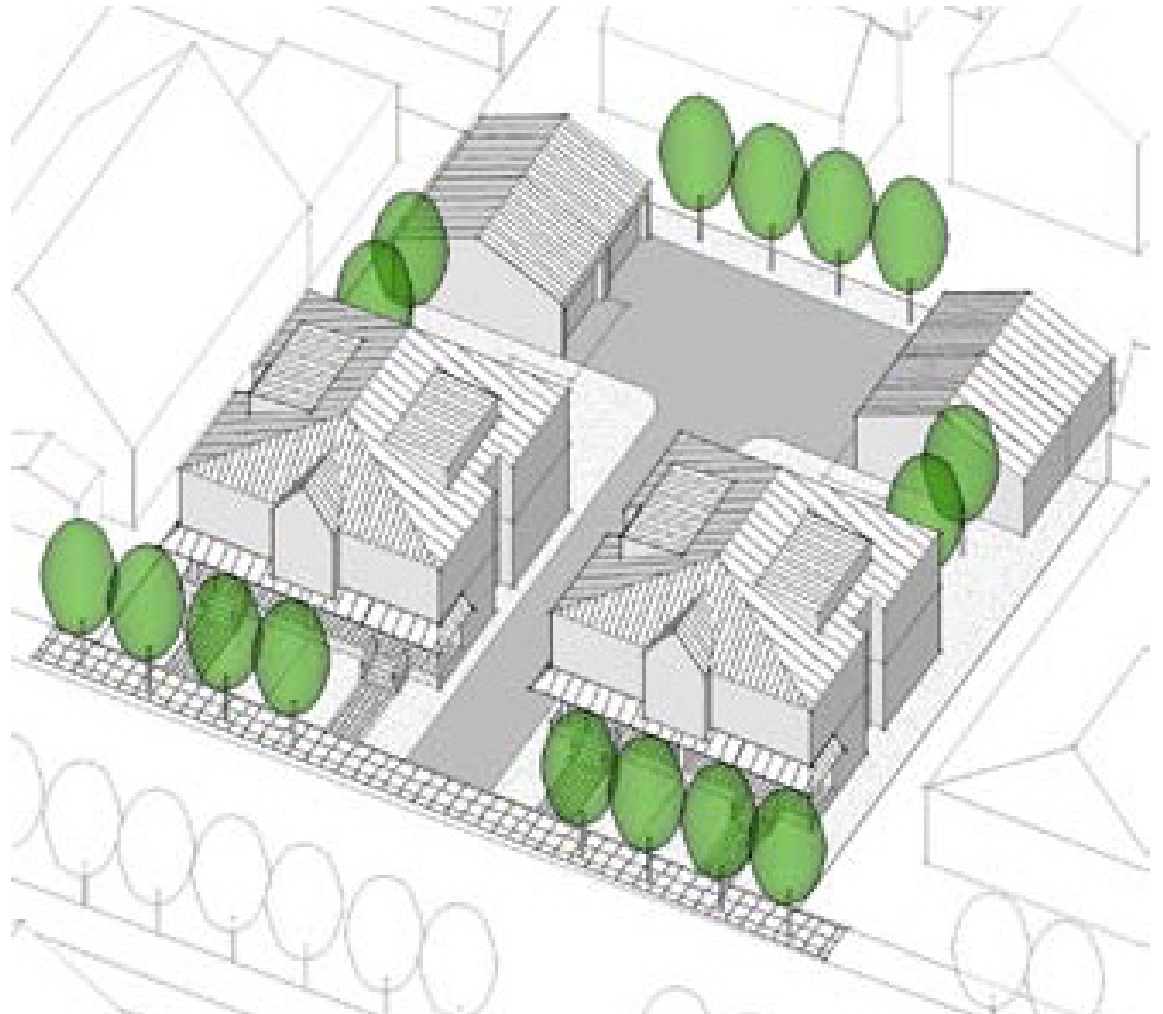
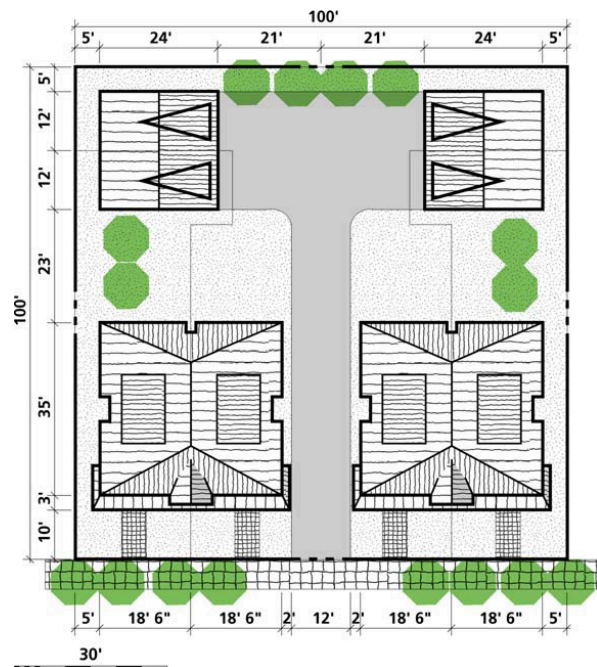


Figure 17. Contextual Rowhouse Variant housing example adapted from *Solutions for Achieving Density and Neighborhood Friendly Design* (CPBP, 2008)





## COTTAGE COURT

Density Pictured – 16 units per acre

This side-by-side duplex example demonstrates four or five attached or detached units (1,600–1,850 sq.ft each). Two of these units face public streets, giving the appearance of two single-family homes when viewed from the street. With some modification, it would also be possible to use this street front design as a “shared court” configuration, with units on separate lots oriented toward a shared court street. The shared driveway uses special paving, providing both vehicle and pedestrian access. Because there is a single access point, space remains for up to four on-street parking spaces.

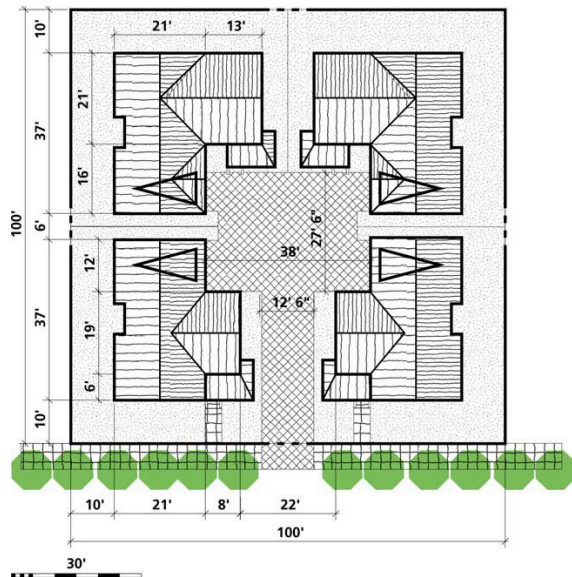


Figure 18. Cottage Court housing example adapted from *Solutions for Achieving Density and Neighborhood Friendly Design* (CPBP. 2008.)



## CONTEXTUAL ROWHOUSE

Density Pictured – 20 units per acre

This side-by-side duplex example demonstrates five rowhouse units (1,050–1,300 sq.ft each). This massing of units is intended to blend in detached single-family context, similar to the majority of neighborhoods found in Spanish Valley. Parking is provided in detached garages to the rear of each unit, accessed by alley easement. Small private gardens are provided between each unit and the garages. Additional square footage is possible if living space is added in a full third story or above garages.

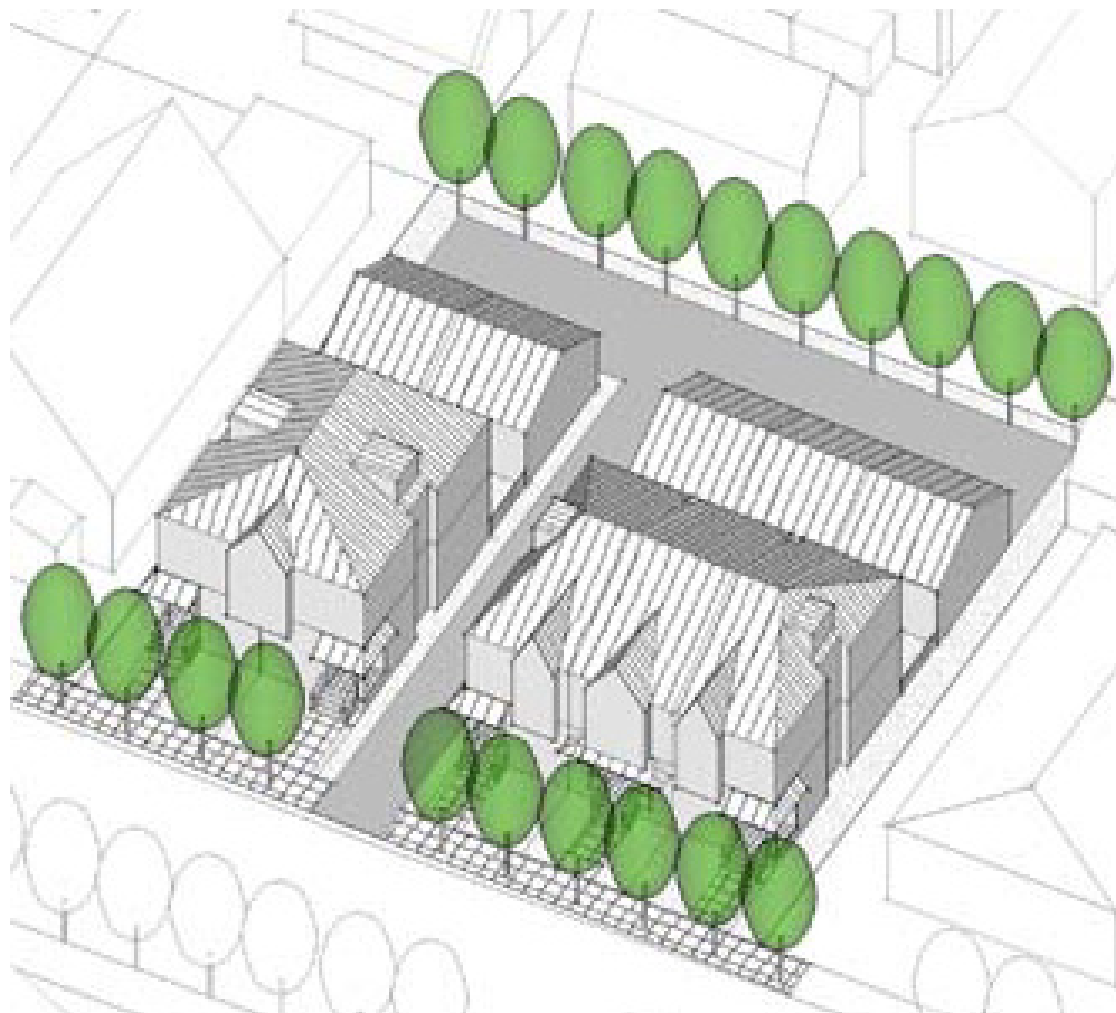
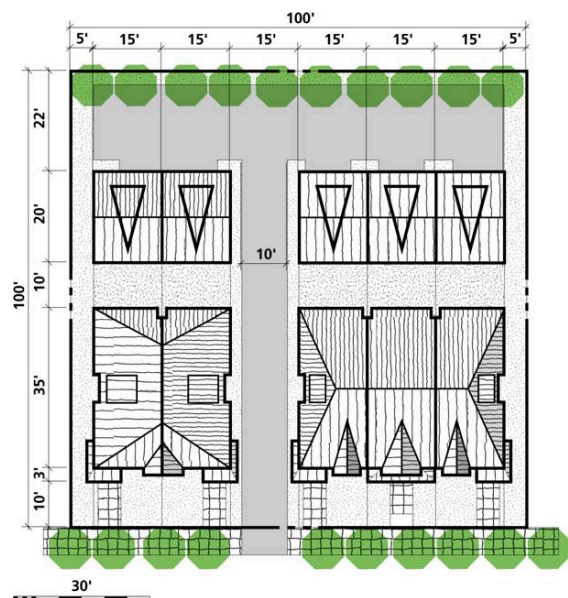


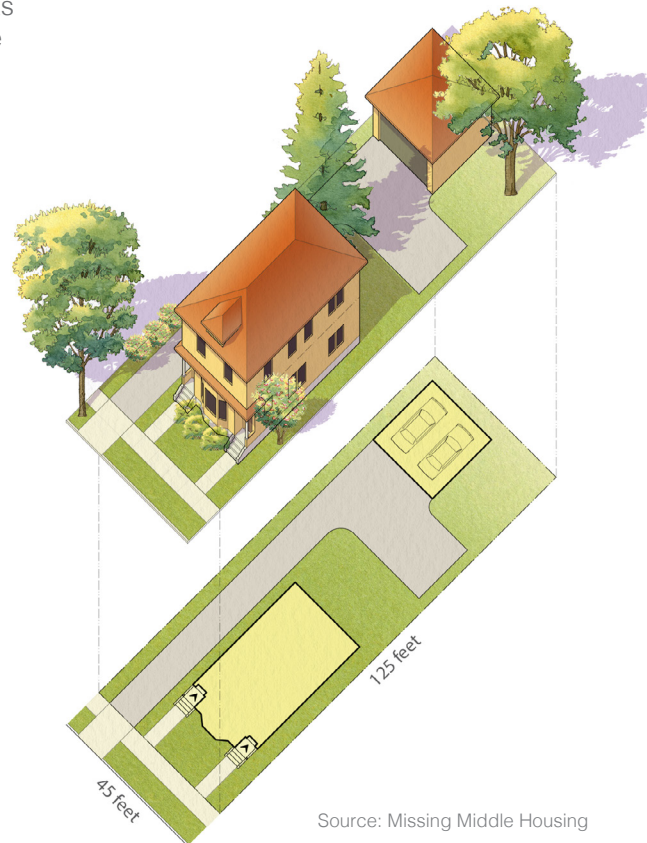
Figure 19. Contextual Rowhouse housing example adapted from *Solutions for Achieving Density and Neighborhood Friendly Design* (CPBP, 2008)



## DUPLEX: STACKED

A small- to medium-sized structure that consists of two stacked dwelling units, one on top of the other, both of which face and are entered from the street

<b>Lot</b>		
Width*	55–75 feet	40–70 feet
Depth*	100–150 feet	100–150 feet
Area*	5,500–11,250 sq. ft. 0.13–0.26 acres	4,000–10,500 sq. ft. 0.09–0.24 acres
<b>Units</b>		
Number of Units	2	2
Typical Unit Size	600–2,400 sq. ft.	600–2,400 sq. ft.
<b>Density</b>		
Net Density	8–16 du/acre	8–22 du/acre
Gross Density	7–16 du/acre	7–16 du/acre
<b>Parking</b>		
Parking Ratio*	2–2.5 per unit	2–2.5 per unit
On-street Spaces	2–3	2–3
Off-street Spaces	1 per unit max.	1 per unit max.
<b>Setbacks</b>		
Front*	10–25 feet	
Side*	5–12 feet	
Rear (main building)*	30–60 feet	
Between Main and Accessory Buildings	10–20 feet	
<b>Building</b>		
Width	28–55 feet	
Depth	28–60 feet	
Height (to eave)*	20–24 feet	



[www.architectmagazine.com/project-gallery/entrepinos\\_o](http://www.architectmagazine.com/project-gallery/entrepinos_o)



[www.canadianarchitect.com/features/union-street-ecoheritage/](http://www.canadianarchitect.com/features/union-street-ecoheritage/)

**Figure 20.** Duplex stacked example adapted from missing middle housing concepts developed by Opticos Design Inc. (Opticos Design Inc., 2018)



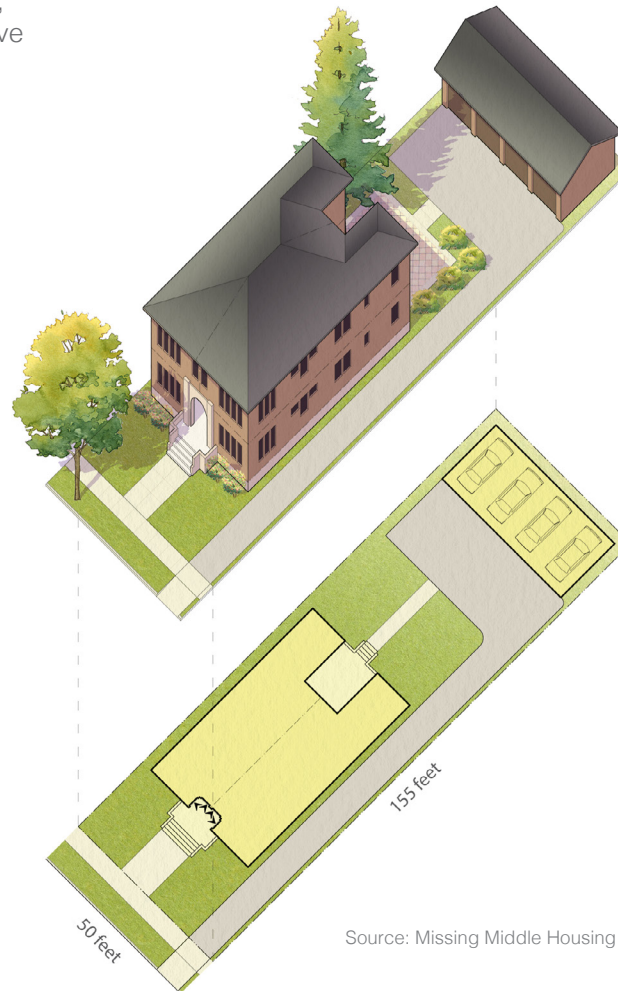


## Fourplex

### FOURPLEX

A medium structure that consists of four units, typically two on the ground floor and two above with a shared entry

Lot	Front-loaded	Rear-Loaded
Width*	60–75 feet	50–65 feet
Depth*	100–150 feet	100–150 feet
Area*	6,000–11,250 sq. ft. 0.14–0.26 acres	5,000–9,750 sq. ft. 0.11–0.22 acres
<b>Units</b>		
Number of Units	4	4
Typical Unit Size	500–1,200 sq. ft.	500–1,200 sq. ft.
<b>Density</b>		
Net Density	15–29 du/acre	18–35 du/acre
Gross Density	13–22 du/acre	14–25 du/acre
<b>Parking</b>		
On-street Spaces	2–3	2–3
Off-street Spaces	1.5 per unit max.	1.5 per unit max.
<b>Setbacks</b>		
Front*		10–25 feet
Side*		5–12 feet
Rear (main building)*		30–60 feet
Between Main and Accessory Buildings		10–20 feet
<b>Building</b>		
Width	36–56 feet	
Depth	32–60 feet	
Height (to eave)*	20–24 feet	



Source: Missing Middle Housing



[www.bizjournals.com/albuquerque/news/2016/04/12/local-developers-new-approach-investors-rio-rancho.html](http://www.bizjournals.com/albuquerque/news/2016/04/12/local-developers-new-approach-investors-rio-rancho.html)



[www.inertiaincorporation.com/multi/](http://www.inertiaincorporation.com/multi/)

**Figure 21.** Fourplex example adapted from missing middle housing concepts developed by Opticos Design Inc. (Opticos Design Inc., 2018)



## BIG COTTAGE COURT

Density Pictured – 16 units per acre

This variation on fourplex housing demonstrates eight units in five buildings (1,380–2,250 sq.ft each). Units are arranged around a driveway with decorative paving. Surface parking spaces near each unit are provided. The driveway is designed with special paving that serves as an alternative to a grade-separated walkway and provides multi-functional space for residents.

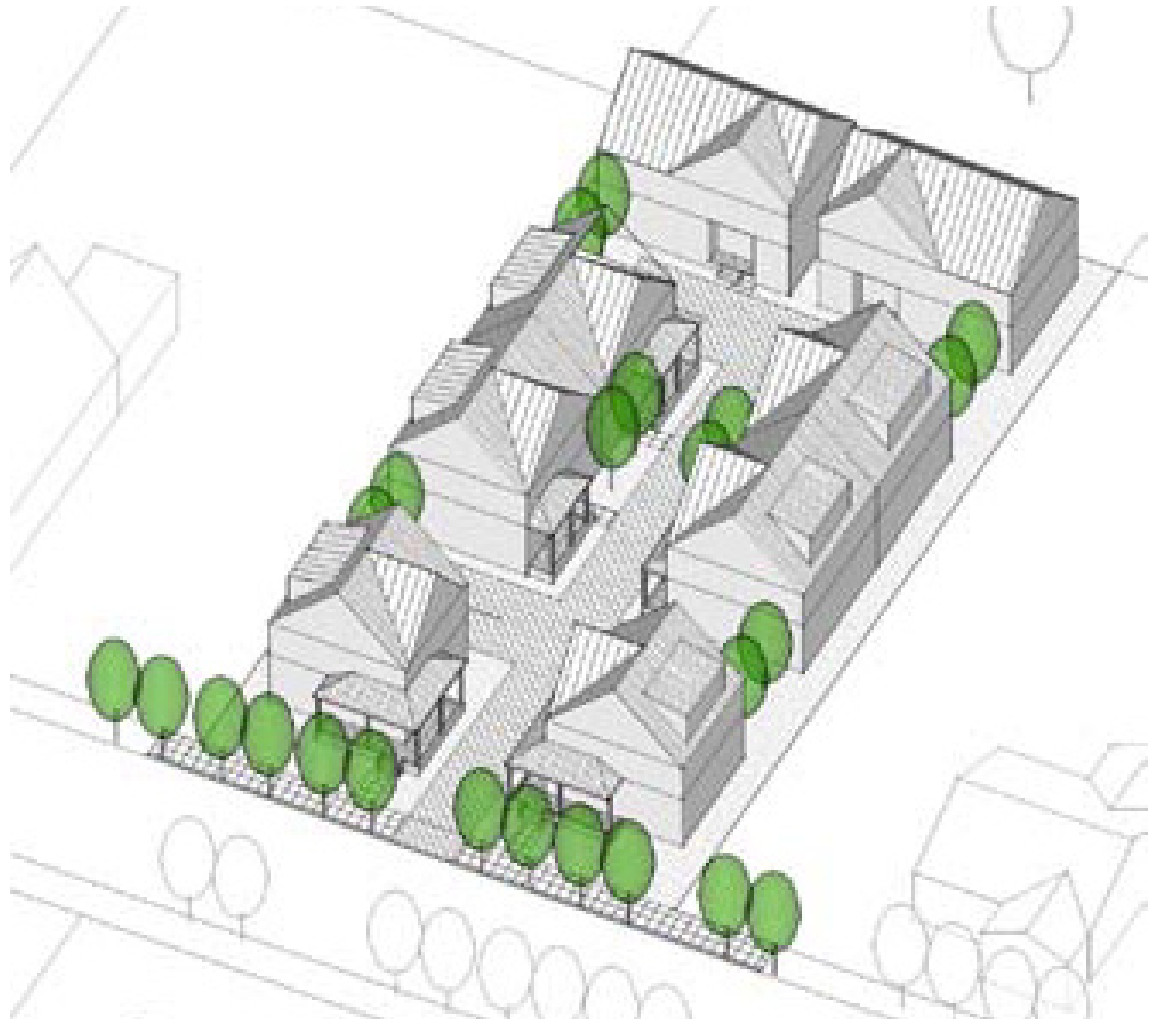
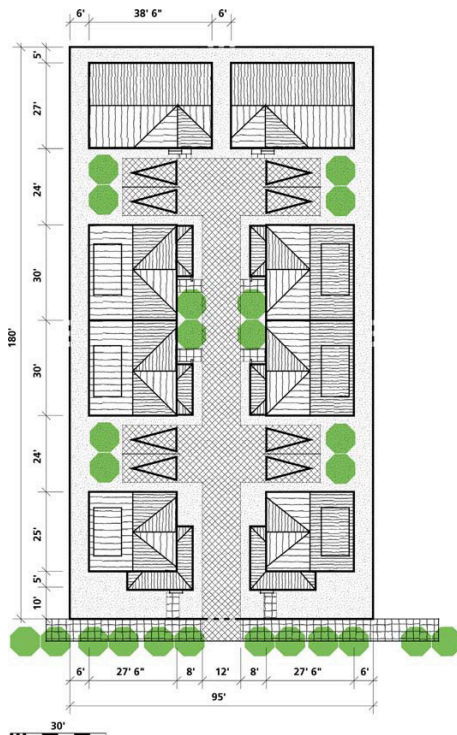


Figure 22. Big Cottage Court housing example adapted from *Solutions for Achieving Density and Neighborhood Friendly Design* (CPBP, 2008)



## HOUSE-PLEX

Density Pictured – 24 units per acre

This variation on fourplex housing demonstrates three to four units (1,000–1,400 sq.ft each, not including garages). Street frontage of the units is designed to reflect the scale of a detached single-family dwelling home. This will help the units blend with existing neighborhood contexts found in Moab and Spanish Valley.

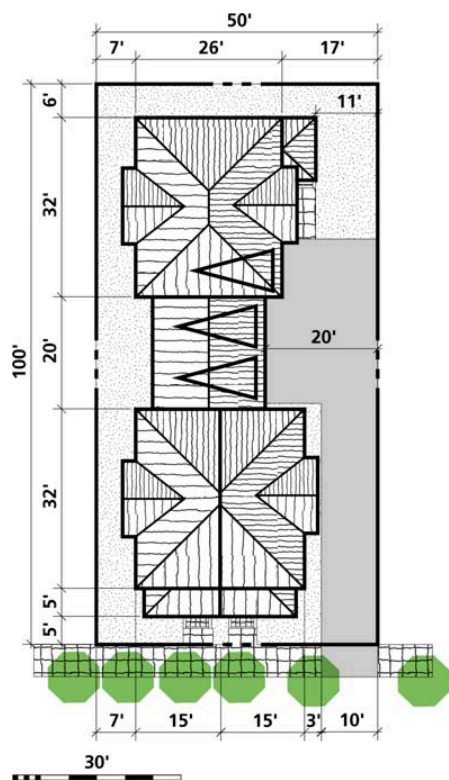


Figure 23. House-plex housing example adapted from *Solutions for Achieving Density and Neighborhood Friendly Design* (CPBP, 2008)





## TOWNHOUSE

A small- to medium-sized structure, consisting of two to eight (usually) attached single-family homes placed side by side.



[uc-bproperties.com/property/63oak/63-oak-417-3-bedroom-townhouse/](https://uc-bproperties.com/property/63oak/63-oak-417-3-bedroom-townhouse/)



[www.vrbo.com/766460](https://www.vrbo.com/766460)



## COURTYARD TOWNHOMES

Density Pictured – 16 units per acre

This variation on traditional townhomes demonstrates eight units in three buildings (1,100–2,150 sq.ft. each, not including garages). These are arranged around a courtyard pedestrian walkway. A shared surface parking area is provided at the middle of the site. A specially paved walk crosses the driveway to link a pedestrian walkway to a courtyard community space. The “house-like” form of front units and courtyard landscaping responds to neighborhood character, allowing for increased density without drastically altering the feel of existing detached single-family home neighborhoods.

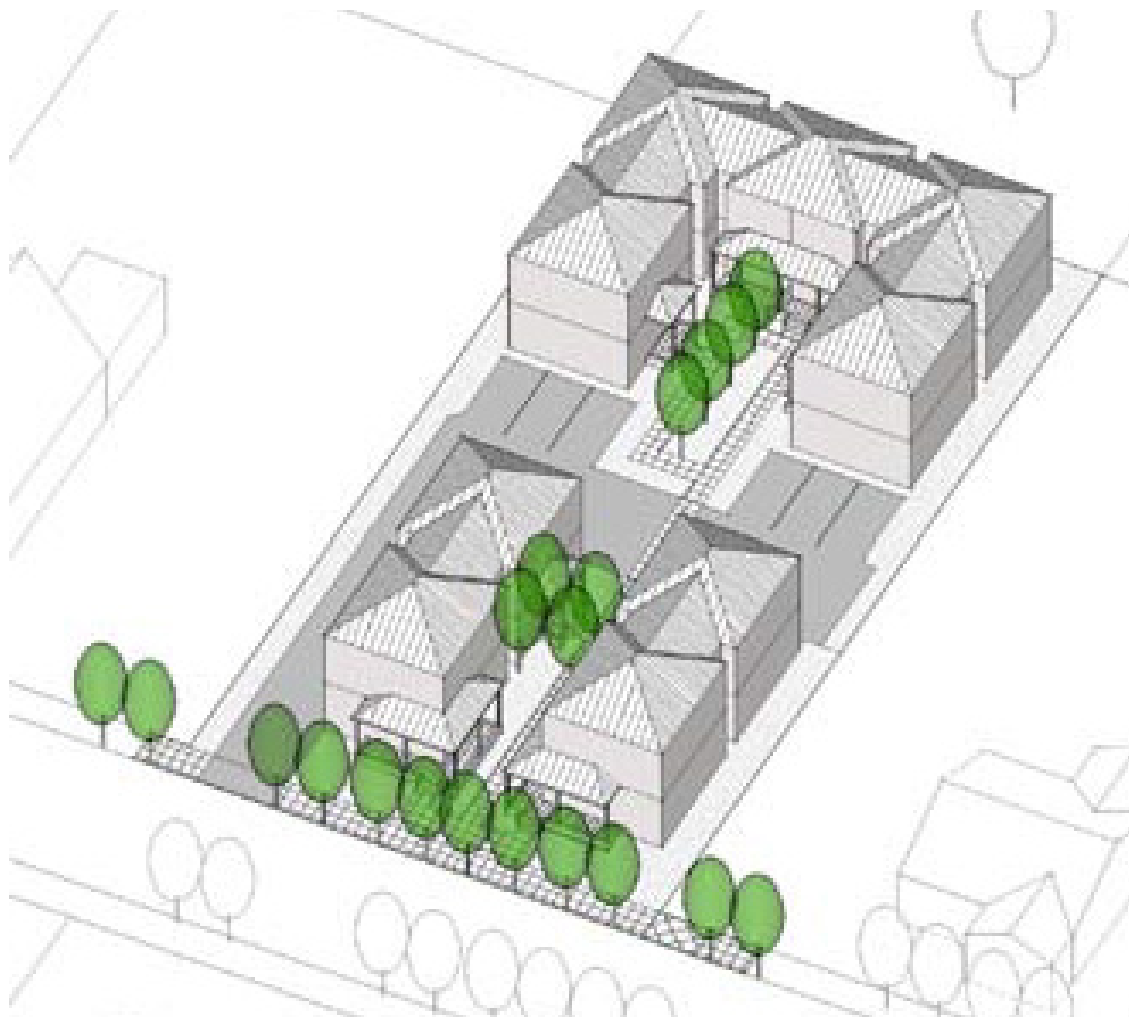
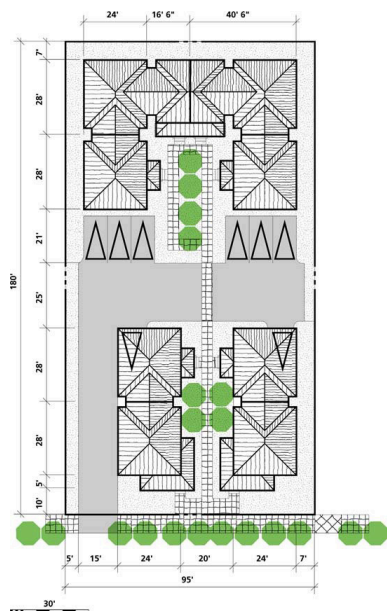


Figure 24. Courtyard Townhomes housing example adapted from *Solutions for Achieving Density and Neighborhood Friendly Design* (CPBP, 2008)



## TOWNHOUSE CLUSTER

Density Pictured – 24 units per acre

This variation on traditional townhomes demonstrates two sets of paired townhouses, modeling four units in total (1,000–1,300 sq.ft each, not including garages). This prototype illustrates the use of driveway paving blocks as an alternative to a grade-separated walkways for access to the rear units, saving space by expanding the use to automobiles as well as pedestrians. Cantilevering living space over vehicle areas provides efficient use of limited site area.

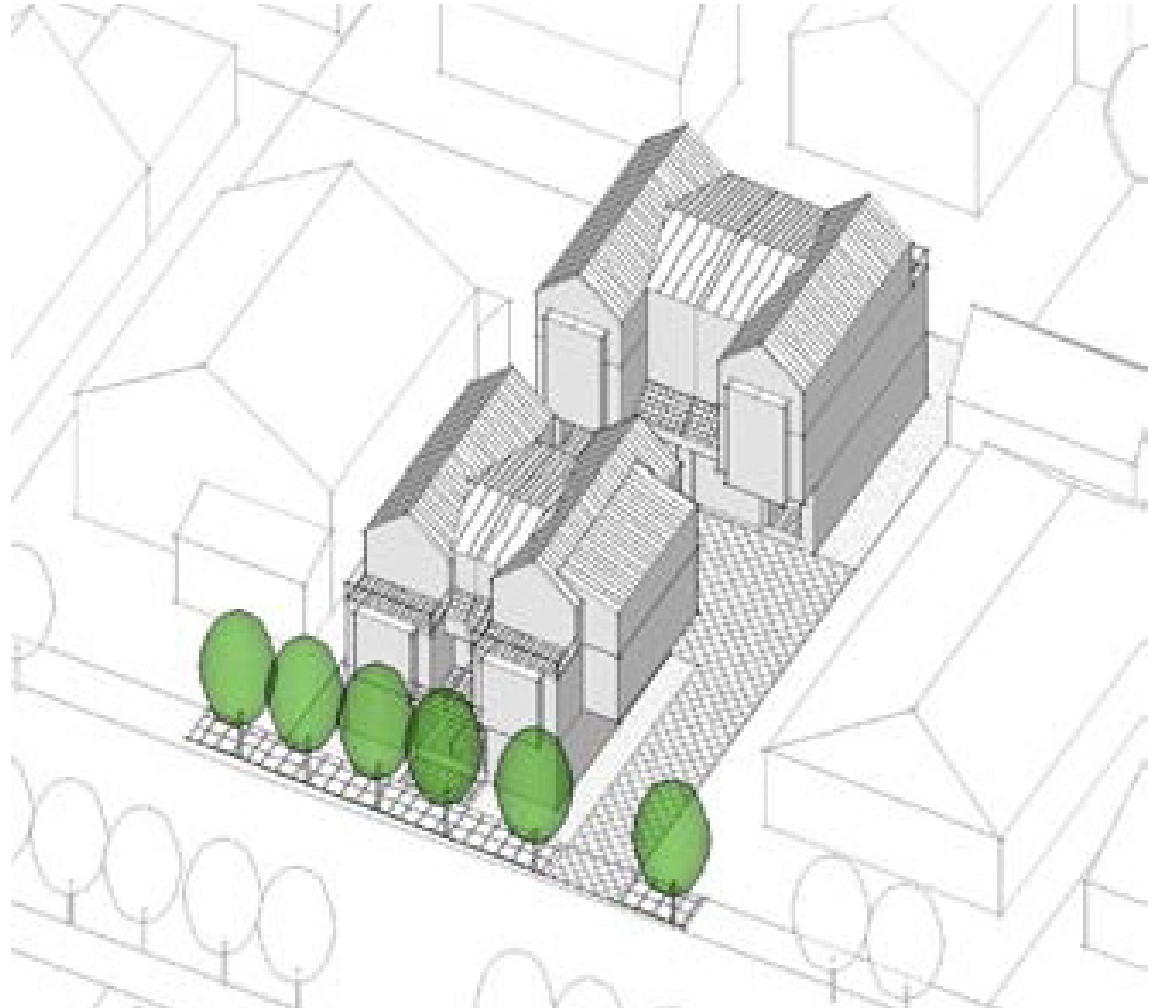
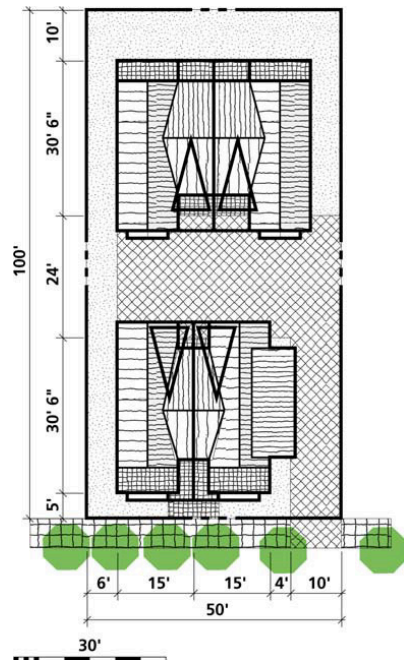


Figure 25. Townhouse cluster housing example adapted from *Solutions for Achieving Density and Neighborhood Friendly Design* (CPBP, 2008)





## SHARED COURT ROWHOUSE

Density Pictured – 24 units per acre

This variation on traditional townhomes demonstrates eight attached units (1,025 sq.ft each). The units are grouped around a shared court. It would also be possible add to detached units, creating a cottage court with smaller two-story units. Units could be expanded with the addition of a full third story, although this may compromise contextual fit in existing detached single-family neighborhoods.

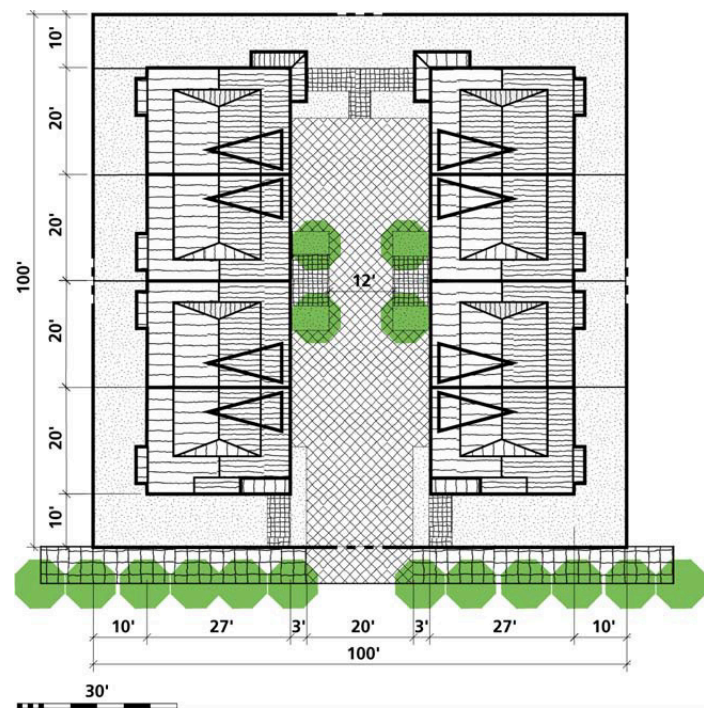


Figure 26. Shared court rowhouse housing example adapted from *Solutions for Achieving Density and Neighborhood Friendly Design* (CPBP, 2008)



## COURTYARD TOWNHOUSES VARIATION

Density Pictured – 26 units per acre

This variation on traditional townhomes demonstrates 13 townhouse-type units (900–1,150 sq.ft) grouped along a central courtyard. These units are accessed by rear drives. This design provides space for three potential studio units along the street frontage. These smaller units provide a diversity of housing options increasing affordable choices for different housing needs. The buildings divided into smaller groupings, diverging from traditional townhome orientation of the long, barracks-like groupings of units. The three-story units along the site's frontage are intended to provide an edge to a busy arterial road. This creates ground-level spaces suitable as home offices, entry hallways, or studio apartment units.

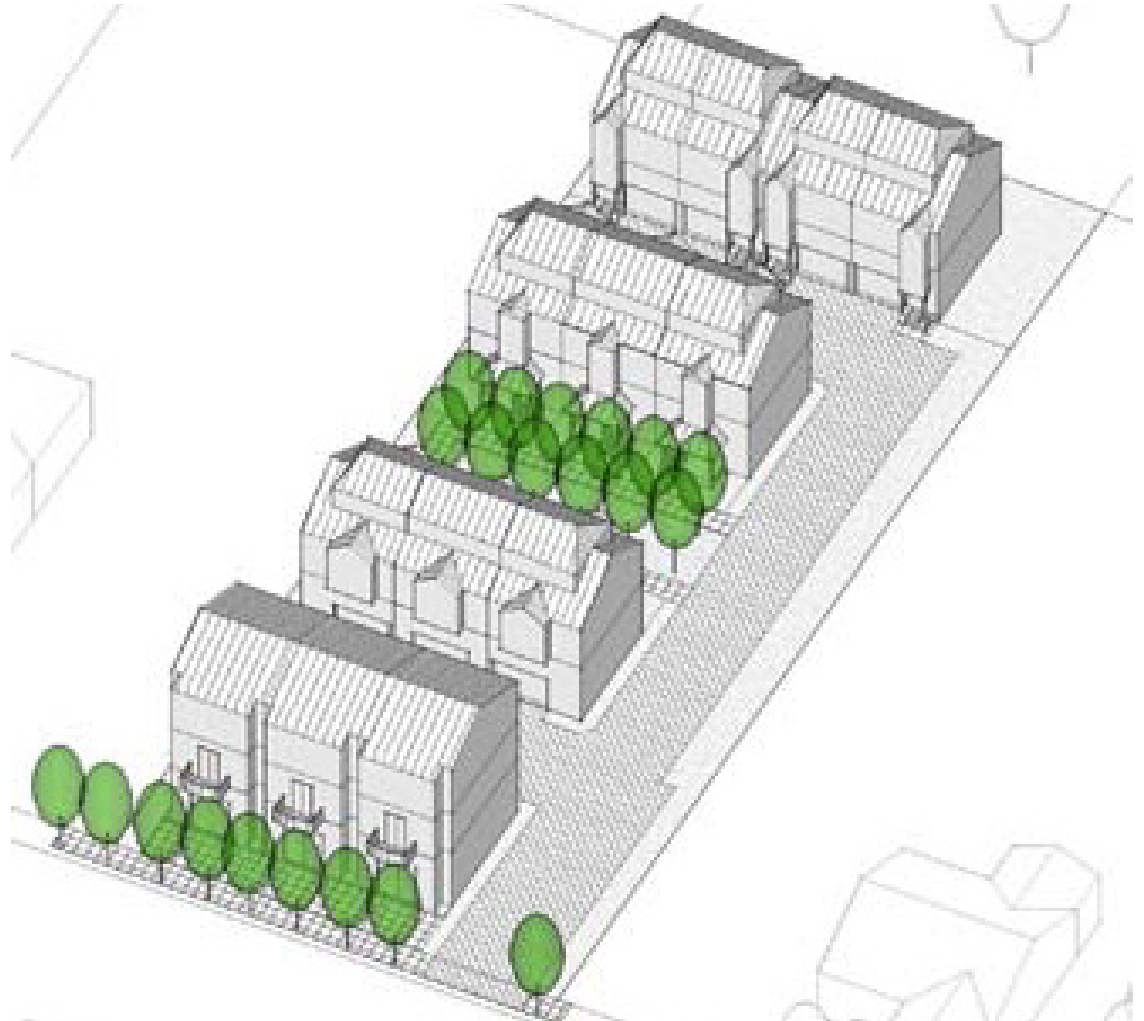
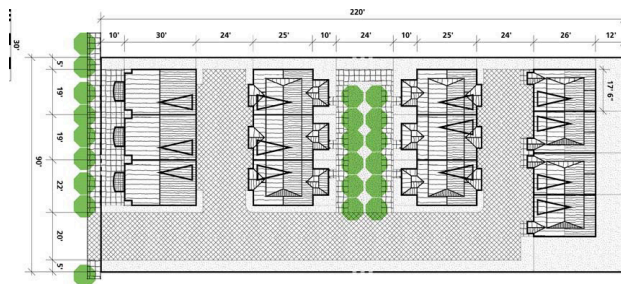


Figure 27. Courtyard townhomes variation housing example adapted from *Solutions for Achieving Density and Neighborhood Friendly Design* (CPBP, 2008)



**CORNER ROWHOUSE**

Density Pictured – 28 units per acre

This variation on traditional townhomes demonstrates seven rowhouse units (950–1,050 sq.ft each). This organization of units is designed to be situated on a corner parcel. Parking is found in “tuck-under” enclosed garages at the rear of each unit. The shared open space allows for larger recreation space than would be possible separately for each unit.

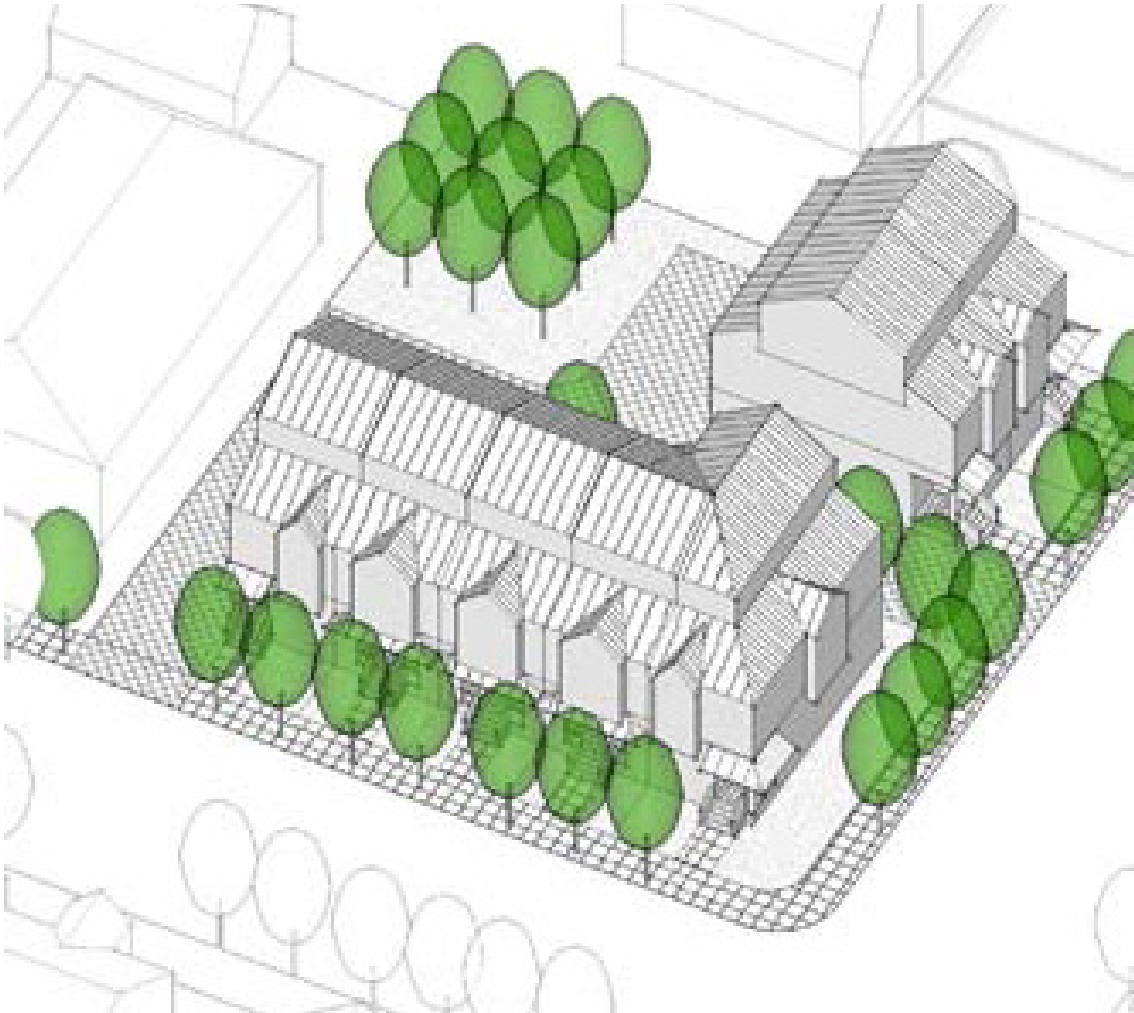
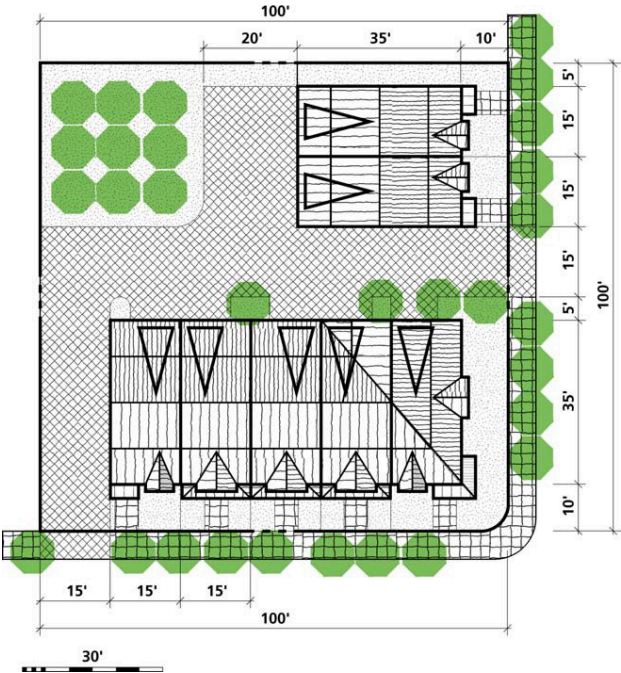


Figure 28. Corner rowhouse housing example adapted from *Solutions for Achieving Density and Neighborhood Friendly Design* (CPBP, 2008)



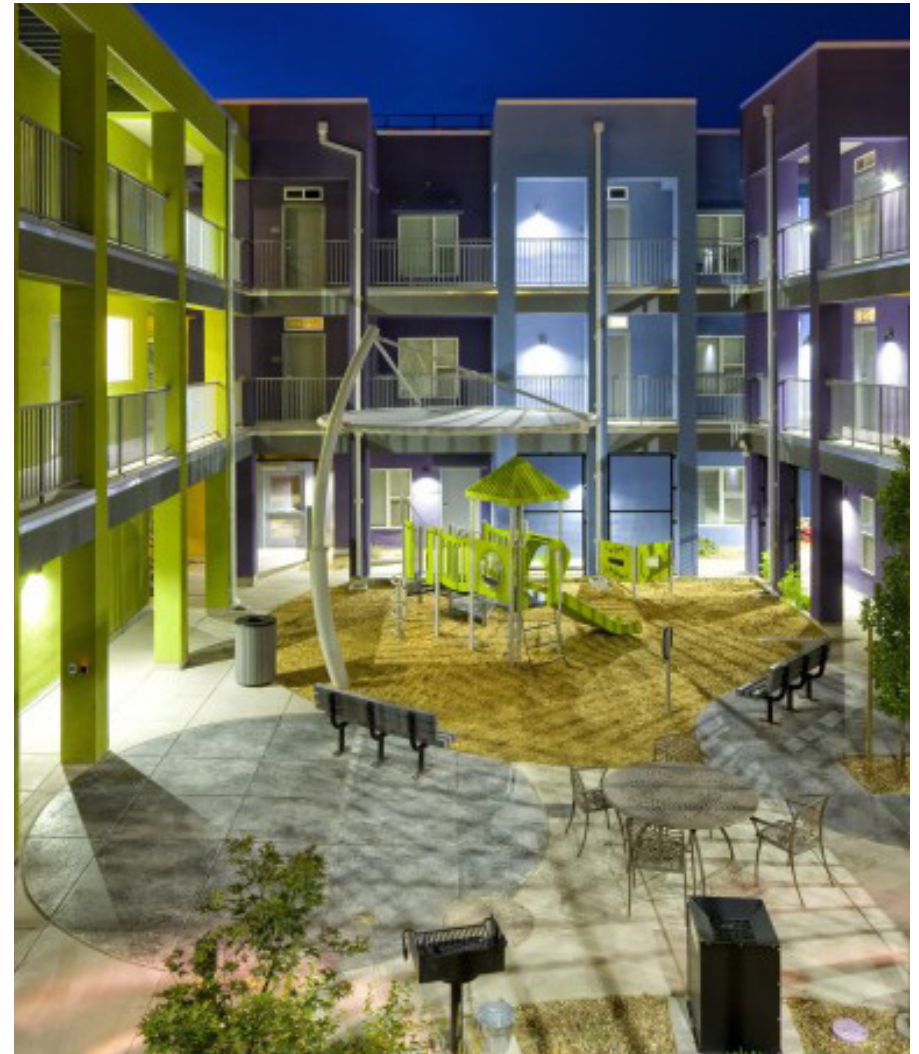


## COURTYARD APARTMENTS

A medium- to large-sized structure consisting of multiple side-by-side and/or stacked dwelling units accessed from a courtyard or series of courtyards. Each unit may have its own individual entry or up to three units may share a common entry.



[www.apartments.com/seventeen-west-atlanta-ga/07g5143/](http://www.apartments.com/seventeen-west-atlanta-ga/07g5143/)



[www.architectmagazine.com/project-gallery/casitas-de-colores](http://www.architectmagazine.com/project-gallery/casitas-de-colores)



### COURTYARD FLATS

Density Pictured – 36 units per acre

This courtyard apartment variation demonstrates 18–20 stacked-unit apartments (900–1,000 sq.ft each). Units are grouped around a shared open space. The building orientation provides a strong edge to busy arterial streets and creates an open space sheltered from traffic. The units features open “tuck-under” parking, considered more economical than structured or underground parking, while allowing more efficient use of site area than surface parking. This plan could be mirrored on adjacent or larger site, with a single large central courtyard.

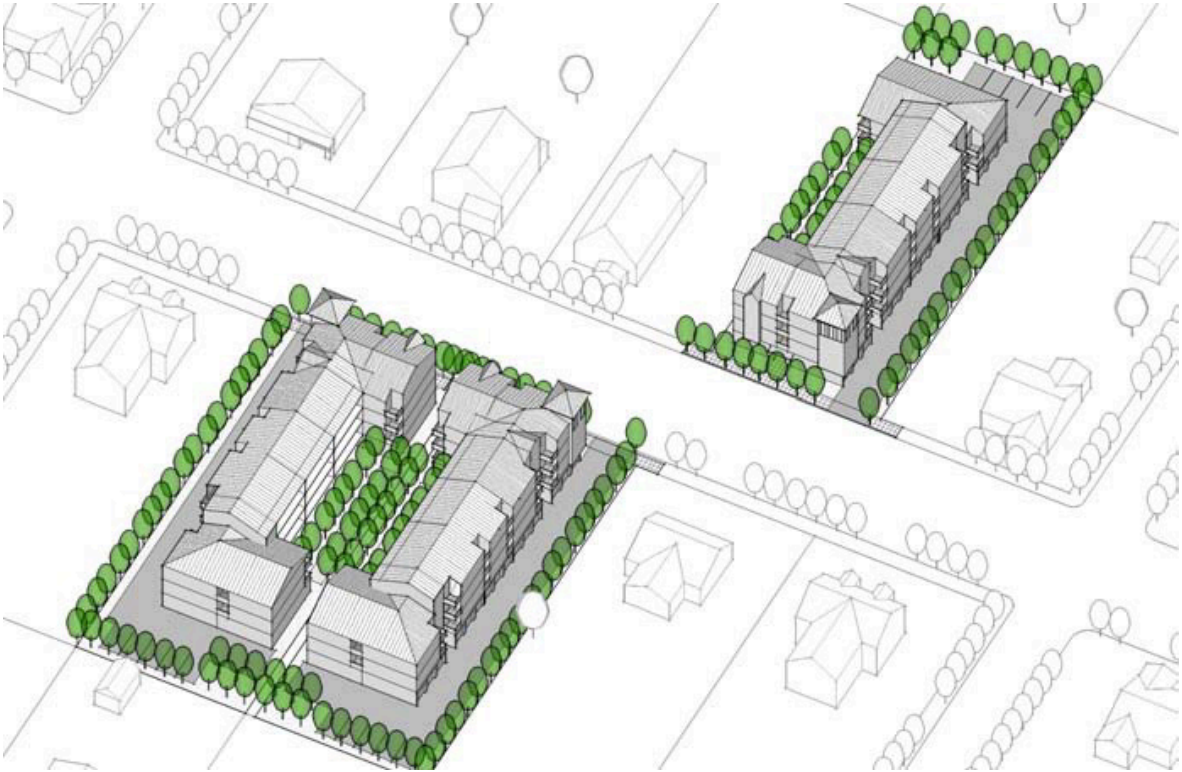
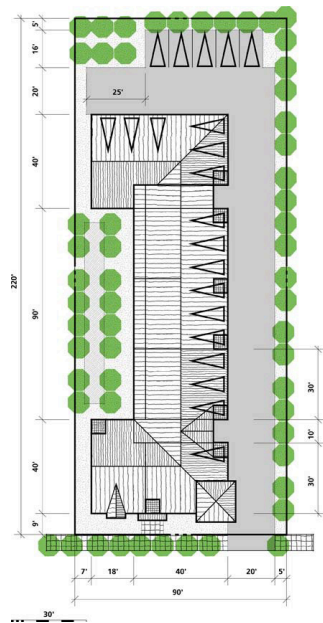


Figure 29. Courtyard flat apartment housing example adapted from *Solutions for Achieving Density and Neighborhood Friendly Design* (CPBP, 2008)

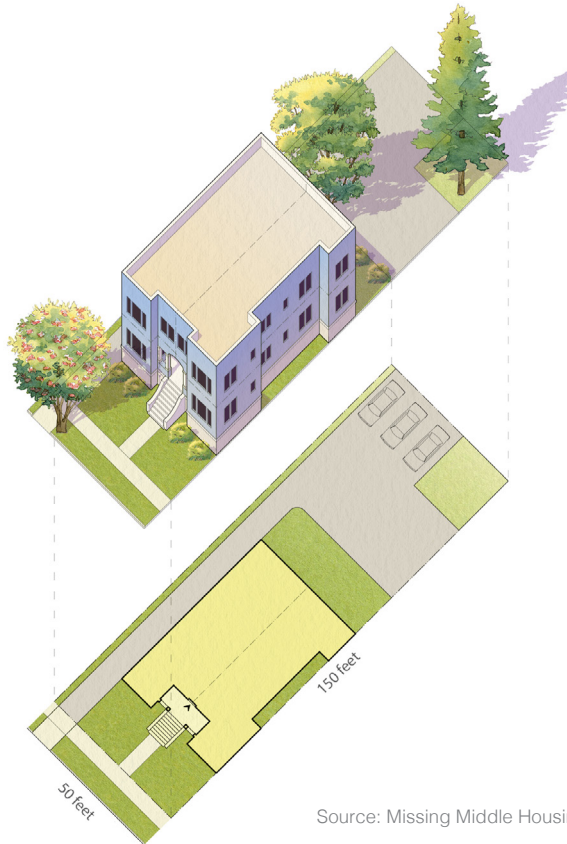




## MULTIPLEX: SMALL

A medium structure that consists of five to ten side-by-side and/or stacked dwelling units, typically with one shared entry or individual entries along the front

<b>Lot</b>		
Width*	60–75 feet	50–65 feet
Depth*	100–150 feet	100–150 feet
Area*	6,000–11,250 sq. ft. 0.14–0.26 acres	5,000–9,750 sq. ft. 0.11–0.22 acres
<b>Units</b>		
Number of Units	6–10 units	6–10 units
Typical Unit Size	500–1,200 sq. ft.	500–1,200 sq. ft.
<b>Density</b>		
Net Density	23–58 du/acre	26–70 du/acre
Gross Density	19–56 du/acre	21–62 du/acre
<b>Parking</b>		
On-street Spaces	2–3	2–3
Off-street Spaces	1.5 per unit max.	1.5 per unit max.
<b>Setbacks</b>		
Front*	10–25 feet	
Side*	5–12 feet	
Rear (main building)*	30–60 feet	
Between Main and Accessory Buildings	10–20 feet	
<b>Building</b>		
Width	36–56 feet	
Depth	32–60 feet	
Height (to eave)*	20–24 feet	



Source: Missing Middle Housing



[www.architectmagazine.com/project-gallery/casitas-de-colores](http://www.architectmagazine.com/project-gallery/casitas-de-colores)



[www.laction.com/actualities/economies/2015/10/30/vers-un-meilleur-acces-du-programme-allo-4327996.html](http://www.laction.com/actualities/economies/2015/10/30/vers-un-meilleur-acces-du-programme-allo-4327996.html)

**Figure 30.** Multiplex small example adapted from Missing Middle Housing concepts developed by Opticos Design Inc. (Opticos Design, Inc., n.d.)





## Commercial Mixed-Use

### COMMERCIAL MIXED-USE

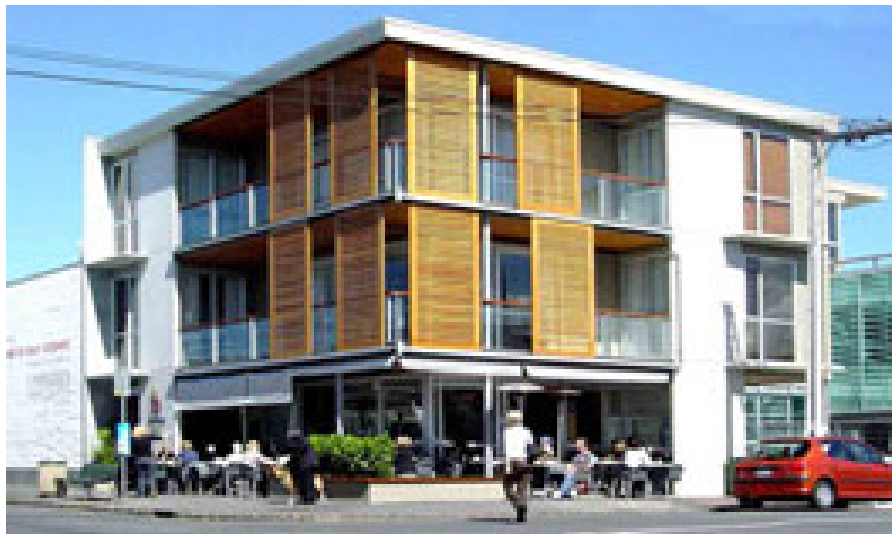
The Ministry for the Environment of the New Zealand National Government has produced a guide for mixed-use development, intended for a scale that might be appropriate for Moab City and Spanish Valley (Sills, 2005). Looking at a series of case studies of successful mixed-use developments, the authors evaluated urban design principals. This study is a choice reference for the area because it identifies a number of principles that are significant for affordable housing development in the growing Moab and Spanish Valley area. The authors found that the mixed-use developments in their study created opportunities to live near the workplace, a rise in the number of people

working from home, easy access for residents to services and entertainment, an increase in awareness that commuting by car contributes to air pollution and traffic congestion, an increase in the population of elderly persons living in the area, and an increased desire for low-maintenance living spaces.

The study also highlights how mixed-use developments can be beneficial to the environment by reducing sprawl and conserving the area's natural environment. This, in turn, also reduces the amount of time residents spend in cars, reducing air pollution and congestion on the roads. It also reduces the use of the car by creating opportunities for using public transportation, cycling, and walking.

In addition, the study also found that well-designed mixed-use developments are safer for residents. By combining facilities that are active at different times of the day, mixed-use streets remain well used and passively monitored throughout the day, reducing crime and threat of danger to residents and visitors.

The ministry stresses the importance of well-designed mixed-use developments that provide a comfortable and attractive street environment, enhancing the public domain on streets and at street corners. The character of the design will determine how readily the surrounding community is willing to accept and incorporate the development. This highlights the importance of design that integrates new structures into the context of the community.



[www.mfe.govt.nz/publications/towns-and-cities/urban-design-case-studies-local-government/mixed-use-town-centres](http://www.mfe.govt.nz/publications/towns-and-cities/urban-design-case-studies-local-government/mixed-use-town-centres)



[www.multifamilyexecutive.com/design-development/zoning-change-encourages-development-in-denver\\_o](http://www.multifamilyexecutive.com/design-development/zoning-change-encourages-development-in-denver_o)



### MIXED-USE DEVELOPMENT IN A TOWN CENTER

- Helps to contain urban sprawl and allow occupants to be close to new or existing services and facilities
- Provides opportunities for living and working in close proximity, potentially reducing private vehicle use
- Retains 24-hour vibrancy, which might otherwise be lost if residential uses predominate
- Provides work-from-home accommodation that is well connected to commercial areas and their available services
- Allows people to live close to recreation, entertainment, and services (reducing the amount of car use or providing further opportunities for those who do not drive)
- Provides low-maintenance accommodation opportunities
- Provides diversity and choice in accommodation type, style, and size

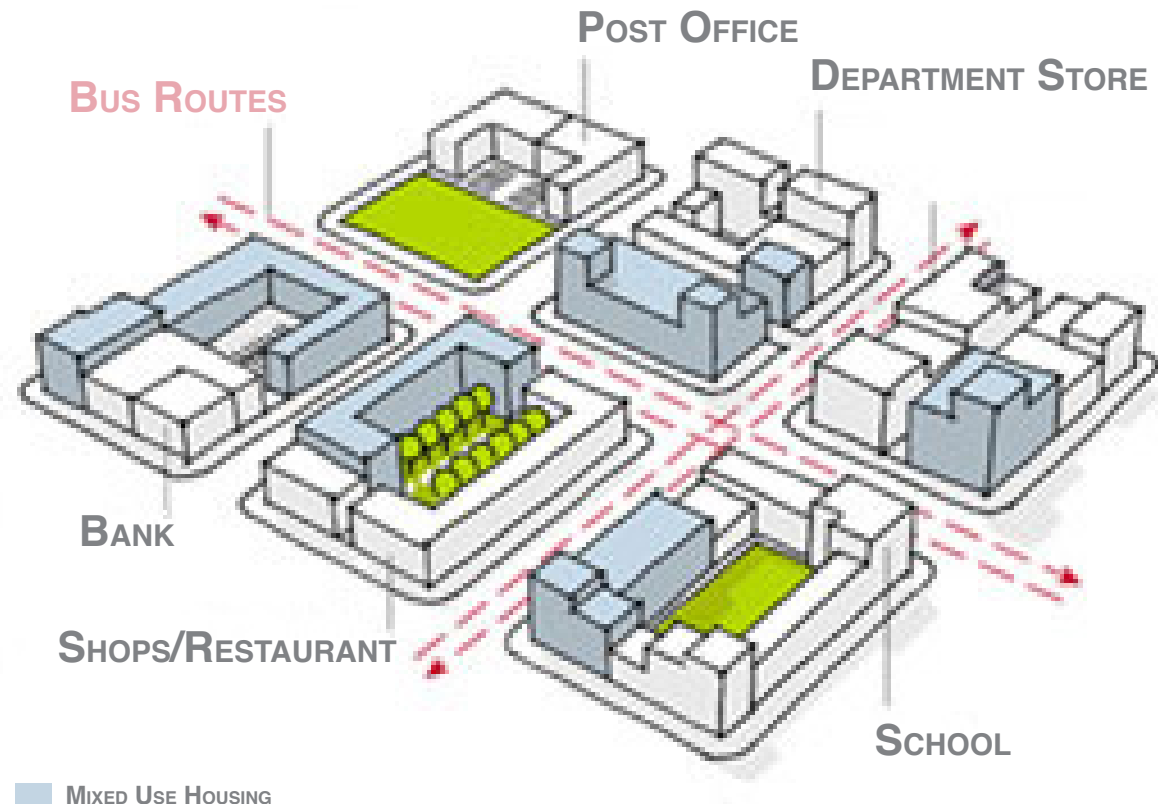


Figure 31. Mixed-Use development in a town center

[www.mfe.govt.nz/publications/towns-and-cities/urban-design-case-studies-local-government/mixed-use-town-centres](http://www.mfe.govt.nz/publications/towns-and-cities/urban-design-case-studies-local-government/mixed-use-town-centres)

# BUILDING CONSENSUS AMONG COMMUNITY STAKEHOLDERS

## SPANISH VALLEY HOUSING DISTRICTS AND AFFORDABLE HOUSING FOCUS AREAS

### MOAB AREA HOUSING WORKSHOP 2018

#### ENVISIONING A FUTURE FOR HOUSING IN MOAB AND SPANISH VALLEY

Figure 32 shows the five housing districts in Moab and Spanish Valley that were used in the geodesign workshop.

Figure 33, on the following page, displays an overview workshop results for the five housing districts. This includes the projects and policies selected, the higher-density housing projects and the focus areas within each district where affordable housing might be located.

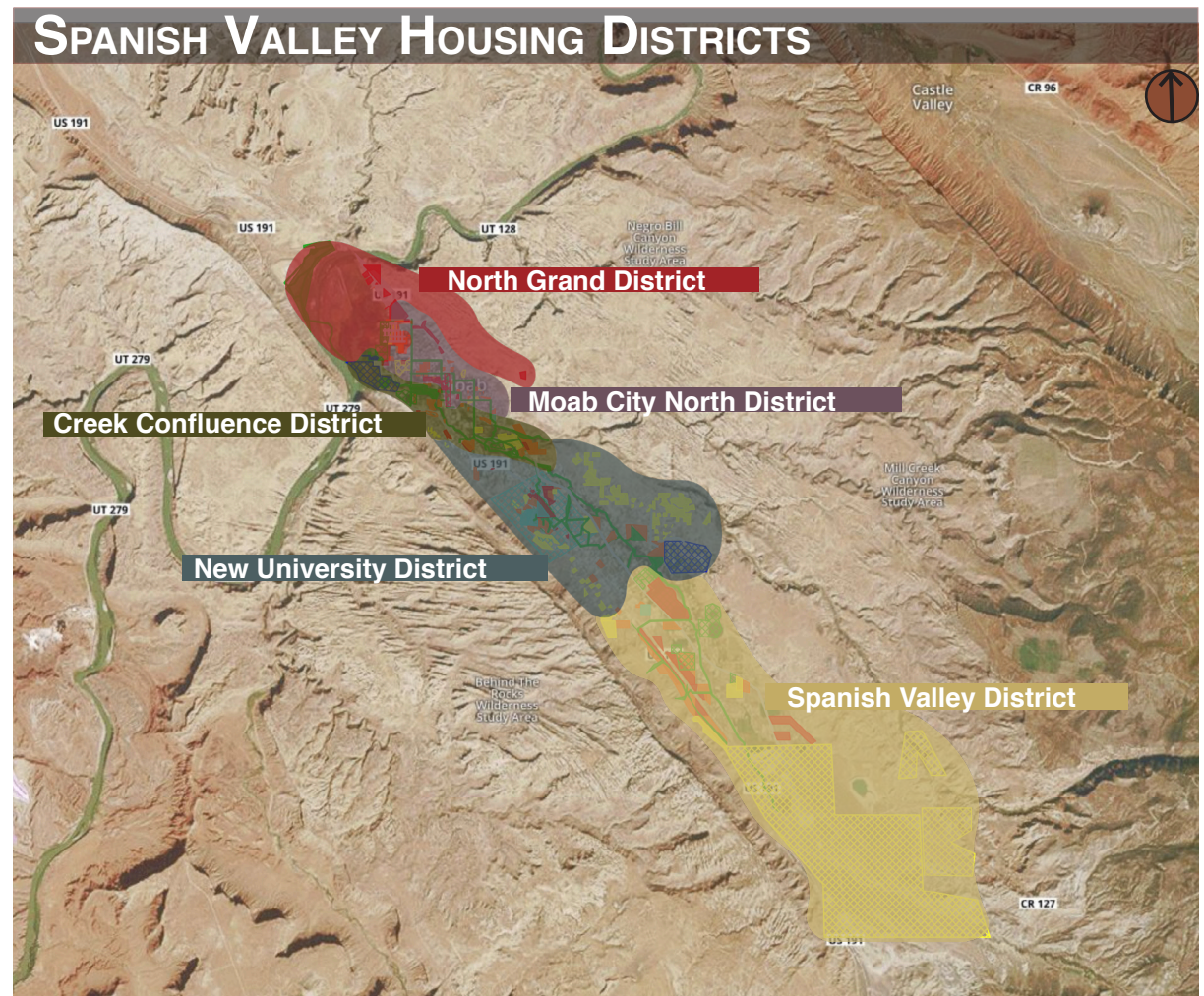


Figure 32. Spanish Valley housing districts developed from a study of Moab Area Housing Workshop 2018



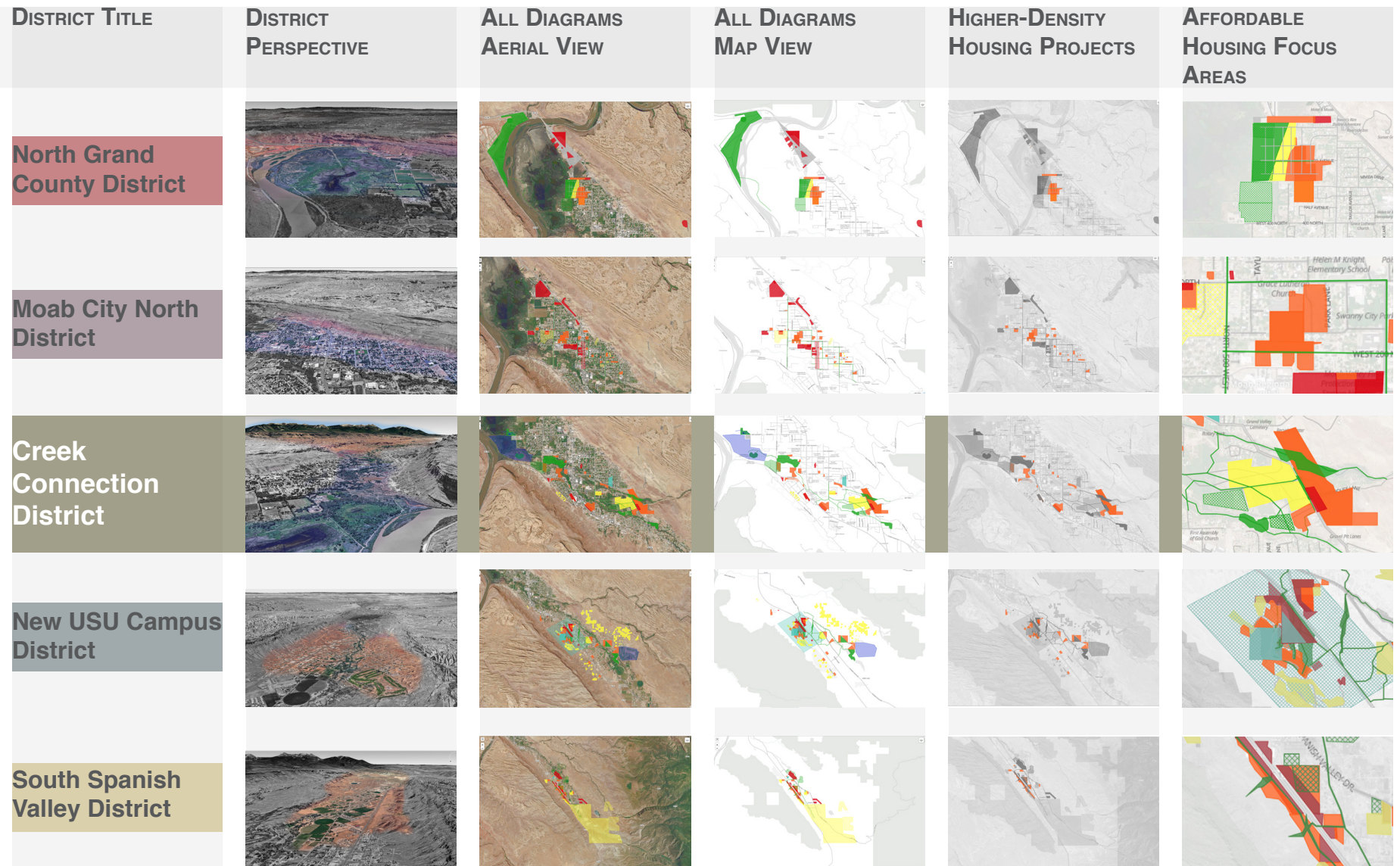


Figure 33. Moab Housing Workshop 2018 – Districts and Priority Focus Areas breakdown

## Creek Connection District

### WORKSHOP RESULTS FOR THE PRIORITY FOCUS AREA FOR INTRODUCING AFFORDABLE HOUSING

#### INTRODUCTION

Figure 34 shows the site that the MAHTF chose to locate the initial affordable housing design. This is the Priority Affordable Housing Focus Area. It lies between Mill and Pack Creek at the east side of the valley near Grand Valley Cemetery and the Gravel Pit Lanes.

The figure also includes a list of the project and policy ideas included in the final workshop masterplan, which fall within this area. Each of the projects and policies are listed and color coded according to the system they relate to, and labeled with a number matching the number to the left of the project or policy name. Solid polygons and lines represent projects proposals. Areas that are hashed represent policy proposals.

The projects and policies used in the workshop are diagrammatic and do not provide site specific details. The conceptual plans for the focus area, which are presented in this section, are intended to give form to the workshop ideas. Three different scenarios are developed in the conceptual plans: conservation focus, housing density focus and graduated density focus.

#### SYSTEM: HIGHER-DENSITY HOUSING

Three higher-density housing projects are colored in orange. Two of these projects are located to the east of S Mill Creek Dr. Both express a desire for higher-density housing with some mixed-use housing. Combining opportunities for shopping and retail with

higher-density housing supports a walkable environment, and allows residents to shop and run errands without having to rely on a personal automobile. This supports affordability by reducing expenses for residents, and promoting the Moab area's active lifestyle brand.

#### SYSTEM: LOWER DENSITY HOUSING

Two lower-density housing projects, colored in yellow, were selected during the workshop for the priority focus area. Lower-density housing, in the context of the workshop, was defined as six units per acre.

#### SYSTEM: OPEN SPACE / GREEN INFRASTRUCTURE

Twelve individual open space and green infrastructure projects and policies. Six of the project proposals represent bike/walking trails. Many of these trails follow the Mill and Pack Creek systems, while others crisscross the site. This suggests that a well-connected bike/walk trail system would be desired here.

The three larger green polygons in the design represent riparian restoration park projects, with stormwater management and flood control. These three projects work in concert with larger policies of riparian restoration and stormwater management (these policies have not been displayed in the map to the right, with the intent of preserving clarity of the design, as overlaid projects and policies can appear muddled and indecipherable). These projects and policies suggest that a healthy riparian

system, well integrated with trails and recreation opportunities, was a high priority for workshop participants. These projects also propose the riparian restoration is seen as an opportunity to provide stormwater retention for the surrounding area.

The two green hashed areas, representing policy ideas, propose the preservation of existing agricultural use in the area.

#### SYSTEM: GRAY INFRASTRUCTURE

The only gray infrastructure project in the focus area is represented by a series of gray lines crossing under larger project and policy proposals. This project proposes a street circulation system that supports proposed development.

#### SYSTEM: COMMERCIAL / INDUSTRIAL

In the workshop, one commercial project, colored in red, was selected for the area. The project proposes a commercial core for the area along S Mill Creek Dr.

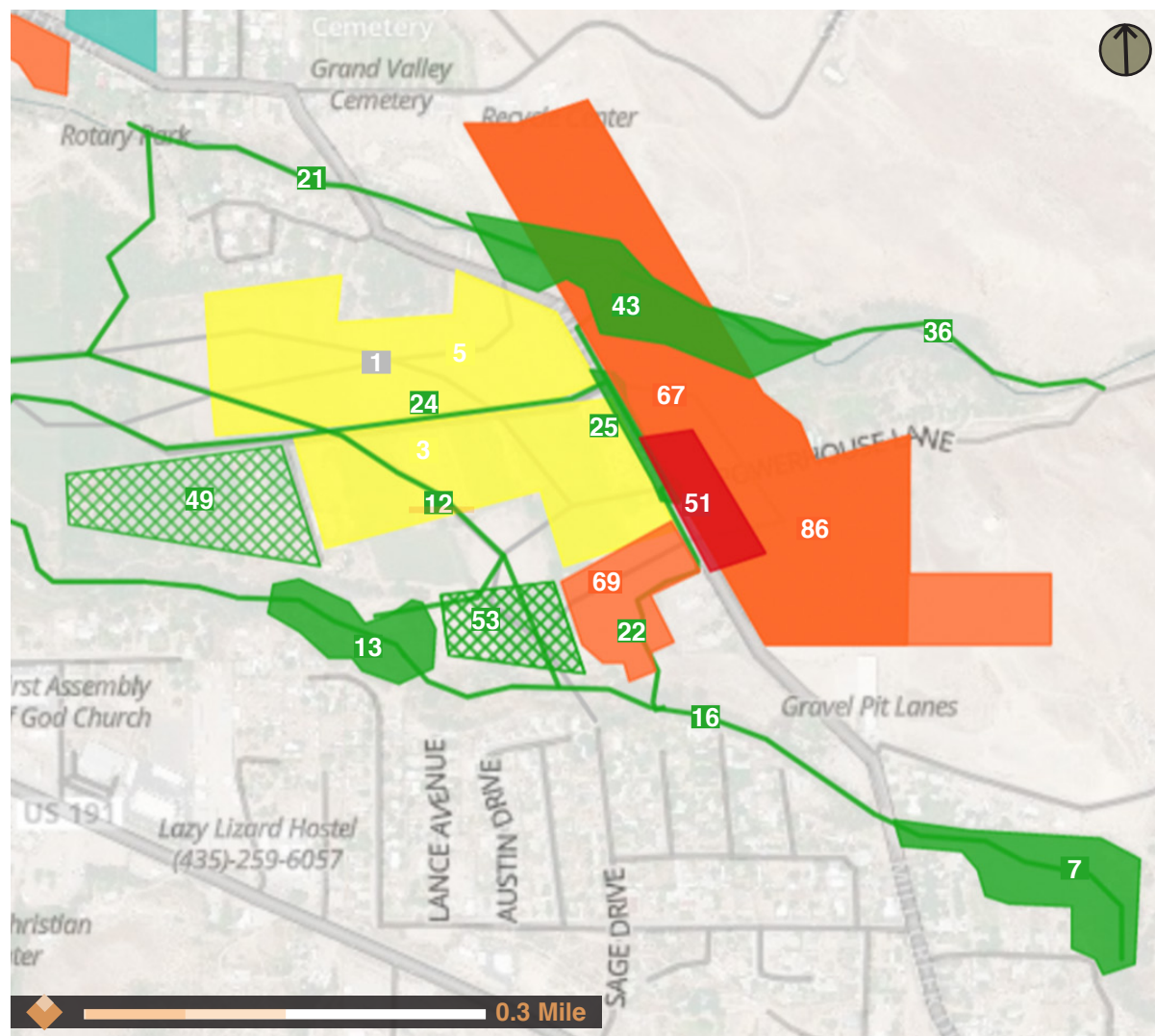
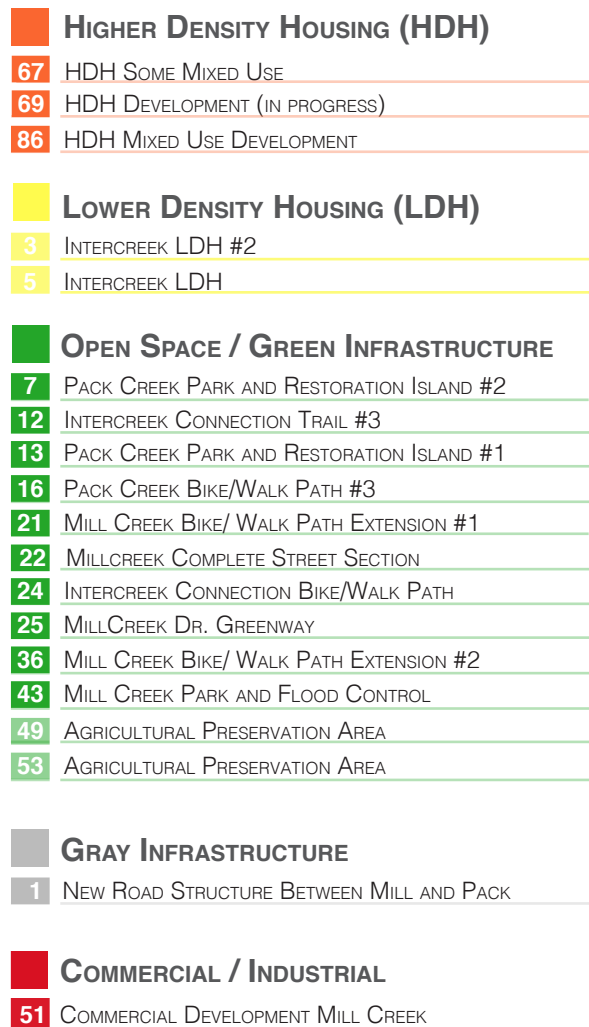


Figure 34. Moab Housing Workshop 2018 – Priority affordable housing focus area breakdown



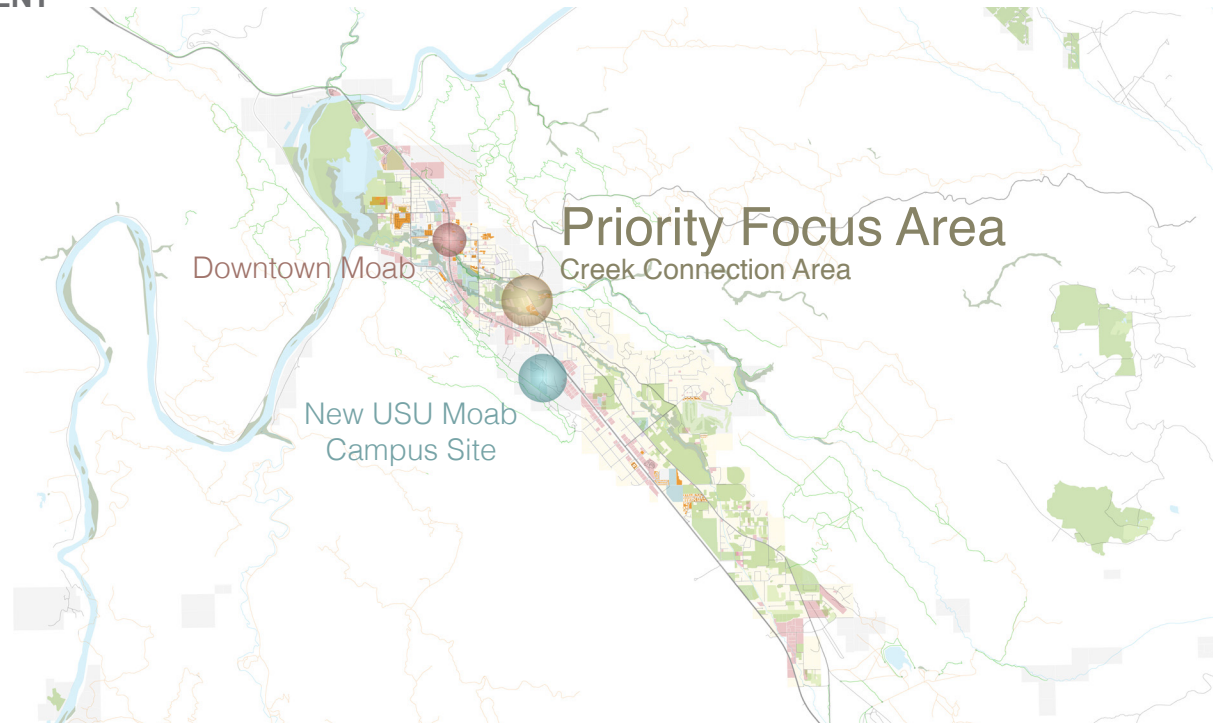
# CONCEPTUAL DESIGNS FOR THE PRIORITY FOCUS AREA

## CONTEXTUAL ISSUES FOR DEVELOPMENT

This section includes a review of issues affecting development for the Creek Connection Housing focus area. These are issues that effect the site externally. Issues discussed include; the 500-year floodplain, ecological of the riparian and wetlands areas, loss of agricultural land, the valleys road network, and trail system.

## SITE SCALE ANALYSIS

This is an analysis of issues affecting development of the Creek Connections Housing Focus Area at a site scale. Issues analyzed include; slope, the 100-year floodplain, and existing land use.



## THREE CONCEPTUAL DESIGNS FOR PRIORITY FOCUS AREA

- 1 CONSERVATION FOCUS SCENARIO**  
PRESERVATION OF THE AGRICULTURAL CHARACTER / RIPARIAN CONSERVATION AND RESTORATION
- 2 COMMON CORE FOCUS SCENARIO**  
MAXIMIZED HOUSING DENSITIES / MIXED-USE COMMERCIAL CORE
- 3 CONNECTED NEIGHBORHOODS FOCUS SCENARIO**  
RESIDENTIAL NEIGHBORHOOD / SHARED OUTDOOR SPACE AND TRAILS

## CREEK CONNECTION HOUSING FOCUS AREA: CONTEXTUAL ISSUES FOR DEVELOPMENT

### FLOODPLAIN: PRIORITY FOCUS SITE DRIER THAN DOWNTOWN MOAB

Counter intuitively, although the Priority Focus Area lies directly between the two creeks, the site is actually farther from the 500-year floodplain than is all of Downtown Moab, as figure 35 demonstrates. The large blue area represents the floodplain. Recreation sites and trails have been called out in green. Stop lights are marked with red spheres.

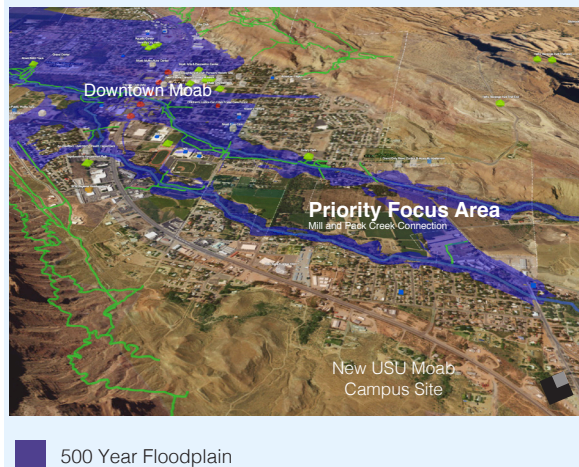


Figure 35. Spanish Valley 500-year floodplain

### ECOLOGICAL CONCERNS: RIPARIAN AND WETLAND SENSITIVITIES

Runoff from the La Sal Mountains flows through Mill Creek and Pack Creek and along with underground streams, creates Moab's unique Wetland environment which provides an important resting place for migrating birds and local wildlife species. As the creeks make their way through urban Spanish Valley they become encroached by development. This interrupts connectivity between ecological systems; reduces the creeks' ability to absorb stormwater runoff; and potentially introduces harmful chemicals, oils, and excess nitrates from urban runoff. Results of the geodesign workshop revealed a great deal of concern for the health of the Mill and Pack Creek riparian systems. Protecting the ecological health of the creeks will mean protecting the health of the source, in the beautiful La Sal Mountains, as well the terminus, the wetland's ecosystem.

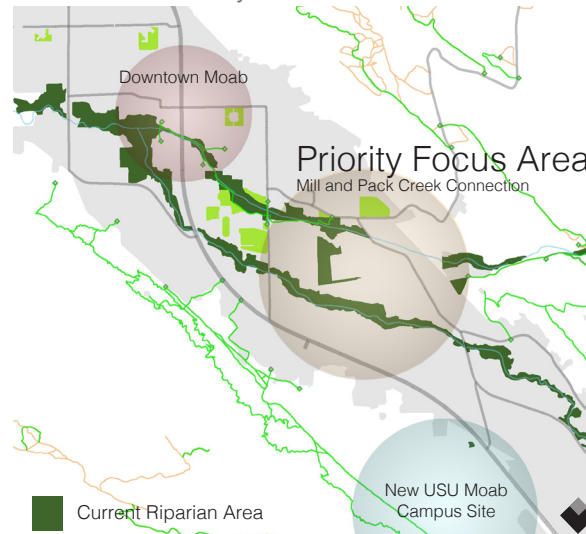


Figure 36. Riparian Areas in relationship to the Priority Focus Area

### AGRICULTURAL LAND: JUSTIFYING LOSS

The priority focus area selected for the conceptual designs is currently primarily agricultural land. Many residents in the valley would like to preserve agricultural areas and the heritage they represent. In the focus area, agricultural land is dispersed in isolated patches and detached from the larger patches of agricultural land at the south end of Spanish Valley. Developing higher density housing in the priority focus area is preferred in part because it bears a walkable relationship to Downtown Moab and the proposed USU campus site (as shown in figure 37 below). Development here may justify the preservation of agricultural land to the south, as the site provides housing for the population growth predicted for the valley.

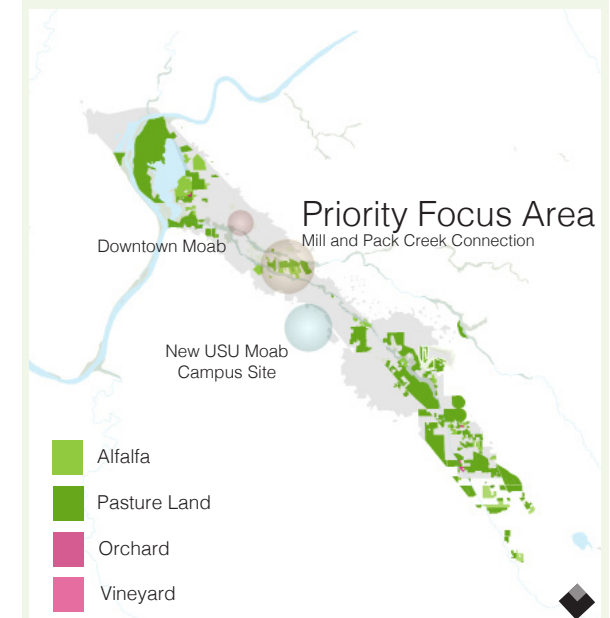
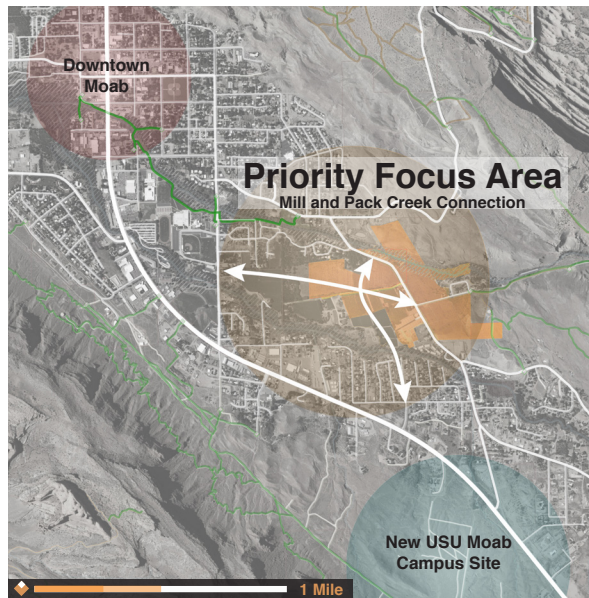


Figure 37. Agricultural land use in Spanish Valley

## ROAD NETWORK:

### DESIRED CONNECTIVITY

In order to support a higher-density housing development, a road network has been suggested for each of the following conceptual designs. Connectivity is needed on the site to join Mill Creek with Highway 191. S Mill Creek Drive is an important arterial road for the community and will need to be improved to carry the increased traffic load associated with development. The proposed connections through the priority focus area are illustrated with white arrows in Figure 38.



*Figure 38. Priority Focus Area potential connections to Downtown Moab and the proposed USU Moab campus site*

## TRAILS NETWORK:

### UTILIZING THE RIPARIAN NETWORK AS THE BACKBONE OF A PEDESTRIAN TRAIL NETWORK

Connecting the urban system of Spanish Valley through the natural resource of Mill and Pack Creeks creates a number of opportunities for Moab City and Grand County. Restoring the riparian system and integrating a trails network supported by parks also allows the valley to nestle development within a transportation network that supports opportunities to live without daily reliance on the automobile.

The Priority Focus Area is located within a half mile from Downtown Moab and the proposed Utah State University Moab campus. This is a walkable or bikeable distance for many residents and creates an opportunity to alleviate traffic on the, at times, heavily overburdened Highway 191 corridor. "Development of a multimodal transportation corridor is a viable alternative to adding capacity to an existing roadway or building another parallel roadway in the same corridor. Moving some short or medium distance trips to [multimodal] transit can reduce some demand for capacity on existing roadways" (Mobility Investment Priorities, n.d.).

Equitable transportation policies are described as "policies that increase the accessibility of transportation and its benefits to current and historically undeserved populations." The document suggests that prioritizing walking, biking, and public transportation can have significant health benefits for residents (USDOT, 2015).

Creating opportunities for walking and biking trips along the riparian corridor will allow

residents the opportunity to complete trips, while enjoying the beautiful natural environment Spanish Valley has to offer. Building this network into a restored riparian system also presents opportunities to reduce the ecological impacts of growth and development on the wetlands environment, the Colorado River and provides stormwater retention and detention for the Moab City and Grand County residents.

### MULTIMODAL TRANSPORTATION FEATURES

- Benches and shelters at public transportation stops
- Sidewalks, multi-use paths, and other pedestrian and bicycle infrastructure connections to public transportation
- Crosswalks, pedestrian signals, and sufficient crossing times
- Capacity to carry bikes on public transportation
- Parking and storage of bicycles at public transportation centers and stops
- Availability of shared bike services
- Amenities such as showers and changing areas
- Parking for vehicles
- Coordination of regional public transportation systems and services
- Informational and navigational support
- Transit-oriented development

(USDOT, 2015)



## CREEK CONNECTION HOUSING FOCUS AREA: **SITE ANALYSIS**

### **SLOPE**

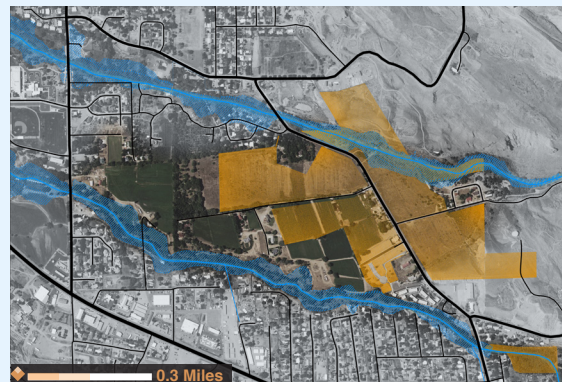
Areas identified in shades of red are those having > 10% slope. The darker the value the greater the degree of slope. The site is framed on its eastern edge with beautiful redrock cliffs. These clearly define the buildable areas of the priority focus area.



- >15% Slope
- >10% Slope

### **FLOODPLAIN**

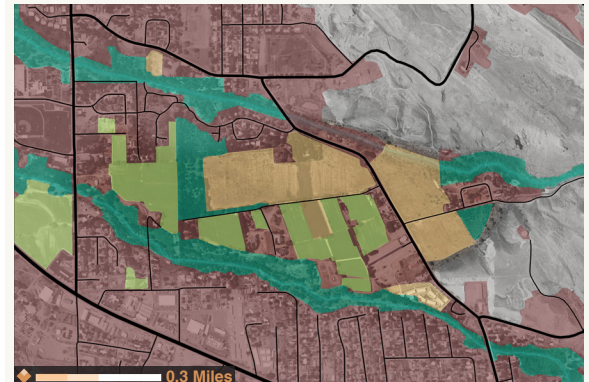
Areas hashed in blue represent the extent of the 100-year flood plain. These areas provide an opportunity for riparian restoration, trails connectivity (as demonstrated by Mill Creek Trail), rainwater detention, and filtration. Restoration of the riparian system will increase the floodplain, and prevent channeling, which occurs when stormwater is forced into narrow channels, which increases the speed and impact of the water, and cutting a deep groove that fails to support riparian vegetation and retains much less stormwater. Restoring the riparian area within the floodplain will protect Downtown Moab and other areas downstream from flooding, as well as improve the ecological health of the unique wetlands environment and the riparian system itself. The areas highlighted in orange are those that were included the Moab Housing Workshop 2018 final design.



- 100 Year Floodplain
- Priority Focus Area - Land Area of Workshop Projects

### **LAND USE**

Much of the area is currently agricultural in use. Although many valley residents would rather not see agricultural land lost to other uses, this particular parcel is isolated from other plots the make up the valleys agricultural system. By focusing more dense growth in this area, it may be possible to avoid the expansion of single family housing development on the agricultural land in the south end of the valley. As a result, the viewscapes and cultural character of the valley will see less impact.



- Riparian Area
- Irrigated Agricultural
- Non-Irrigated Agricultural Land
- Currently Developed Land

# 1

## CONSERVATION FOCUS SCENARIO

### PRESERVATION OF THE AGRICULTURAL CHARACTER / RIPARIAN CONSERVATION AND RESTORATION

**1.2** CONSERVATION FOCUS: **TRANSPORTATION AND LAND USE PLAN**

**1.3** CONSERVATION FOCUS: **PROPOSED TRANSPORTATION PLAN**

**1.4** CONSERVATION FOCUS: **LAND USE AREAS**

**1.5** CONSERVATION FOCUS: **SCENARIO TAKEAWAYS**

#### OBJECTIVES

- Connect to the existing road network with a system of community connector and arterial roads
- Preserve and restore the riparian system
- Demonstrate a commercial mixed-use core
- Preserve the agricultural heritage of the site, by integrating a large community garden buffered by existing large lot residential homes
- Provide network of trails supporting multimodal transportation, linking the community through preserved riparian open space
- Demonstrate diverse housing typologies offering a variety of unit styles, with higher-density typologies clustered around a commercial mixed-use core

#### NARRATIVE

This conservation focused scenario identifies a road network and land use plan that allows for restoration and preservation of the riparian areas surrounding developable land within the priority focus area.

A mixed-use core centered on Mill Creek Drive and a proposed community arterial will provide access to grocery and retail opportunities, as well as restaurants and entertainment. Centralizing these opportunities reduces reliance on the personal car for short- and medium-distance trips. In order to facilitate walking

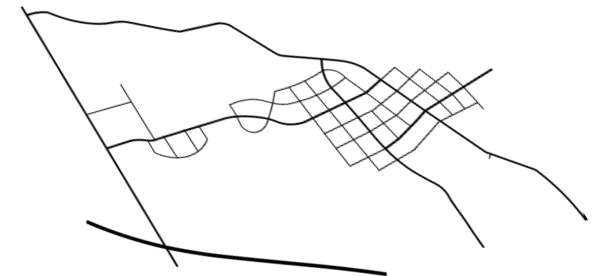
and biking, a greenway and trail system are suggested.

This system relies on the restored riparian system as the backbone of a pedestrian public transit network. Clustering these commercial opportunities and higher-density residential units creates opportunities for expanding the public bus system.

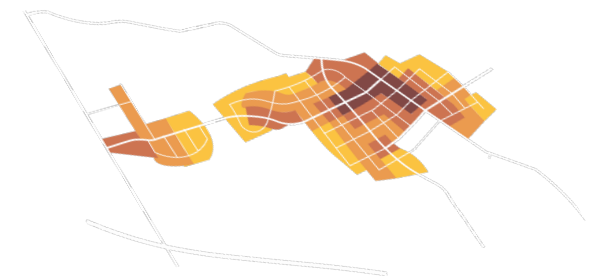
A large community garden space will offer opportunities for residence to grow their own produce.



Open Space/Trails Network



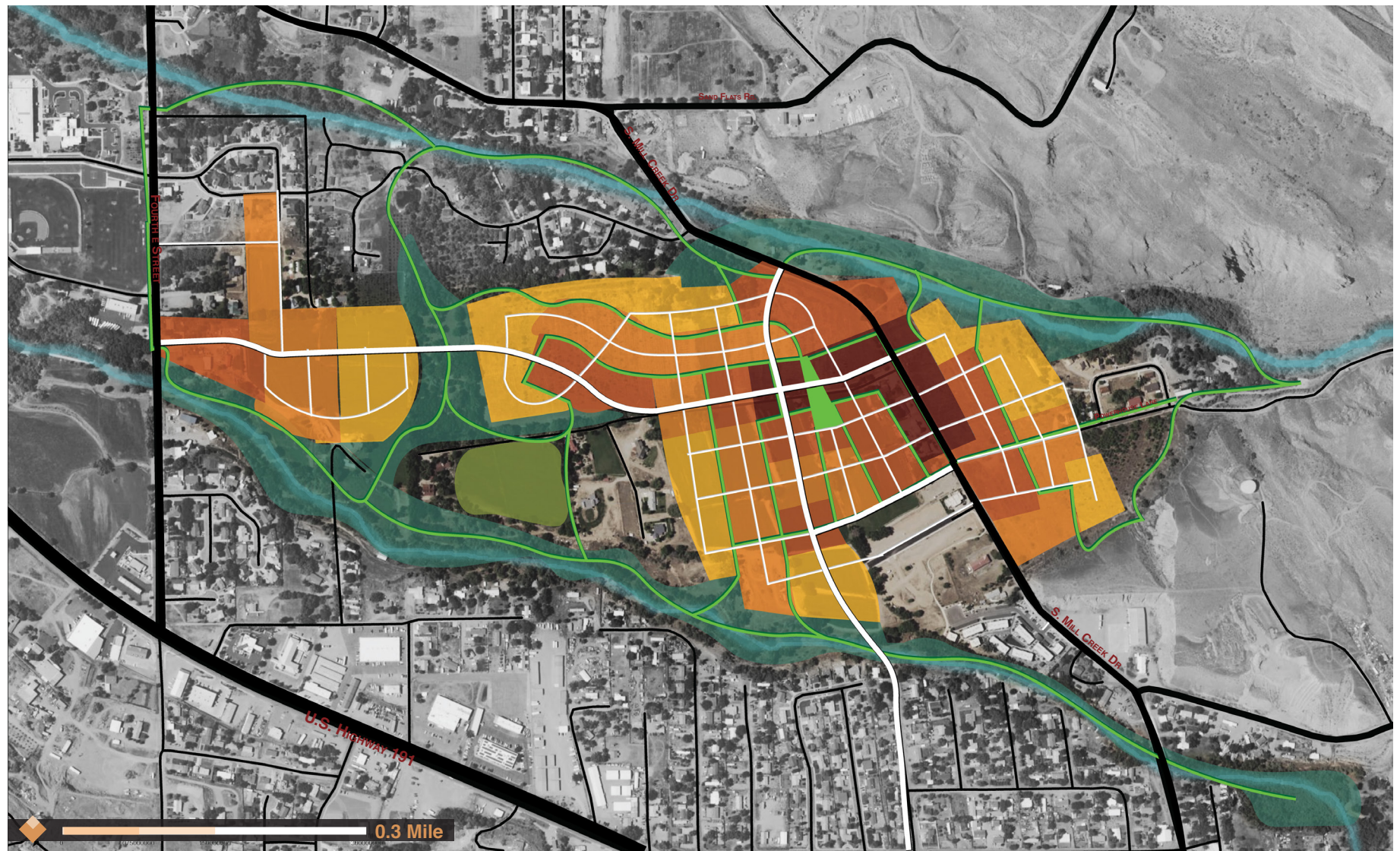
Road Network



Residential Land Use



## 1.2 Conservation Focus: Transportation and Land Use Plan



### LAND USE MAP KEY

- Riparian Restoration/Stormwater Detention
- Parks and Trails

- Commercial Mixed-Use
- Residential 20 Units Per Acre
- Residential 16 Units Per Acre

- Residential 12 Units Per Acre
- Community Garden Space

Figure 39. Conservation Focus transportation and land use plan

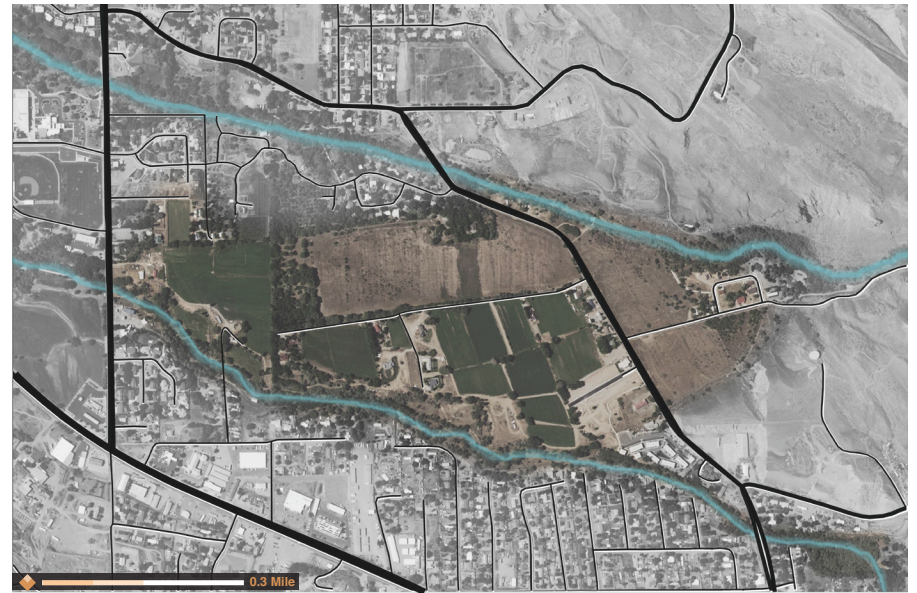


### 1.3 Conservation Focus: **Proposed Transportation Plan**

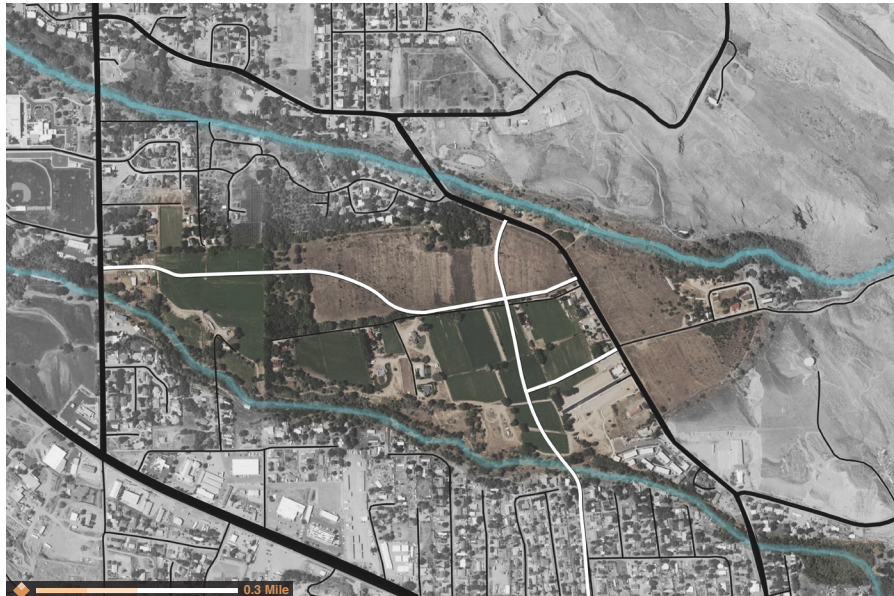
The proposed road network for the conservation-focused scenario is designed to reduce congestion on South Mill Creek Drive. This street may likely see increased traffic, when there is congestion on Highway 191. In response, an east-west arterial road is proposed that links South Mill Creek Drive with Fourth East Street (see Road Network Community Arterials below). Existing roads are displayed as black. Proposed roads are displayed as white.

The plan also creates a secondary connection that runs parallel to South Mill Creek Drive and connects to Highway 191 through Duchesne Avenue and Sage Drive. This may also reduce congestion on South Mill Creek Drive. This provides a secondary entrance and exit to the highway that is unconnected to the proposed university site, which may experience heavy traffic at peak hours.

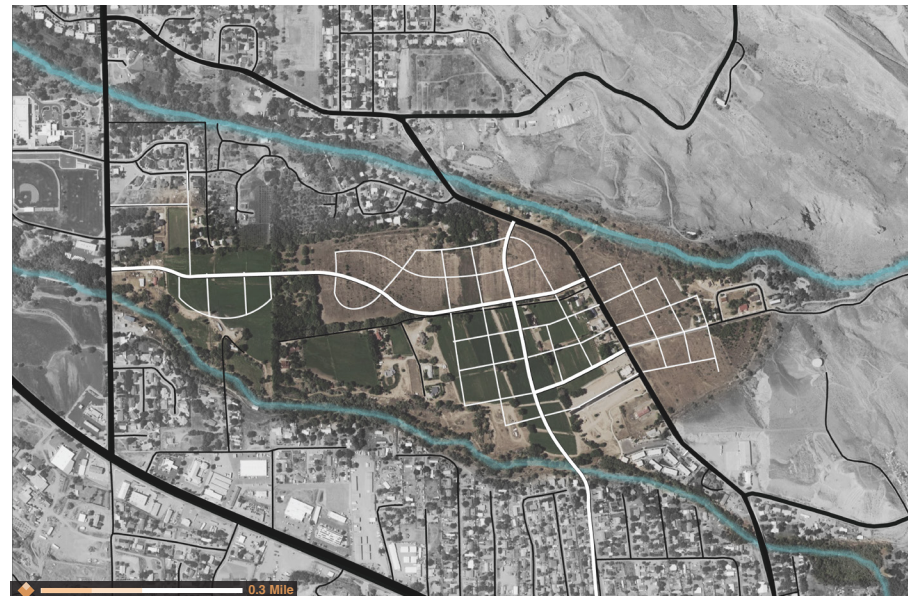
Existing Conditions



Proposed Road Network: **Community Arterials**



Proposed Road Network: **Community Connectors**





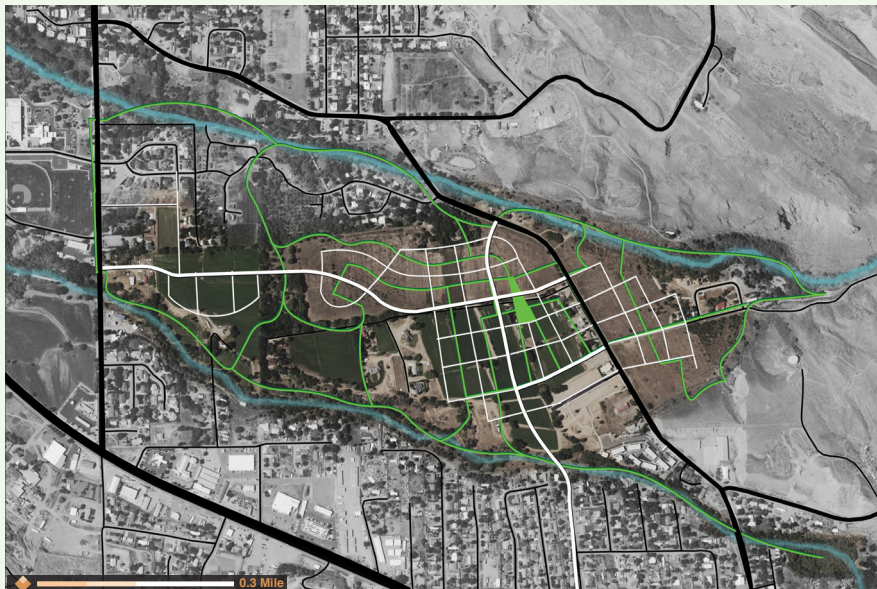
## 1.4 Conservation Focus: Land Use Areas

### ■ Parks and Trails

- Bike/walk trail network
- Parks

By creating a wide riparian buffer along Mill Creek, there is ample space for a bike/pedestrian trail system that provides connectivity to the surrounding communities. The trail system only intersects with streets at a few locations. In this way, the trail system can become a pedestrian link between the in very few locations. This creates a pedestrian thoroughfare linking the mixed use commercial core of the proposed development with Downtown Moab and the proposed USU campus.

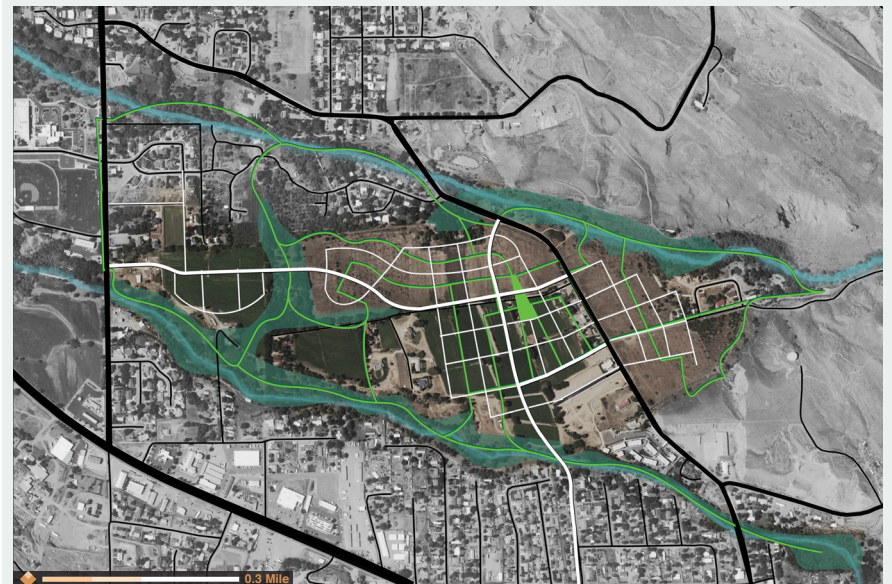
A central park has been located in center of the proposed mixed-use development, providing a space for community events and for area residents to recreate and relax.



### ■ Riparian Restoration/Stormwater Detention

- Widening the floodplain channel
- Re-vegetation of native plants

Preserving and restoring the riparian areas in and around the potential development produces a number of benefits for residents and visitors, as well as for the city and county. Restored riparian areas provide flood retention for the city residents downstream, as well as important habitat connections linking the wetlands environment to the La Sal Mountain Range to the east. Residents and visitors can also enjoy riding and walking to work on well developed trails. This also allows for the development of bio-swales reducing the impact of rainwater runoff and pollution of the riparian system and the sensitive wetlands just two miles beyond. Such developments reflect the expectations of outdoor adventure oriented residents and visitors, and enhances the recreational image of Moab and Spanish Valley.



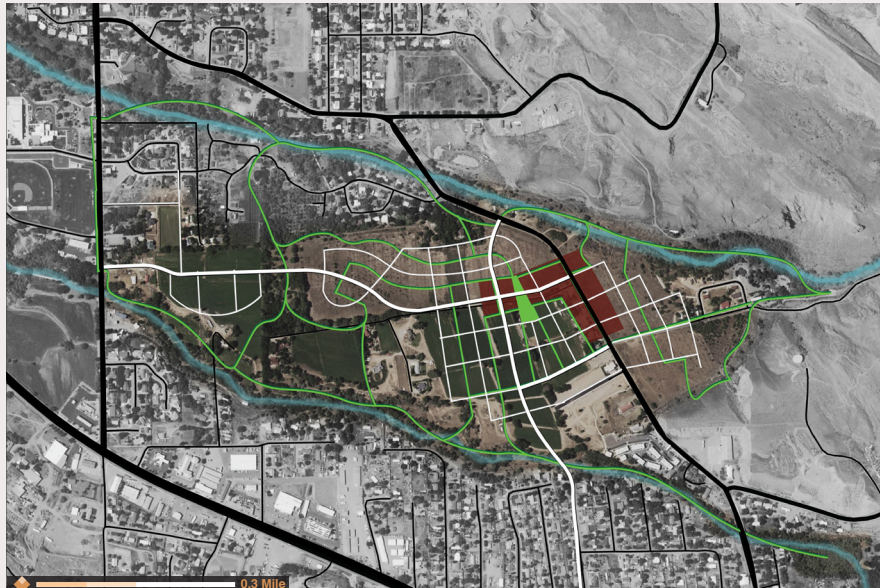


## ■ Commercial Mixed-Use 24 Units Per Acre

### Housing Typologies Applicable

- Work/live
- Small mixed-use multiplex
- Courtyard apartments

This mixed-use zone is intended to provide residents with opportunities to shop at, for example, a co-op grocery at the corner of S. Mill Creek Drive and a proposed community arterial linking S Mill Creek Drive with Fourth East Street. This co-op would provide community gardeners and nearby farmers with a permanent venue to share their produce, and provide residents with an opportunity for locally sourced organic produce. The northeast corner of the proposed zoning meets the proposed riparian restoration area, and provides a great opportunity for an outdoor gathering space. A restaurant, cafe, or bar nestled into the neighborhood can provide residents a place to relax and gather. Such an establishment would invigorate the streets with use around lunchtime and later into the evening, creating lively, self-policing streets. First-floor commercial space will provide opportunities for office spaces and retail. In combination, this can create an environment that supports work/live units and a walkable district core.

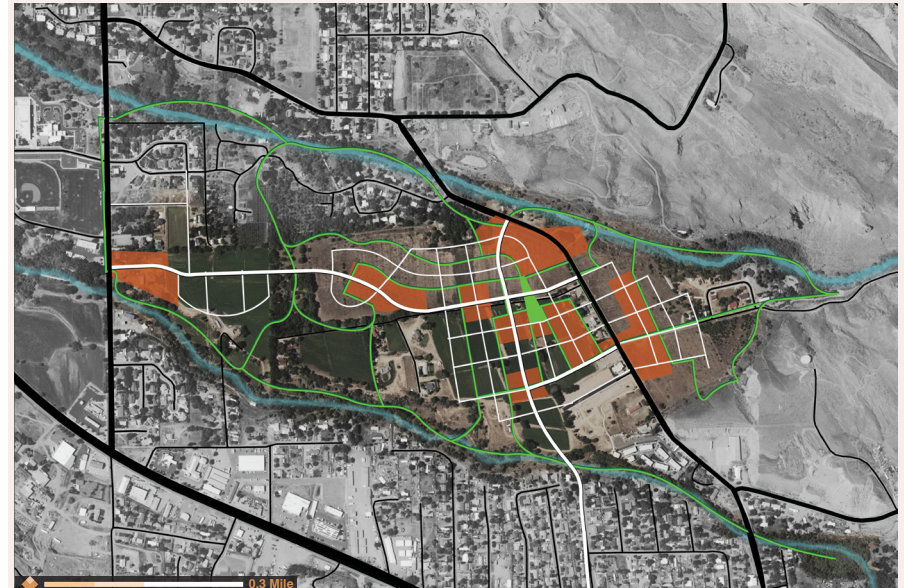


## ■ Residential 20 Units Per Acre

### Housing Typologies Applicable

- Small multiplex
- Fourplex
- Courtyard apartments
- Townhomes

This highest-density residential zone is organized around community arterial roads. These areas include groupings of townhomes, courtyard apartments, small multiplex apartments, and fourplex apartments. These higher density units provide smaller, lower-maintenance units that provide affordable options for valley residents. By also including two- and three- bedroom units, the district can provide affordability for a variety of household types. This clustering of density also preserves land by limiting sprawl, and provides opportunities for the restoration and preservation of the riparian system, as well as dedication of land for local gardeners.



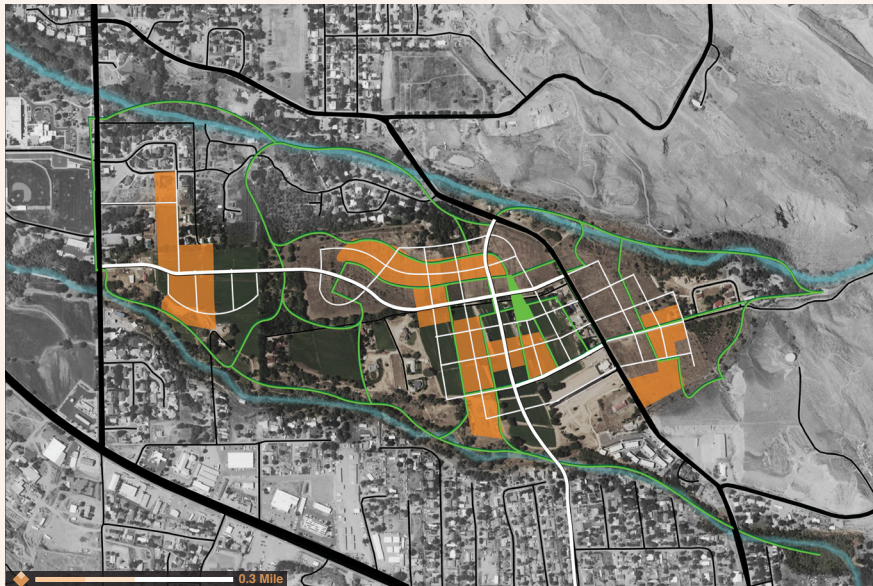


## ■ Residential 16 Units Per Acre

### Housing Typologies Applicable

- Townhomes
- Duplex: stacked
- Fourplex

This land use zone illustrates the use of townhomes, fourplexes, and stacked duplex units to achieve the desired density of 16 units per acre. Mixed clusters of these unit types gathered around community arterial streets will provide an interesting neighborhood with uniform building heights and street relationship similar to existing Moab neighborhoods.

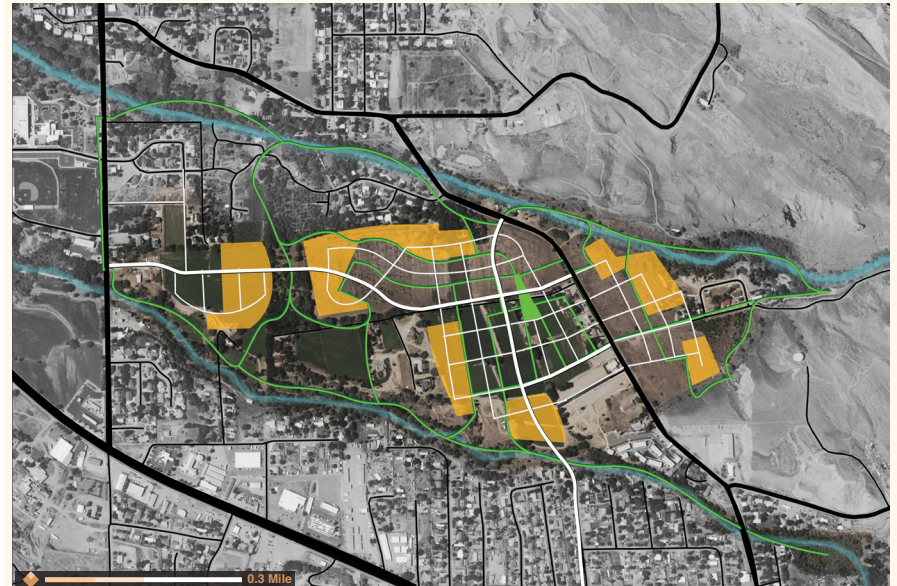


## ■ Residential 12 Units Per Acre

### Housing Typologies Applicable

- Duplex: side-by-side
- Duplex: stacked
- Bungalow court
- Prefabricated and manufactured housing

A number of housing typologies are proposed for this area, such as side-by-side and stacked duplex units, bungalow courts, and clusters of prefabricated and manufactured housing. This lower density zone is intended to help the neighborhood reflect the context of surrounding neighborhoods by gradating density at the edges of the development. This also decreases density at the riparian edge, allowing for greater space for retention and bioremediation of stormwater runoff from the development.



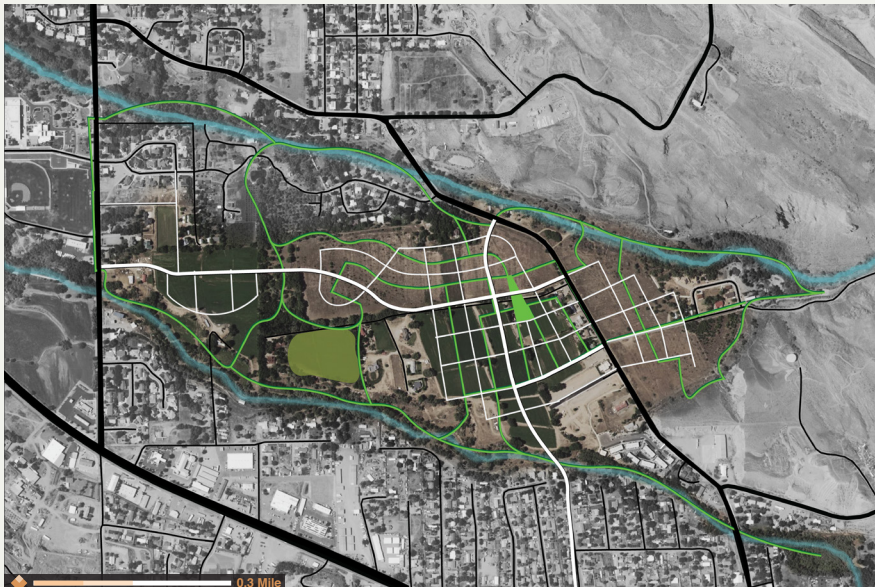
## 1.5 CONSERVATION FOCUS: SCENARIO TAKEAWAYS

### ■ Community Garden Space

Preserves agricultural heritage of the site in a context that can contribute to affordable housing by providing opportunity to offset cost of food, as well create community

This scenario includes the preservation of a large plot of agricultural land for gardening activities. Within Moab there is a precedent for the preservation of community gardening spaces. Just to the north of the proposed garden site, the Mullberry Drive Development has preserved a large orchard site. To the north east of the site, lies The Youth Garden Project, whose mission is “to cultivate healthy children, families, and community through educational programs and the profound act of connecting people with food from seed to table.” Both of these projects are adjacent to the riparian system and provide a wonderful opportunity to connect the proposed development physically, as well as socially to surrounding communities. It is also proposed that this garden project might be supported through the creation of a co-op grocer located at the center of the commercial mixed-use district.

- A pedestrian-oriented mixed-use commercial core developed around community arterials providing a co-op grocer and opportunities for retail, office, and dining spaces
- Diverse housing typologies offering opportunities for affordable housing for a variety of family sizes and individual needs
- Open space preservation and riparian restoration
- Community outreach and preservation of site character through community gardening space
- Bike/Walk trail network connecting the development the Downtown Moab, the USU campus, surrounding neighborhoods, and outdoor recreation opportunities
- A road network providing access through the site, through a network of community collector and arterial roads







## 2 COMMON CORE FOCUS SCENARIO MAXIMIZED HOUSING DENSITIES / MIXED-USE COMMERCIAL CORE

**2.2** COMMON CORE FOCUS: **TRANSPORTATION AND LAND USE PLAN**

**2.3** COMMON CORE FOCUS: **PROPOSED TRANSPORTATION PLAN**

**2.4** COMMON CORE FOCUS: **LAND USE AREAS**

**2.5** COMMON CORE FOCUS: **SCENARIO TAKEAWAYS**

### OBJECTIVES

- Connect to the existing road network with a system of community connector and arterial roads
- Demonstrate highest housing density
- Create a mixed-use commercial core large enough to include a grocery store, restaurants, and retail
- Preserve the agricultural heritage of the site by integrating community garden spaces and buffering development from the riparian system
- Provide city parks and network of trail systems supporting multimodal transportation
- Preserve and restore the riparian system

### NARRATIVE

The objective of the common core scenario is to develop high density housing options for the priority focus area. Increasing the number of affordable housing units is a priority in this scenario. This scenario portrays a mixed-use commercial core that is large enough to house a first-floor grocery store. This gives residents and surrounding neighborhoods an opportunity to run daily errands without a personal automobile.

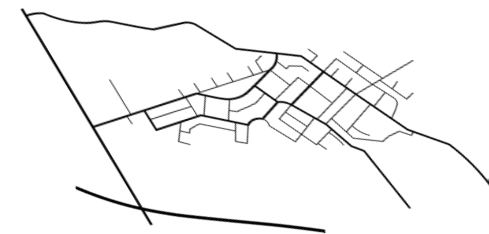
This scenario also portrays a series of developed parks, supported by a bike/walk trail network

that allows residents to connect to the homes of friends and family, recreation opportunities, and retail and shopping within the development and in nearby Downtown Moab.

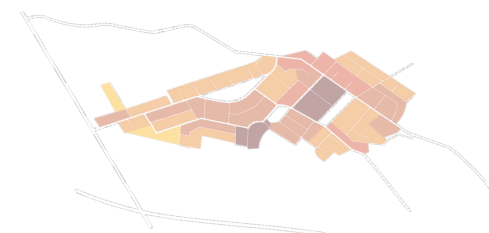
The inclusion of a diversity of housing unit types and sizes provides opportunities for affordable housing for a variety of family sizes and needs.



Open Space/Trails Network



Road Network



Residential Land Use



Land Use and Circulation

## 2.2 COMMON CORE FOCUS: TRANSPORTATION AND LAND USE PLAN



### LAND USE MAP KEY

- Riparian Restoration/Stormwater Detention
- Parks and Trails

- Commercial Mixed-Use
- Residential 20 Units Per Acre
- Residential 16 Units Per Acre

- Residential 12 Units Per Acre
- Community Garden Space

Figure 40. Housing Density Focus transportation and land use plan

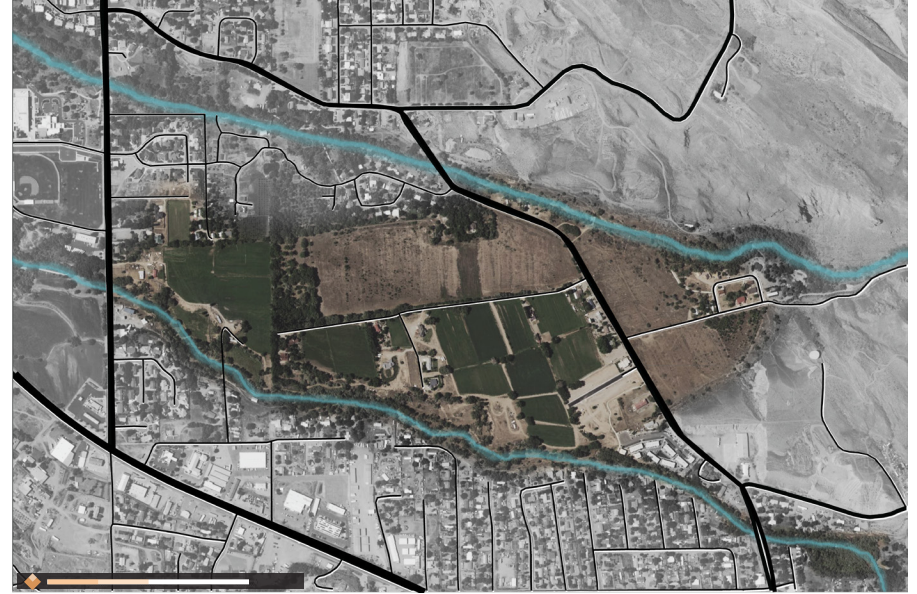


## 2.3 COMMON CORE FOCUS: PROPOSED TRANSPORTATION PLAN

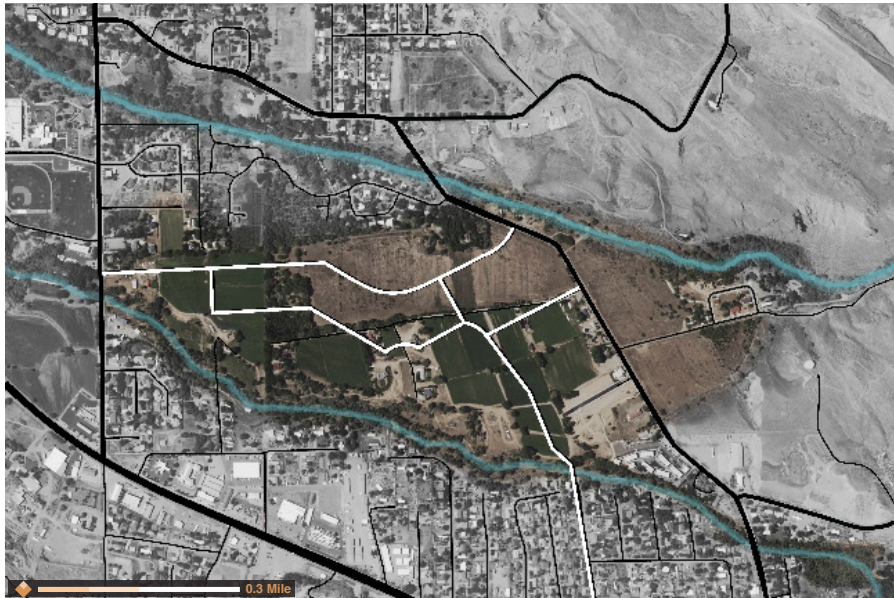
The proposed road network for the conservation-focused scenario is designed to reduce congestion on South Mill Creek Drive. This street may likely see increased traffic, when there is congestion of Highway 191. In response, an east-west arterial road is proposed that links South Mill Creek Drive with Fourth East Street (see Road Network Community Arterials below). Existing roads are displayed as black. Proposed roads are displayed as white.

Unlike the previous scenario, this east to west connection through the site splits into two larger roads. The objective is to reduce congestion on South Mill Creek Drive due to the increased number of housing units proposed for the area.

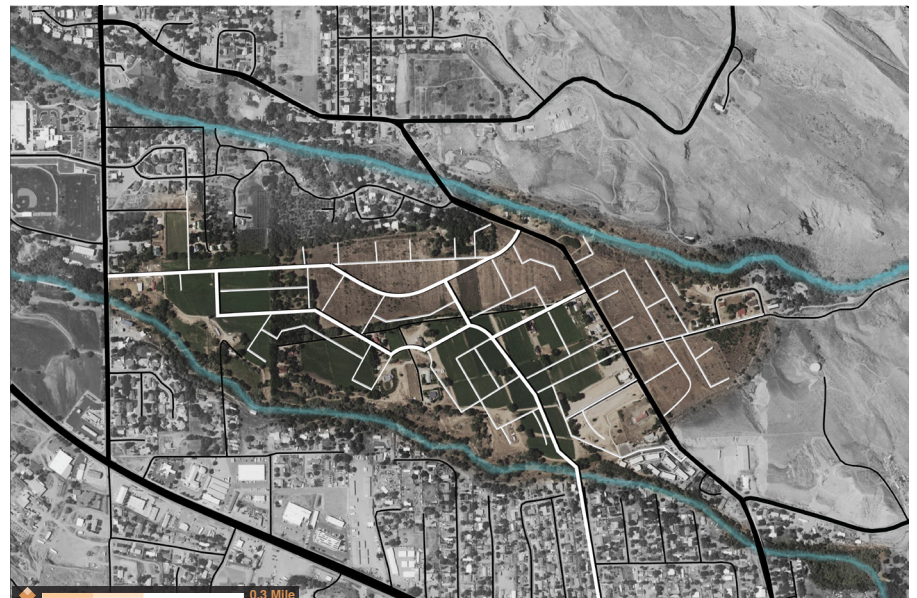
Existing Conditions



Proposed Road Network: **Community Arterials**



Proposed Road Network: **Community Connectors**



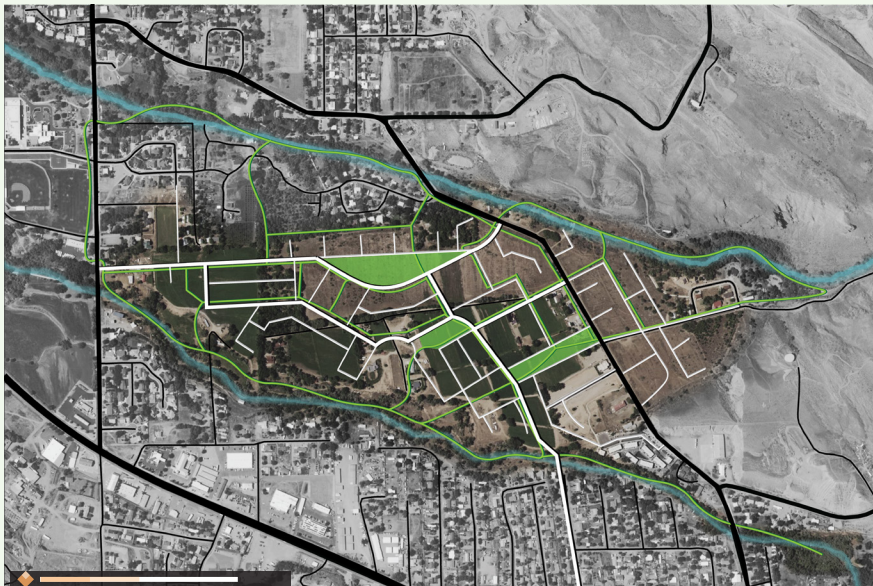


## 2.4 COMMON CORE FOCUS: LAND USE AREAS

### ■ Parks and Trails

- Bike/Walk Trail Network
- Parks

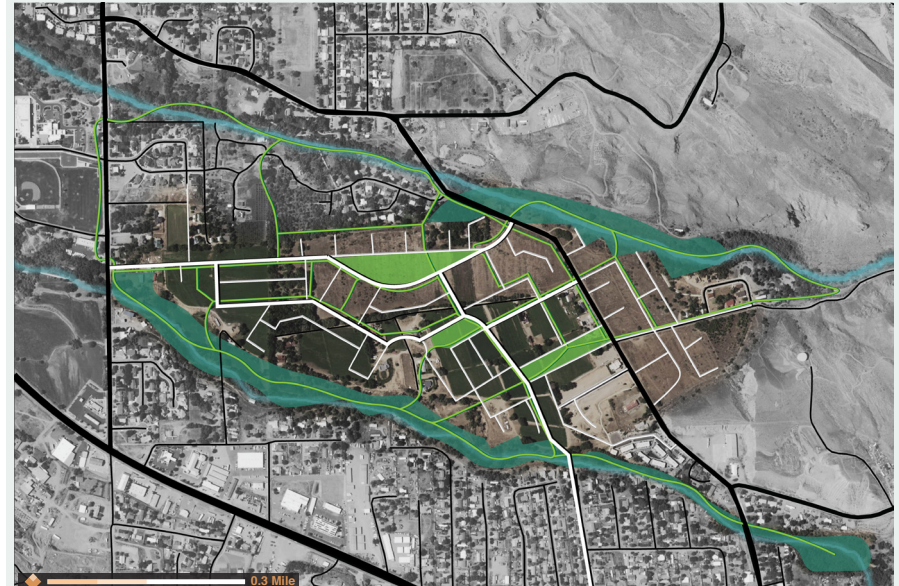
This scenario proposes public parks as an open space for the surrounding development. Three larger parks are linked by an urban bike/walk trail system. This creates a pedestrian thoroughfare linking the mixed-use commercial core of the proposed development with Downtown Moab and the proposed USU campus.



### ■ Riparian Restoration / Stormwater Detention

- Widening the Floodplain Channel
- Re-vegetation of Native Plants

Riparian restoration and preservation are not a priority in this scenario. This is reflected in the amount of land use that has been dedicated to the system. This means less space dedicated to stormwater retention and detention, meaning that the design will have to be more efficient with stormwater management and bioremediation.

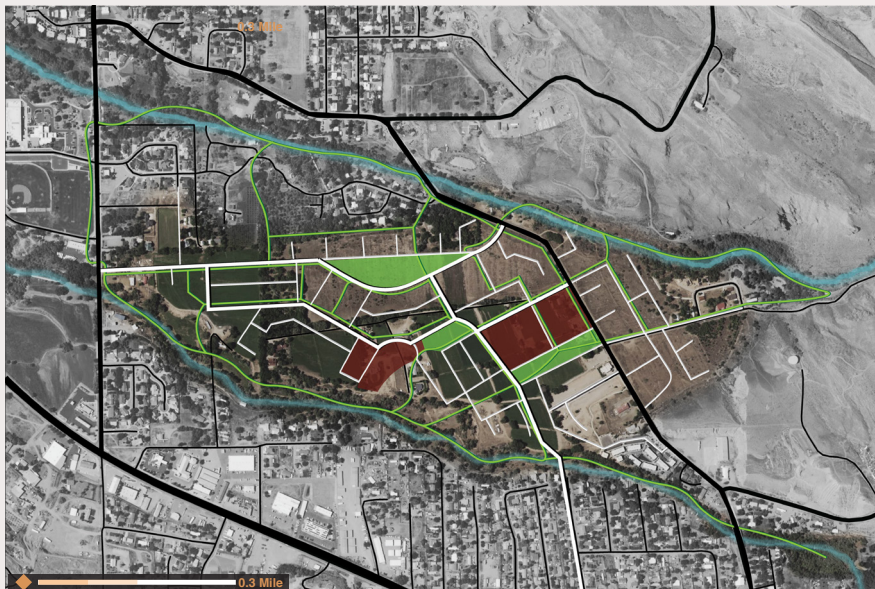


## ■ Commercial Mixed-Use 24 Units Per Acre

### Housing Typologies Applicable

- Work/Live
- Small Mixed-Use Multiplex
- Courtyard Apartments

There are two areas dedicated to commercial mixed use in this scenario. The larger area to the east is intended to house first-floor retail and grocer, with second-floor office space and housing units on remaining floors. The area to the west is envisioned as a series of micro-units with smaller 500 sq.ft. units that could be rented out for a season. This may provide affordable temporary housing for service industry workers or rented as nightly rentals.

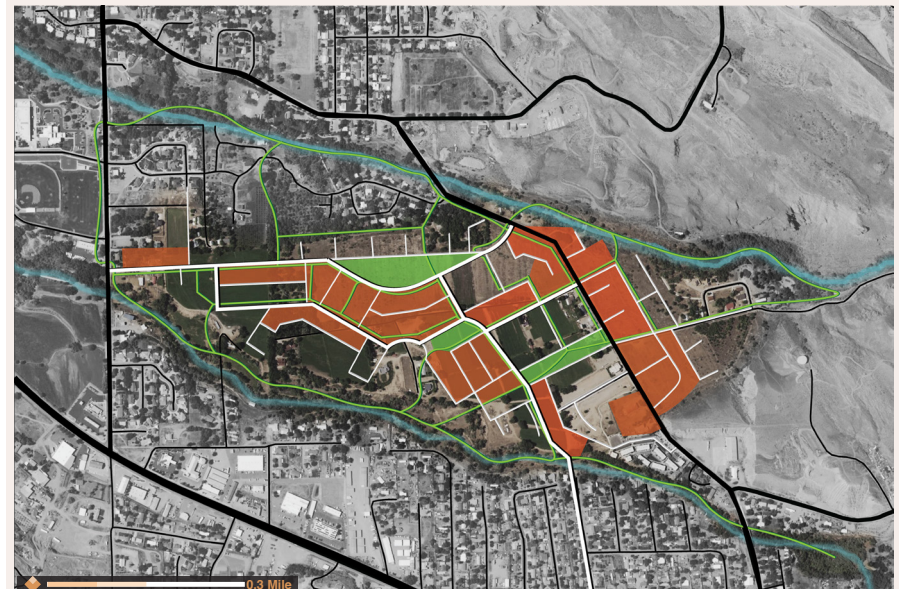


## ■ Residential 20 Units Per Acre

### Housing Typologies Applicable

- Small Multiplex
- Fourplex
- Courtyard Apartments
- Townhomes

This highest-density residential zone is organized around community arterial roads. These areas include groupings of townhomes, courtyard apartments, small multiplex apartments, and fourplex apartments. These higher-density units provide smaller, lower-maintenance units that offer affordable options for valley residents. By including two- and three-bedroom units, the district can provide affordability for a variety of household types. This clustering of density also preserves land by limiting sprawl, which in turn, provides opportunity for the restoration and preservation of the riparian system as well as dedication of land for local gardeners.



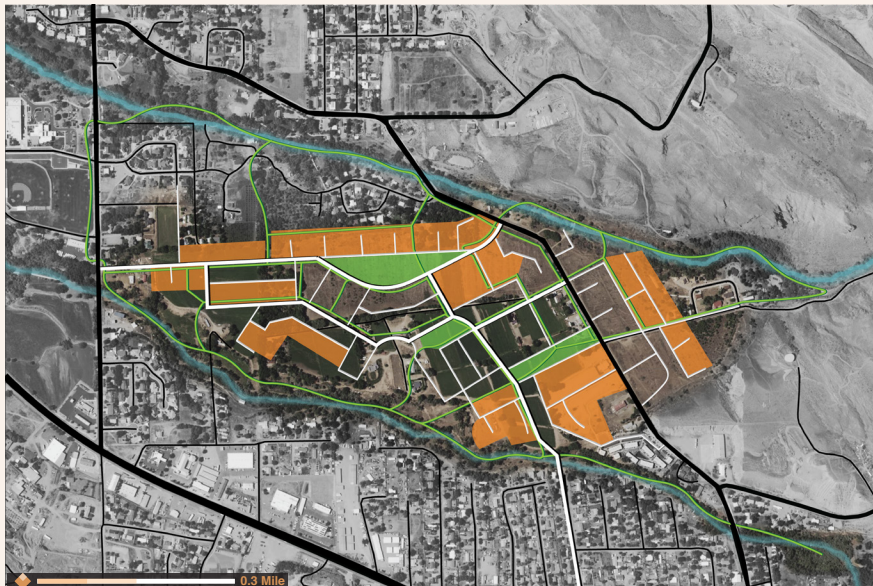


## ■ Residential 16 Units Per Acre

### Housing Typologies Applicable

- Townhomes
- Duplex: Stacked
- Fourplex

This land use zone proposes townhomes, fourplexes, and stacked duplex units to achieve the desired density of 16 units per acre. Mixing clusters of these unit types, gathered around community arterial streets will provide an interesting neighborhood with uniform building heights and street relationships similar to existing Moab neighborhoods.

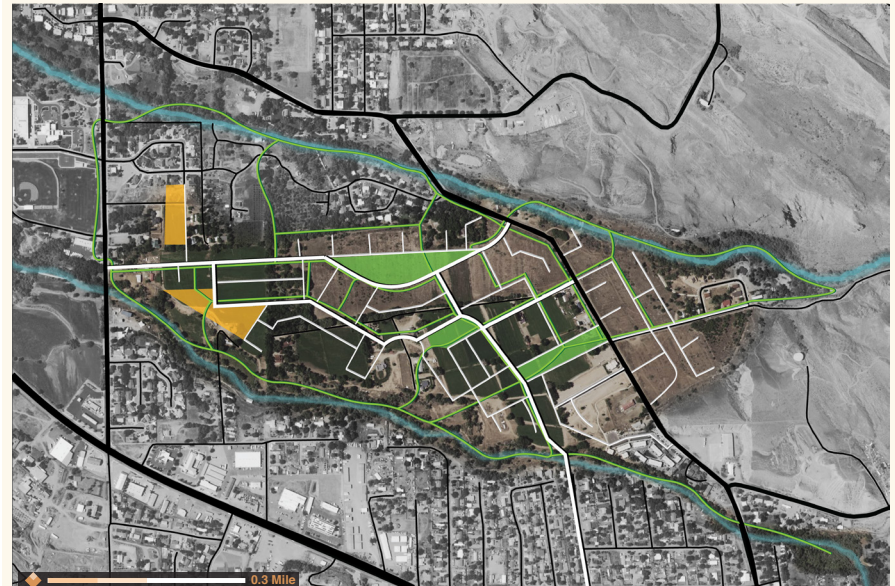


## ■ Residential 12 Units Per Acre

### Housing Typologies Applicable

- Duplex: Side-by-Side
- Duplex: Stacked
- Bungalow Court
- Prefabricated and Manufactured Housing

This area incorporates a number of housing typologies such as side-by-side and stacked duplex units, bungalow courts, and clusters of prefabricated and manufactured housing. This lower-density housing zone is intended to help the neighborhood match the context of surrounding neighborhoods by gradating density at the edges of the development. This also decreases density at the riparian edge, allowing for greater space for retention and bioremediation of stormwater runoff from the development.





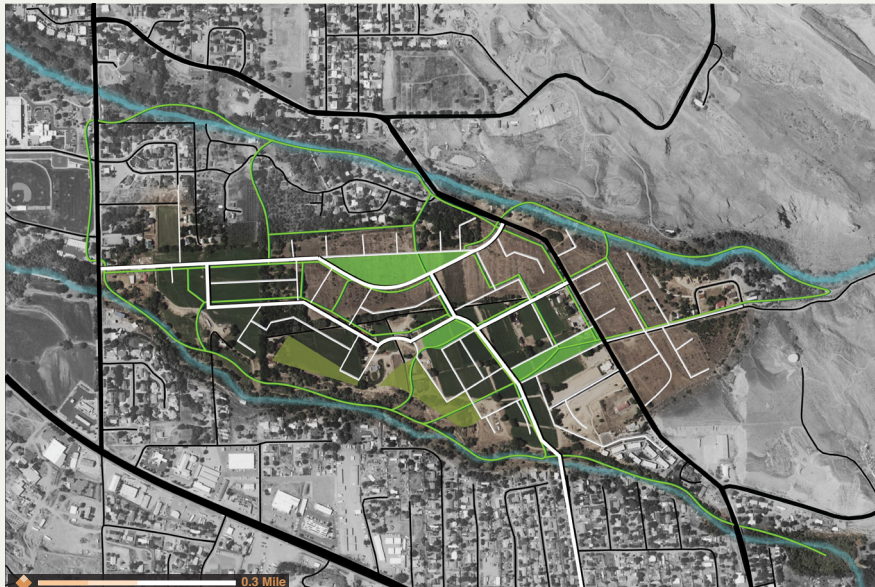
## 2.5 COMMON CORE FOCUS: SCENARIO TAKEAWAYS

### ■ Community Garden Space

Preserves agricultural heritage of the site in a context that can contribute to affordable housing by providing opportunity to offset cost of food, as well create community

Similar to the “conservation” scenario, this scenario includes the preservation of a large plot of agricultural land for a venue for gardening activities. The area currently has a strong precedent set for the preservation of community gardening spaces. Just to the north of the proposed garden site the Mullberry Drive Development has preserved a large orchard site. To the northeast of the site lies The Youth Garden Project, who’s mission, “to cultivate healthy children, families, and community through educational programs and the profound act of connecting people with food from seed to table” presents a wonderful opportunity to connect the proposed development, physically as well as socially, to surrounding communities.

- Greatest number of housing units, providing a variety of opportunities for affordable housing
- Mixed-use development providing retail, grocery, and short-term and nightly rental, as well as live/work opportunities
- Pedestrian and transit-orientated design, supported by a bike/walk trail network
- Developed recreation and community gardening spaces
- A road network providing access through the site, through a network of community collector and arterial roads
- Open space preservation and riparian restoration





# 3

## CONNECTED NEIGHBORHOODS FOCUS SCENARIO RESIDENTIAL NEIGHBORHOOD / SHARED OUTDOOR SPACE AND TRAILS

**3.2** CONNECTED NEIGHBORHOODS FOCUS: **TRANSPORTATION AND LAND USE PLAN**

**3.3** CONNECTED NEIGHBORHOODS FOCUS: **PROPOSED TRANSPORTATION PLAN**

**3.4** CONNECTED NEIGHBORHOODS FOCUS: **LAND USE AREAS**

**3.5** CONNECTED NEIGHBORHOODS FOCUS: **SCENARIO TAKEAWAYS**

### OBJECTIVES

- Connect to the existing road network with a system of community connector and arterial roads
- Demonstrate a more consistent gradient between housing densities, matching more closely the housing densities found in surrounding neighborhoods
- Provide a network of urban pocket parks, linking homes to a larger central park through a system of urban trails
- Preserve and restore much of the riparian system found on the site
- Provide city parks and a network of trail systems linking to the surrounding community, supporting multimodal transportation

### NARRATIVE

The Connected Neighborhoods Focus Scenario creates a transportation network and land use plan for the priority focus area that increases density, while maintaining a consistency of scale and density with existing surrounding neighborhoods. This scenario has preserved much of the riparian network but has allowed much of the agricultural land to be developed.

Housing units in this scenario are integrated into a network of smaller parks linked with a bikeable/walkable trails network. These smaller parks function as neighborhood backyards, allowing residents to gather and recreate in common spaces. The intent is to engender a sense of

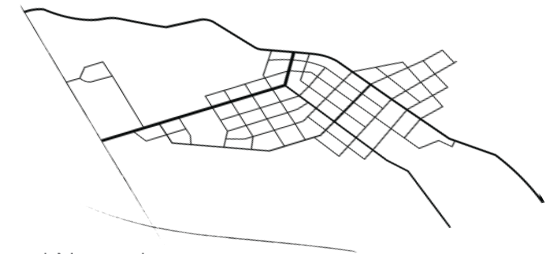
community among new residents. A large park is located in the center of the highest density housing area.

Offering diverse housing styles and sizes creates a neighborhood that may retain residents for long periods of time, by allowing them to move into larger or smaller units as family sizes and needs change with time.

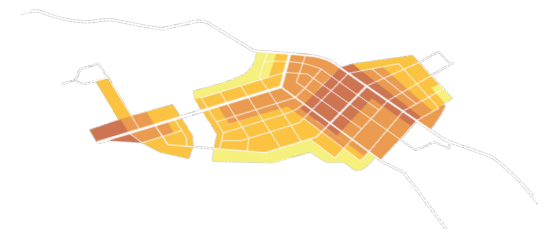
This conceptual design does not include commercial mixed-use zoning in order to reflect the feel of traditional Moab neighborhoods and to focus the commercial activities in downtown Moab.



Open Space/Trails Network



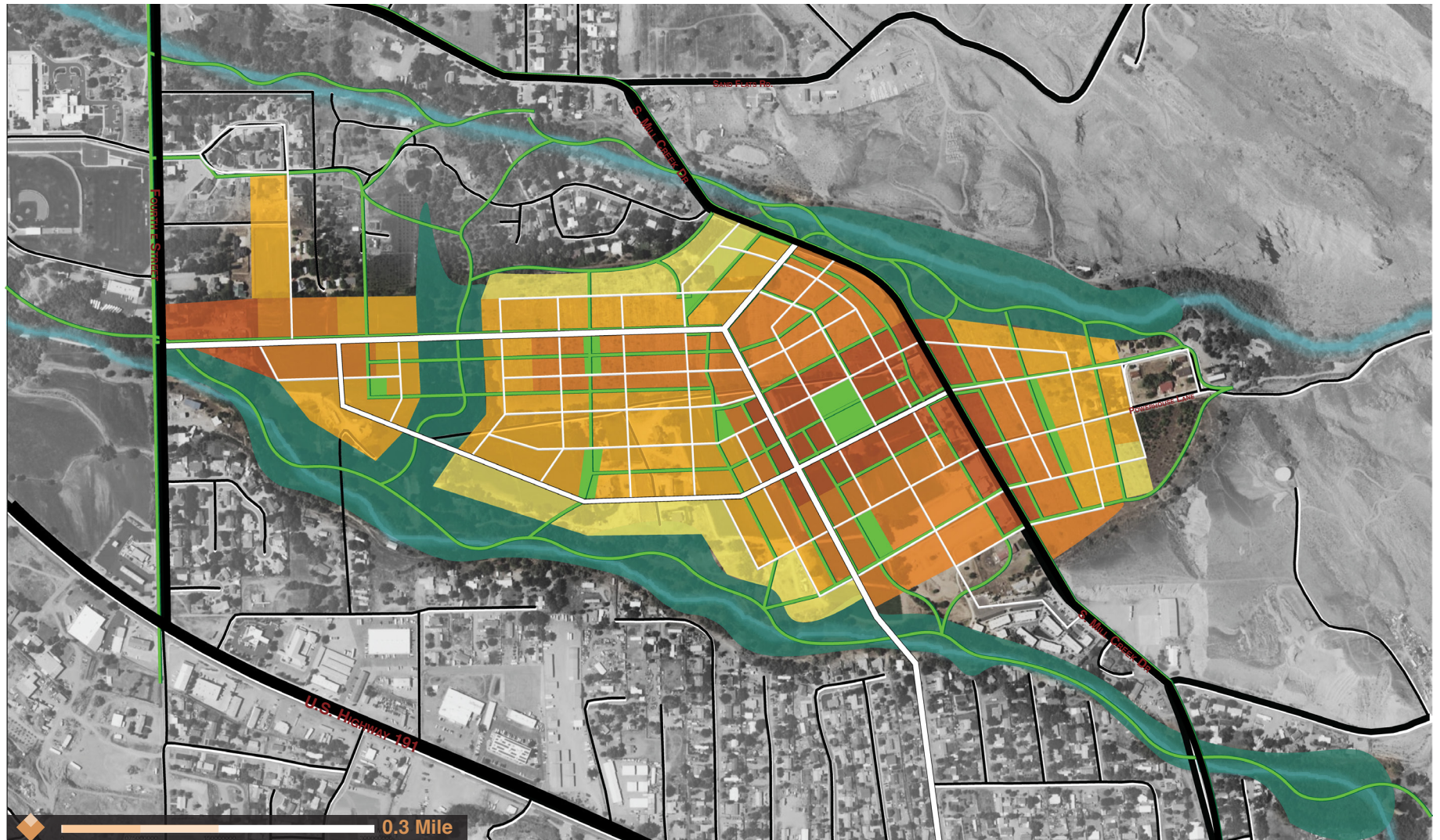
Road Network



Residential Land Use



### 3.2 CONNECTED NEIGHBORHOODS FOCUS: TRANSPORTATION AND LAND USE PLAN



#### LAND USE MAP KEY







 Riparian Restoration/Stormwater Detention	 Residential 20 Units Per Acre	 Residential 12 Units Per Acre
 Parks and Trails	 Residential 16 Units Per Acre	 Residential 8 Units per Acre

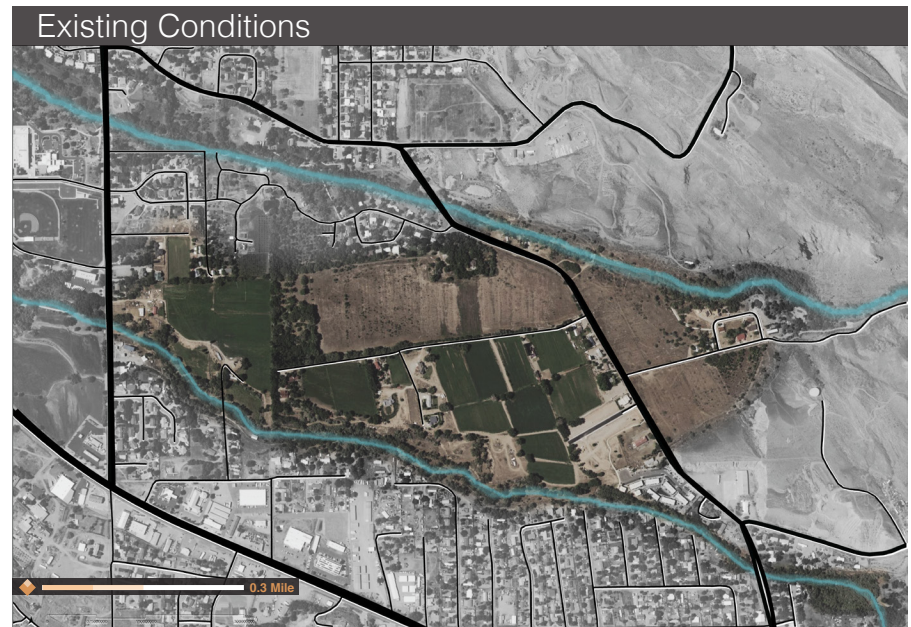
Figure 41. Gradated Density Focus transportation and land use plan



### 3.3 CONNECTED NEIGHBORHOODS Focus: **PROPOSED TRANSPORTATION PLAN**

Similar to previous scenarios, the proposed road network for the Connected Neighborhoods Focus Scenario demonstrates a more traditional gridded street structure. This design reduces stress on South Mill Creek Drive, which will likely see a great increase in traffic, as residents and visitors look to avoid the, at times, overburdened commercial highway stretch. This will involve a proposed community arterial linking South Mill Creek Drive with Fourth East Street. Unlike some previous scenarios, this east to west connection through the site splits into two larger roads, in order to handle a greater density of housing units.

The plan also creates a secondary connection running parallel to S Mill Creek Drive and connecting to Highway 191 through Duchesne Avenue and Sage Drive. This will also reduce stress on S Mill Creek Drive, providing a secondary entrance and exit to the highway that is not connected to the proposed university site, which is likely to become a heavily trafficked area at certain times of the day and year.



#### Proposed Road Network: **Community Arterials**



#### Proposed Road Network: **Community Connectors**

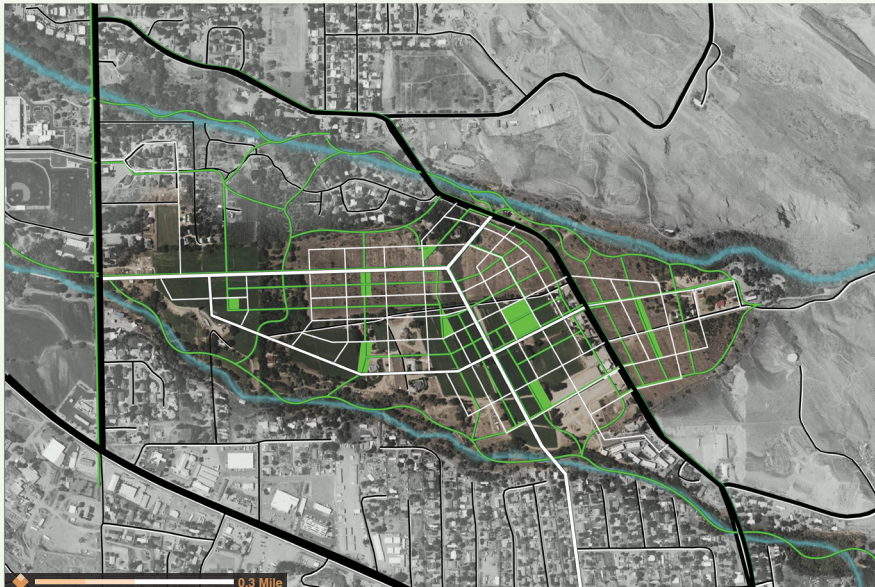




#### ■ Parks and Trails

- Bike/Walk Trail Network
- Parks

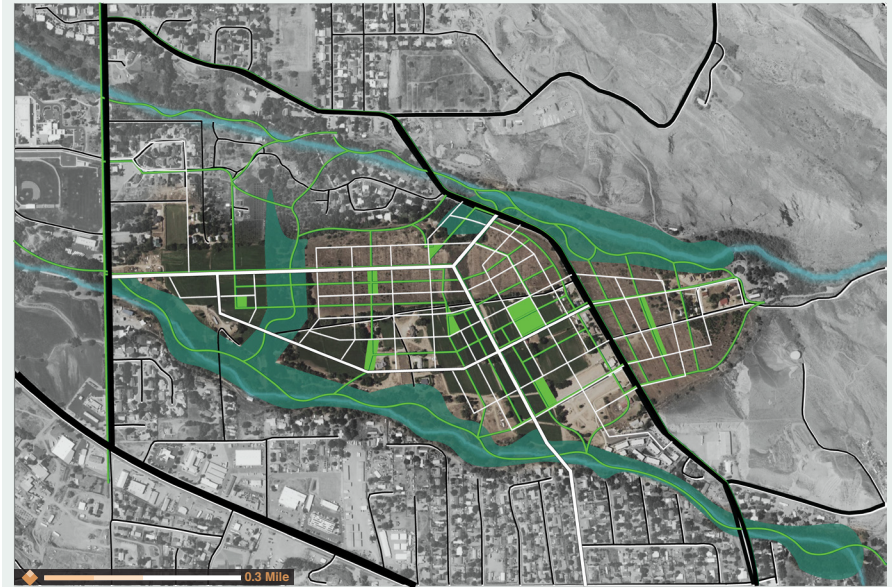
This scenario provides a series of pocket parks linked by a well-developed network of bikeable/walkable trails. Frequent smaller parks at regular intervals provide residents opportunities to recreate and gather, replacing the personal yard with a more communal setting, engendering the social relationships that create communities within developments. This allows for increased densities, retaining a traditional neighborhood feel.



#### ■ Riparian Restoration / Stormwater Detention

- Widening the floodplain Channel
- Re-vegetation of Native Plants

Preserving and restoring the riparian areas in and around the potential development produces a number of benefits for residents, visitors, as well as the city and county. Widening creek channels can provide flood retention for city residents downstream by dissipating stormwater energy and creating greater space for retention and detention. Important habitat connections are also improved, linking the Scott M Matheson Wetlands environment to the La Sal Mountain Range to the east. Residents and visitors will love walking and riding in the naturalized environments on well-developed trails. This links the development with the ethos of outdoor adventure that attracts residents and visitors to the area, making it easily adapted into the existing social and cultural framework of Moab and Spanish Valley.



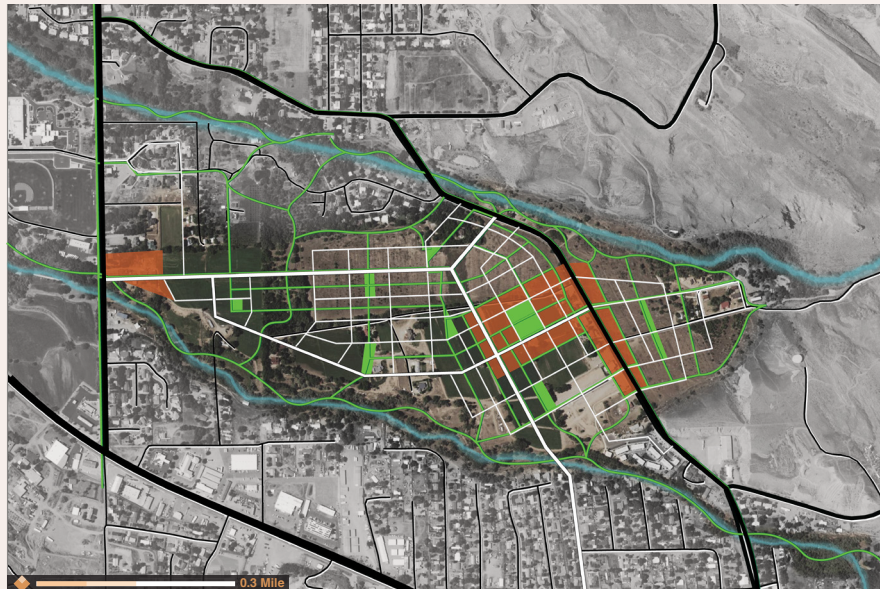


## ■ Residential 20 Units Per Acre

### Housing Typologies Applicable

- Small Multiplex
- Fourplex
- Courtyard Apartments
- Townhomes

This highest-density residential zone is organized around community arterial roads. The bulk of the higher-density zone is supported by the largest open space in the park network. This zoning would include groupings of townhomes, courtyard apartments, small multiplex apartments, and fourplexes. These higher-density units provide smaller, lower-maintenance housing that offer affordable options for valley residents. By including two- and three-bedroom units, the district can provide affordability for a variety of household types. This clustering of density also preserves land by limiting sprawl. This allows for restoration and preservation.

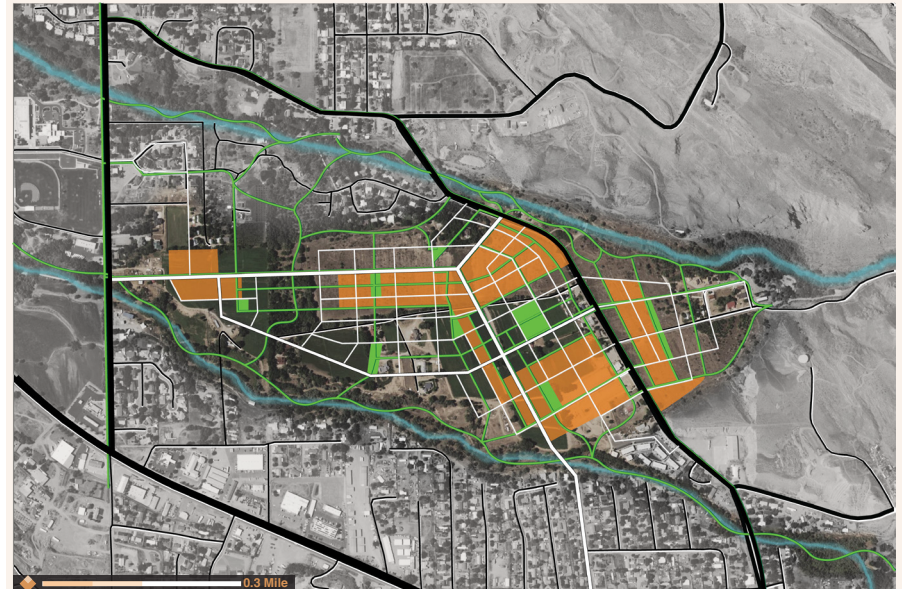


## ■ Residential 16 Units Per Acre

### Housing Typologies Applicable

- Townhomes
- Fourplex
- Duplex: Stacked

This land use zone suggests the use of townhomes, fourplexes, and stacked duplex units to achieve the desired density of 16 units per acre. Mixing clusters of these unit types, gathered around community arterial streets will provide an interesting neighborhood, while retaining uniform building heights and street relationships, not too dissimilar to existing Moab neighborhoods.



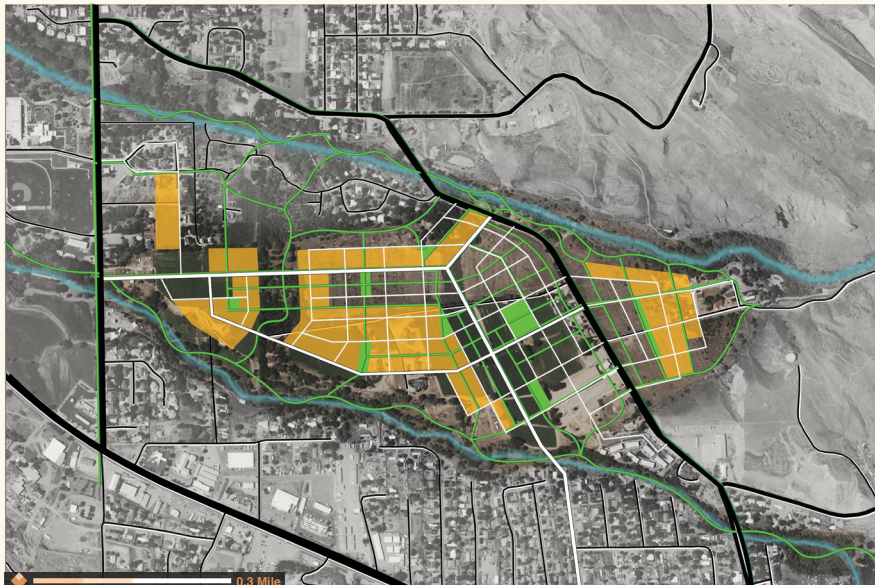


## ■ Residential 12 Units Per Acre

### Housing Typologies Applicable

- Duplex: Side-by-Side
- Duplex: Stacked
- Bungalow Court
- Prefabricated and Manufactured Housing

This land use zone suggests the use of a number of housing typologies such as side-by-side and stacked duplex units, bungalow courts, and clusters of prefabricated and manufactured housing. These units are grouped around community collector streets and are supported by a number of smaller parks and bikeable/walkable trail network.

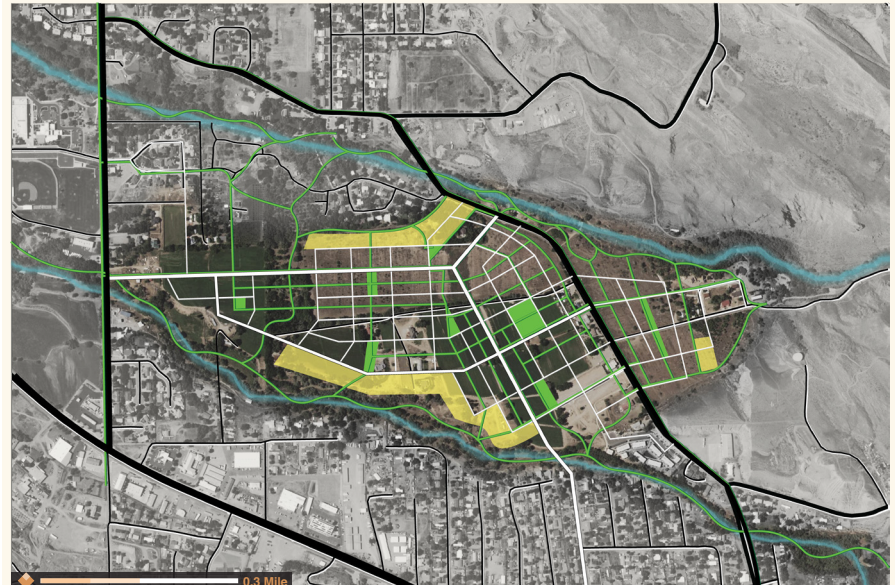


## ■ Residential 8 Units Per Acre

### Housing Typologies Applicable

- Duplex: Side-by-Side
- Duplex: Stacked
- Bungalow Court
- Prefabricated and Manufactured Housing

This lightest-density zone is intended to help the development visually match the context of surrounding neighborhoods by gradating density at the edges. This also decreases density at the riparian edge allowing for greater space for retention and bioremediation of stormwater runoff.



### 3.5 CONNECTED NEIGHBORHOODS FOCUS: SCENARIO TAKEAWAYS

- Lower densities at the fringes of development matching existing neighborhood densities
- Mixed densities of housing offering a variety of affordable housing unit opportunities
- Public transit and pedestrian bike/walk-oriented design
- Traditional neighborhood design
- Shared network of urban parks and pocket parks
- Open space preservation and riparian restoration



# CONCLUSION

Moab and Spanish Valley are beautiful communities attracting residents and visitors from all walks of life. Their role as a gateway for Arches and Canyonlands National Parks, as well as the variety of outdoor adventure activities hosted by the unique landscapes of the surrounding area, will likely continue to drive demand for affordable housing units for years and decades to come. Also, the development of the Utah State University Moab Campus will attract new residents to the area, who drive the demand for affordable housing options. Community leaders and planners are aware of the need to identify opportunities to provide affordable housing for service industry workers, students, and valley residents in order to avert an affordable housing crisis.

The 2018 Moab Affordable Housing workshop, conducted in the context of this thesis project, developed consensus among community

leaders and stakeholders who participated in the workshop. They identified a number of areas within the valley that have great potential as development sites that incorporate affordable housing units for valley residents. During the course of this project, development strategies and housing typologies for introducing a greater number of affordable housing units in the area were identified.

The conceptual design plans produced for the priority focus area for introducing affordable housing serve as examples of how development in Moab and Spanish Valley can address affordability by diversifying available housing typologies. They also demonstrate how strategically increasing housing densities in appropriate locations offer solutions to a myriad of issues confronting community planners. These include congestion of the H191 corridor, the preservation of open space within the city and agricultural heritage of the valley, increasing

opportunities for public transit and walkability, as well as addressing the ecological concerns of developing in this unique and sensitive landscape.

These strategies and approaches to development are applicable to each of the affordable housing focus areas identified during the 2018 Moab Affordable Housing workshop. Concentrating pockets of housing density throughout the valley, can provide affordable units that are well integrated with the existing urban framework and social community. Are strategies that allow Moab and Spanish Valley to attract service industry employees, students, and full-time residents. This approach will hopefully enable Moab to provide the infrastructure to maintain its reputation as one of the premier outdoor recreation destinations in the West.

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