

# THE SANTAQUIN GREENWAY SYSTEM

Preserving the Future of  
Santaquin Trails and Open Space

An MLA Thesis Project  
by Ian Kola, June 2022





## ACKNOWLEDGMENTS

I'd first like to express my deepest thanks to my wife and daughter for getting me through this thesis project and putting up with the bumps along the way. I'd also like to recognize the invaluable assistance of my thesis committee: Jake Powell, David Evans, and Nate Trauntvein who encouraged and guided me throughout the process. I'd also like to acknowledge all the hard work put into the Santaquin planning project, including the sophomores and juniors for their analysis and the seniors for their vision plans and countless recommendations. I am also grateful to the many contributors from Santaquin that met with members of the department during the process and helped guide our efforts.

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**Cover Image:** Overview of Santaquin, featuring its natural assets and expanding infrastructure (Image 1.0).

## THESIS COMMITTEE

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## SENIOR CAPSTONE ALIGNMENT

Based on the information compiled during the Charrette, the USU Senior Class of 2021 put together a comprehensive framework to inspire future plans in the City of Santaquin. This greenway system design complements the seniors' work, aligning its recommended zones and features with the designed areas proposed by the seniors.

## CHARRETTE CONTRIBUTION

In January 2021, the LAEP department and involved citizens of Santaquin began the planning process for the future of Santaquin over a five-day workshop.

From the 2021 Charrette came the following categories of emphasis:

- Revitalizing the downtown and Main Street areas.
- Developing the south gateway.
- Integrating the reservoir and west neighborhood.
- Improving the west gateway and water treatment areas.
- Planning for the new north interchange.
- Promoting future agritourism.
- Creating connections and trails.

## EXECUTIVE SUMMARY

Santaquin residents value their open spaces, trails and gathering spaces. Greenways are a space-efficient form of open space that can ensure a community has access to these amenities.

This greenway master plan is a cumulative result of work compiled and completed by students from Utah State University's Landscape Architecture and Environmental Planning department, Santaquin residents, and city government. Extensive community engagement occurred through USU's senior capstone and Charrette projects, and this master plan coincides with the planning conclusions made in these projects.

This plan represents a conceptual layout and design of a greenway system in Santaquin, UT. These plans are meant to justify and inspire the inclusion of a greenway system in the city's plans, in hopes that a system of similar breadth and qualities can be built and maintained by the city of Santaquin for the benefit of generations to come.

## LESSONS LEARNED FOR THE CITY

Through the development of this plan and its accompanying design projects by USU students, the City of Santaquin and its residents have become more accustomed to the iterative design process and the comprehensive products it can achieve. Iterative processes can effectively produce different designs for the same land areas, especially when a different set of goals is employed.

Additionally, the city became more familiar with the difference between a planning project and a design project. A project like this, in such an early stage of development, makes broader strokes and less definitive suggestions as the design represents a vision rather than a plan to be built. Compiling a functional open space vision plan requires understanding the community needs, desires and upcoming hazards.



**1 - INTRODUCTION & VISION ..... 6**

INTRODUCTION ..... 8-9

WHY SANTAQUIN? ..... 9

PLANNING STRATEGY ..... 10-11

ECOLOGY OF GREENWAYS ..... 11

TRAILS INCORPORATION ..... 12

TRANSPORTATION INCORPORATION ..... 12

SOCIAL SIGNIFICANCE ..... 13

RESIDENTIAL AREAS ..... 14

TOURISM ..... 14

TRAIL HEADS ..... 16

SEATING AREAS ..... 17

COMMUNITY GARDENS ..... 18

PUBLIC ART ..... 19

DESIGN PRINCIPLES ..... 20-21

**2 - INVENTORY AND ANALYSIS ..... 22**

REGIONAL LAND OWNERSHIP ..... 24

REGIONAL AGRICULTURAL LAND ..... 25

REGIONAL INFRASTRUCTURE ..... 26

REGIONAL POPULATION ..... 27

IMAGINE SANTAQUIN SURVEY ..... 28-29

NODES ..... 30

DISTRICTS ..... 31

LANDMARKS ..... 32

EDGES AND BARRIERS ..... 33

PATHS ..... 34

CRIME AND EXISTING PARKS ..... 35

PARKS AND CORRIDOR POTENTIAL ..... 36

PARKS AND WALKABILITY ..... 37

DEMOGRAPHIC DISTRIBUTION ..... 38

MEDIAN HOUSEHOLD INCOME ..... 39

AGRICULTURAL LANDS ..... 40

NON AGRICULTURE LAND ..... 41

LOCAL FLORA AND FAUNA ..... 42-43

**3 - MASTER PLAN DESIGN ..... 44**

OVERALL SYSTEM DESIGN ..... 46-50

NORTHERN ORCHARD CONNECTOR ..... 52-55

AGRITOURISM ENTRANCE SITE DESIGN ..... 56-57

EXIT 242 CONNECTOR ..... 58-61

TRAIL HEAD SITE DESIGN ..... 62

SUMMIT RIDGE GREENWAY ..... 64-67

AGRICULTURAL HERITAGE GREENWAY ..... 68-70

RED BARN CONNECTOR ..... 72-74

DESIGN METRICS ..... 75

**4 - MOVING FORWARD ..... 76**

MOMENT OF OPPORTUNITY ..... 78

FUNCTION OF SANTAQUIN GREENWAY .... 78-79

PURPOSE OF A VISION PLAN ..... 80-81

THE POWER OF VISION ..... 82

LESSONS LEARNED ..... 82

APPLICATIONS FOR PRACTICE ..... 83

**APPENDIX A:  
GREENWAY PRECEDENTS ..... 84-89**

**APPENDIX B:  
PLANTING SUGGESTIONS ..... 90-91**

**APPENDIX C:  
BIBLIOGRAPHY ..... 92-94**

**APPENDIX C:  
BIBLIOGRAPHY ..... 96-98**





## CHAPTER

# 1

## INTRODUCTION & VISION

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“Greenways are linear parks and trails which connect neighborhoods to vital **community resources** and provide all citizens with barrier-free access to **natural resources** and **recreational** opportunities.”

- Nashville Greenways Commission

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Page left: A cyclist and walkers utilize the Mountain to Sound Greenway in Washington state (Image 2.0).



INTRODUCTION

Exposure to nature improves the physical, mental, and spiritual well-being of the members of a community (Bratman, Levy, Gross, 2015). However, natural areas continue to disappear in communities across the U.S.. Between 2001 and 2011, about 4,300 square miles of natural areas in western states were lost because of urban sprawl, commercial developments, and energy developments (Center for American Progress, 2016).

Greenways are a space-efficient form of green space that can increase access to nature, improve ecological services, and work well within and between communities (Ahern, 2003). Fitting greenways into existing, densely developed communities can be very difficult, whereas, designing and implementing greenways ahead of development can insure proper inclusion of these systems (Hellmund & Smith, 2006). There are dozens of books covering technical, scientific, and design theory for urban greenways; however, there is very

little explanation of how greenways can connect and strengthen agricultural communities that are transitioning to a suburban structure in the Intermountain West. In agricultural communities experiencing growth pressures, greenway planning is an important tool to preserve linkages of natural areas within and between communities. The examples Flink outlines in is book with this circumstance, however, are limited in number as much these greenway projects are located on the east coast where densification has already widely occurred (Flink, 2020).

Greenways are features of the landscape that can support ecological function, recreation, and cultural heritage (Shafer et al., 2000). According to Hellmund and Smith 2006, "Greenways are bands on the landscape, designated for their natural or recreational resources or other special qualities.... They range from narrow urban trail corridors to winding river floodplains to very wide, wilderness landscape linkages." Greenways can support diverse landscape functions and are far

more than just strips of forested land or a bike path; they can improve the ecology of an area by enhancing connectivity for animals and by restoring or preserving riparian function along a river (Hellmund & Smith, 2006).

Greenways can be planned in four ways: defensive, offensive, protective, or opportunistic. The defensive strategy is often seen as a last resort after fragmentation has occurred and can have limited results. The offensive strategy can be resource heavy, though effective, as it essentially places nature back in the landscape according to an accepted vision. The remaining strategies fall in the middle of the prior two in regards to the severity of intervention. The protective strategy actually involves recognizing unaffected natural land and choosing to incorporate it as a greenway use; this takes the most foresight and the opportunities for this strategy are quickly dwindling. The opportunistic strategy involves recognizing a special land acquisition opportunity such as with the rails to trails initiative which takes advantage of the previously prepared land in railroad right of ways (Ahern, 1995).

Community revitalization can be achieved through greenway implementation and can be used to protect agricultural heritage sites through the tourism greenways can facilitate (Zhao et al., 2018). Greenways are also capable of improving quality of life by providing spaces for contemplation which is tied to attention restoration and stress reduction (Guizzo & Farinha Marques, 2016). Additionally, greenways can be integral in historic preservation and raising property values and family retention rates in a community (Hellmund & Smith, 2006).

Greenways can offer a political and social framework that can expose people to diverse perspectives and values in regards to land use (Ahern, 2010). Greenways are also integral to the social realm and can improve a community's access to nature, improve the ability

Bottom left: Expansive greenway bridge crossing a river (Image 3.o).

to safely travel within the community, and can unite communities; they are a space-efficient form of green space that can increase access to nature, improve ecological services, and work well within and between communities. Greenways are commonly found in the form of linear open spaces along natural corridors or right of ways, linkages to parks, and recreation corridors; they allow for natural areas to be situated within and between developed areas, making better use of minimally developed zones (Ahern, 2003). It should be noted that a handful of authors highlight that some species thrive in isolation, which would be counter-productive in the case of a socially activated greenway (Ahern, 2005).

WHY SANTAQUIN, UTAH?

The community of Santaquin was settled in 1851 by pioneers helping settle Payson, Utah. The Santaquin area was an ideal location for a settlement, boasting a plentiful supply of water, fertile land, and trees for firewood and building materials. Industries crucial to the early development of Santaquin were farming, mining, silk farming, furniture making, and flour and molasses milling.

Today, Santaquin has approximately 15,000 residents located in southern Utah county, about 70 miles south of Salt Lake City. The area is surrounded by numerous peaks of the Wasatch Range and Utah Lake to the north. Santaquin is a low-density urban area that has yet to experience a massive acceleration in urban development. Santaquin has only 1,486 people per sq. mile compared to the 5,359 people per sq. mile of Orem, Utah, and the 27,788 people per sq. mile of New York City (U.S. Census Bureau, 2010). It should be noted that development pressures from Northern Utah county will impact Santaquin in the near future. Santaquin currently features a balance of development and agriculture, but it is at risk of losing its rural and



Top Right: A typical condition showing Santaquin's precious natural resources alongside nearby development that is on the steady increase. It is these transition areas that are the most important to conserve in a naturalized state (Image 4.o).

agriculturally rich identity (The City of Santaquin, 1984). The community of Santaquin offers a unique opportunity to get out ahead of development by setting aside land for a greenway and designing an expansive, inclusive system that enhances the unique agricultural attributes and history of the land.

This greenway system also looks to improve the community's access to nature and improving ecological services in the area. This document is intended as reference for designers and planners to utilize the same principles to better design high-functioning greenways in the intermountain West of the U.S. to preserve agricultural land.

The purpose of this study is to apply best practices for the design of greenways to an intermountain agricultural community on the cusp of intensive development in order to preserve agricultural land, restore access to natural areas, and improve the ecological services provided while improving its sense of community.

KEY TAKEAWAYS

- Santaquin has deep agricultural roots that are in danger of being cut off by incoming residential expansion.
- Proper planning can ensure space for agriculture, open space and recreation, nature and residential homes.



The following section features general greenway background information that explains the history, form, and function of a “greenway.”

BACKGROUND

GREENWAYS AS A PLANNING STRATEGY

In many urban areas, preservation of natural areas results in “creative fragmentation” while attempting to set aside land ahead of developments. Creative fragmentation is the unintentional fragmentation of lands as a byproduct of politically influenced decision making. The ecological, physical and social implications of the connections greenways create must be considered in order to develop a beneficial greenway system (Hellmund & Smith, 2006). A landscape’s cultural and natural richness, and various other unique qualities can be preserved through designating greenways in the master plan of a community. Well-designed greenway systems have the potential to support and improve agritourism in addition to creating more wholesome, connected, and healthy communities (Flink, 2020).



Identifying Values

Greenways can form networks that connect and integrate people of varying values and perspectives in regards to land use and planning; this stands in stark contrast to other landscape planning concepts that can separate and segregate people by their land use views (Ahern, 2010). The design of the Santaquin Greenway starts with a comprehensive inventory and analysis of Santaquin’s infrastructure, demographics, and resources in order to best site and integrate a greenway system into the community to achieve the most beneficial and effective system (Ahern, 2013).

Improving Environmental Quality

Traditionally, in the development and planning of urban growth in western and central European cities, greenways have been proposed as a way to reduce air pollution (Groome, 1990). According to Flink, greenways can also play an active role in reducing impact from flooding (Flink, 2020). A greenway system in Santaquin will improve the quality of living in the area through gradually reducing air pollution and minimizing

environmental risks such as habitat loss and migration disruption.

Popularizing a Greenway in the Community

Sharma (2010) reminds us that open spaces and greenway connections were originally lost during urbanization because of a systematic under-valuing of open spaces and natural resources. This makes it pertinent to highlight the importance of these areas to society, to incorporate programming such as recreation opportunities in these areas to maintain support and interest. The concept of greenways must be popularized while maintaining ecological integrity and function. The following quote from the Nashville Greenways Commission, a city appointed conservation organization working to ensure equitable open space access, illustrates the function of greenways:

“Greenways are linear parks and trails which connect neighborhoods to schools, shopping areas, downtown, offices, recreation areas, open spaces, and other points of activity. Often located along natural landscape features like streams, rivers and ridges, or along built features, such as railroad corridors and scenic highways, greenways provide valuable green spaces for conservation, recreation and alternative transportation. Greenways provide all citizens with barrier-free access to natural resources and recreational opportunities.”

(Nashville Greenways Commission, 2010)

Santaquin would benefit from a community group representing greenways who could support and convey aspects of a greenway to the community.

Bottom Left: Myriad Botanical Gardens, located in downtown Oklahoma City is an interactive urban park featuring multiple tiers of densely landscaped areas and a multitude of educational opportunities for youth and adults (Image 5.o).

Planning Process

Regarding the role of greenways in the planning process, Arendt (2004) recommends identifying and designating ideal land conservation areas in a systematic manner to form the “building blocks” for a successful open space network once the development process is complete. These techniques can be used in Santaquin in order to prevent further fragmentation through future development.

THE ECOLOGY OF GREENWAYS

Greenways are largely praised for their capability of effectively preserving green space and natural areas and preserving the biodiversity and ecosystem functions of these areas. The recreation aspect of greenways is, according to most experts, such as Hellmund and Smith (2006), considered to be a secondary role of greenways. Some of the most bio-diverse areas are the least managed, least designed, and the most overlooked spaces in a city (Forman, 2010). Additionally, disturbances are a crucial part of low-management areas and result in the creation of patches in the landscape, which creates altered levels of resources such as light and nutrition. Modeling human systems off of naturally disturbed systems, could decrease the negative impact of such disturbances on a designed system (Turner & Gardner, 2015).

According to Hellmund and Smith, and landscape ecologists such as Forman, landscapes are made up of patches, corridors and matrices. Forman (2010) argues that the patch-corridor-matrix model is crucial for land-use planning because spatial pattern directly control the flows, movements, and changes of both people and natural systems. A patch is a uniform non-linear area that differs from its surrounding, whereas, a corridor is a uniform linear area of land that differs from the land types it is adjacent to on both sides. A matrix is



Top Right: Example of an ecologically rich greenway with a mix of various habitat types and human focused programming (Image 6.o).

the broadest and best connected landscape element of the three; examples of this are agricultural land areas, forest areas or cities. The matrix of a landscape dominates the function of the landscape but can have patches and corridors that interrupt it. Locating and connecting patches to matrices of similar land use is important, especially when working to maintain species populations and migration habits. Evaluating patches, corridors, and matrices can ensure the most beneficial connectivity and interrelationship between land uses (Hellmund & Smith, 2006).

These three aspects of the landscape can occur on a breadth of different scales. Foreman (2010) recognizes three scales of green spaces (all of which can be incorporated in a greenway): the city and metropolitan area, the metro area border and inner-urban ring, and the outer urban ring.

According to Robel (2016), a city’s green infrastructure, can provide opportunities for animals to move, spread and colonize new habitats, though there is little evidence to support an overarching value of green space for all species. Likewise, it should be noted that green infrastructure can be targeted at key species in an environment, such as mule deer migration in Santaquin’s case. As naturally occurring open spaces are fixed on the landscape, the planner’s utmost challenge becomes wisely arranging constructed spaces around existing open spaces (Foreman, 2010). Perlman (2005) emphasizes the need to preserve remnant habitat patches as they are likely the last refuge for individual species in a certain area. Remnant habitat patches can often be present in areas not traditionally considered “natural” such as buildings, city parks, rooftop gardens, and suburban backyards.



## TRAIL INCORPORATION

Trails are a common feature within a greenway system and can expand the functions of a greenway to connect key community features (Hellmund & Smith, 2006). According to Krizek and Johnson (2006), "efforts to enhance connectivity to points of interest could also enhance the [greenway's] capacity to serve as a transportation corridor by promoting higher levels of use among pedestrians/cyclists and individuals living within walking distance of the trails."

According to Lindsey et al. (2008), "trail traffic is higher on trail segments in neighborhoods with greater population density, higher household income, better educated adults, fewer older and younger residents, more commercial land use, and more parking." Interestingly, Lindsey found, contrary to what theory suggests, that higher levels of trail use correlated with longer length blocks in pedestrian access zones. Lindsey believes that this finding could be because of the barrier effect that trail intersections can cause, which can result in longer travel times for pedestrians and cyclists.



## TRANSPORTATION INCORPORATION

According to Viles & Rosier (2001), an integrated approach to greenway planning is necessary when planning for greenways alongside roadways. This involves working with conservation managers, road management and construction authorities, utilities managers, local government and landowners. In Santaquin, a notable percentage of the greenway system is likely to be situated adjacent to roadways especially when dealing with agricultural land. According to Pena et al. (2010), vegetation should be used as a barrier to separate different traffic types and paving types should be varied.

Top right: Center of road bike lanes in Washington, DC (Image 7.o).  
Bottom Left: Cannon Valley Trail, Minnesota (Image 8.o).



Intersections should reflect the connections that need to be made within the community but uninterrupted trail segments should be considered where commuting is more likely between features (Lindsey et al., 2008).

## SOCIAL SIGNIFICANCE

Certain environments, known as "restorative environments" can promote recovery from mental fatigue. Four elements are required for an area to be considered a "restorative environment": fascination, a sense of temporary escape, a sense of being part of a larger whole, and compatibility with an individual's purposes (Kaplan & Kaplan, 1989). These elements can be designed into greenways in order to provide users with the benefits of "restorative environments." The following quote illustrates the various health benefits natural areas can provide to a community:

"...the individual and community benefits arising from contact with nature include biological, mental, social, environmental and economic. Nature can be seen therefore as an under-utilized public resource in terms of human health and well-being, with the use of parks and natural areas offering a potential gold mine for population health promotion."

(Maller, C, Et. Al., 2006)

According to Hellmund and Smith (2006), greenways serve as an ideal canvas for reviving the concepts and functions of common or public land. Greenways naturally tie communities, regions and other types of common spaces together and open up opportunities for cooperation between government and civil society, which will be of great benefit in Santaquin because of the importance it places on adding to the greater good of the community (Hellmund & Smith, 2006).

Successful green space is devised to facilitate diverse activity, and green space that is planned and designed to suit the demographic, cultural and behavioral characteristics of a local community is more likely to be well used. Accordingly, green space can play an important role in the day-to-day life of children and



Top Right: An all-ages and abilities, community cycling event (Image 9.o).

Bottom Right: Integration of a greenway with a paved trail alongside businesses (Image 10.o).

adults of all ages (Robel, 2016). Additionally, greenways have the capacity to enhance the social connectivity of a community which can influence social interaction within neighborhoods and improve sense of place and shared identity (Hellmund & Smith, 2006). Also, according to Arendt (1994), there is an increasing amount of evidence showing that property values increase as a result of green space provision in and adjacent to development areas.





RELATIONSHIP WITH RESIDENTIAL AREAS

Palardy (2018) warns that “without treating residential neighborhoods as unique with their own idiosyncrasies, urban planners run the risk of developing urban greenways that alienate residents and fail to provide the sustainable benefits so often praised.” To avoid doing this necessitates, in the analysis stage, becoming familiar with the demographic’s wants and needs. According to Giles-Corti et. al. (2005), both the quality of the walking environment and ease of access are key factors in motivating people to choose walking as a form of transport or exercise.

According to Crompton (2001), a greenway can add property value by virtue of the expansive or prolific views it provides, or, in the case of narrow greenway corridors, by virtue of the provided trail accessibility. It is a common concern that greenway trails will result in privacy loss, trespassing, litter, noise, and increased crime. However, the reality is most often not as severe as expected, and a greenway’s informed design and role and function in the community are crucial to its success



(Crompton, 2001). Additionally, a study done at the Bush Creek trail in Santa Rosa, CA shows that there was no significant increase in crime or decrease in property value associated with proximity to trails. According to the National Park Service, notable increase in property value actually depends on how successfully

greenway proponents are used to integrate open space with neighborhood developments and the greater community and its assets (Racca & Dhanju, 2006).

RELATIONSHIP WITH TOURISM

According to Robal (2016), some urban parks and green spaces such as Regent’s Park, Park Guell, or Jardin du Luxembourg, largely contribute to motivating tourists to visit a city. As an urban landscape becomes more attractive due to the influence of its open space, civic officials face the decision of using this to promote and market the city (Robel, 2016). In the case of Santaquin, the city already boasts an established agritourism culture based around its orchard enterprise, which can be incorporated into its open space system for further integration and effectiveness.

**Bottom left:** A concept rendering of a modern residential community with ample access to multi-use open space (Image 11.o).  
**Top right:** An example of an agritourism event in a community, engaging its members in the processes and atmosphere of local agricultural production and lifestyle (Image 12.o).



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The following section features a selection of design elements and principles that serve as a road map to follow when designing the Santaquin Greenway.

PROGRAMMED SPACES: TRAILHEADS

A trailhead serves as the public access point for a trail, and is usually located at a trail terminus. Trailheads should effectively welcome and orient visitors to the trail or trail network, such as in a greenway system. A trail head is different than a typical trail entrance or intersection as it is a developed site that is specifically designed to offer trail users a host of amenities.

Trail amenities can include the following:

- Parking
- Restrooms
- Information Kiosks and Signage
- Bike Racks
- Bike repair stations
- Public art
- Trash receptacles

Trailheads can be ideal for managing access to trails by discouraging prohibited uses such as motorized vehicle use. Barriers can be used such as gates, bollards or fences to discourage unwanted uses. Trailheads also have to be designed with the types of users in mind, with different needs being associated with locals versus tourists, for example. Trailheads for tourists may include regional context maps, travel related amenities with prime visibility and a more formalized appearance whereas locals may desire increased separation between greenspace and parking lot and may require fewer and more passive amenities.

Locating a trailhead correctly is one of the most important factors related to its effectiveness. Though a trail terminus is a typical location, other pertinent locations for trailheads are locations where a high volume of people are expected to access the trail. Locating trailheads at already existing parks, or incorporating them into park designs can be an efficient allocation of funding



and can result in a multi-functional space for users; in these cases even sign installation can transform the space into an effective trailhead if funding is a concern. Where applicable, trailheads can even be integrated into existing buildings such as old rail depots (Rails to Trails Conservancy, 2021).

Top Right: Informal, natural surface trailhead (Image 13.o).  
Bottom Left: Formal, hardscaped trailhead (Image 14.o).



SIGNIFICANCE TO SANTAQUIN

- Trailheads effectively invite and orient potential trail users to their location in the system and the opportunities offered.
- Trailheads in Santaquin should be combined with park spaces in order to increase the number of effective trailheads and reduce costs.
- Trail heads can lessen the burden on adjacent residential areas by offering an alternative to on-street parking.

PROGRAMMED SPACES: SEATING AREAS

Seating areas are critical to the enjoyment of a greenway because of the respite they provide for users. It is critical to incorporate seating at regular intervals along the trail in order to accommodate elderly or physically challenged persons.

Additional seating recommendations:

- Utilize seating between trailheads.
- Provide a concrete pad or similar.
- Provide adequate shade.
- Combine with interpretive signage.
- Prioritize backed benches as they are more multi-purpose.
- Combine with viewing areas.

(Great Rivers Greenway, 2022)



Top right: Covered, trail-side seating area (Image 15.o).  
Bottom Left: Outdoor classroom seating made with natural materials (Image 16.o).

SIGNIFICANCE TO SANTAQUIN

- Seating areas can be combined with viewing areas and educational signage to provide respite and increase users knowledge of important topics of Santaquin history or current-day practices.
- Seating should be directly shaded by trees in order to promote the most use and offer the most comfort.



**PROGRAMMED SPACES:  
COMMUNITY GARDENS**

Community gardens can bring community involvement trailside and can serve as an important draw for local visitors. Additionally, locating community gardens on trails ensures proper pedestrian-level connection between important amenities and other community gardens.

These gardens become effective gathering spots for community residents which could, in turn, increase safety on the trail because of its concentrated and more constant use. Abandoned or empty parcels can be effective locations for community gardens which can effectively turn unproductive sites into active and valuable areas (Rails to Trails Conservancy, 2021).



**Top right:** Community members tend to raised bed community garden plots (Image 17.o).  
**Bottom Left:** One of five community gardens in Vancouver, Washington, featuring a variety of available plot sizes and types for residents (Image 18.o).

**SIGNIFICANCE TO  
SANTAQUIN**

- Community gardens can help increase local involvement in the trail system and promote social interaction.
- Community gardens can become hubs of activity that improve the “eyes on the trail” effect which can, in turn, provide for a safer trail atmosphere.

**PROGRAMMED SPACES: PUBLIC ART**

Artwork can play a role in identifying the trail and effectively “branding” it which can increase draw and user-ship. An important function of public art is its role in associating a community identity with a trail and effectively instilling a sense of ownership; this can result in better treatment of the space by its users.

Examples of public art include the following:

- Gardens
- Lighting
- Trail surface painting
- Murals
- Interactive art
- Sculptures

(Rails to Trails Conservancy, 2021)



**Bottom left:** Artwork along the Marvin Gaye Trail in Washington, D.C. (Image 19.o).  
**Top right:** Brick Bay sculpture trail at Snells Beach, Auckland, Australia (Image 20.o).

**SIGNIFICANCE TO  
SANTAQUIN**

- “Branding” with local art is crucial to creating a sense of ownership for the community.
- Sculptures and other artwork can become new landmarks for Santaquin that will attract users to different areas of the system and provide a better sense of place.
- Artwork can promote exploration if placed wisely off main trails and makes use of viewsheds.



## DESIGN PRINCIPLES FOR GREENWAYS

The following design principles were adapted by Paul Hellmund (2016) from Jusuck Kohl's general principles of ecological design to pertain specifically to greenway design.

These design principles are crucial to developing a holistic, effective greenway system for a community and are employed in the Santaquin Greenway Master Plan found later in this document.

### FEATURE SIGNIFICANT TOPOGRAPHY

Site the greenway to showcase topography in the focus area rather than avoiding grade changes.

Topography changes can help establish edges and frame use areas while creating increased visual interest through "capturing views."



Image 23.0

### PROVIDE SPACES THAT CAN BE EASILY ADAPTED

Include elements that can be easily adapted by users to fulfill the unique needs of the community, such as community gardens or natural play areas. These types of elements can promote continual, future engagement by community members, and the literal re-design of space over time, in contrast to fixed-use areas.



Image 25.0

### EXTEND FUNCTIONS OUTWARDS

Where appropriate, extend the greenway function outwards, beyond the physical boundary of the greenway to integrate the greenway within its context, resulting in a softer visual boundary of the greenway that promotes its land-use and landscape types for adoption in adjacent land areas.



Image 22.0

### USE LOCAL MATERIALS

Use local materials in the construction of any features such as pathways, bridges, benches or buildings. Use of local materials helps give the greenway a specific sense of place and can have a positive and direct impact on the local economy.



Image 24.0

### PROVIDE MULTI-FUNCTIONAL SPACES

Multi-functional spaces can adapt to the needs of the community by offering opportunities for use: recreation, community gardens, or public gathering spaces.



Image 26.0

### MARK GREENWAY FREQUENTLY

Marking the greenway can improve a users locational awareness and help make the greenway known as a distinct place with a purpose. Thresholds, entrances, trail intersections, and points of interest should be well marked to ensure users can best benefit from those features.



Image 27.0

### HIGHLIGHT LANDSCAPE COMPLEXITY

When siting the greenway, include areas that can showcase natural processes such as erosion, in order to create educational opportunities for users. Proper siting would include a range of landscape types in order to effectively communicate the breadth of local natural processes.



Image 29.0

### CREATE VANTAGE POINTS

Create specific areas, within or adjacent to the greenway, where users can view wildlife and other processes occurring in and adjacent to the greenway without causing disturbances.



Image 31.0

### CREATE TRANSITION AREAS

Including transition areas in the greenway can communicate to users that they are entering a place where appropriate behaviors may differ from adjacent land areas.

Transition areas can include a change in vegetation rhythm or type of structures such as gateways.



Image 28.0

### MAKE NATURAL PROCESSES VISIBLE & PROVIDE ACCESS TO SEASONALITY

Restore disturbed areas to highlight natural processes such as with daylighting streams. Avoid hiding natural processes by over-manicuring areas when unnecessary. Express connection to seasonal rhythm by including features that change with the seasons such as leaf colors, frozen water, or fruit.



Image 30.0

### PROVIDE EQUAL ACCESS

Ensure the collective community has equal access to greenway segments. Avoid clustering greenway segments in one area of the community. Opt for an even spread throughout the community for equitable access.



Image 21.0

Text Source of Spread: Hellmund, 2006





Conducting an inventory and analysis ensures a design project is taking into account all relevant aspects of its study area. A project with a solid inventory and analysis will best serve the community it is being designed for and will be more successful.

CHAPTER

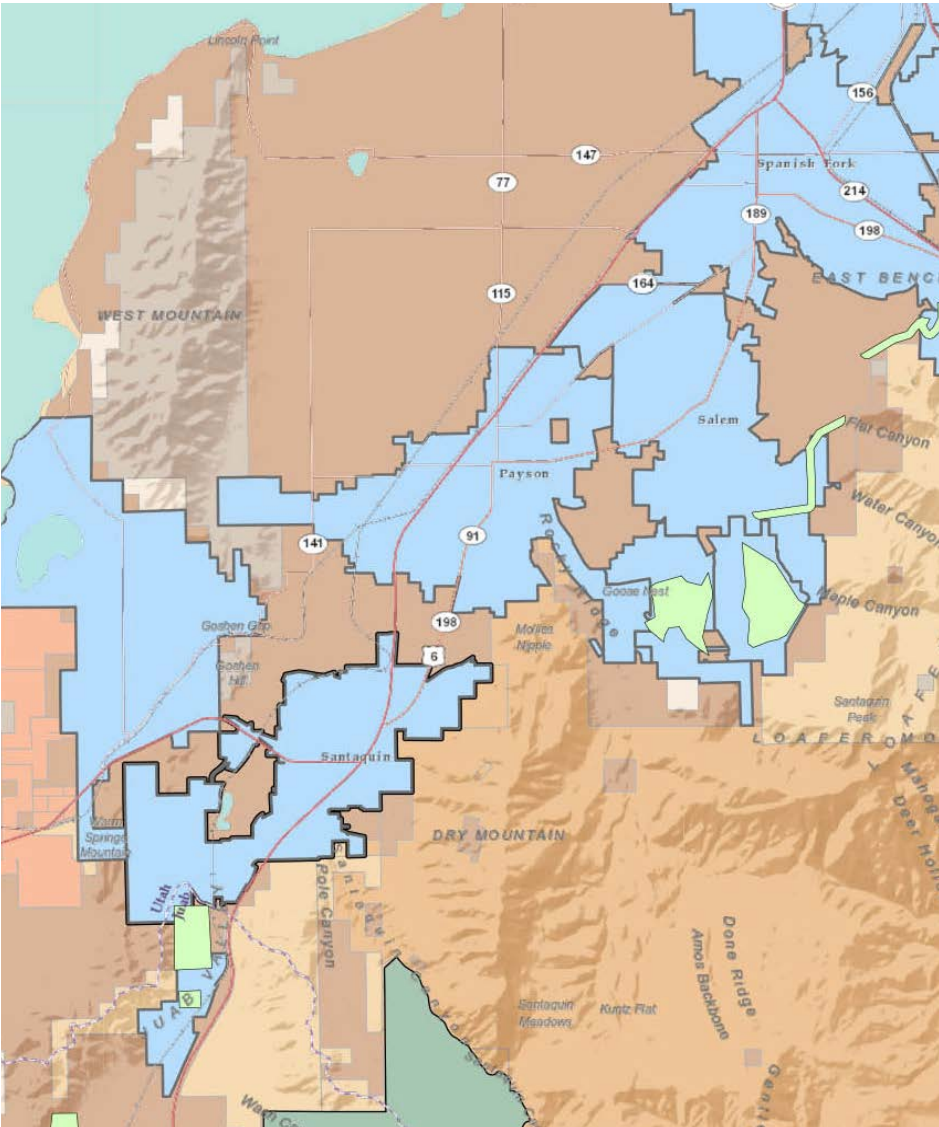
2

INVENTORY & ANALYSIS

A study of Santaquin's **natural** and **cultural** resources, **previously proposed plans** and what they mean for Santaquin's Greenway Network design.



REGIONAL LAND OWNERSHIP



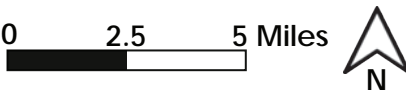
Legend

- |                           |         |
|---------------------------|---------|
| Wild-land Interface Areas | DNR     |
| Wilderness Areas          | Private |
| Santaquin Boundary        | SITLA   |
| BLM                       | UDOT    |
| BR                        | USFS    |

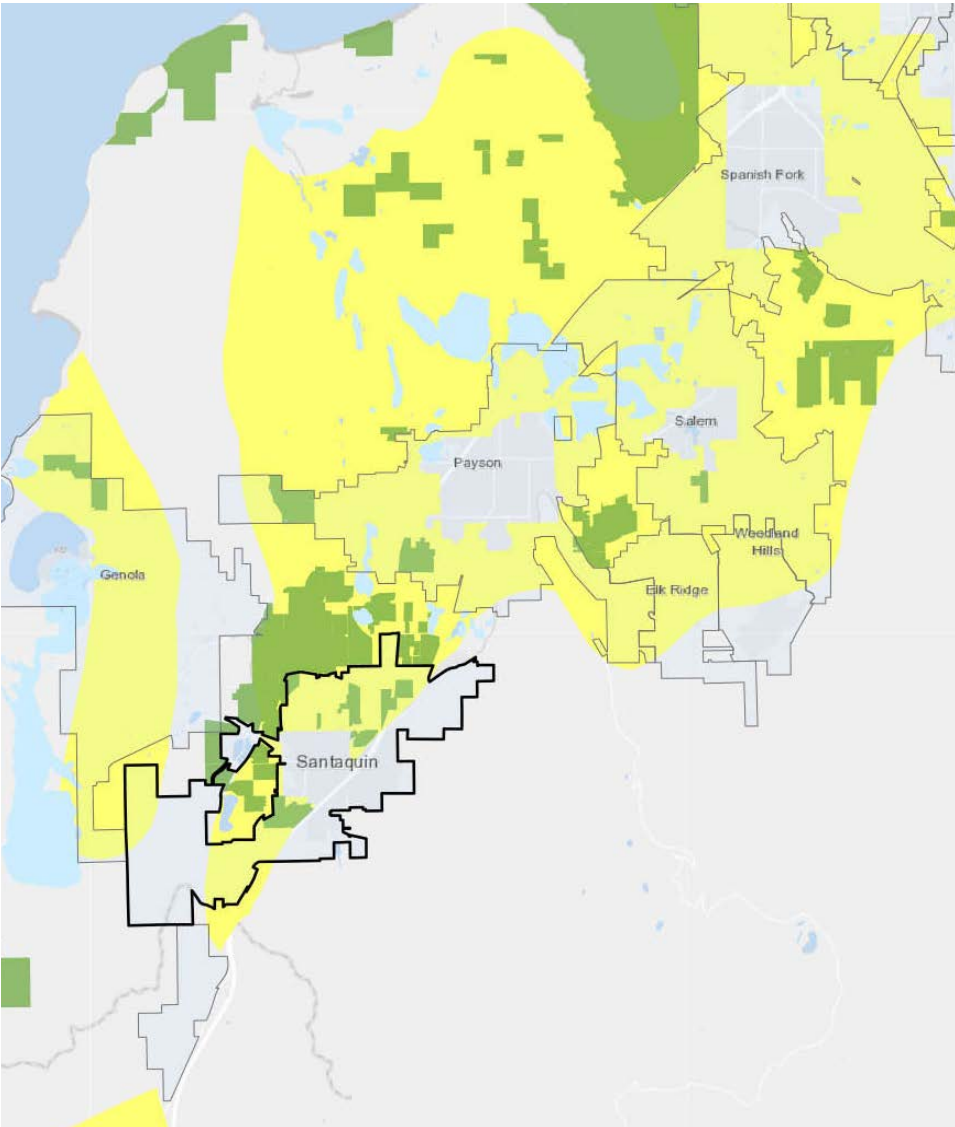
DESIGN SIGNIFICANCE

- Forest Service, Bureau of Land Management, and Department of Natural Resources land are significant in the region, especially in mountainous areas, laying the groundwork for regional connection.
- A high concentration of wild-land interface areas highlights a regional need to protect negative impacts from imposing residential developments eastward.
- Greenways provide the opportunity to preserve and enhance crucial wildlife corridors.

Figure A1.0



REGIONAL AGRICULTURAL LAND



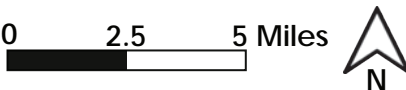
Legend

- |                              |
|------------------------------|
| Santaquin Boundary           |
| Agriculture                  |
| Protected Agricultural Areas |

DESIGN SIGNIFICANCE

- About half of the region's agricultural land is officially protected from development under Utah Law.
- Protected agricultural areas are protected against use of eminent domain, re-zoning and effects from state development projects without prior approval (Utah State Legislature, 2019).
- Open space planning should be focused on and around non-protected agricultural areas to avoid re-development by residential or commercial means.

Figure A2.0





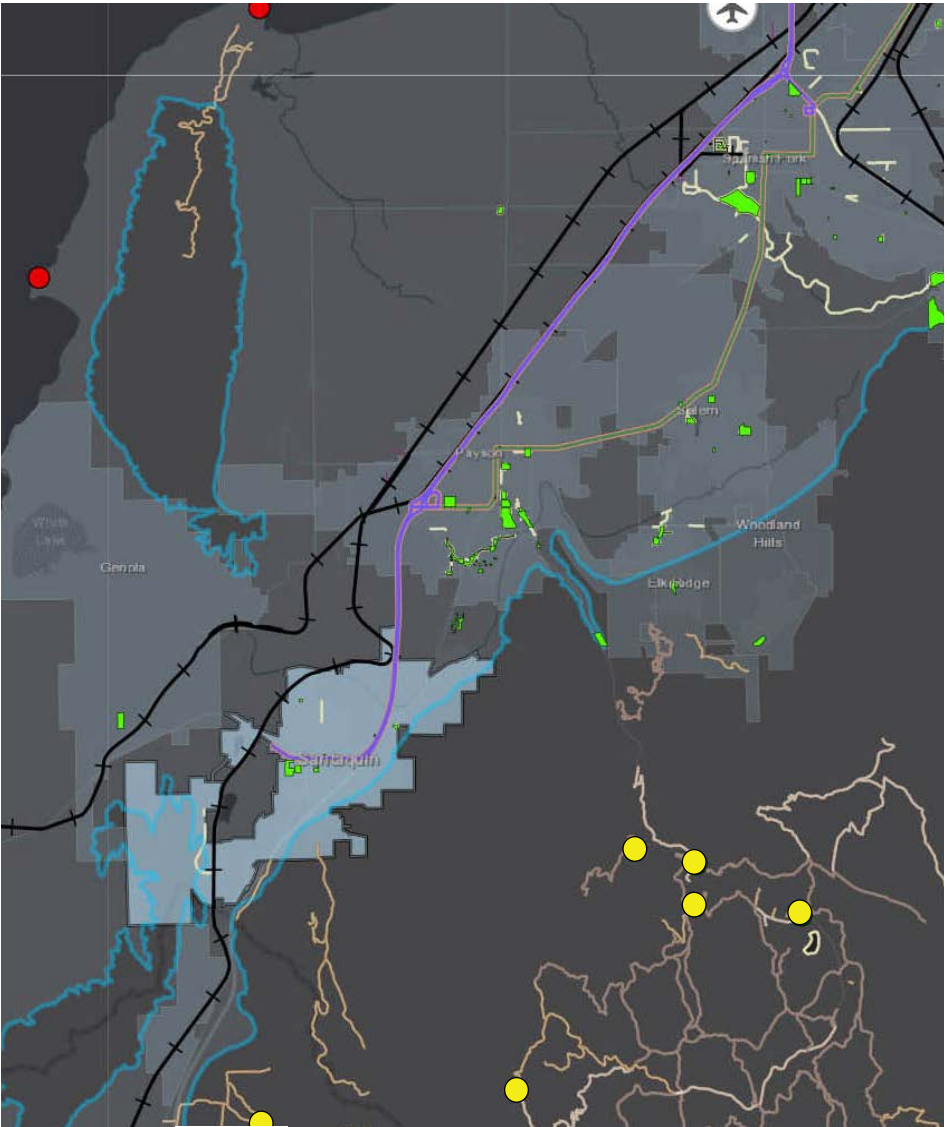


Figure A3.0

Legend

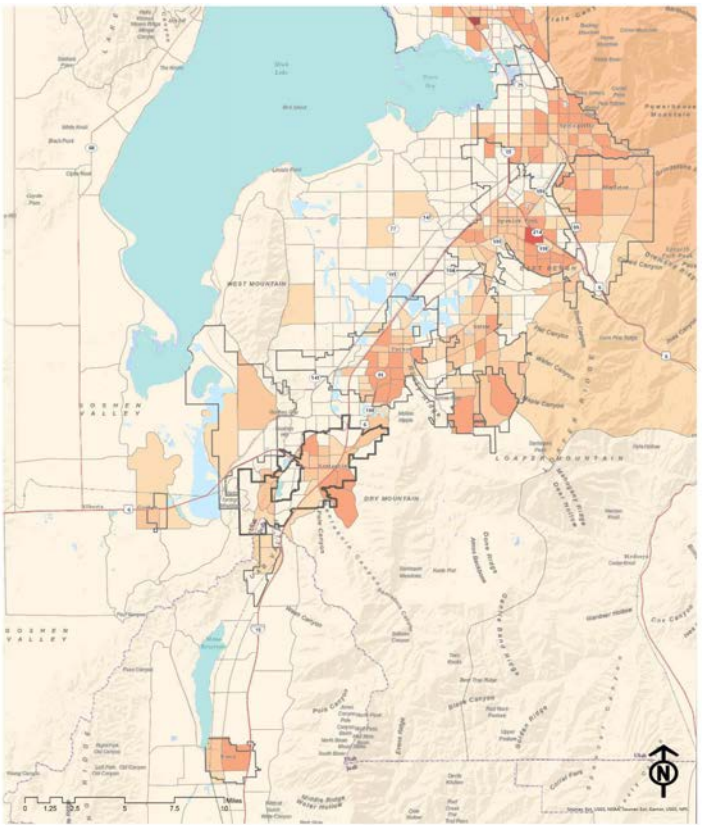
- Santaquin Boundary
- Local Parks
- Historic Bonneville Shoreline
- Hiking/Biking Trail or Path
- Railroads
- Santaquin-Provo Bus Line
- South County-UVU Bus Line
- Airports
- Trail Heads
- Boat Ramps

DESIGN SIGNIFICANCE

- Santaquin and its neighboring cities are serviced by two bus lines that run north to the southern most front runner station in Provo.
- Future high speed mass transit expansion will further connect Santaquin to its region, increasing tourism potential.
- Local parks are generally found in close proximity to urban core areas in this region.

2020

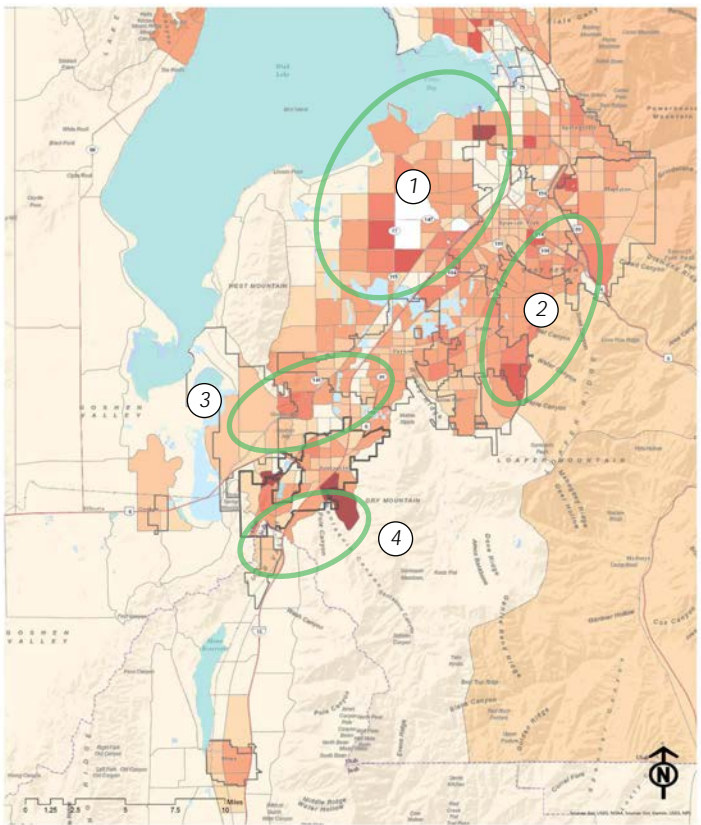
Figure A4.0



- 1 Utah Lake Shore Region
- 2 Loafer Ridge Foothills
- 3 Ag. Zone North of Santaquin
- 4 Santaquin South Border

2050

Figure A4.1



Legend

- Santaquin Boundary
- < 200
- < 500
- < 1000
- < 2000
- < 2500
- < 3000
- < 3500

DESIGN SIGNIFICANCE

- Population is set to greatly increase to Santaquin's north, with expansion both to the east and west.
- Population increase in Santaquin's neighboring communities will bring more opportunity for tourism through regional connectors such as greenways.
- Santaquin's borders will be directly affected by population increase which warrants effective land protection measures.



Imagine Santaquin Survey Results

In April and May 2021, The City of Santaquin, through the Imagine Santaquin community visioning initiative, surveyed 300 Santaquin residents to begin shaping a new general plan for the city. These selected results include responses that are relevant to the prospect of a city-wide greenway system.



Image 34.0

**79%** of people believe Santaquin should provide more opportunities for walking and biking.



Image 38.0

**92%** of people believe Santaquin should support water conservation efforts.



Image 39.0

**81%** of people prefer walkable, complete streets.



Image 35.0

With past growth in mind, **40%** of people feel positive about the impacts of future growth on their family.



Image 36.0

**51%** of people feel strongly that Santaquin should preserve local hillsides.



Image 40.0

According to residents, the top two most important types of open spaces are **public land** access and **recreational trails**.



Image 37.0

**92%** of people support Santaquin's preservation of Orchards and Agricultural lands.



Image 41.0

**86%** of people believe Santaquin should focus on creating recreation and parks for families and kids.

SIGNIFICANCE TO SANTAQUIN

- A high percentage of residents approve of open space and trail development.
- Bonneville Shoreline Trail development will help preserve local hillsides.
- Preservation of orchards and agriculture should be a major focus for a greenway system.



CITY STRUCTURE DIAGRAM - NODES

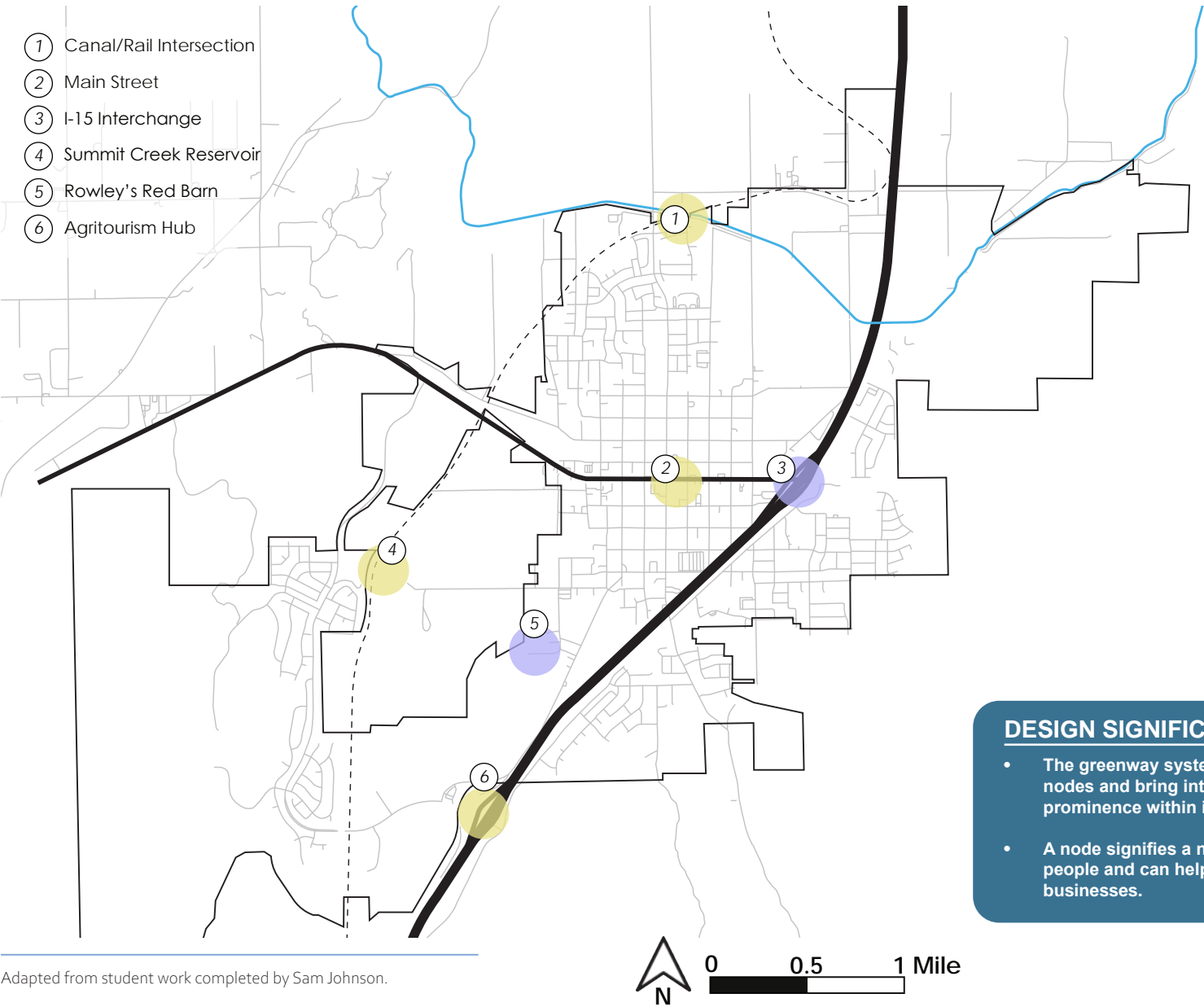


Figure A5.0

DESIGN SIGNIFICANCE

- The greenway system can connect existing nodes and bring into existence new nodes of prominence within its circulation.
- A node signifies a notable confluence of people and can help increase visibility for businesses.

Adapted from student work completed by Sam Johnson.

CITY STRUCTURE DIAGRAM - DISTRICTS

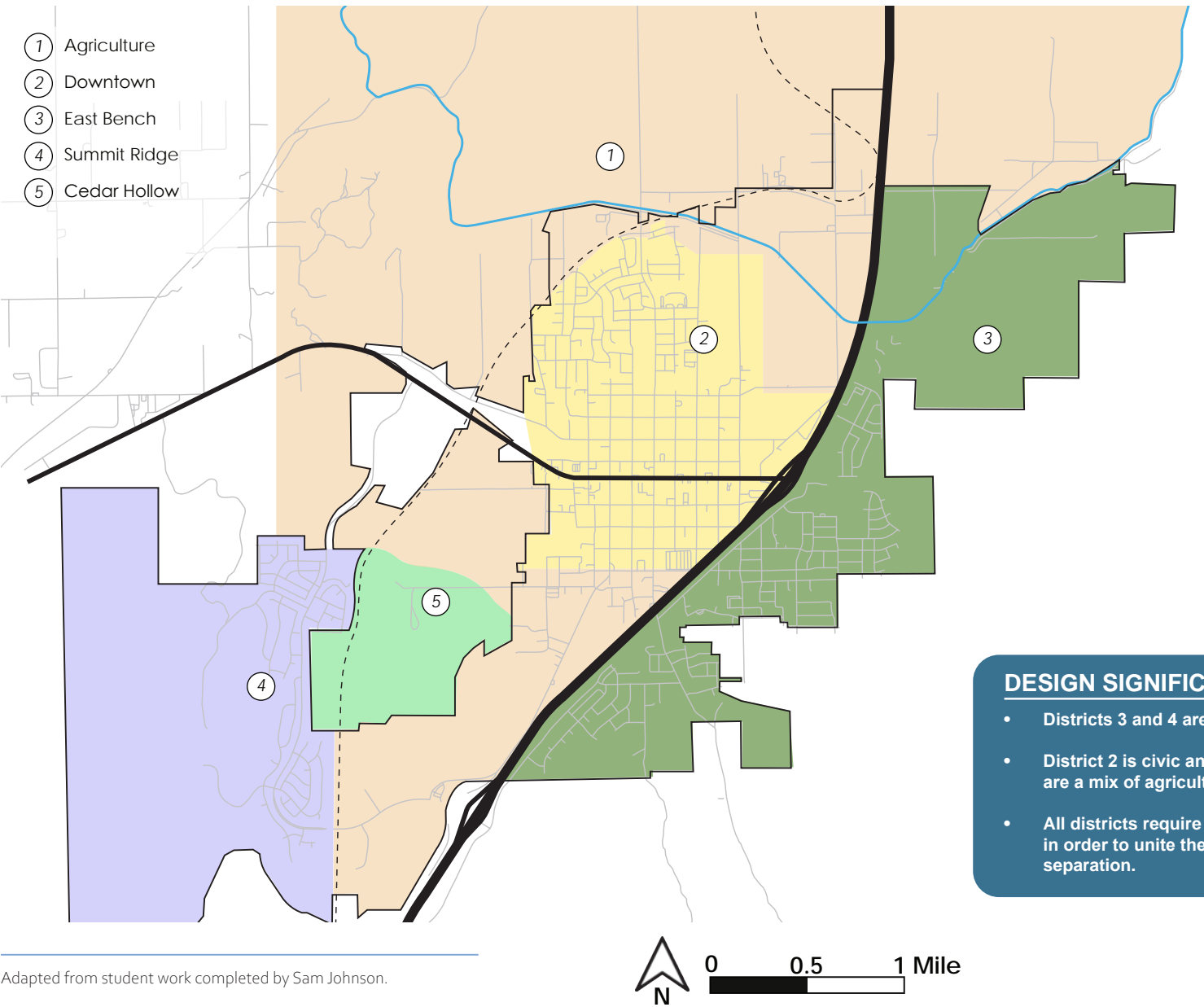


Figure A6.0

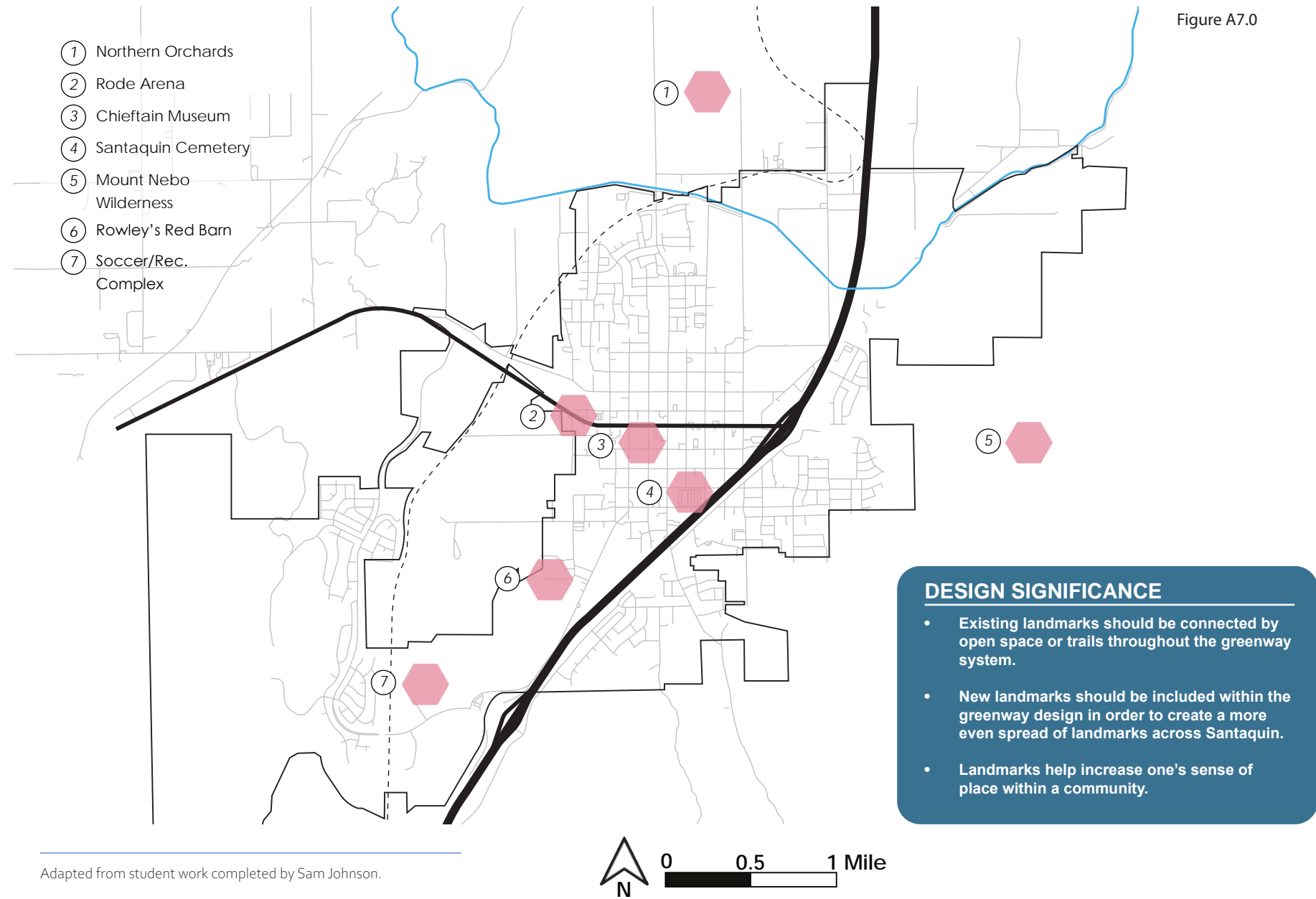
DESIGN SIGNIFICANCE

- Districts 3 and 4 are entirely residential.
- District 2 is civic and residential while 1 and 5 are a mix of agriculture and open spaces.
- All districts require equal access connections in order to unite them and avoid continued separation.

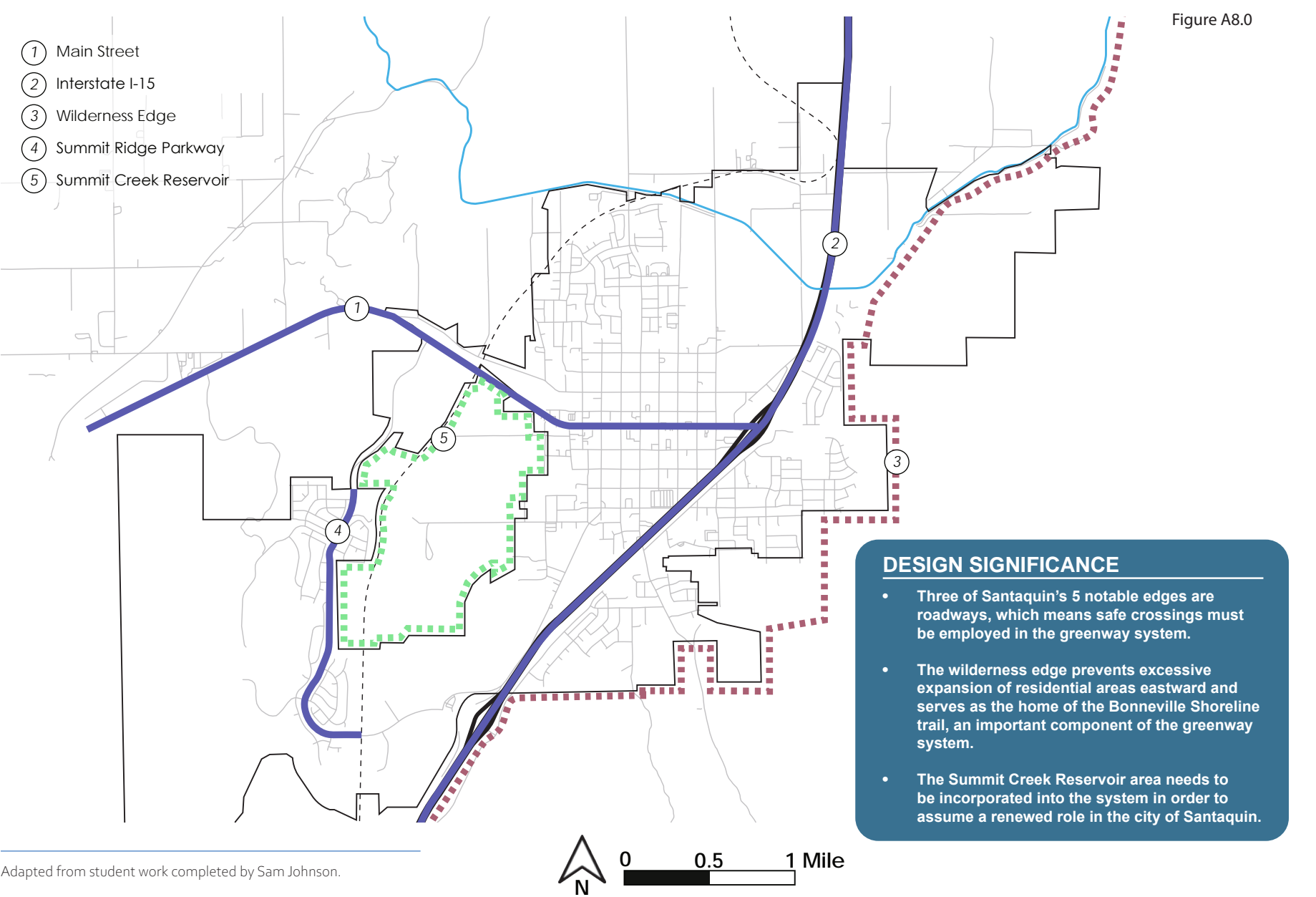
Adapted from student work completed by Sam Johnson.



CITY STRUCTURE DIAGRAM - LANDMARKS

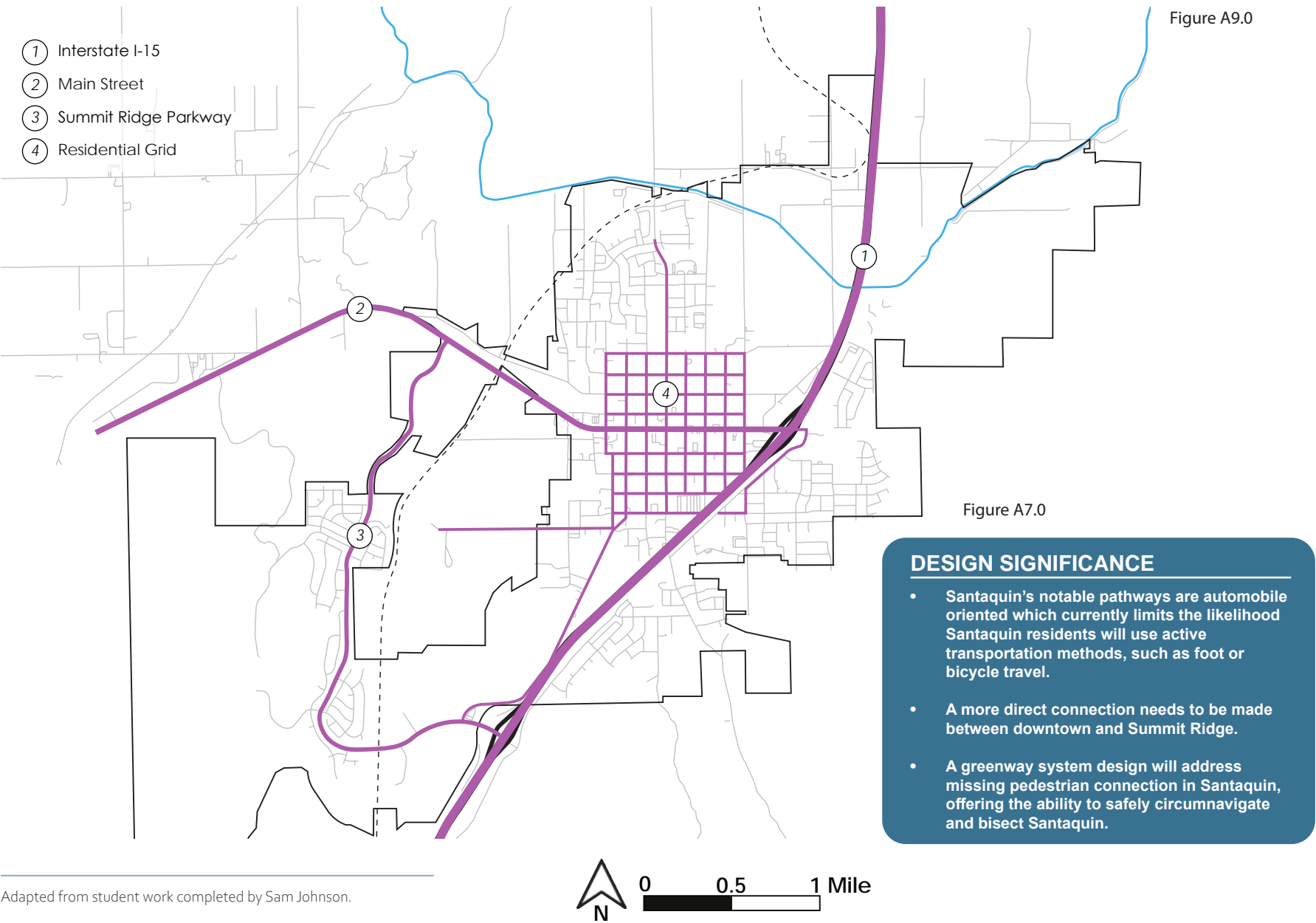


CITY STRUCTURE DIAGRAM - EDGES AND BARRIERS

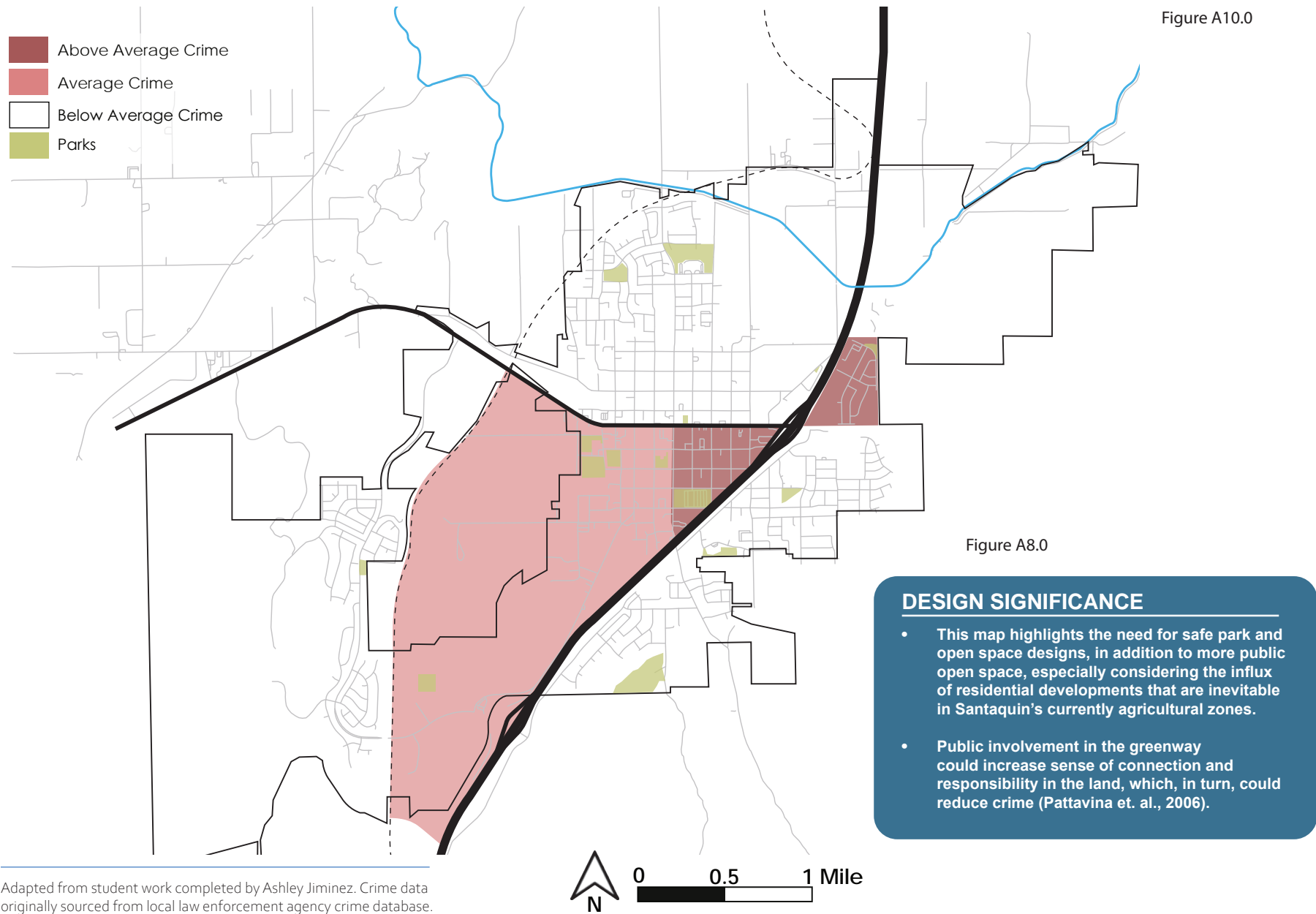




CITY STRUCTURE DIAGRAM - PATHS

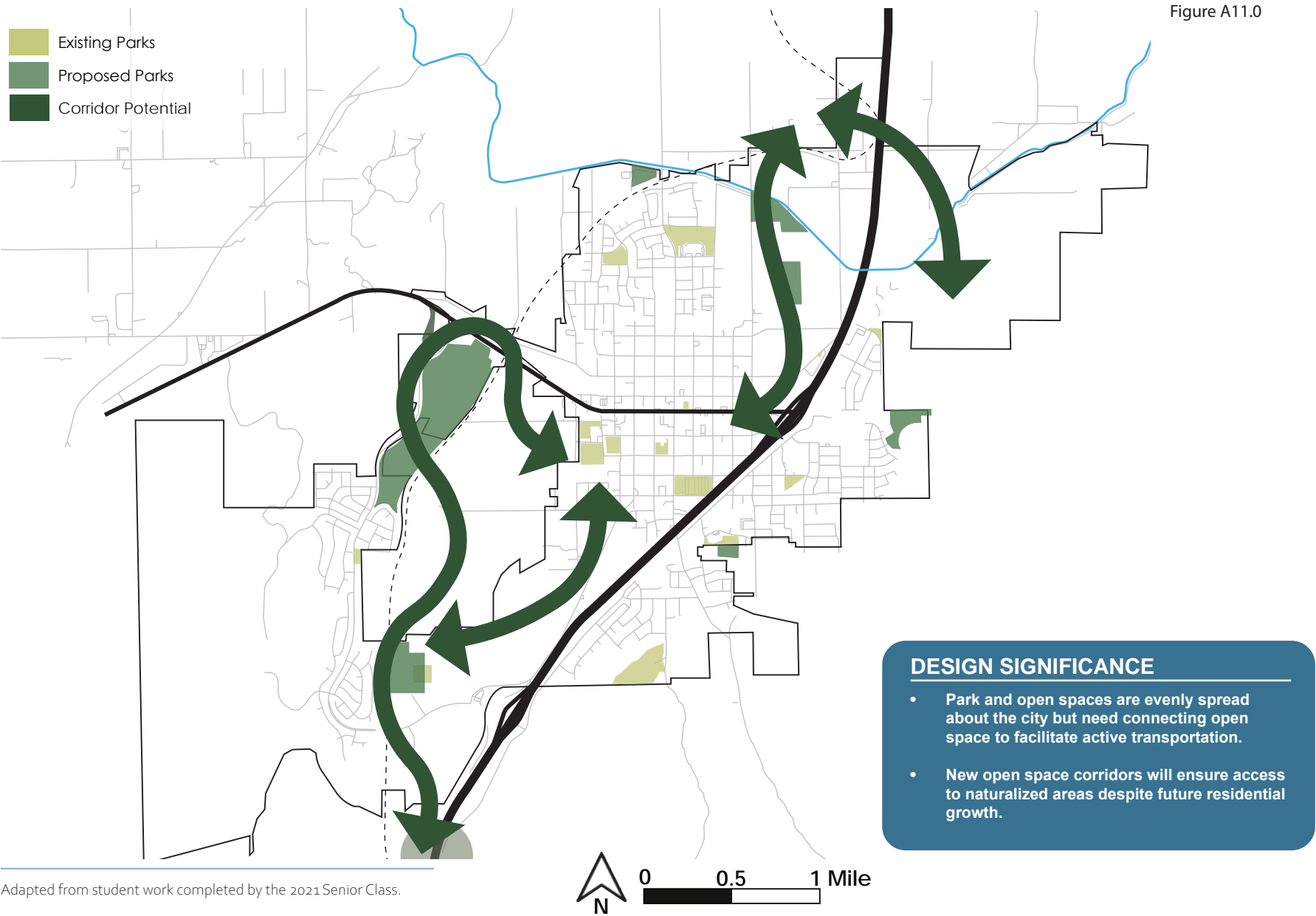


CRIME AND EXISTING PARKS

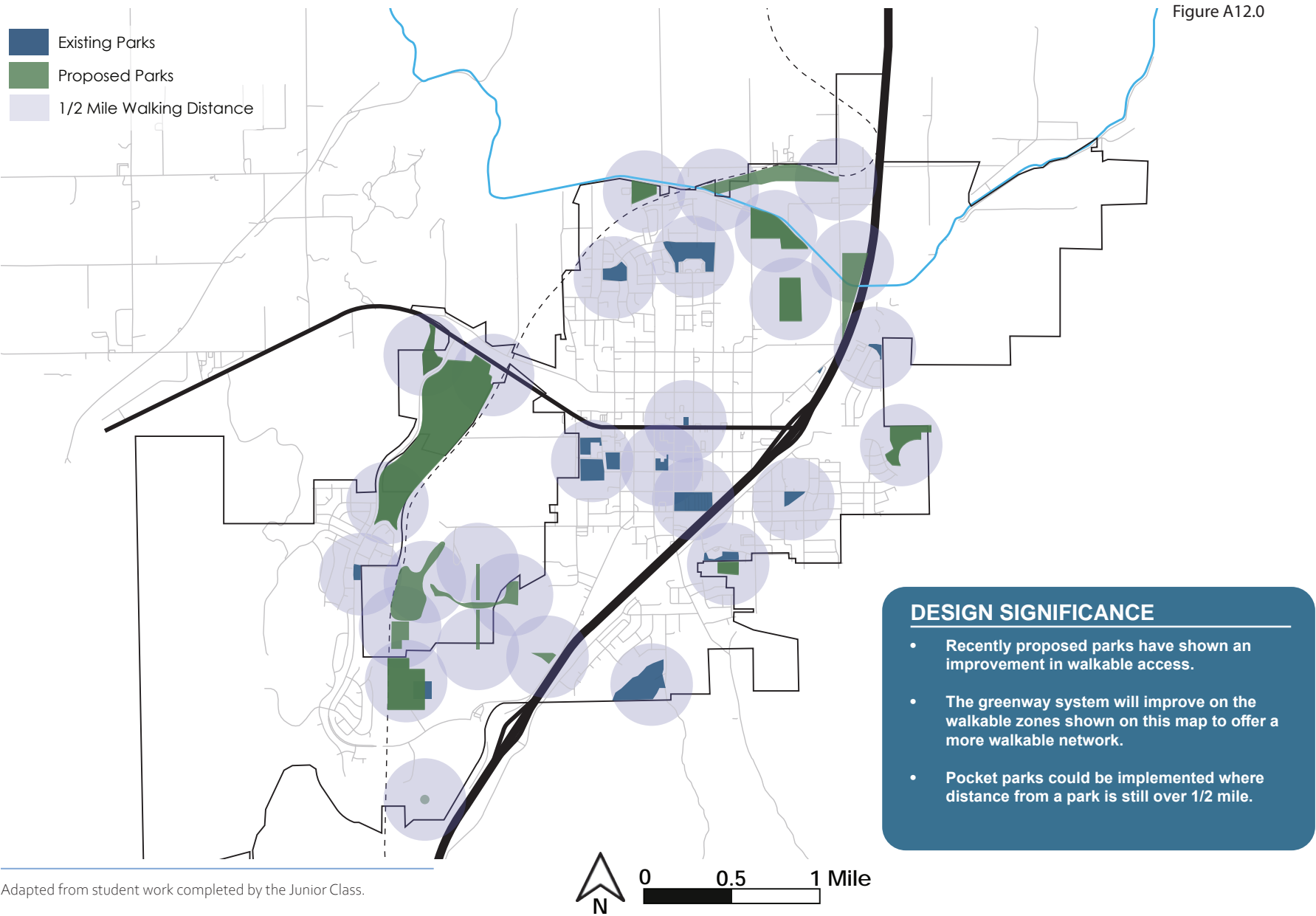




PARKS AND CORRIDOR POTENTIAL

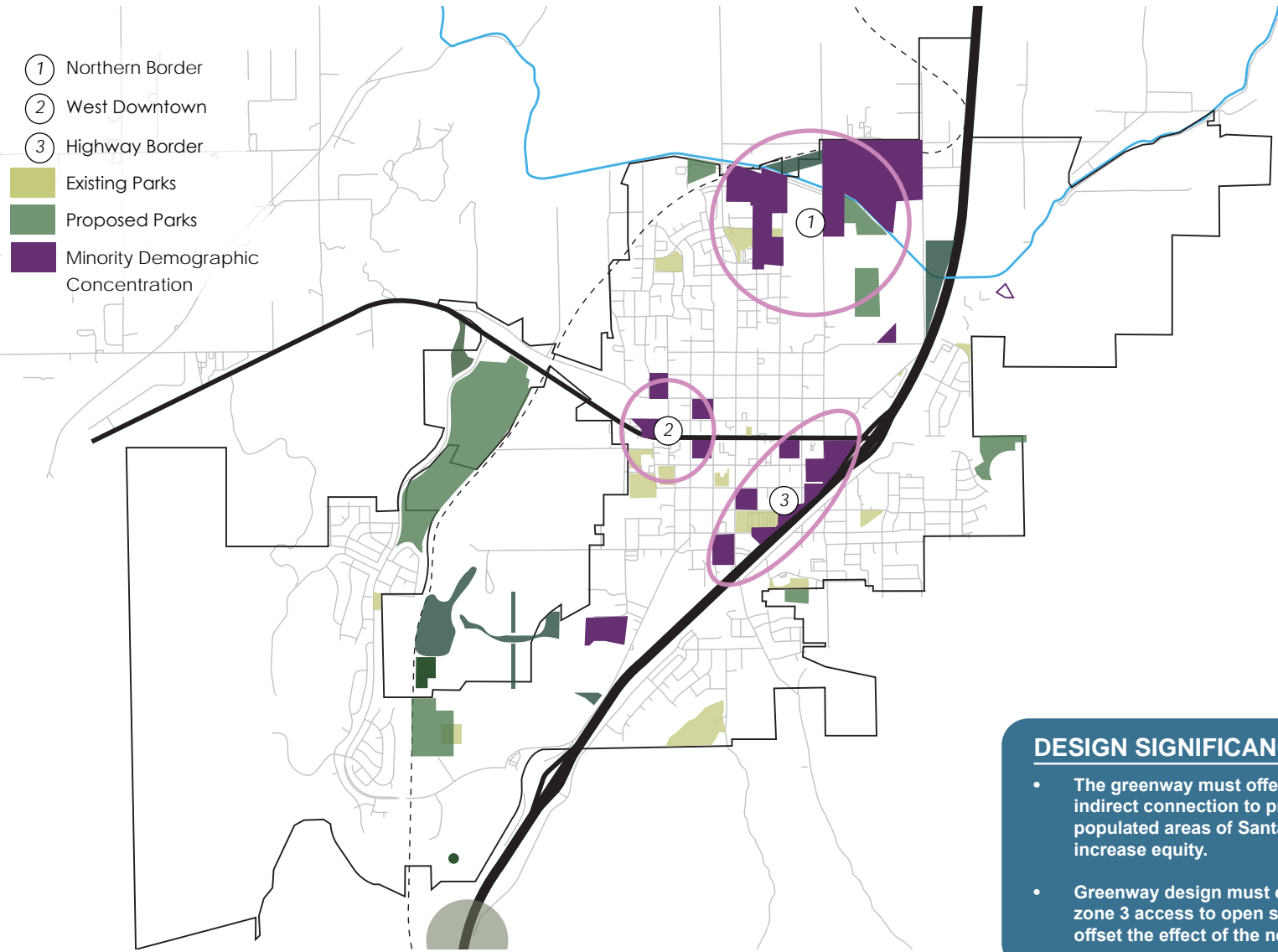


PARKS AND WALK-ABILITY





DEMOGRAPHIC DISTRIBUTION



Adapted from student work completed by the Junior class. This graphic depicts the probable location of minority demographics in Santaquin according to census block, not their density.

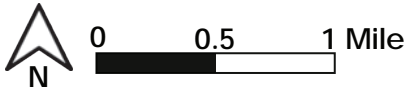
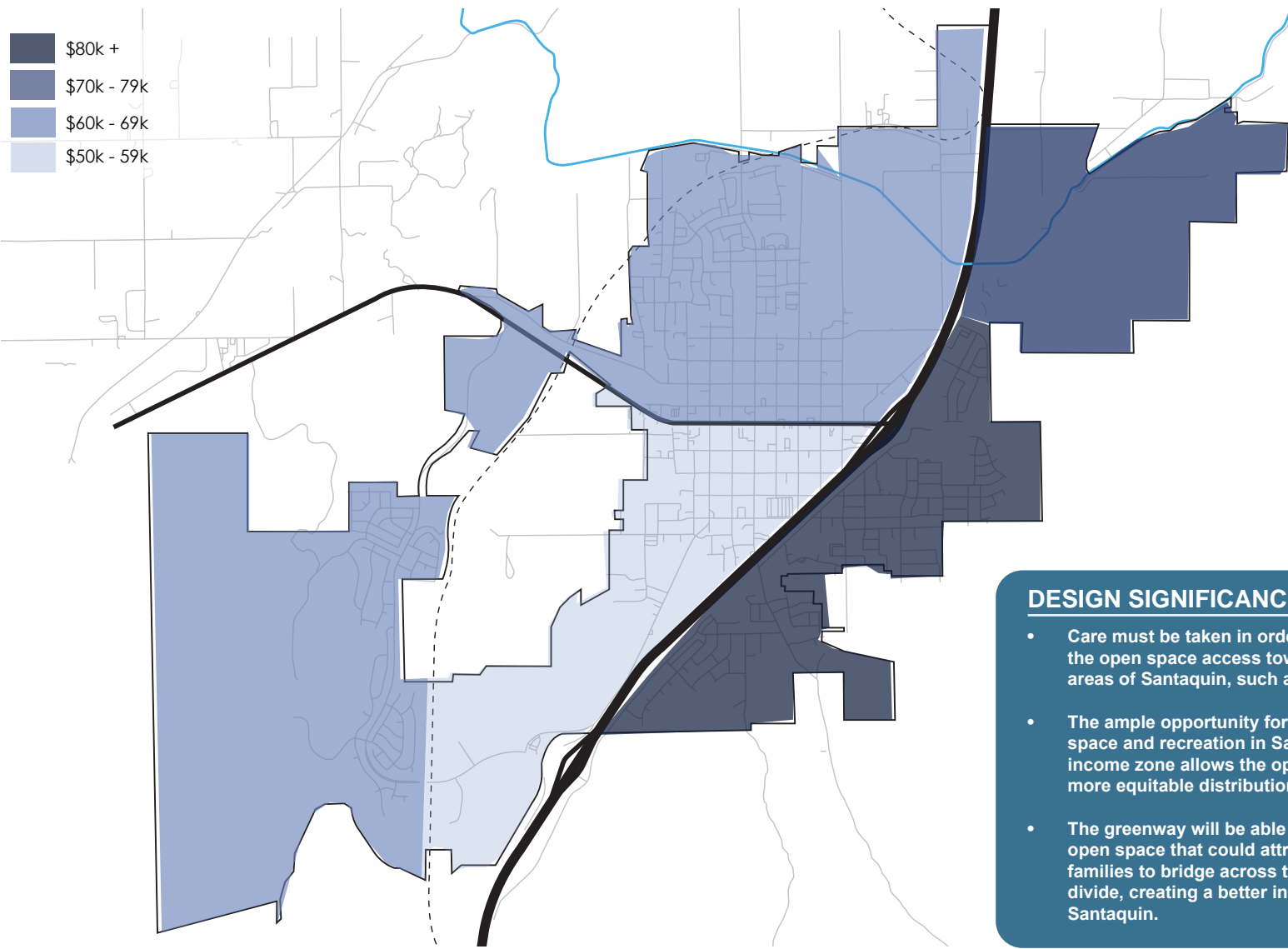


Figure A13.0

MEDIAN HOUSEHOLD INCOME



Adapted from student work completed by the Junior Class.

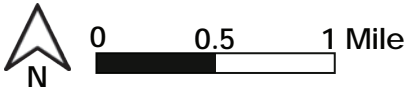
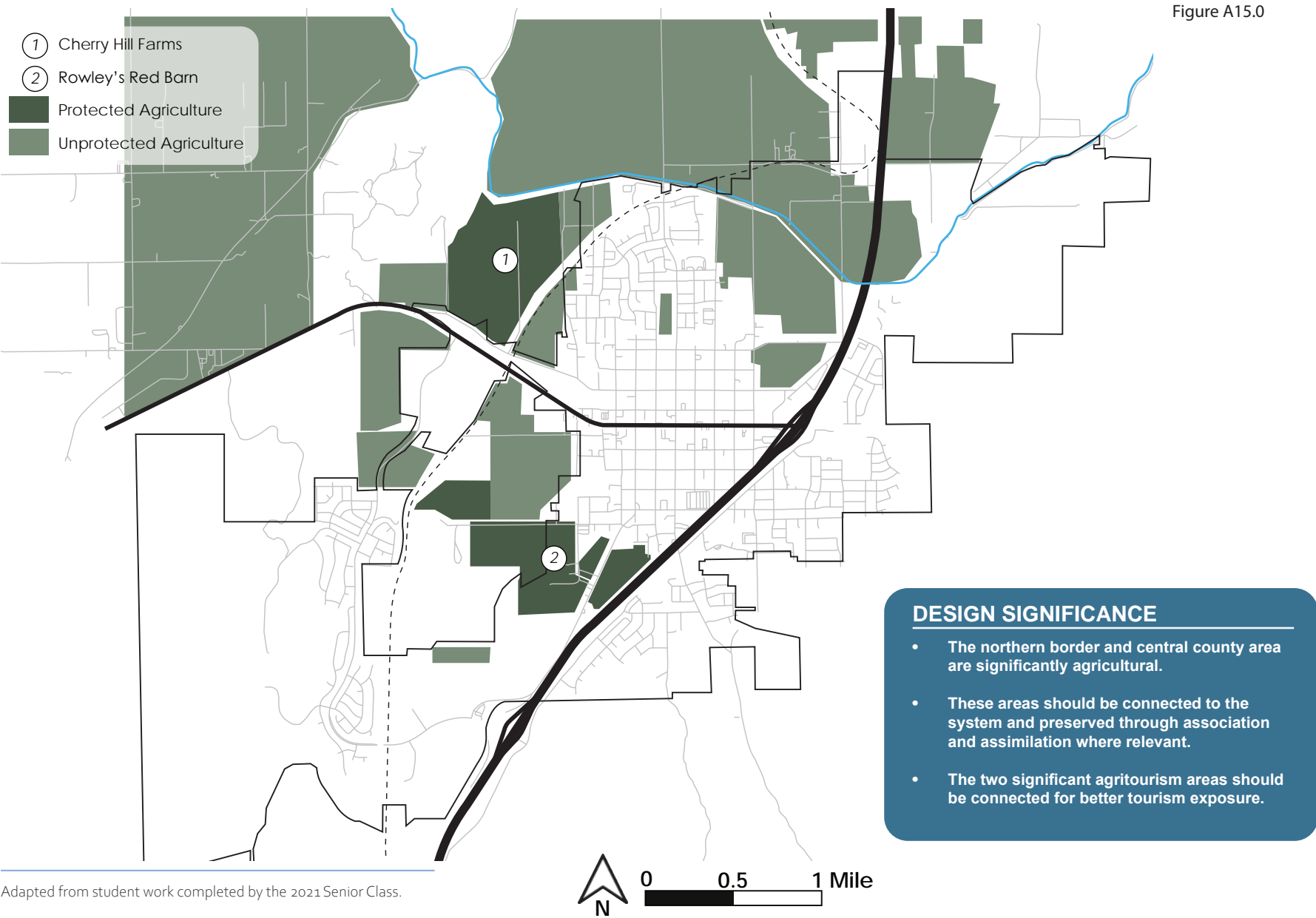


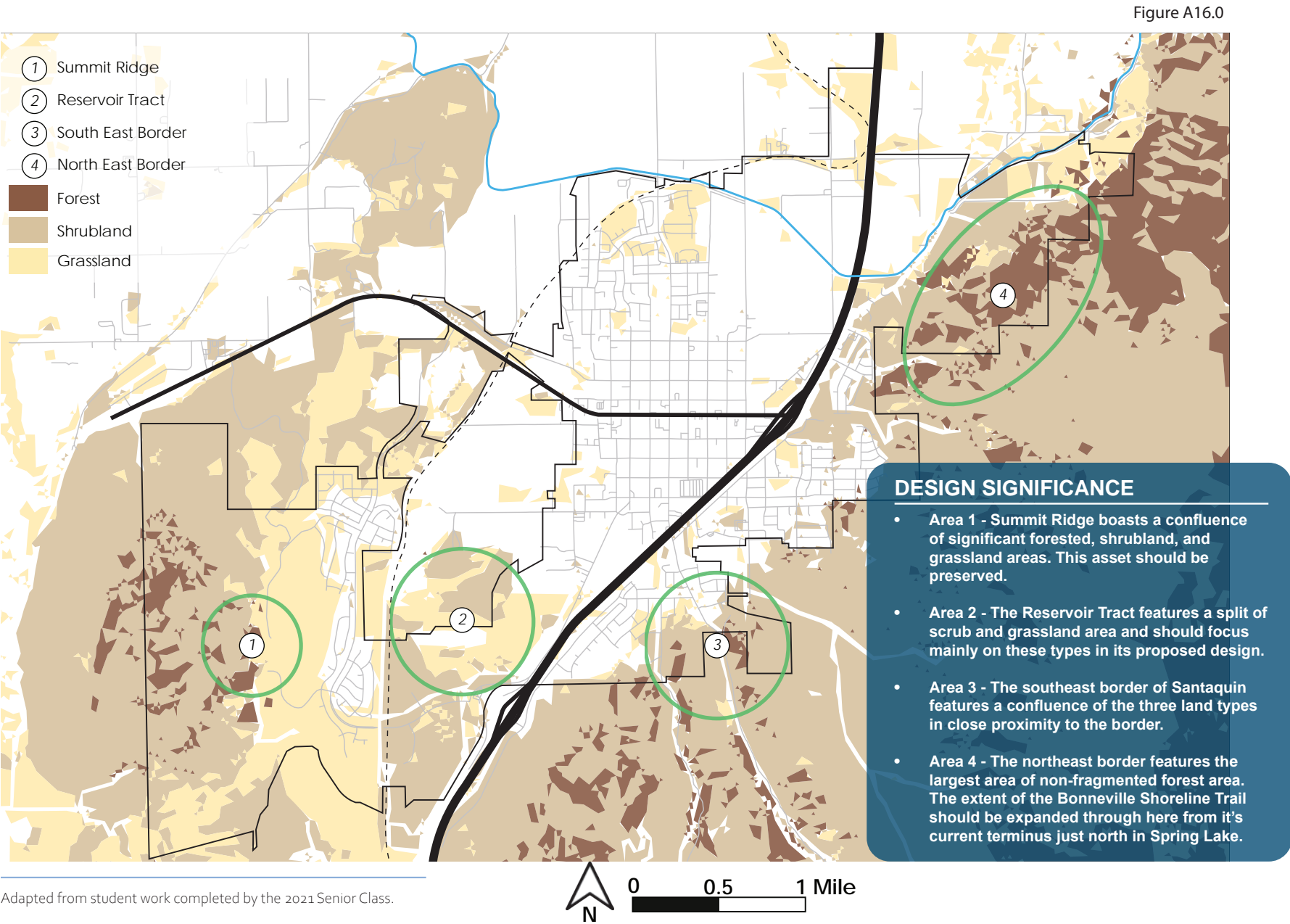
Figure A14.0



AGRICULTURAL LANDS



NON-AGRICULTURE LAND TYPES





LOCAL FLORA AND FAUNA SELECTION

Located at the base of the mountains, Santaquin is commonly host to mule deer, coyote, and mountain lions, especially because Santaquin is found between two significant areas of wildlife habitat. Many of the animals found around Santaquin are dependent on corridors, such as the wildlife underpass, in order to successfully migrate.

In the recent past, much of the valley floor was home to both sagebrush and wildflowers. As human development moved forward, orchards and agriculture replaced much of this selection of flora. Santaquin's boundaries consists of a 6b hardness rating for plants, which is about middle on the scale for how much water is needed and the cold that can be endured (Utah Division of Wildlife Resources, 2021).

Deseret Milk Vetch



Image 50.0  
Basin Big Sagebrush



Image 54.0

Rabbitbrush



Image 51.0  
Clay Phacelia



Image 55.0

Aspen



Image 52.0  
Fir



Image 56.0

Spruce



Image 53.0  
Pine



Image 57.0

Mule Deer



Image 42.0  
Mountain Lion



Image 46.0

Coyote



Image 43.0  
Greater Sage Grouse

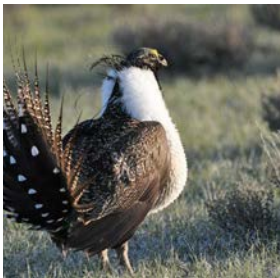


Image 47.0

Red Tailed Hawk



Image 44.0  
Wild Turkey



Image 48.0

Black Bear



Image 45.0  
Snowshoe Hare



Image 49.0

Information adapted from sophomore Santaquin analysis posters.

SIGNIFICANCE TO SANTAQUIN

- Native species are good low-water options for new planting that can serve as viable habitat.
- Evergreen trees naturally grow higher up in the mountains and would require more water if planted in Santaquin.
- Sufficient natural buffers and open space are needed to satisfy habitat needs for native animals.

Mule Deer Habitat

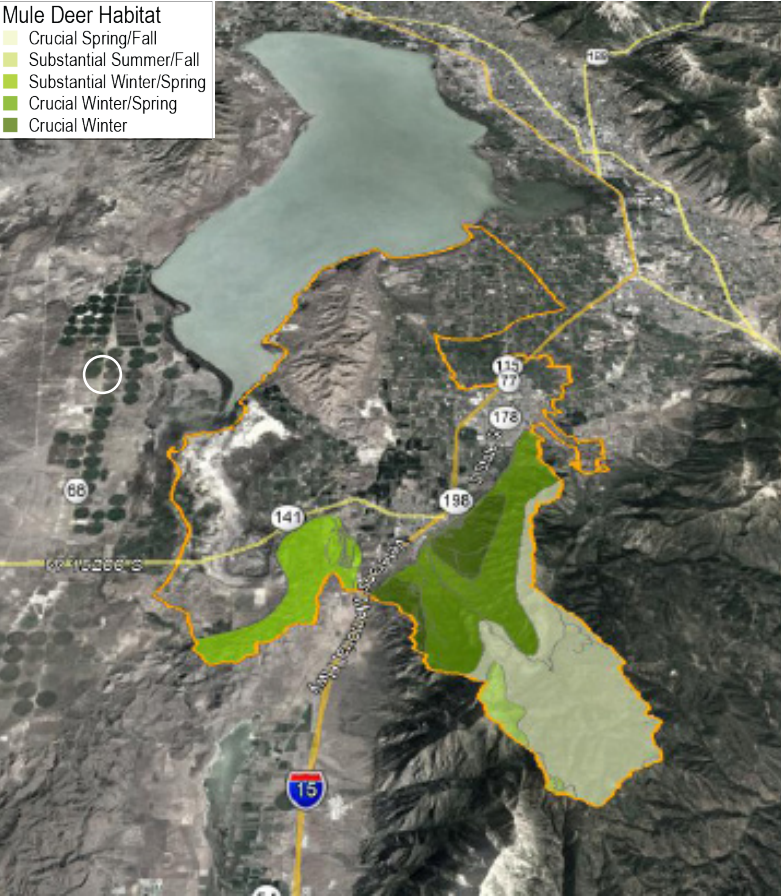


Figure A16.1

Above: a large gap between the crucial winter habitat and substantial winter/spring habitat. This gap is created by I-15 making a dangerous corridor between the patches.

Ring Neck Pheasant Habitat



Figure A16.2

Above: the habitat in the study area. Fragmentation of the habitat can be seen in the map. Two of the largest gaps are created by I-15 and by Highway 141. Since pheasants spend most their time on the ground, the roadways are extremely hazardous.

Maps and information sourced from LAEP 6100 Final Project (LAEP, 2020).





A master plan sets the stage for and guides the focus and creation of future site plans that work together to fulfill the holistic vision of a system under a cohesive design.

---

CHAPTER

3

MASTER PLAN DESIGN

---

A **visionary plan** of Santaquin's open space: spaces for humans and nature to co-exist and inspire **rediscovery of lands once lost.**

---

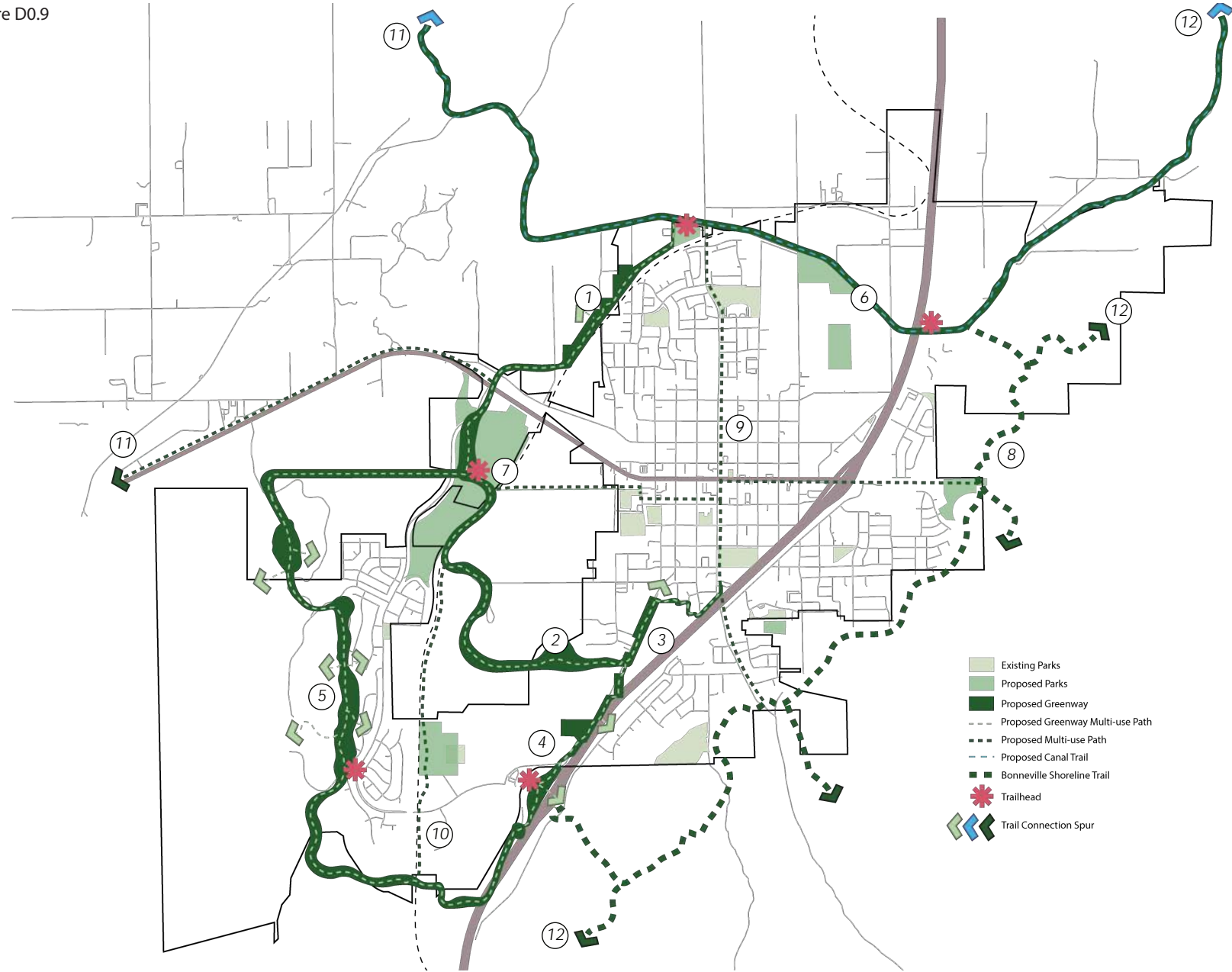
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**Page left:** Aerial image along Santaquin's northern boundary looking towards West Mountain and Utah Lake, highlighting notable scenery and significant regional connection opportunities (Image 58.o).



# OVERALL GREENWAY SYSTEM DESIGN

Figure D0.9



The Santaquin Greenway System is made up of dedicated greenway areas, downtown and connecting pathways, and the planned Bonneville Shoreline Trail.

The system forms a cohesive web of connecting lands and trails in addition to opening up regional trail connections with neighboring cities.

- ① Northern Orchard Connector
- ② Agricultural Heritage Greenway
- ③ Red Barn Connector
- ④ Exit 242 Connector
- ⑤ Summit Ridge Greenway
- ⑥ Canal Greenway
- ⑦ Reservoir Greenway Node
- ⑧ Bonneville Shore Line Trail
- ⑨ Intra-Urban Connecting Paths
- ⑩ Rail Pathway
- ⑪ Genola Trail Connection
- ⑫ Regional Trail Connection

## COMPLETE PEDESTRIAN CONNECTION



Image 59.0

- The complete system will provide for pedestrian circulation around the edges of the city and through the center in key areas.
- Solar lighting can be employed for **increased safety**.

## SPACE FOR ANIMALS AND HUMANS



Image 60.0

- The key factor of this system is the assurance of adequate **spaces set aside for animals and humans** in light of future development.
- A focus on re-naturalized land area, including typical native vegetation and low-water tree species.

## COMPATIBILITY WITH AGRITOURISM



Image 61.0

- Greenway areas pass through agricultural zones, allowing tourists to easily access agricultural sites through alternative transportation.
- Fencing, buffers and gates allow for **continued controlled access** for farms.

## PARK AND RESIDENTIAL CONNECTION



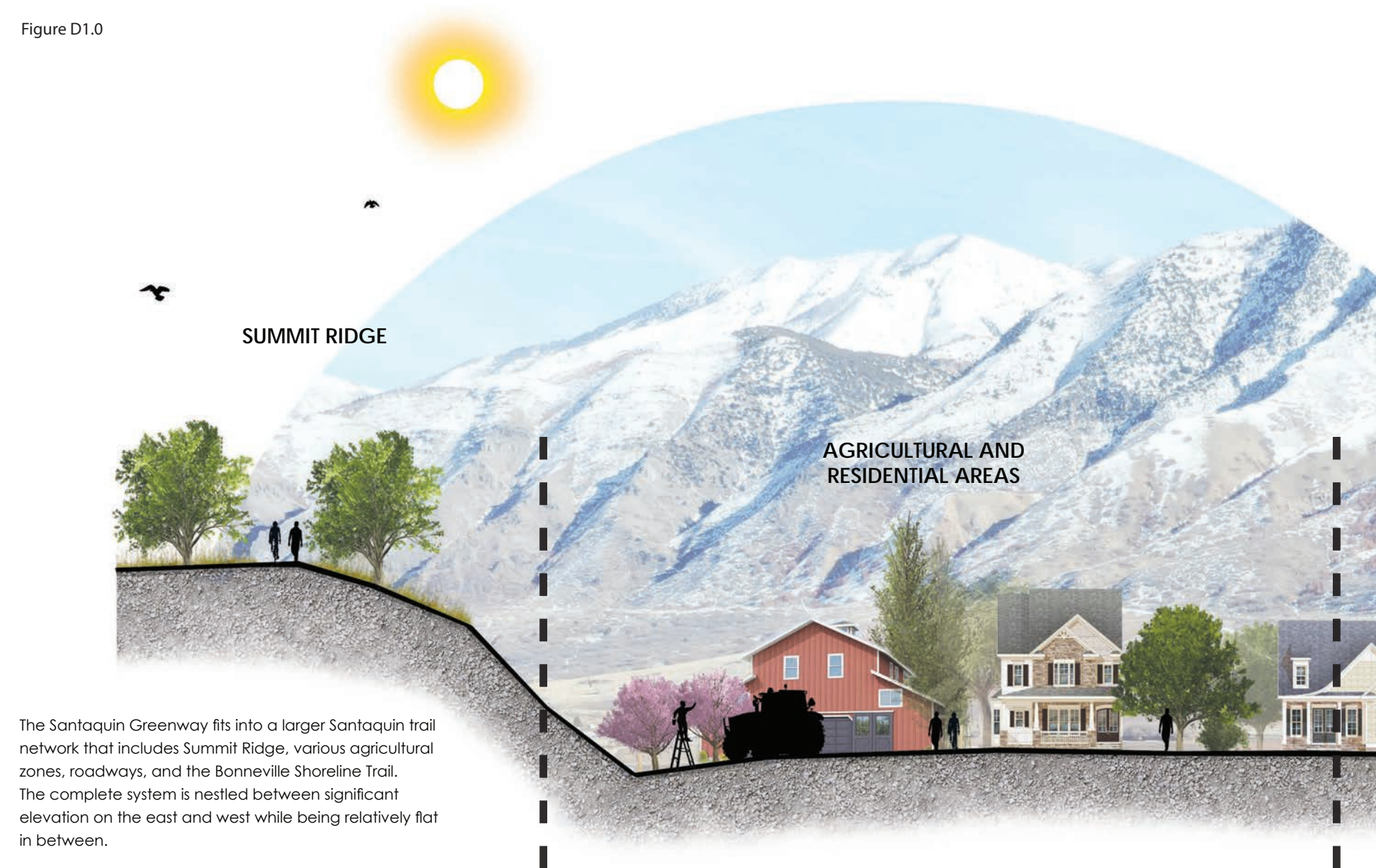
Image 62.0

- The systems trails provides a multitude of **connections** with existing and proposed **parks** as well as **residential areas**.
- The system is meant to extend traditional park functions, forming a **mutual relationship**.



### GENERAL CONTEXT ELEVATION VIEW

Figure D1.0

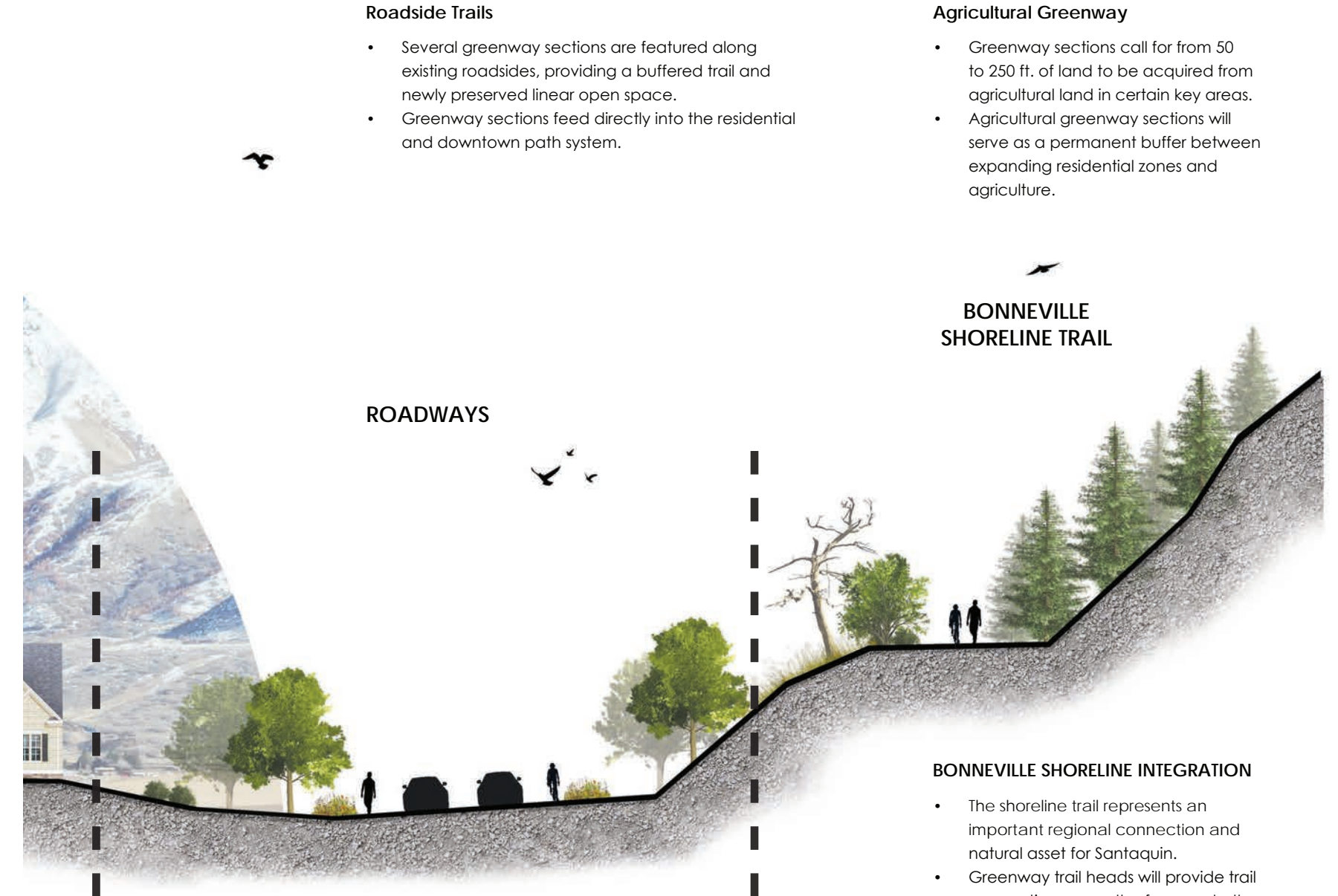


## Roadside Trails

- Several greenway sections are featured along existing roadsides, providing a buffered trail and newly preserved linear open space.
- Greenway sections feed directly into the residential and downtown path system.

## Agricultural Greenway

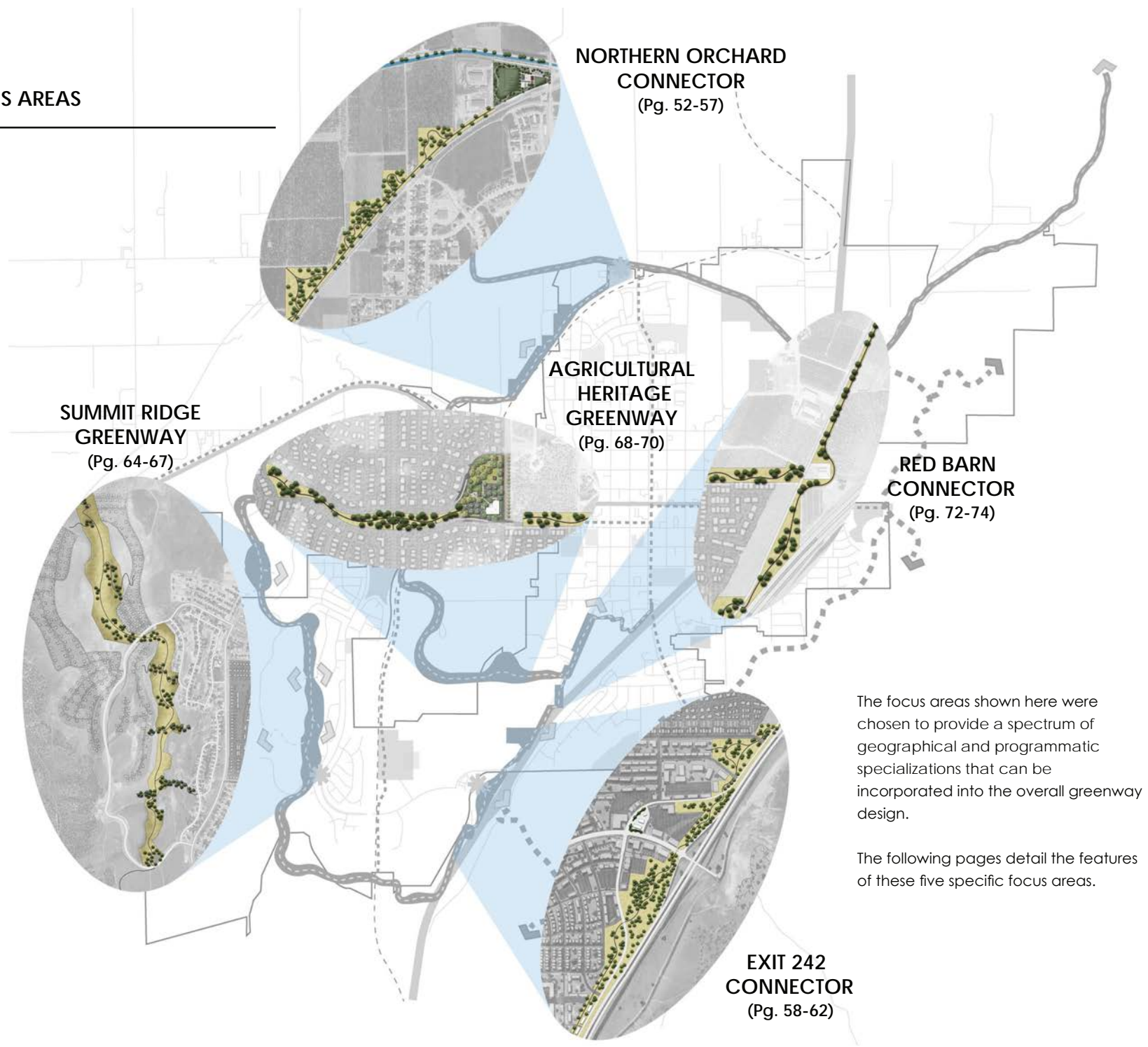
- Greenway sections call for from 50 to 250 ft. of land to be acquired from agricultural land in certain key areas.
- Agricultural greenway sections will serve as a permanent buffer between expanding residential zones and agriculture.





DESIGN FOCUS AREAS

Figure D1.1



The focus areas shown here were chosen to provide a spectrum of geographical and programmatic specializations that can be incorporated into the overall greenway design.

The following pages detail the features of these five specific focus areas.

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# NORTHERN ORCHARD CONNECTOR

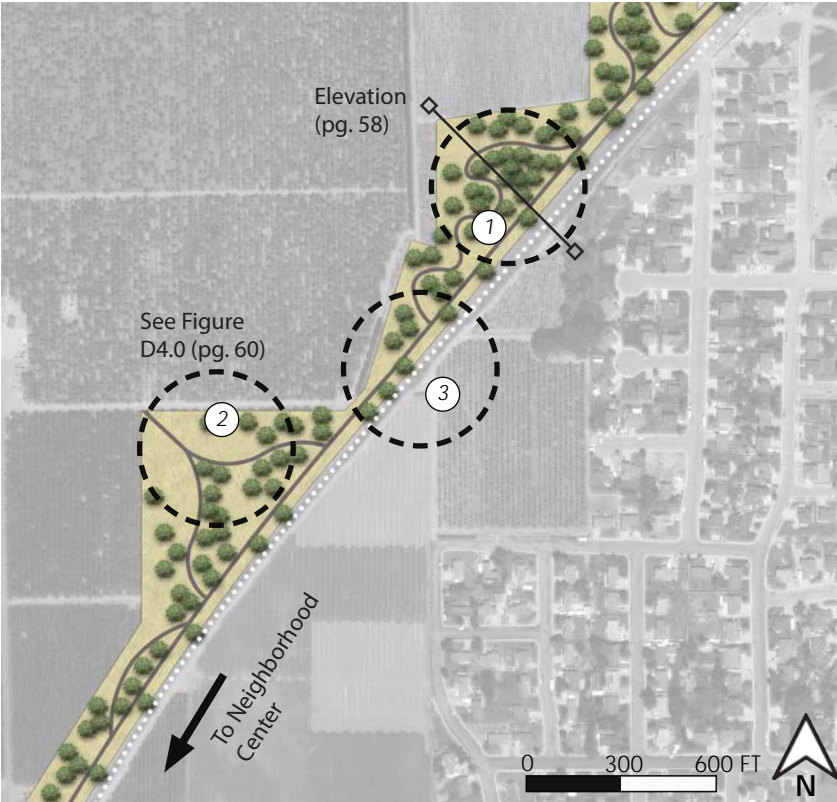


Figure D2.0

## SYSTEM CONTEXT

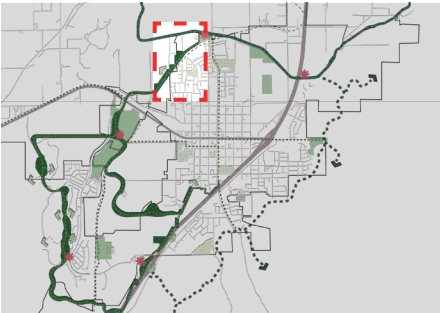


Figure D2.1

- ① Nature Play Forest
- ② Cherry Hills Farms Entrance
- ③ Diffuse buffer from Railroad
- ④ View-shed into Cherry Hill Farms
- ⑤ Integration with High Line Park

The Northern Orchard Connector sets the precedent for open space integration with agritourism, providing an improved discovery opportunity of Cherry Hill Farms to residents and tourists.

This section connects with the Canal Trail and proposed Highline Park for ultimate integration within Santaquin. On the southern end, this section is accessed through the proposed neighborhood center development.

## INTEGRATION WITH HIGHLINE PARK



- The north terminus of this section feeds into the proposed Highline Park path circulation.
- This park should be adapted to act as a trailhead for the greenway system.

## NATURE PLAY/EXPLORATION FOREST



- This spur will feature a denser distribution of native forest and a mix of local sculpture, nature play features, and resting areas.



Figure D3.0

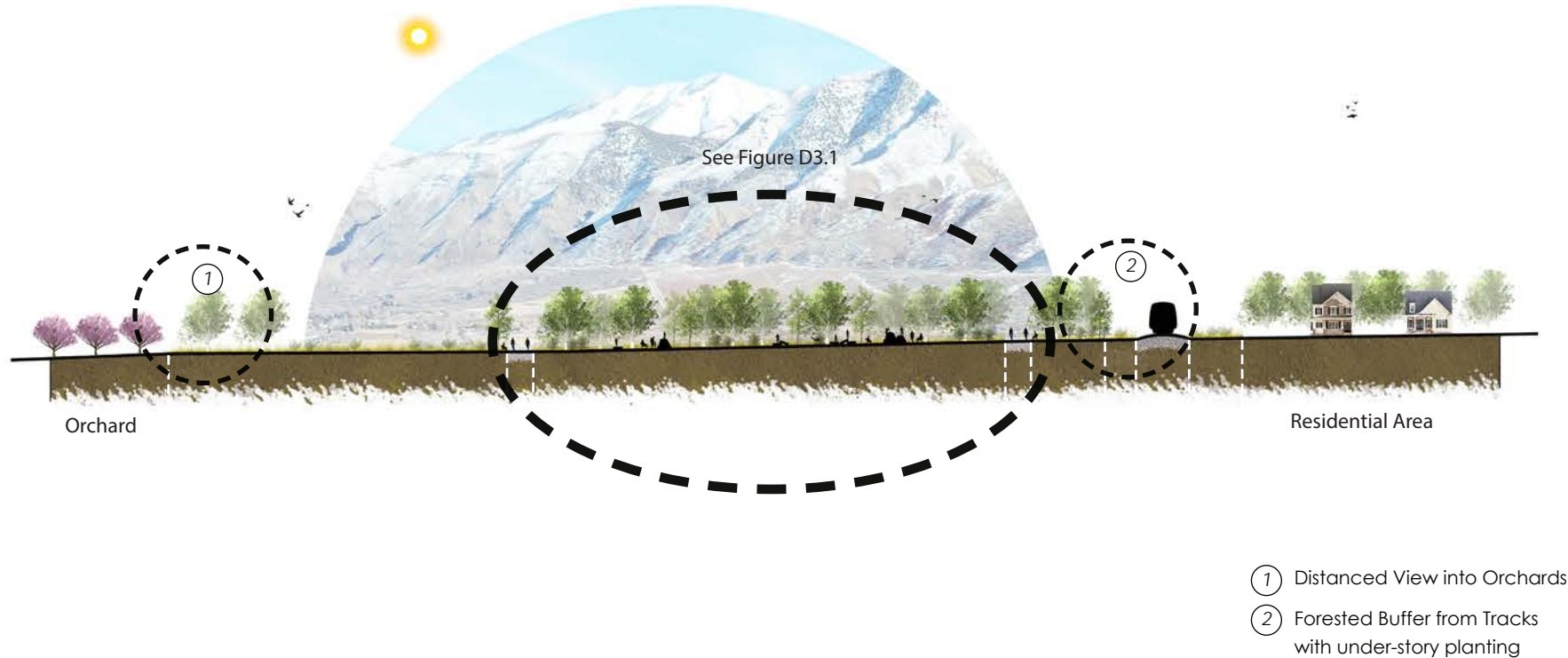
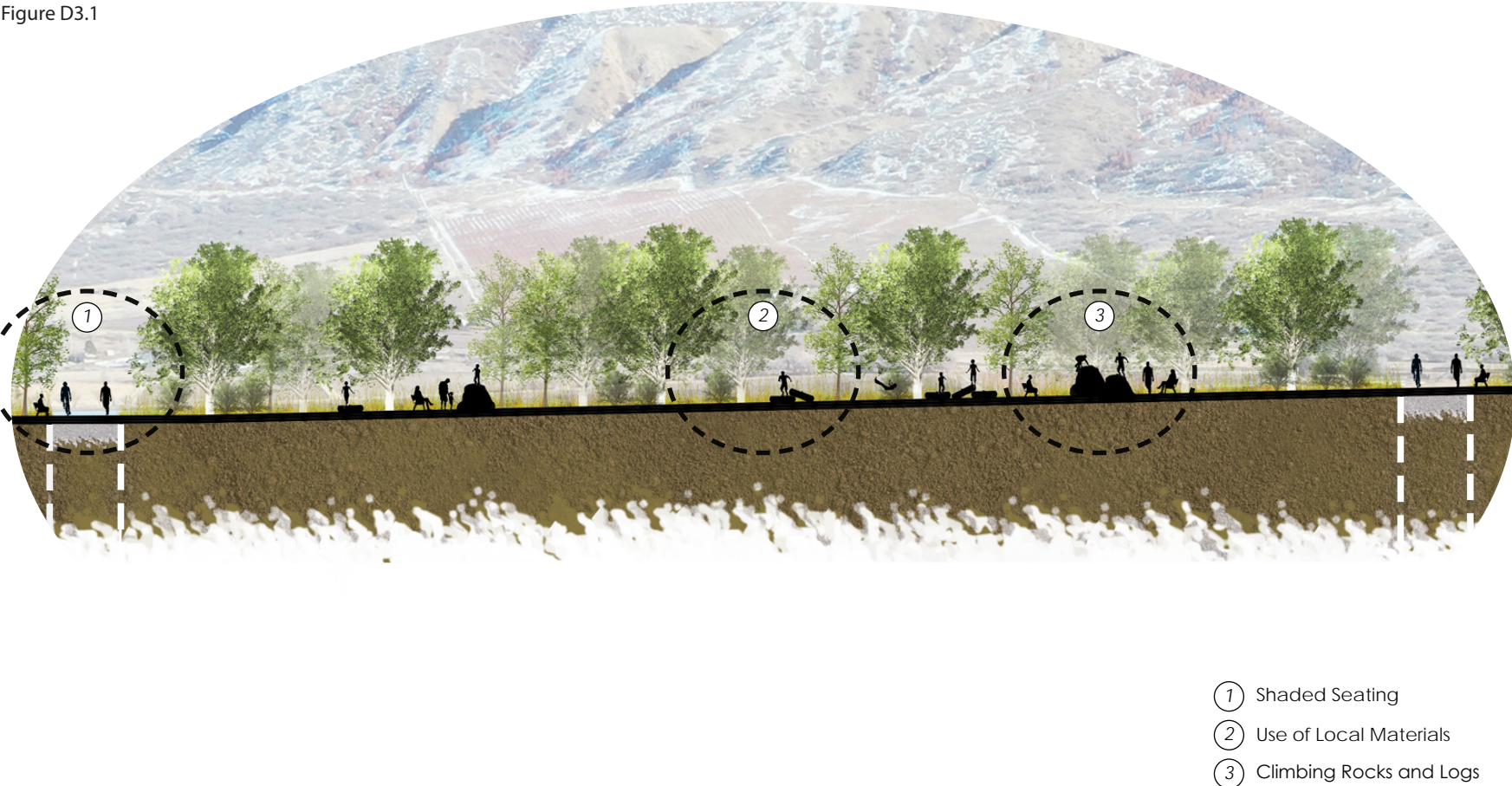


Figure D3.1



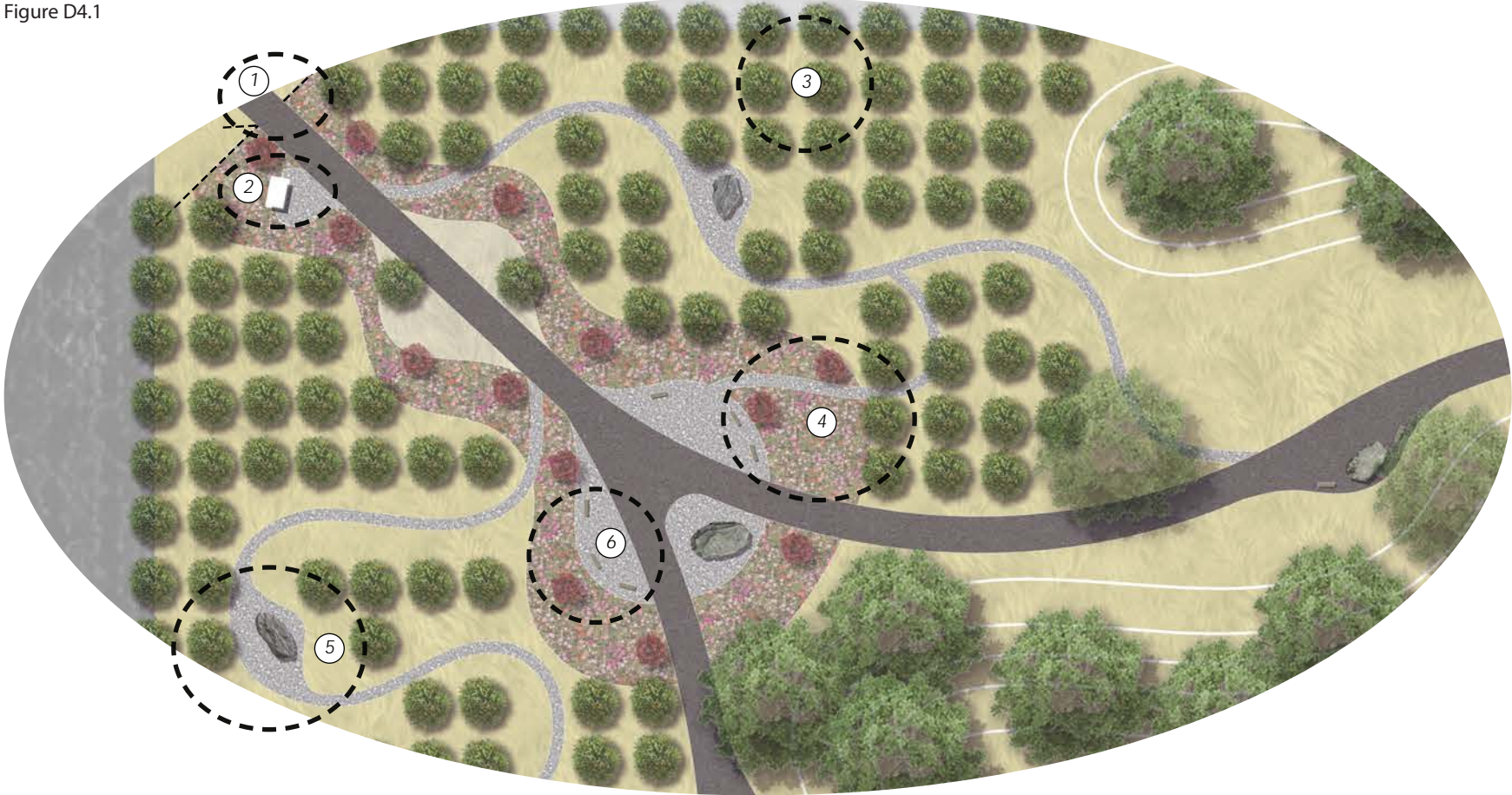


# NORTHERN ORCHARD CONNECTOR - CHERRY HILL ENTRANCE SITE

Figure D4.0



Figure D4.1



- This new orchard entrance will feature sculptures, signage, and landscape features to draw trail users into the orchard experience.
- Entrance will feature an orchard management controlled access gate for maximum compatibility.

- This area features an inviting view into Cherry Hill Farms with seating along the forested edge looking in.

- ① Orchard Access
- ② Information Kiosk
- ③ Flowering Trees (Seasonality)
- ④ Interpretive Garden
- ⑤ Orchard Themed Sculpture
- ⑥ Grouped Seating



EXIT 242 CONNECTOR



SYSTEM CONTEXT

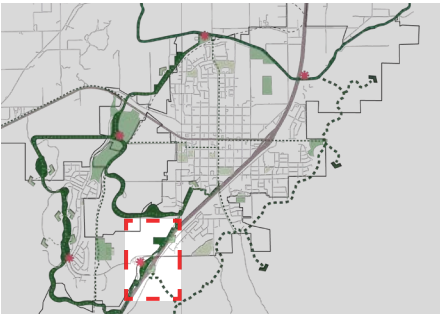


Figure D5.1

- ① Forest Walk
- ② Road Crossing
- ③ Views to "Denatured" Highway Area
- ④ Connection w/ Amenities
- ⑤ Buffer along Highway
- ⑥ Crossing w/ Safety Median
- ⑦ Trailhead

The Exit 242 Connector sets apart land adjacent to the freeway to add to animal habitat and migration opportunities in addition to human recreation opportunities. This section connects Red Barn with Summit Ridge and provides supplementary connections along the way.

Trail sections close to the freeway are buffered while sight lines to the freeway are allowed along distant trail sections.

FOREST WALK



- High density native, deciduous forested area provides a shaded respite in this freeway interchange zone.

SPUR AND CONNECTION WITH AMENITIES



- Features a spur trail that breaks off, connecting into the adjacent amenities through more open space.

BUFFERED HIGHWAY PROXIMITY



- Native trees and under-story planting featured here reduce audible and visual presence of the freeway.

ROAD CROSSING W/ SAFETY MEDIAN



- Road crossing to feature safety median and flashing pedestrian warning signs for safe trail crossing in higher traffic area.



Figure D6.0

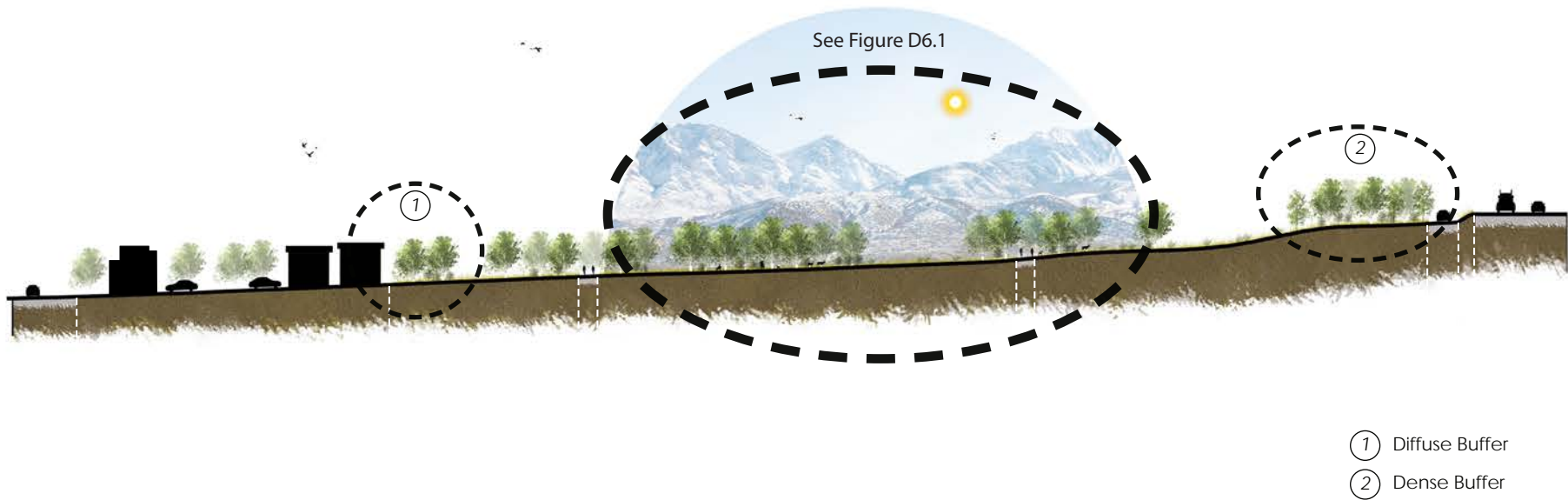
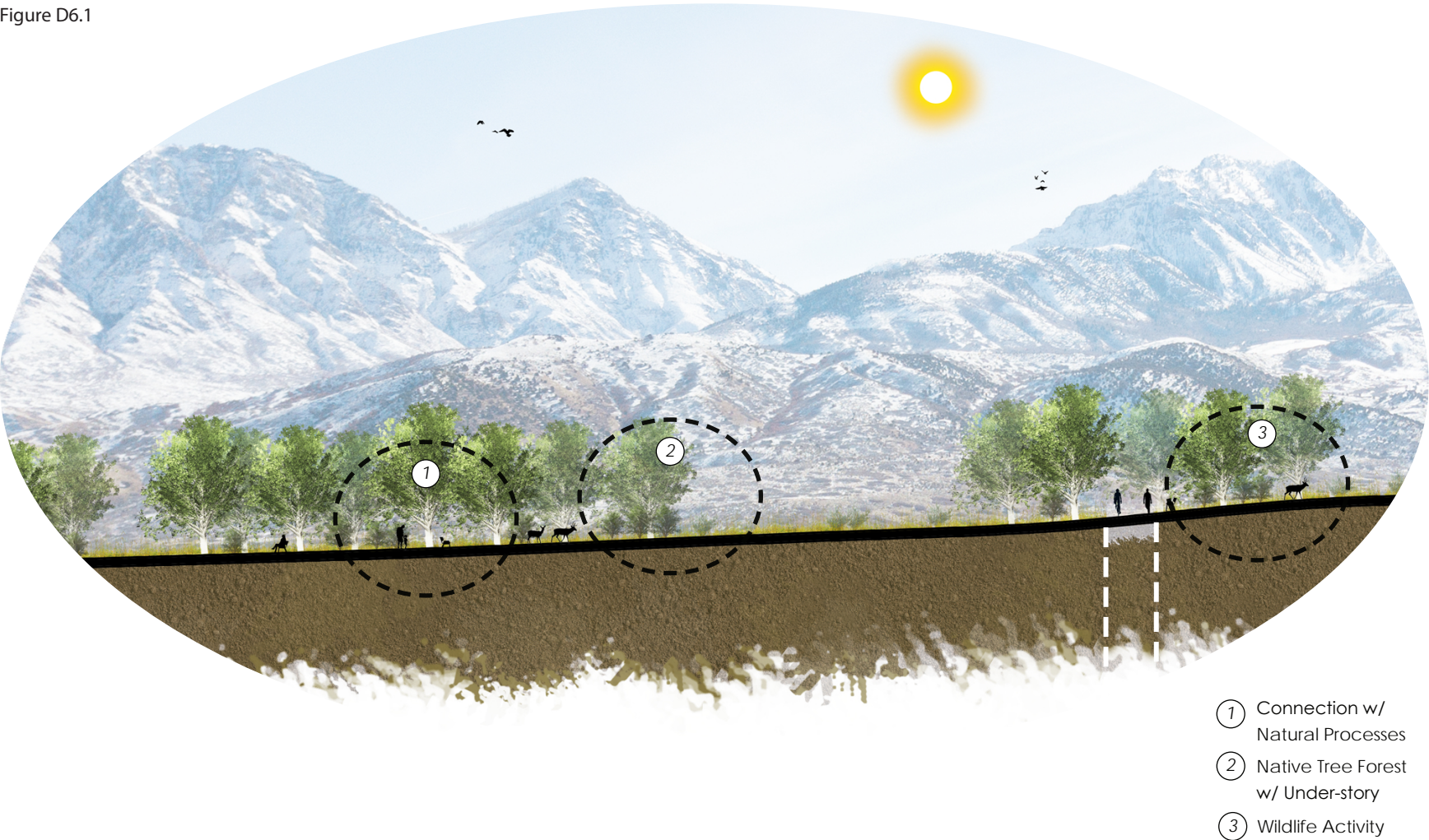


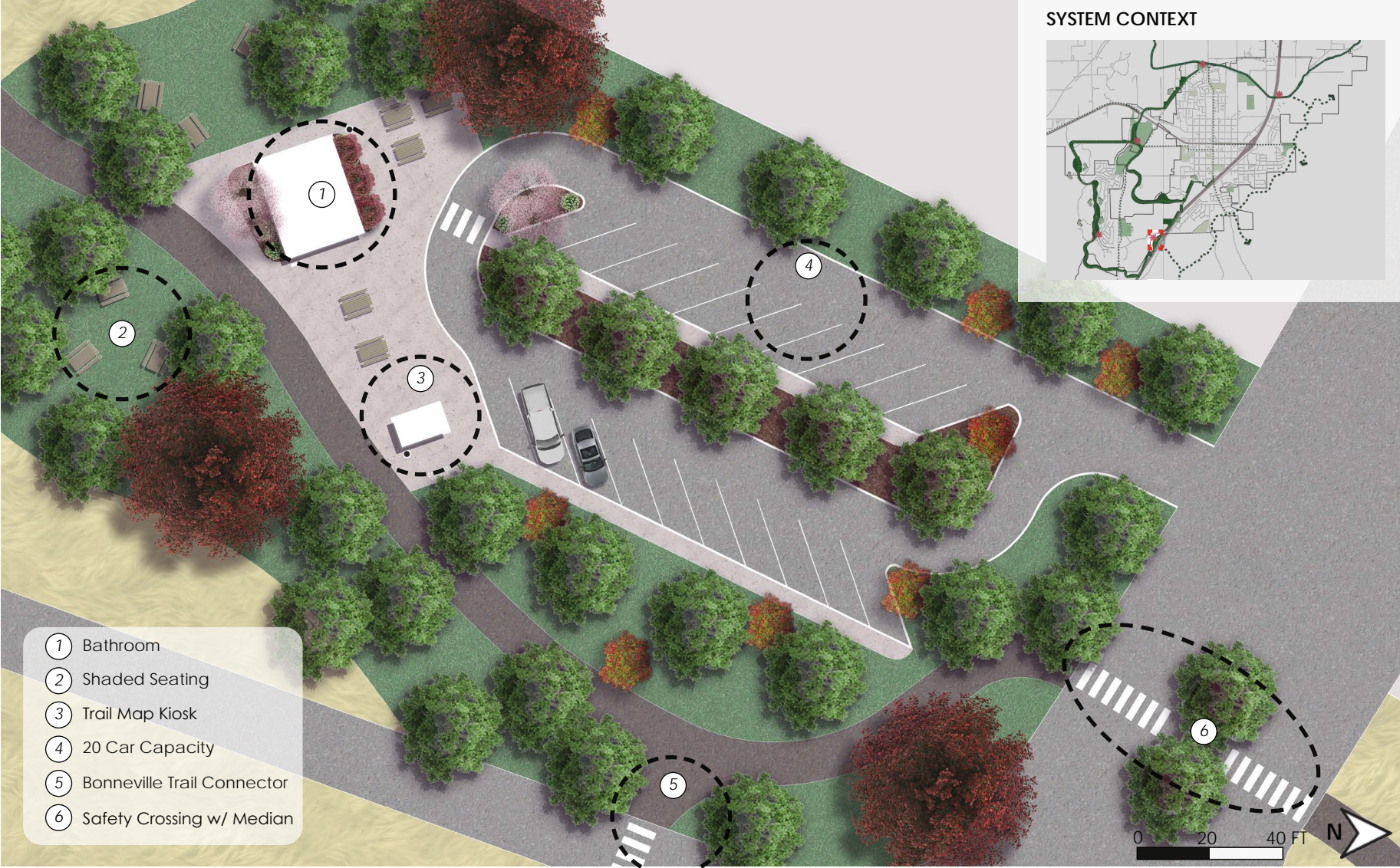
Figure D6.1





EXIT 242 CONNECTOR - TYPICAL TRAIL HEAD CONCEPT

Figure D7.0



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SUMMIT RIDGE GREENWAY

Figure D8.0



Figure D8.1

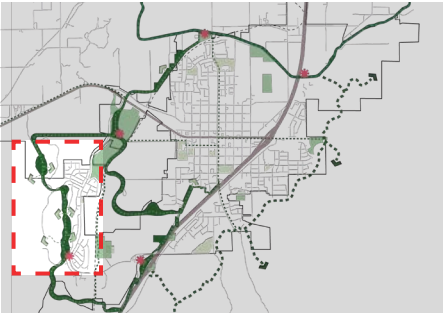


The Summit Ridge Greenway features significant existing topography and makes use of non-build-able land area by preserving the general look and impact of the natural landscape while increasing accessibility.

This section features mostly existing shrubland and grasses but with the addition of concentrated areas of planted native trees. This section features an extensive offering of connecting paths to the nearby residential neighborhoods.

- ① Viewing Deck
- ② Tree-Lined Switchback
- ③ Trailhead
- ④ Transitional Entrance Area
- ⑤ Road Crossing with Median

SYSTEM CONTEXT

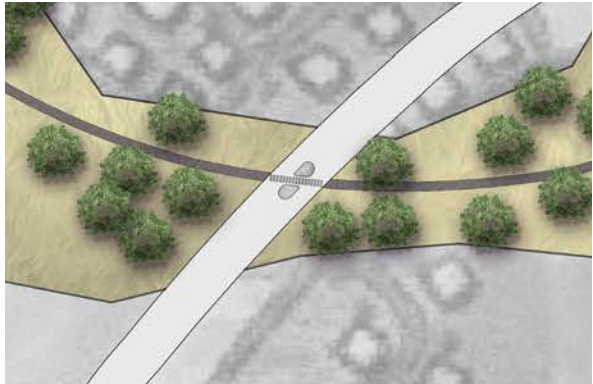


TRAIL HEAD



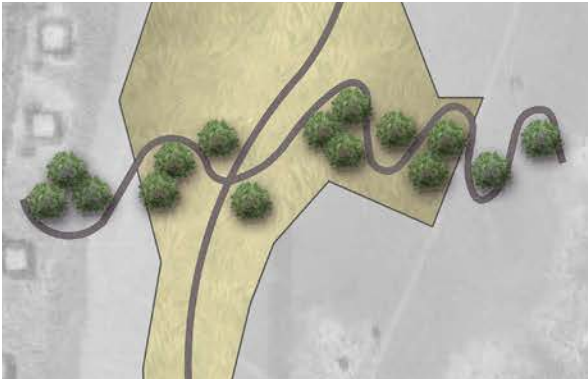
- Summit Ridge trailhead allows for tourists to park and use the greenway.
- Will include informational signage including trail maps, and the function and goals of the greenway.

ROAD CROSSING W/ SAFETY MEDIAN



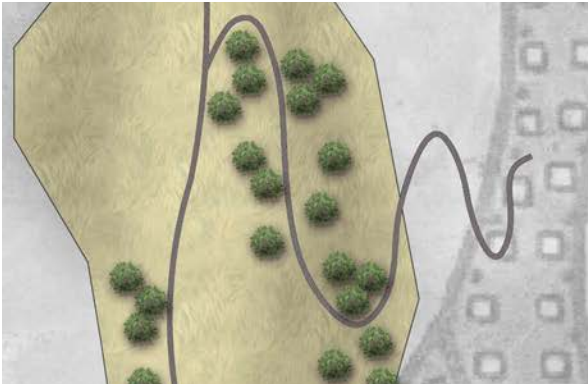
- Road crossing with median allows trail users to safely complete the greenway connection across the Summit Ridge Parkway.

VIEWING DECK



- Viewing deck made of local materials to be located by connector intersection allows trail users to access a truly expansive view of the region.
- Will include informational signage on the history and future of Santaquin.

TREE-LINED SWITCHBACK CONNECTOR



- Switchback connectors provide an accessible trail that allows access for Summit Ridge's residents.
- Acts as a transition area for the greenway, notifying users of a change in land use.



Figure D9.0

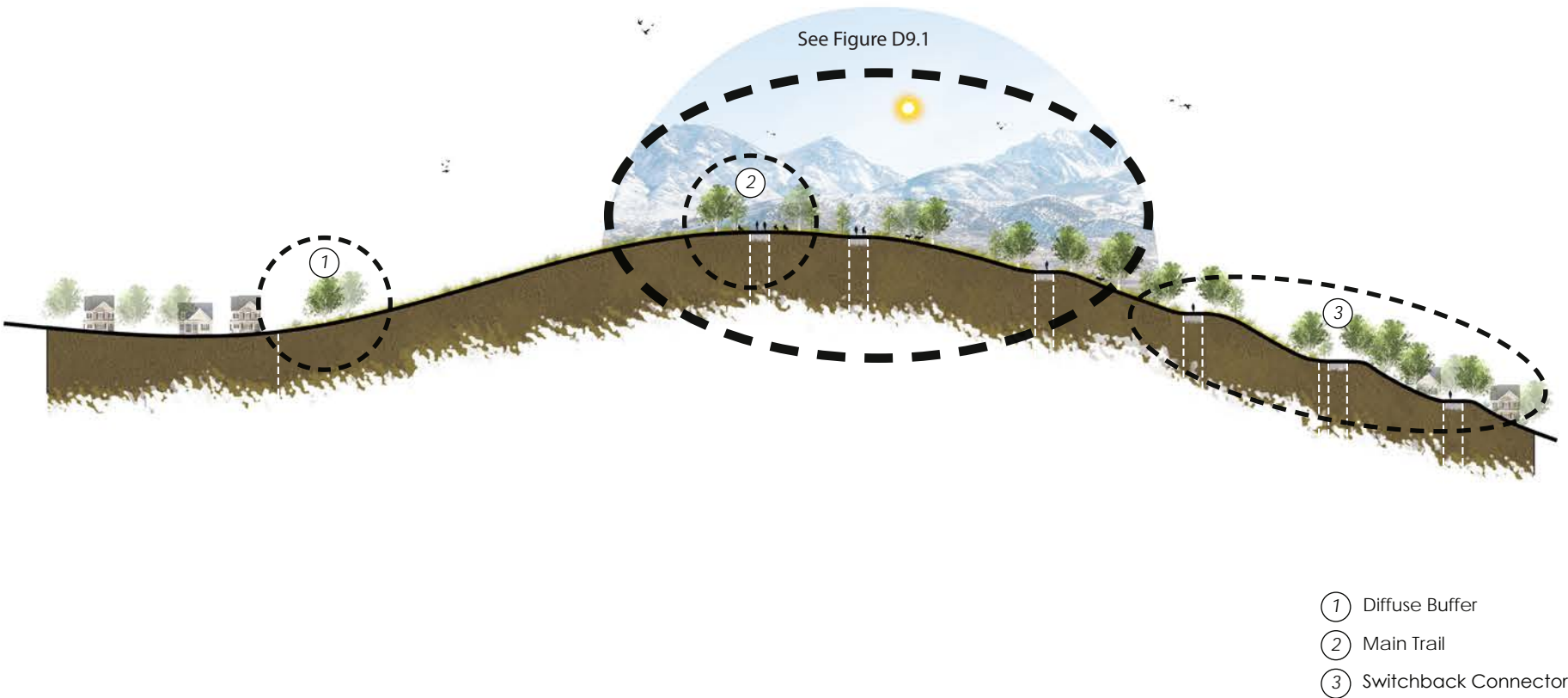
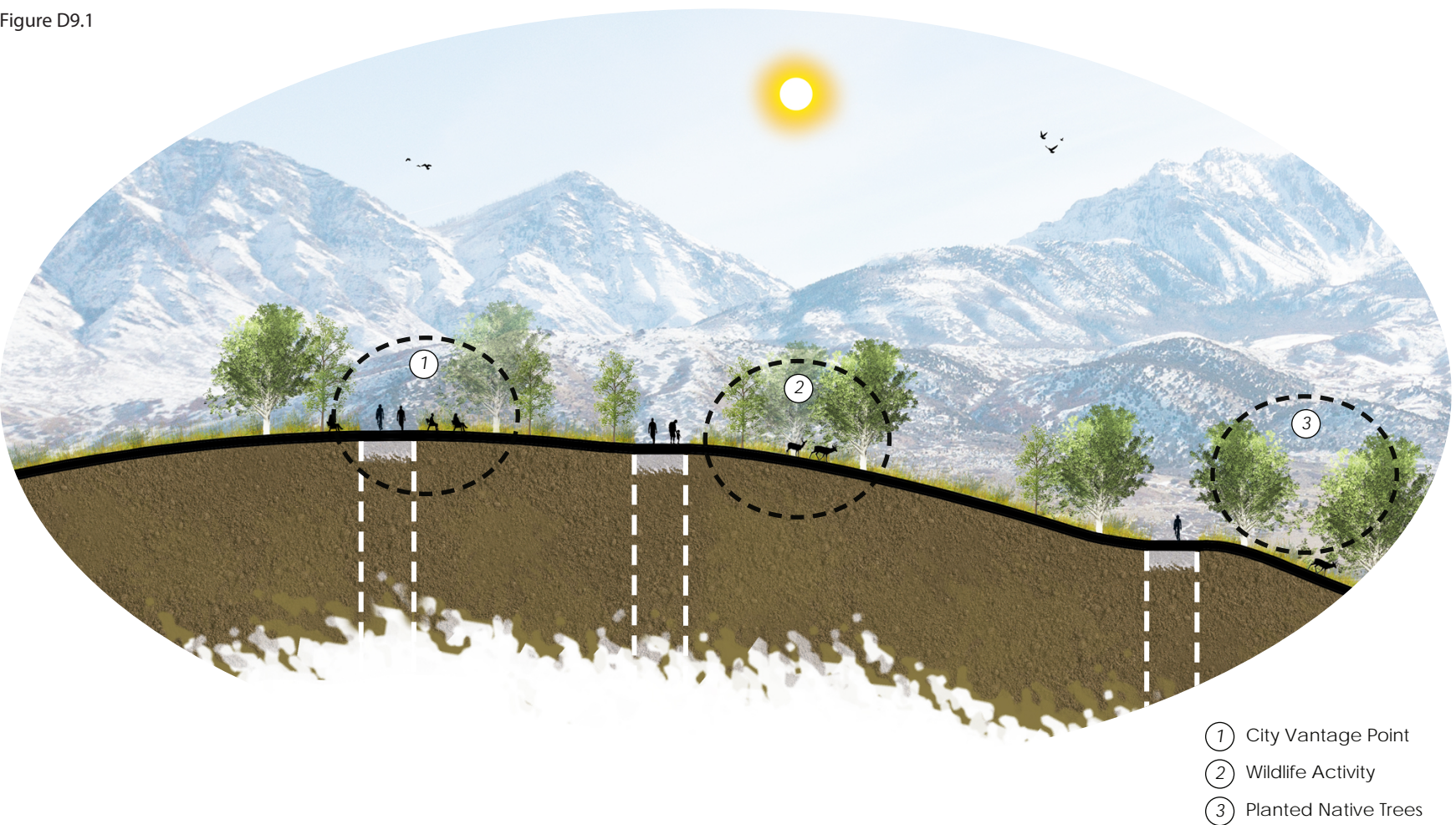


Figure D9.1



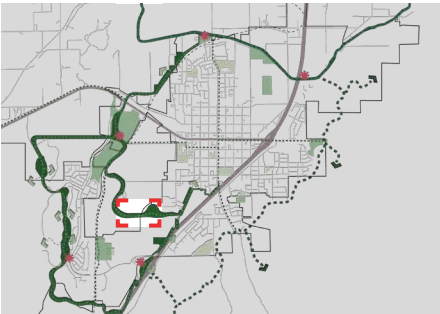


AGRICULTURAL HERITAGE GREENWAY

Figure D10.0



SYSTEM CONTEXT



- ① Transition Area
- ② Community Garden
- ③ Center Plaza
- ④ Interpretive Garden
- ⑤ Integration w/ Ag. Heritage Pathway

This narrow greenway section is located amongst a dense distribution of development and offers a naturalized landscape providing respite and connection. Numerous connecting paths are featured, connecting to the adjacent amenities.

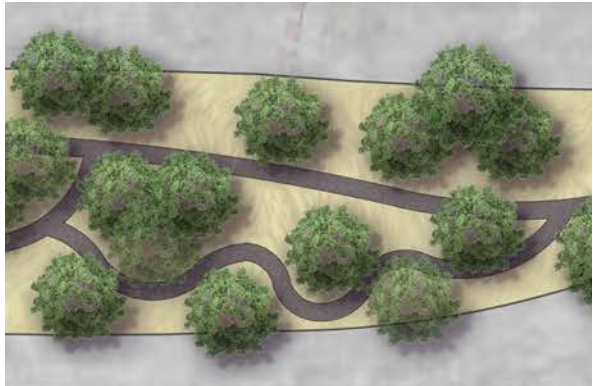
This section connects the Reservoir Campground to the Agricultural Heritage Hub and Red Barn. It is recommended that the neighboring landscapes mimic the greenway's naturalized look and function to effectively extend the greenway's function outwards and create a blended feel.

COMMUNITY GARDEN



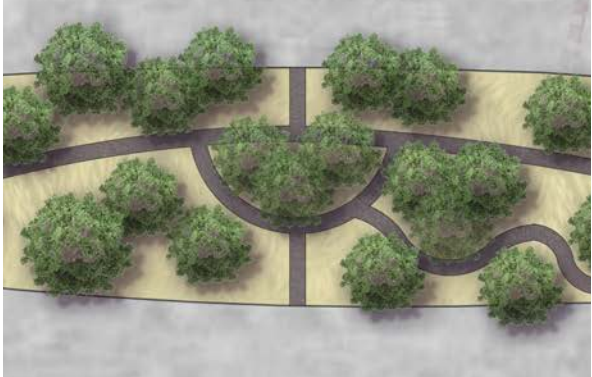
- Community garden with proximate drive-up access and transitional area from residences.
- Gives residents the resources and space to come together over communal gardens, allowing opportunities for improved community relations.

INTERPRETIVE GARDEN/



- Native interpretive garden features native perennials, shrubs, and trees to facilitate learning and contemplation.
- Features shaded seating areas and subtle, graded hills for an intimate feel.

CENTER PLAZA



- Plaza is located at the center of the trail intersection with the formalized business greenway.
- Features local artwork and sculpture mixed with curated landscape features.

INTEGRATION WITH AGRICULTURE HERITAGE PATHWAY



- Features integration with the pathway at the proposed Agricultural Heritage Center off the main path.



Figure D11.0



- ① Native Interpretive Garden
- ② Vantage Points into Garden
- ③ Benches Focused on Trail
- ④ Subtle Hills to Frame Trails

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# RED BARN CONNECTOR

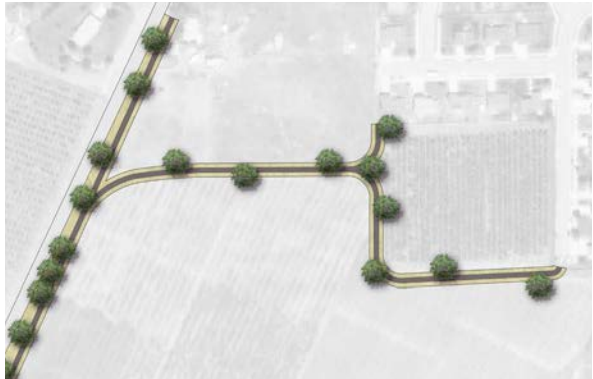


Consisting of 35 ft. wide of roadside land area, the Red Barn Connector provides connection to the Rowley Red Barn from Downtown, the Agriculture Heritage Center, and Exit 242.

Here, narrow tracts of land are transformed into a safe and contemplative space for human travel and enjoyment.

- ① Residential Connectors
- ② Tree-lined Buffer
- ③ Ped. Crossing w/ Warning Lights
- ④ Integration w/ Red Barn
- ⑤ Forested Exploratory Trail

## RESIDENTIAL CONNECTORS



- Connector trails feed into nearby neighborhoods for convenient greenway system access.

## TREE-LINED BUFFER FROM ROADWAY



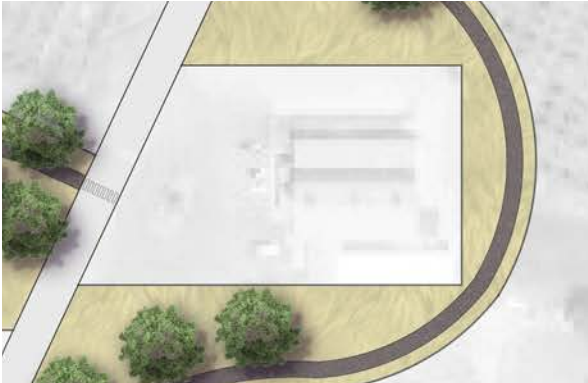
- 25 foot buffer from roadway with trees and native under-story plantings.

## PEDESTRIAN CROSSING WITH WARNING LIGHTS



- Pedestrian crossing connects trail users safely between the Agricultural Heritage Center Trail and the Red Barn.

## INTEGRATION WITH RED BARN PROPERTY

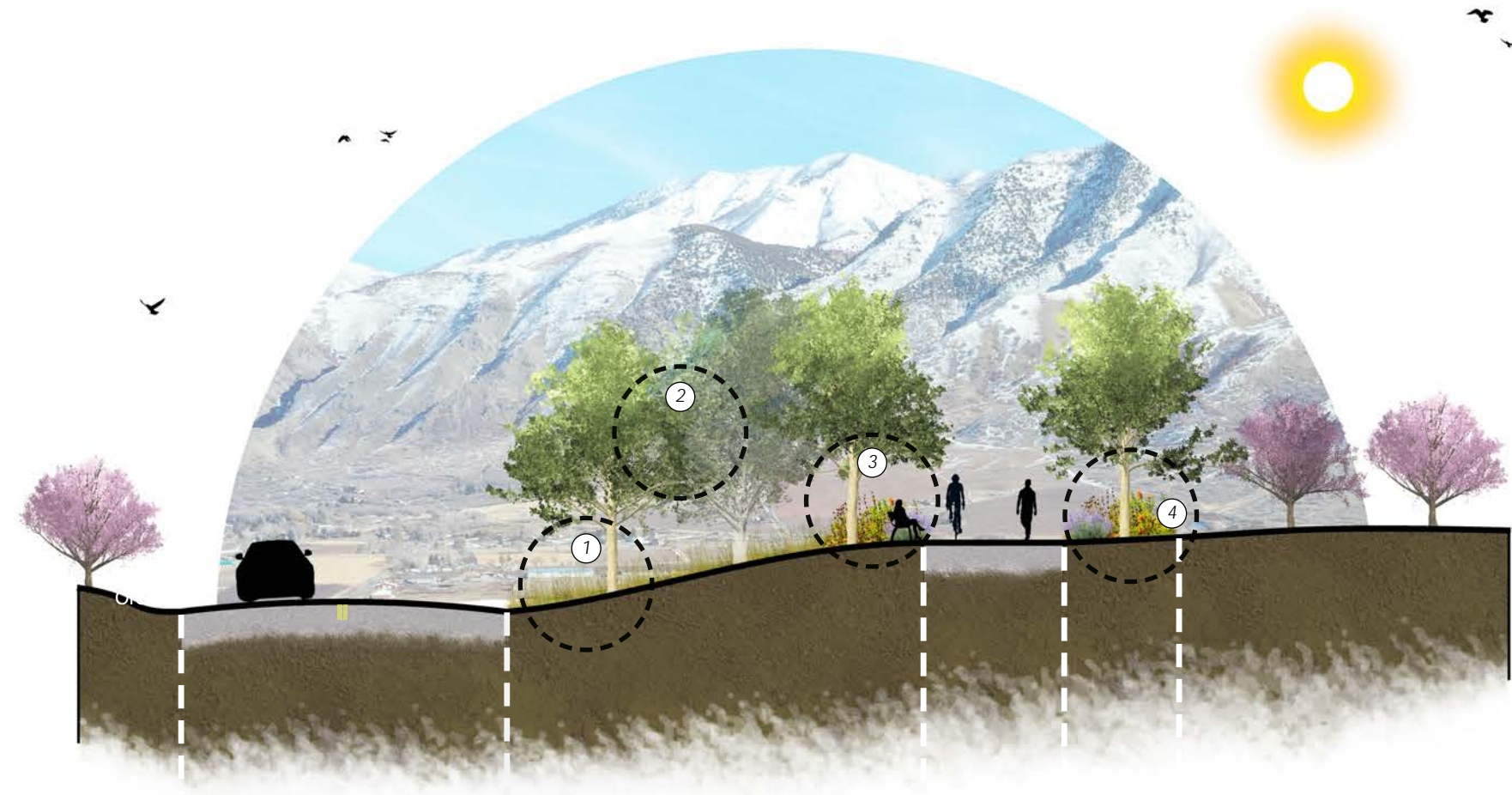


- Features integration with the Red Barn to facilitate agritourism and access by residents and workers.
- Can be woven through an adapted orchard entrance feature.



RED BARN CONNECTOR - ELEVATION VIEW

Figure D13.0



- ① Storm Water Bioswale
- ② Tree Buffer from Roadway
- ③ Trail/Orchard Oriented Seating
- ④ Wildflower Trail Edge

An estimation of the physical metrics that this conceptual greenway design features.

DESIGN METRICS

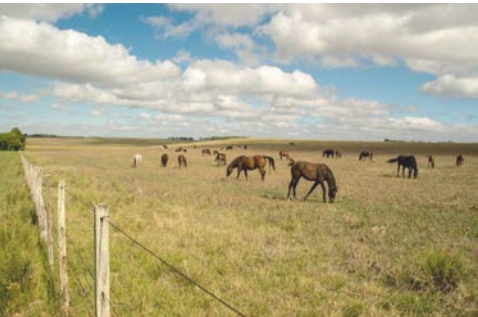


Image 63.0

**360 Acres**  
of greenway land  
acquired from a  
variety of sources.



Image 64.0

**16 Miles**  
of circulatory trail.



Image 65.0

**1,100 Trees**  
planted.

The Santaquin Greenway System represents a substantial investment in Santaquin's social, economic, and environmental integrity. The system will positively contribute to habitat area, active transportation, recreational area, agritourism, as well as resident health and wellness. The majority of the 360 acres included in this greenway design will not contribute to a loss of housing units or develop-able land.





## CHAPTER 4

### MOVING FORWARD

A discussion of where this plan fits in Santaquin's future, personal development and professional practice.

**Page left:** Aerial image of Santaquin, Utah featuring the intersection of the railroad and the Strawberry-Highline Canal. This is an area of crucial opportunity for the greenway system and its success will rely on proper coordination and land rights deliberation (Image 66.o).



MOMENT OF OPPORTUNITY

The City of Santaquin is currently at a turning point regarding its identity and structure. Coming from its strong agricultural past, the city wishes to hold tight to its agrarian identity and hopes to infuse its growing economy with a fresh influx of agritourism. Meanwhile, the cities just north of Santaquin, such as Payson, are beginning to respond to a great influx in population by rapidly constructing spreading residential communities, as Provo has in the recent past. The trend is moving southward and will strongly impact Santaquin over the next 50 years and beyond. Santaquin faces a choice right now: to preserve open spaces indefinitely for community use, or to leave this land unprotected and vulnerable to the potentially crippling effects of residential and commercial development.

While residential areas can be argued as being the “highest and best use” for a tract of land, going this route can commonly be destructive to sources of livelihood and community character. Likewise, careful planning must go into the specific land

areas and density needed for residential areas while accommodating cultural and natural areas appropriately (Lyle, 1985).

The most success will be attained through a combination of proactive and pre-active decision making. Proactive, or interactive, decision making is made up of visions of a future that is distinctly different from the past or present and makes active choices to reshape the area. Pre-active decision making is made up of choices based on a forecast of potential futures and works to develop solutions before the problem has arisen (Shearer et. Al, 2009). The risk of an inactive decision-making process is that of unintended consequences of the current trends. The choices made now will determine the future of Santaquin. Land is much easier to transform to open space use from a state of natural or low-impact development than it is when in a tightly developed state. A completely connected open space system would be enormously difficult and, likely, very expensive to plan and implement once the current land is developed over (Arendt, 1994).

FUNCTION OF A GREENWAY IN SANTAQUIN

The Santaquin Greenway System, which includes newly proposed land acquisitions and the land adjacent to the canal, is meant to work in concert with the proposed downtown trails, Bonneville Shoreline Trail, and additional connection trails. Both the Bonneville Shoreline Trail and Canal Trail will offer regional connectivity to the communities of Payson, Goshen, Rocky Ridge, and surrounding areas. The greenway itself offers land area for human and wildlife use, in addition to its 16 miles of trails.

The greenway allows for incorporating community gardens, interpretive gardens, gathering spaces, viewing areas, and resting spaces. The traditional lawn areas reminiscent of parks are meant to be kept to a minimum and focused mainly on trailhead areas. The great majority of the land is to be left as native vegetation, or re-planted and restored with a combination of native vegetation and low-water vegetation; this allows for better habitat function for mammals, birds, and other resident wildlife.

Bottom left: Students and community members working together at the USU Santaquin Charrette, January 2021 (Image 67.o).

KEY TAKEAWAYS

- Santaquin faces losing its open space to future development if provisions aren’t made now.
- Understanding of community needs, desires and hazards is necessary for effective open space planning.

Additionally, the system allows for integration with the local fruit farms and actively promotes the agritourism economy by enabling access through active transportation means by tourists and residents. The greenway is to feature an abundance of educational information on Santaquin's history, present and future, in the forms of signage and interactive art. Sculptures and murals from local artists are encouraged to be incorporated and commissioned on a by-need basis.

The 16 miles of main trail service Santaquin's perimeter and facilitate connection with Santaquin's downtown trails and the Bonneville Shoreline Trail. Additional trails can be found in the form of trails connecting to amenities and residential communities, spurs and secondary routes, and tertiary, exploratory routes in the form of dirt or gravel paths. The greenway, while having a tourism function, will have a very strong function within the community of Santaquin through its conservation of naturalized land areas, numerous community spaces and its exceptional trail connection with key amenity areas in the City of Santaquin.

The spaces within the Santaquin Greenway can serve as extensions of existing, adjacent community features such as existing schools, community parks and gardens, and natural areas. For example, schools could use the greenway space for class demonstrations (outdoor classrooms) or recreation time. Trail connections into community parks will extend the range of their circulatory paths and offer opportunities to actively explore other areas of Santaquin. Adjacency to existing natural areas will effectively promote a natural bleed over of function, promoting active and passive use by wildlife. The greenway system, while providing functions within itself, will enhance the functions of Santaquin's many community amenities through its accessibility and expansive coverage.



Top Right: Mona reservoir in Santaquin, Utah (Image 68.o).

KEY TAKEAWAYS

- The Santaquin Greenway system can provide for both tourist and resident functions.
- The system incorporates newly proposed land acquisition, as well as the Bonneville Shoreline Trail, downtown trails, and connector trails.



THE PURPOSE OF A VISION PLAN

The purpose of this greenway master plan is to present a grand vision of the open space network Santaquin can implement. A vision plan focuses on offering a set of values and forward-looking goals as a framework on which a community can base its active planning (MRSC, 2021). The plan considers the current development of Santaquin, land ownership, and the USU Senior Capstone vision plan. The plan is not meant to be a definitive, all or nothing solution; it is meant as inspiration for developing individual sections of connection, one at a time. Santaquin's open space system might look different in practice due to collective differences in land management choices. Large and expansive land areas in the proposed plan could be implemented in a paired down manner, whereas some of the smaller areas could be implemented in a more expansive manner depending on land availability and development trends. The goals, functions and opportunities presented in this plan, if made a city priority, will lead to a



successful, open space system for Santaquin's adjacent and resident human and wildlife populations.

When implementing this plan, it is pertinent that the city puts together a list of priority areas and acquires the most accessible and vital land parcels in a combination that best facilitates complete connections.

The designs presented in this plan are intended to be further adapted and developed by all required licensed professionals before any land preparation, trail and amenity construction or planting is initiated.

The most important step vital to implementing this vision is land acquisition and access. Many of the sections proposed in this plan incorporate parcels or portions of parcels that are currently under commercial agriculture production. The greenways proposed in these areas can increase the prospects of agritourism for these farms which can offset the effects of the land being transfered to a public use. Land is not likely to be acquired at an

even rate, hence a phasing process will likely need to be implemented to achieve connections early on and achieve a cohesive experience of the land. For example, a greenway section intended to be 200 feet wide could initially be implemented at a 30-foot width to initially facilitate a multi-use trail and adequate landscape buffer. The following methods can be used to acquire the necessary land: conservation easements, restrictive covenants, transfer of development rights, and eminent domain.

The Texas Land Trust Council (2021) defines a conservation easement as the following: "A voluntary, written agreement between a landowner and the holder of the conservation easement under which a landowner voluntarily restricts certain uses of the property to protect its natural, productive, or cultural features".

Bottom right: Aerial image of Santaquin, Utah (Image 69.o).

KEY TAKEAWAYS

- A vision plan seeks to define key values and forward-looking goals for a community to base its planning decisions.
- A conservation easement is one of the most mutually beneficial forms of open space land acquisition.
- This greenway plan can be implemented in alternative ways depending on land availability and development trends, while still meeting the set objectives.

With conservation easements, the property owner retains the legal property title and establishes the land use types that can or cannot persist. Periodic assessment as per the holder of the easement is typical to ensure the property condition is maintained according to the agreement (Texas Land Trust Council, 2021). Typically, a conservation easement will maintain a more mutual relationship between the landowners and the city government. Additionally, working through conservation easements would more actively involve landowners in the mission and work of the greenway system and its facilitators.

A restrictive covenant, in contrast, is a method of land control that constitutes a contractual agreement that mandates a property buyer to take or avoid certain actions. The specific language that binds the property owner is located directly in the property deed and usually carries penalties for ignoring the mandate (Assets America, 2021). This method differs from a conservation easement because it occurs before purchase rather than as an addendum after land purchase.

A transfer of development rights is one method of implementing a conservation easement or restrictive covenant; it is a type of zoning technique that is used to protect lands of conservation value by redirecting imminent development to a pre-determined land area planned to accommodate growth and development. A TDR program typically financially compensates landowners for making the choice to conserve their land rather than develop it. Once the development rights are legally severed, the land in question is permanently protected through either a conservation easement or restrictive covenant. Through this process, the land which the development rights are moved to will typically become enhanced with an allowance of greater density, greater intensity, or other regulatory flexibilities (WeConservePA, 2021). Using this zoning technique can provide incentive for landowners to forgo traditional



Top right: Aerial image of Santaquin, Utah and the existing wildlife underpass (Image 70.o).

development of their land and, instead, set aside their land for incorporation into Santaquin's publicly beneficial greenway system.

Eminent domain represents the power possessed by a government to assimilate an individual's private property for public purpose without the individual's consent; it has infamously been used to clear the way for the interstate highway system in the past. This technique can be used at federal, state, or local levels only if the property owner is compensated at "fair market value" (Stimmel Law, 2021). This method is less desirable than the previously mentioned methods because of the lack of mutual agreement on the transaction, regardless of compensation. Additionally, eminent domain can easily be abused and can result in unfair compensation and can lead to mass evictions (Gaïlle, 2015). Eminent domain will be less necessary in Santaquin if early action

is taken in regards to planning and land acquisition.

Fortunately, the width of a greenway can vary greatly over its length while maintaining its function, hence compromises can be made where property owners remain wary of relinquishing their land. Ultimately, a first line of defense in assuring a smooth land acquisition phase is to properly educate landowners of the goals, functions, and benefits of a project such as the Santaquin Greenway System.

KEY TAKEAWAYS

- Eminent domain is to be used as a last resort for completing essential land connections.
- A greenway's optimal width is flexible which allows for alternate routing in case of obstacles in land acquisition.



## THE POWER OF VISION

Frederick Law Olmsted was a revolutionary landscape architect who used his strong sense of vision to design and implement landscapes that bolstered community connection and access to naturalized spaces. Olmsted was inspired by the picturesque landscapes of England and saw them to be vital to an unconscious process of human revitalization. He was adamant that the goal of landscape architecture was to benefit the health, safety, and welfare of the people.

Olmsted is well known for his park systems, such as the Emerald Necklace in Boston, which effectively connect numerous communities through a continuous system of parks that help preserve the restorative effects of nature amongst the hustle and bustle, and spreading residential areas. Olmsted was also sensitive to the particularities of regional climates, standing behind the necessity of a regional landscape style of water conservation, and using this approach in many projects in the San

Francisco Bay area and in Colorado (Birnbaum, et al., 2000). Olmsted's park systems serve as a solid foundation for the potential role of a greenway system in Santaquin, Utah, with promises increased human and wildlife health and wellbeing, land use balance, and enhanced community connectivity and function.

## LESSONS LEARNED FOR THE CITY

This greenway system was developed from the information gathered through recent discussions carried out through the LAEP charrette and Senior Capstone design processes. Additional meetings and discussions during the design phase of this specific system could have yielded a resulting vision plan more acutely aligned with stakeholder opinions and goals. Developments currently underway might already compete with some of the proposals made in this plan, however, there may be possibilities for adaption to this plan's recommendations, in some cases.

Through the development of this plan and its accompanying design projects by USU students, the City of Santaquin and its residents have become more accustomed to the iterative design process and the comprehensive products it can achieve. Iterative processes can effectively render different designs for the same land areas, especially when a different set of goals is employed. Additionally, the city became more familiar with the difference between a planning project and a design project. A project like this, in such an early stage of development, makes broader strokes and less definitive suggestions as the design represents a vision rather than a plan to be built. Compiling a functional open space vision plan requires understanding the community needs, desires, and upcoming hazards.

Bottom right: The Emerald Necklace in downtown Boston, MA. Designed by Frederick Law Olmsted and Associates (Image 71.0).

## APPLICATIONS FOR PRACTICE

This plan collectively serves as an example of what Intermountain West cities can achieve through attentive and focused planning and design. There are numerous cities that are in similar situations to Santaquin and this plan can serve as a starting point for planners and designers working with these cities to begin developing comprehensive open space networks prior to increased development.

The suggestions made here argue that effective open space does not need to be overly complex and expensive to be functional and revolutionary for a community. Additionally, this plan brings to light greenway planning and design principles that are less familiar to many current planning landscape professionals and illustrates how these principles can be implemented on the land.



### KEY TAKEAWAYS

- **Olmsted's park systems serve as a foundation for connecting open space in Santaquin.**
- **Greenways can contribute to the health and well-being of individuals, wildlife, and communities as a whole.**
- **This plan illustrates simple and affordable landscape solutions for effective open spaces in Intermountain cities.**



A selection of greenway projects that illustrate principles in practice that can be incorporated into the Santaquin Greenway System.

## HIGH LINE CANAL TRAIL, DENVER, CO

The High Line Canal Trail is a well-used, point to point trail, that extends through Denver's Southside suburbs for 71 miles between Aurora and Roxborough State Park. This trail is owned by Denver Water, the company that owns and operates the canal that is responsible for Denver's water access, while other agencies from the surrounding municipalities are in charge of management over the trail.

The trail is considered easy, flat, and is accessible to bicyclists, hikers, equestrian users. It features old cottonwood trees, expansive, scenic views, and countless wildlife viewing opportunities; it is paved through Denver and Aurora and consists of natural surface in the remaining municipalities (Trail Link, 2021).



Top Right: Plan view of trail extent from Denver to Aurora (Image 72.o).  
Top Left: Trail section featuring a fitness installation (Image 73.o).  
Bottom Left: Cyclists using the High Line Canal trail (Image 74.o).



### SIGNIFICANCE TO SANTAQUIN

- Similar to Santaquin's Strawberry Canal, the Highline Canal trail utilizes an existing canal to link adjacent cities.
- Owned by canal company which transfers cost and liability to them in instead of municipalities.
- Features numerous views and wildlife viewing opportunities and offers diverse accessibility.

## LAKE HILLS GREENBELT BELLVUE, WASHINGTON

The Lake Hills Greenbelt consists of a wetland corridor that includes over 150 acres of varied wildlife habitat including wetlands, streams, lakes, and forests. The system features over three miles of trail with access to community gardens, pea patches, blueberry farms, seasonal produce stands, and picnic areas. Likewise, this greenbelt plays a significant role in maintaining agritourism in the area. Other opportunities found in this greenbelt include attending master gardener workshops and guided nature walks with park rangers (City of Bellevue, 2019).

Top Right: Trilside agritourism integration (Image 75.o).  
Bottom Left: Trilside demonstration garden (Image 76.o).  
Bottom Right: Trilside wetlands overlook (Image 77.o).



### SIGNIFICANCE TO SANTAQUIN

- Like Santaquin, this community was looking to connect its agricultural assets through an open space system design.
- Incorporates community classes and events.
- Covers a multitude of habitat and land types, similar to what is present across Santaquin's area.





QUINHUANGDAO FOREST PARK

This greenway incorporates productive landscapes through minimal intervention in its design. Twelve acres of existing farmland were incorporated into this greenway, effectively preserving its function in light of development. A sky walk and boardwalk were built at the edge of the farm, allowing visitors to observe the working landscape in all seasons.

The forest landscapes within the greenway feature self-reproductive wildflowers that add to the beauty of the space with minimal maintenance. The greenway features a network of footpaths and boardwalks designed to link various habitat types that leads visitors through the space. Contemporary pavilions and platforms at strategic places function as vantage points and give the park its unique identity (Saunders, 2013).



Top left: Sky walk with users observing adjacent agricultural lands (Image 78.o).  
Top Right: Plan view of forest park illustrating integration with agricultural lands (Image 79.o).  
Bottom Left: Integration of agricultural field with sky walk (Image 80.o).



SIGNIFICANCE TO SANTAQUIN

- Incorporates trail within productive agricultural lands with minimal disturbance.
- Incorporates multiple land types and uses.
- Strong focus on viewing areas and education.

ROSE KENNEDY GREENWAY, BOSTON, MA

The Rose Kennedy Greenway consists of a 1.5 mile section of linear park found in the heart of downtown Boston and within the Emerald Necklace park system. The park system, covering 200 acres of inner city open space developed in the 19th century, plays an vital role in providing scenic enjoyment, respite, wildlife habitat, storm water management and improved air quality (City of Boston, 2015). This specific, linear park features prime access to local restaurants, food trucks, a beloved carousel, seven iconic water attractions, and beer and wine gardens. The landscape of this greenway is home to an urban wildflower meadow that supports pollinators in the park, beehives, and other notable gardens such as the Carolyn Lynch Garden (Rose Fitzgerald Kennedy Greenway Conservancy, 2022).

Top right: Bird's eye view of greenway and its integration in the urban center (Image 81.o).  
Bottom left: Example of integration of meadows and water features into greenway (Image 82.o).  
Bottom right: Example of integration of seating areas along trail that maximizes user interaction (Image 83.o).



SIGNIFICANCE TO SANTAQUIN

- Illustrates incorporation with a downtown center.
- High integration of seating elements for extended user enjoyment.
- Serves as the spine of the area, which, in Santaquin, could bolster the local economy and improve use of the downtown locale.





SAN DIEGUITO RIVER PARK, CA

The San Dieguito River Park is an expansive greenway in the San Dieguito River Valley that is focused on celebrating and preserving local heritage and natural resources; this park offers both recreational and educational opportunities for its users.

The trail passes through and along many plots of active farmland with a relatively high success rate and approval of local farmers. The trail is expected to span a total of 70 miles upon completion (San Dieguito River Park, 2022).

SIGNIFICANCE TO SANTAQUIN

- The trail provides both recreation and educational opportunities.
- Similar to Santaquin’s goals, it passes through active farmland with a high success rate.
- As Santaquin strives to do, this system successfully preserves local heritage.



Top right: Plan view of trail route and adjacent communities (Image 84.o).  
Bottom left: View of land preservation that accompanies the greenway (Image 85.o).  
Bottom right: Open air classroom and low water landscape (Image 86.o).



MURDOCH CANAL TRAIL, OREM, UT

Located in Orem, UT, this trail is a flat, paved, 17 mile trail following the route of the Murdock Canal (now an underground canal). This trail connects to additional trails at both ends. It features significant scenery, few crowds, ideal trail conditions and many amenities for families (Trail Link, 2022).

Top right: Cyclist using the trail, featuring a curving route and stream crossing (Image 87.o).  
Bottom left: Trail winds through low water landscape and highlights heritage (Image 88.o).  
Bottom right: Plan view of trail extent through multiple Utah communities (Image 89.o).



SIGNIFICANCE TO SANTAQUIN

- This serves as a local example of how a canal right of way can be transformed into a meaningful community asset, such as the Strawberry Canal in Santaquin.
- Incorporates family-friendly amenities and capitalizes on local scenery, similar to the city of Santaquin.





The following pages include a selection of suggested plants to be considered when planting the greenway. All of the included plants require little to no supplemental water to thrive; many of them are native to the Intermountain West. The plant list is not exhaustive and is meant as a starting point for a planting palette.

SHRUBS

CREeping JUNIPER



Image 90.0

RUSSIAN SAGE



Image 94.0

MALLOW NINEBARK



Image 91.0

MORMON TEA



Image 95.0

CRANBERRY COTONEASTER



Image 92.0

SILVER SAGEBRUSH



(Image 96.0

PINELEAF PENSTEMON



Image 102.0

SULPHUR BUCKWHEAT



Image 103.0

'GRO-LO' FRAGRANT SUMAC



Image 104.0

LITTLELEAF MOUNTAIN MAHOGANY



Image 105.0

RABBITBRUSH



Image 93.0

PERENNIALS

GLOBEMALLOW



Image 97.0

SUNDANCER DAISY



Image 101.0

PRAIRE WINECUPS



Image 98.0

LITTLE BLUESTEM



Image 99.0

ROCKY MOUNTAIN PENSTEMON



Image 100.0

TREES

CURL-LEAF MOUNTAIN MAHOGANY



Image 106.0

UTAH HOLLY



Image 111.0

PINYON PINE



Image 110.0

BRISTLEcone PINE



Image 107.0

BIG TOOTH MAPLE



Image 112.0

DESERT WILLOW



Image 108.0

SMOOTH SUMAC



Image 113.0

WESTERN REDBUD



Image 109.0

Text Source of Spread: Center for Water Efficient Landscaping, 2017







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- 1.o Photograph taken by Justin Jacques, 2021
- 2.o <https://mtsgreenway.org/wp-content/uploads/2017/08/161230-feature-1230x630.jpg>
- 3.o <https://www.justraveling.com/wp-content/uploads/2017/05/us-greenway-feat2>
- 4.o Photograph taken by Justin Jacques, 2021
- 5.o <https://www.archdaily.com/639554/6-finalists-announced-for-uli-s-2015-urban-open-space-award/5570d9doe58ece3e7b000073-6-finalists-announced-for-uli-s-2015-urban-open-space-award-image>
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- 10.o <https://mountainx.com/wp-content/uploads/2017/05/CLKS3335-720x479.jpg>
- 11.o <http://denverurbanreview.com/tag/parks/>
- 12.o <https://oregonfb.org/agritourism-a-chance-to-share-ags-story/>
- 13.o <https://www.wta.org/go-outside/trail-smarts/how-to/how-to-park-like-a-considerate-pro>
- 14.o [https://media.kjzz.org/s3fs-public/styles/gallery\\_image\\_style/public/Camelback%20Mountain%201.jpg?itok=lrVtCrFo](https://media.kjzz.org/s3fs-public/styles/gallery_image_style/public/Camelback%20Mountain%201.jpg?itok=lrVtCrFo)
- 15.o [https://s3-media4.fl.yelpcdn.com/bphoto/MmyNhVsGQ8AFgXH7Do3\\_YQ/o.jpg](https://s3-media4.fl.yelpcdn.com/bphoto/MmyNhVsGQ8AFgXH7Do3_YQ/o.jpg)
- 16.o [http://parkscape.org.za/wp-content/uploads/2016/06/outdoor\\_seating\\_area\\_1.jpg](http://parkscape.org.za/wp-content/uploads/2016/06/outdoor_seating_area_1.jpg)
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- 19.o <https://www.railstotrails.org/build-trails/trail-building-toolbox/design/public-art/>
- 20.o <https://www.aucklandforkids.co.nz/travel/brick-bay-sculpture-trail/>
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