

Mahany Park Open Space Multi-Use Trail

Feasibility Study

April 2021 | CRS-03



Prepared for:

City of Roseville

311 Vernon Street
Roseville, CA 95678

Prepared by:

HELIX Environmental Planning, Inc.

1677 Eureka Road, Suite 100
Roseville, CA 95661

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ACRONYMS AND ABBREVIATIONS

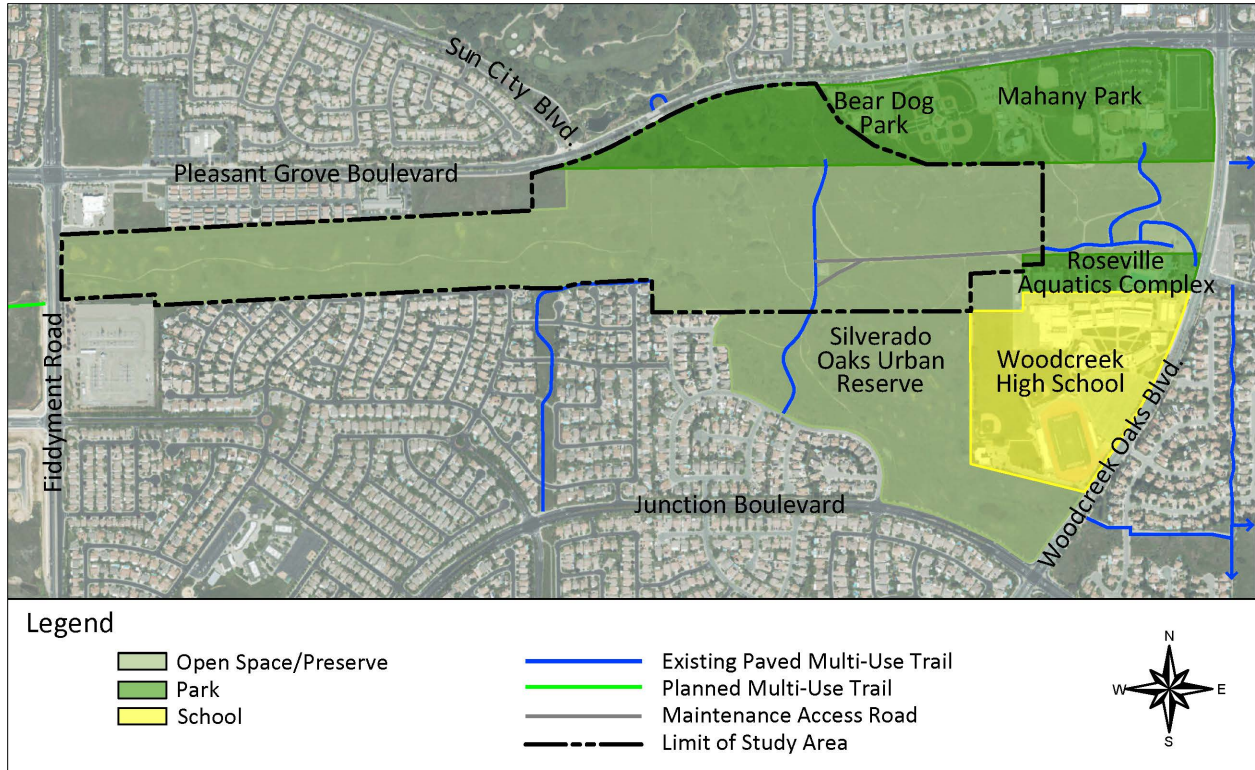
ATP	Active Transportation Program
BMP	City of Roseville Bicycle Master Plan
Caltrans	California Department Transportation
CDFW	California Department of Fish and Wildlife
CEQA	California Environmental Quality Act
City Standards	City of Roseville Design and Construction Standards
CMAQ	Congestion Mitigation and Air Quality
EA	Each
Existing Conditions Report	Mahany Park Open Space Trail Existing Conditions Report
FHWA	Federal Highway Administration
Flood Ordinance	City of Roseville Flood Damage Prevention Ordinance
General Plan	City of Roseville General Plan
HELIX	HELIX Environmental Planning, Inc.
LF	linear foot
LSAA	Lake and Streambed Alteration Agreement
mph	miles per hour
NEPA	National Environmental Quality Act
OSPOMP	Open Space Preserve Overarching Management Plan
PCTPA	Placer County Transportation Planning Agency
PG&E	Pacific Gas and Electric
Roseville Electric	City of Roseville Electric Utility Department
RTP	Recreation Trail Program
RWQCB	Regional Water Quality Control Board
SACOG	Sacramento Area Council of Governments
SMUD	Sacramento Municipal Utility District
Study Area	Mahany Park Open Space Multi-Use Trail Study Area
USACE	U.S. Army Corps of Engineers
USFWS	U.S. Fish and Wildlife Service
WAPA	Western Area Power Administration

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EXECUTIVE SUMMARY

The Mahany Park Open Space Multi-Use Trail Feasibility Study evaluates current conditions and recommends an alignment and cost estimate for a paved, multi-use trail in the Mahany Park open space (see Study Area Map below). A connected, paved trail system would mitigate impacts of current use on sensitive habitats and provide safe, convenient access to the City’s multi-use trail network for people of all ages, abilities, and incomes through the study area.

STUDY AREA MAP



The consulting team documented existing conditions in the study area through site surveys, field walks, trail user counts, review of existing documents, meetings with regulatory agency and utility representatives, and used this information to assess opportunities and constraints. A project development team composed of City of Roseville staff and the consulting team was established and met monthly to review and discuss field and technical reports, project updates, existing conditions, public engagement, and potential trail alignments. Technical teams were established as needed to address specific issues, such as educational opportunities, utility access requirements, and regulatory coordination.

A robust public engagement process was developed to inform the public about current conditions and trail user preferences, however, due to COVID-19 precautions and public health guidelines, public engagement components of the study had to be adjusted. A project website (www.roseville.ca.us/mahanytrail) was created, updated frequently by City staff, and includes an informational video. Due to the COVID-19 pandemic, face-to-face workshops were replaced with two interactive online surveys to learn trail user preferences and to present project alignment alternatives

leading to the final recommendation. Communication to encourage public participation included: direct mailers, a feature story on ABC 10, email newsletters, Facebook, Twitter, Instagram, Nextdoor, and signage in the project area.

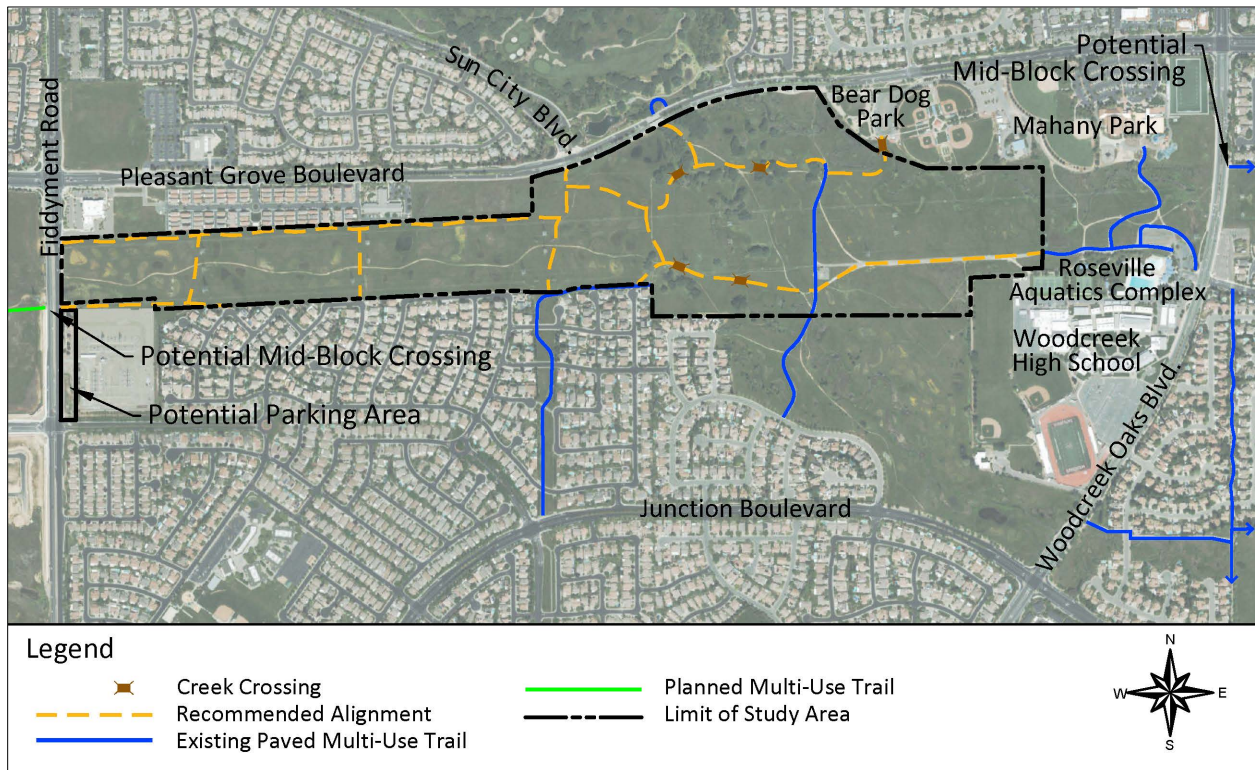
Early in the study process, the consulting team met with regulatory agencies who oversee mitigation measures established when residential construction projects were approved along the southern border of the study area in the early 1990s. At that time, the west half of the Mahany Park Open Space was established as a preserve, and approximately 10 acres of vernal pools were created interspersed with naturally occurring vernal pools. Due to the regulatory history, the presence of these vernal pools and other sensitive resources, including seasonal wetlands, seasonal and perennial creeks, riparian and oak woodland habitat, and the potential for a number of protected species to occur on the site, coordination with the U.S. Fish and Wildlife Service, California Department of Fish and Wildlife, and U.S. Army Corps of Engineers was an important component of this study. Each agency confirmed that the conceptual alignment would be feasible with the appropriate standard permits and agreements.



Constructed vernal pool in the Study Area.

Analysis of existing planning documents, meetings with technical staff, utility companies, regulatory agencies, nearby schools, the Utility Exploration Center, and results from the public engagement components, including two interactive online surveys, led to the recommended alignment shown below. The proposed alignment would result in 2.4 miles of paved trail which provides recreational loops and connects users to all existing and planned trails surrounding the Mahany Park open space.

RECOMMENDED TRAIL ALIGNMENT



When constructed, the proposed trail will allow for year-round use of the area and provide important transportation connections north to south and east to west through the open space by closing gaps in the trail and bikeway system. Adding educational components identifying vernal pools, native plants, and species may help alleviate the impact current usage has had on sensitive habitats and help users understand the importance of staying on paved trails to preserve the protected natural resources in the study area.

The preliminary estimated cost to construct the trail, including a mid-block crossing, on Fiddymment Road, ranges from 4.3 million dollars using standard paving materials to 6.7 million dollars if permeable materials are used throughout. This cost estimate includes all of the remaining steps to complete the project, which include additional traffic studies for a proposed mid-block crossing of Fiddymment Road, geotechnical studies, additional studies required by regulatory agencies, preliminary engineering, environmental reviews, permitting, final design, and construction (see Table 3 in Section 4.7).



User-created dirt paths impact natural resources like this seasonal stream.

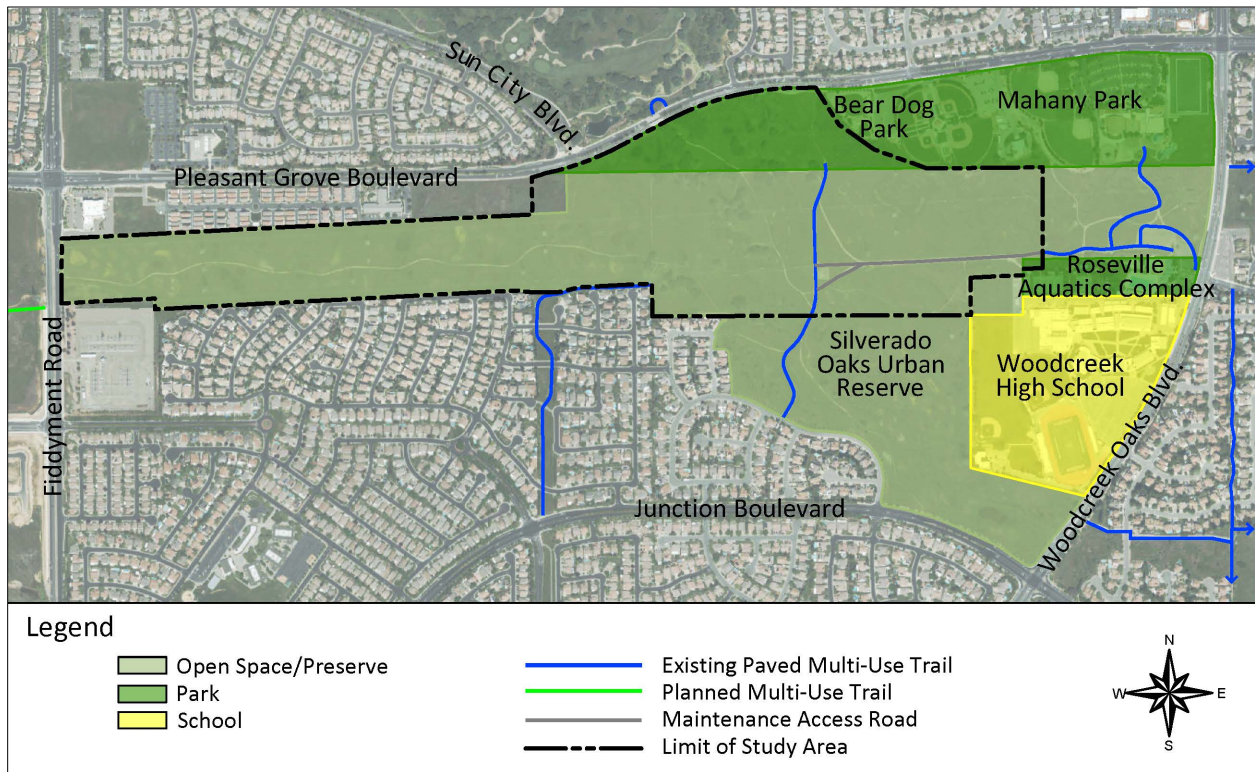
Funding for the next steps necessary to construct the recommended trail alignment has not been identified. As directed by City Council, staff will pursue funding through various federal, state, regional and local sources over the next several years to complete the project. General Fund and Measure B funds were not used for this study and are not used for multi-use trail construction.

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1.0 INTRODUCTION

The approximately 133-acre Mahany Park Open Space Multi-Use Trail Study Area (Study Area) is located in western Roseville between Fiddymment Road and Woodcreek Oaks Boulevard, south of Pleasant Grove Boulevard (Figure 1). Part of the project area is a public park, but most of the area is designated as an open space preserve. It is adjacent to Mahany Park, the Roseville Aquatics Complex, and Woodcreek High School on the east and bounded by residential development on the north and south. The Silverado Oaks Urban Reserve, another open space preserve, is also located immediately south of the Study Area.

Figure 1
SITE LOCATION AND LAND USE



The purpose of this feasibility study is to explore the potential for a paved multi-use trail through the Mahany Park Open Space, resulting in a conceptual alignment, cost estimates and next steps leading to construction. The Study Area includes open space and open space preserves that were established to protect natural resources, including vernal pools, wetlands, creeks, and oak trees. The area is popular for walking, running, and biking and many user-created dirt paths have been established through the area. A paved, connected trail system through the Mahany Park open space may reduce impacts to natural resources, would provide additional recreational opportunities, and would improve the connectivity of the City’s trail system providing more opportunities for active transportation for people of all ages, abilities, and incomes.

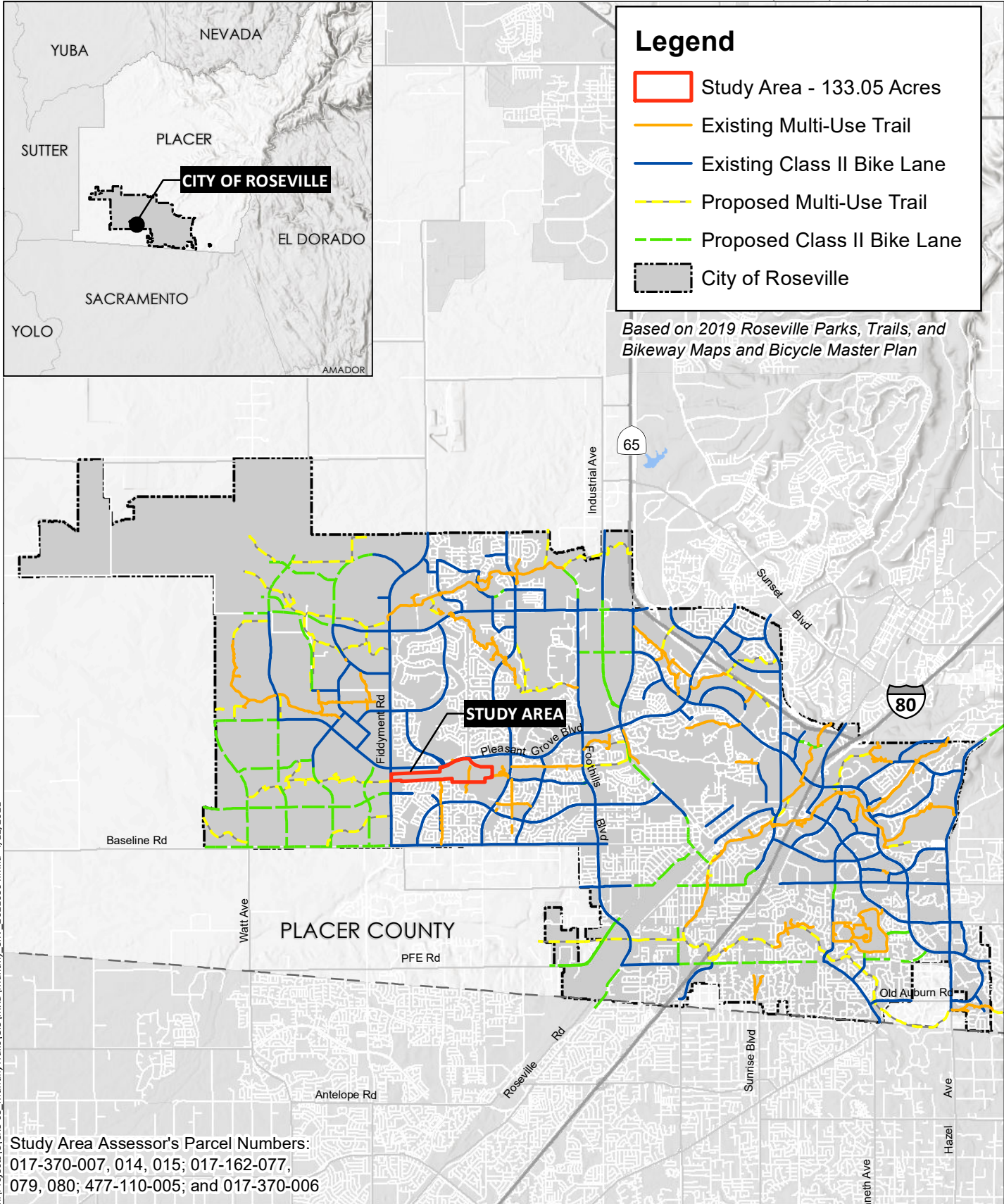
A trail through this area has been considered in several previous planning documents, including the Roseville Open Space Preserve Overarching Management Plan, the City of Roseville Bicycle Master Plan, and Specific Plans for developments adjacent to the area. This document refines the trail alignment

previously considered in those documents based on site conditions, public input, information gathered from regulatory, utility, and City agencies, and the input of the City’s project development team.

The City of Roseville has an extensive trail and bikeway system, which includes over 36 miles of off-street multi-use trails and over 90 miles of Class II bike lanes (Roseville 2021). As shown in Figure 1, paved multi-use trails enter the Study Area at four locations, but there are no complete paved trails through the Study Area. Existing and planned Class I paved, multi-use trails and Class II bike lanes in the City are shown on Figure 2. The recommended alignment would add approximately 2.4 miles of paved, multi-use trails in the Study Area. The proposed trails would close gaps in the existing multi-use trail system by connecting to existing multi-use trails that end at or near the Study Area. When complete, the additional trails would connect Fiddymont Road in the west with Mahany Regional Park, the Roseville Aquatic Center, Woodcreek High School, and ultimately Woodcreek Oaks Boulevard in the east. The additional trails would provide connections between Pleasant Grove Boulevard to the north and the existing multi-use trails that extend through existing neighborhoods to the south.



Existing paved trails in the Study Area end suddenly.



2.0 BACKGROUND

The initial phase of the project consisted of site assessments and research to identify the opportunities and constraints of the Study Area. The Study Area was surveyed by biologists and arborists to assess and document the existing natural resources that have the potential to limit improvements. Landscape architects assessed the existing use, recreation amenities and infrastructure, demographics of the surrounding community, and school locations and attendance areas to identify community needs, opportunities, and constraints. The consultant and technical teams met with regulatory agencies and utility companies to identify design requirements and confirm the development approval process. The consultant team reviewed existing planning documents including trail design guidelines, specific plans, the City General Plan. Additionally, on-site trail use counts and an extensive public engagement component consisting of two interactive online surveys were used to gather information about existing and desired use patterns, current access points and desired access points, and preferred trail alignments and amenities.

Three alternative alignment options were developed using the opportunities and constraints identified in the Existing Conditions Report and input from City staff. Prior to the second public engagement effort, the alternative alignments were reviewed with environmental regulatory agencies to ensure that they could be permitted in the open space preserve. Following this preliminary environmental review, the alternative alignments were presented for public comment in the second virtual survey.

2.1 EXISTING CONDITIONS REPORT

The Existing Conditions Report documented the existing conditions, identified design opportunities and constraints, and provided a summary of applicable design guidelines (*Mahany Park Open Space Trail Existing Conditions Report - Appendix A*). The Study Area has a well-developed network of informal dirt paths as well as abundant natural resources, including vernal pool complexes in the western half of the site and mature oak trees and creeks in the eastern half of the site, which are shown on Figure 3. Additionally, there are both overhead and underground utilities throughout the Study Area. Opportunities and constraints are discussed in detail in Section 2.1.2 and identified in Figure 4.

Figure 3
EXISTING CONDITIONS



2.1.1 Existing Documents

A number of existing documents are relevant to this project because they include conceptual alignments for a trail through the Study Area or goals and requirements that should be considered during trail design. These documents are discussed in detail in the Existing Conditions Report (Appendix A) and are summarized below:

- The *Roseville Open Space Preserve Overarching Management Plan* (OSPOMP) provides a universal approach and specific goals for open space management, maintenance, and monitoring in all City open space. The OSPOMP replaces individual management plans written for each open space as they were established. It specifically discusses bike trails and related amenities, defines different types of open space management areas, and includes recreation goals and actions related to the installation of trails within the Study Area. The OSPOMP includes a conceptual alignment for a Class I bike trail within the Study Area, and includes goals and recommendations to discourage user-created trails through sensitive habitats, reclaim user-created paths in open space preserves, protect biological resources by discouraging vandalism, and off-leash dogs, and encourage safe trail use (Roseville 2011). Since the majority of the Study Area is an open space preserve established to preserve natural resources, any trail in the area must meet the goals of the OSPOMP.
- The *City of Roseville General Plan* (General Plan) includes Circulation, Open Space and Conservation, and Parks and Recreation Elements which focus on the preservation and enhancement of the open space and trail networks. The General Plan includes planned Class I bikeways crossing through the Study Area both east to west and north to south. The General Plan elements address development of a bikeway network, including through the Study Area, and access to open space areas for recreation and education to the extent possible while preserving and enhancing natural resources (Roseville 2020). Design of a new trail must address the multiple goals of recreation, education, circulation, and preservation of natural resources.
- The *City of Roseville Bicycle Master Plan* (BMP) guides bikeway policies, programs, and development standards within the City of Roseville. The BMP identifies four Class I bikeways that terminate at or in the Study Area and proposes two additional segments of Class I bike trail within the Study Area, consisting of a north-south trail connecting the existing bikeways and an east-west trail from Mahany Park to Fiddymont Road. It also encourages associated support amenities, such as wayfinding signage, trail maps, and mile markers (Roseville 2008). Standards established in the BMP should be incorporated into the trail design.
- The *Del Webb Specific Plan, Northwest Roseville Specific Plan, North Roseville Specific Plan, and Sierra Vista Specific Plan* all include portions of, or are adjacent to, the Study Area. Each specific plan has a Circulation Element and all are consistent with General Plan goals for an extensive bikeway network in the City that include connections through the Study Area. The specific plans also address the importance of preserving open space and natural resources, including vernal pools and oak woodlands. A multi-use trail through the Study Area is an integral part of the bicycle/pedestrian master plans in the circulation elements in each of these specific plan areas.
- The *City of Roseville Design and Construction Standards* (City Standards) provide requirements for the design and construction of civil improvements within the City, including bikeways. Design of the trail through the Study Area must meet the minimum standards established in the City Standards.

- The City of Roseville Flood Damage Prevention Ordinance (Flood Ordinance) requires that new development not increase the base flood height by more than one-tenth of a foot in areas where a floodplain elevation has been established but no floodway has been designated. The Kaseberg Creek East Branch is subject to this requirement. Design of the creek crossings must meet the standards established in the Flood Ordinance.

2.1.2 Opportunities and Constraints

The existing conditions in the Study Area were assessed through site walks, trail user counts, interviews with key stakeholders, and biological surveys. Additionally, the demographics of the community and neighborhood schools were researched. This information was used to identify current use of the open space, the opportunities that could facilitate trail construction or improve trail user experience, and constraints that limit where a trail can be located. A feature may simultaneously be both an opportunity and a constraint. Opportunities identified on the site include:



Mature oak trees are a unique feature of the Study Area.

- Connections to existing paved multi-use trails including the bicycle/pedestrian trail undercrossing of Pleasant Grove Boulevard;
- Gravel maintenance access road to lift station;
- User-created dirt trails that indicate the routes users wish to take;
- City monitoring well and potential future permanent well, which may allow construction of joint access facilities;
- Woodcreek Oaks High School that uses the area for education and sports activities;
- A pipe culvert that provides a crossing of one of the smaller seasonal creeks;
- Points of interest that provide good views, unique educational opportunities, or opportunities for trail connections. Photographs of the points of interest are included in Appendix B of the Existing Conditions Report (Appendix A);
- Natural resources such as vernal pools, oak trees, and creeks that provide visual interest and educational opportunities; and
- Mature oak trees that provide shade.

Constraints identified on the site include:

- Existing utilities including overhead utility lines, sewer lift station, and City well site;
- Surrounding residences that are sensitive to changes in noise, traffic, and the visual characteristics of the Study Area;
- Existing walls and fences around the perimeter that limit access points; and

- Sensitive natural resources including vernal pools and seasonal wetlands, mature oak trees, creeks, and riparian habitats.

These opportunities and constraints are summarized in Figure 4, located following page 8, and discussed in more detail below.

2.1.2.1 Constructed Features

Although the Study Area is an open space, there are many constructed features on site, both formal and informal. Formal improvements include a paved multi-use trail connecting to Silverado Oaks Urban Preserve to the south; a gravel maintenance access road connecting the sewer lift station to Mahany Park to the east; perimeter post and cable fences, gates, retaining walls, and soundwalls; utilities; and preserve signs. Utilities are a particular constraint to trail design as extensive overhead power lines and high voltage transmission lines and towers belonging to Pacific Gas and Electric (PG&E), Western Area Power Authority (WAPA), Sacramento Municipal Utility (SMUD), and Roseville Electric run through the open space, and a sewer trunk line with a lift station crosses the eastern half of the site from north to south (see Appendix A, Figure 8). Additionally, a monitoring well is present near the intersection of Sun City Boulevard and Pleasant Grove Boulevard. If this site is selected for a permanent well location, the new well building would likely be located on the east side of the parcel near the existing monitoring well and is expected to be constructed between 2023 and 2025.

Informal improvements consist of a large network of user-created dirt paths and creek crossings. The existing dirt paths illustrate where people want to travel through the Study Area and also indicate what slopes and distances they are willing to navigate. These informal paths are also used extensively by Woodcreek High School classes and sports clubs. Along the informal paths users have constructed bike jumps, “fairy gardens” with small figures and structures, and makeshift bridges, typically of plywood, scrap lumber, or branches. Informal paths are useful to the design process because they clearly show how users wish to access the site. However, they often conflict with the City’s goals to protect natural resources and create hazards that result in public safety concerns.



Example of user-created bridge over Kaseberg Creek East Branch constructed of pallets.

2.1.2.2 Biological Resources

Although most of the Study Area is annual grassland habitat, sensitive habitats including vernal pools and seasonal wetlands, perennial and seasonal creeks, riparian habitat along Kaseberg Creek, and oak woodland composed of protected native oak trees are also present (Figure 4). Vernal pools are

naturally-occurring depressions in soils containing a hardpan or other impermeable layer that prevents water from draining through the soil. They fill with water during the winter and spring rainy season. Vernal pools support unique plants and animals that are found only in California’s central valley, including some endangered and threatened species. Seasonal wetlands are similar to vernal pools in that they are wet only in the winter and spring, but typically hold water for a shorter time or may only have saturated soils and no water on the surface. Seasonal wetlands are also important habitat for many animals and plants. The network of creek channels in the Study Area includes Kaseberg Creek East Branch, a perennial creek that flows year-round, and Kaseberg Creek South Branch, which includes two smaller seasonal creek channels that only carry water after rain events. Riparian habitat is found along Kaseberg Creek East Branch (Figure 4) and includes plants that thrive on the year-round water such as willows and cottonwoods. Groves of mature oak trees form oak woodland habitat in the eastern half of the site. In addition to providing food and shelter for many species of wildlife, oak trees with a trunk greater than six inches in diameter are protected by the City of Roseville Tree Ordinance.



Riparian areas are important habitat for mallards and other species.












The potential for special-status species, plants and animals that are listed on the federal or state endangered species list or otherwise legally protected, to occur on the site was assessed. Thirty-three special-status species were identified with the potential to occur on the site. Although only one of these species, an active white-tailed kite nest, was observed during the general site surveys, those surveys were not targeted specifically for those species, so more may be present. The Biological Constraints Report provides a detailed discussion of natural resources in the Study Area, special-status species that might be found in the Study Area, and recommended design and construction measures to avoid or minimize impacts to sensitive biological resources (Appendix B).

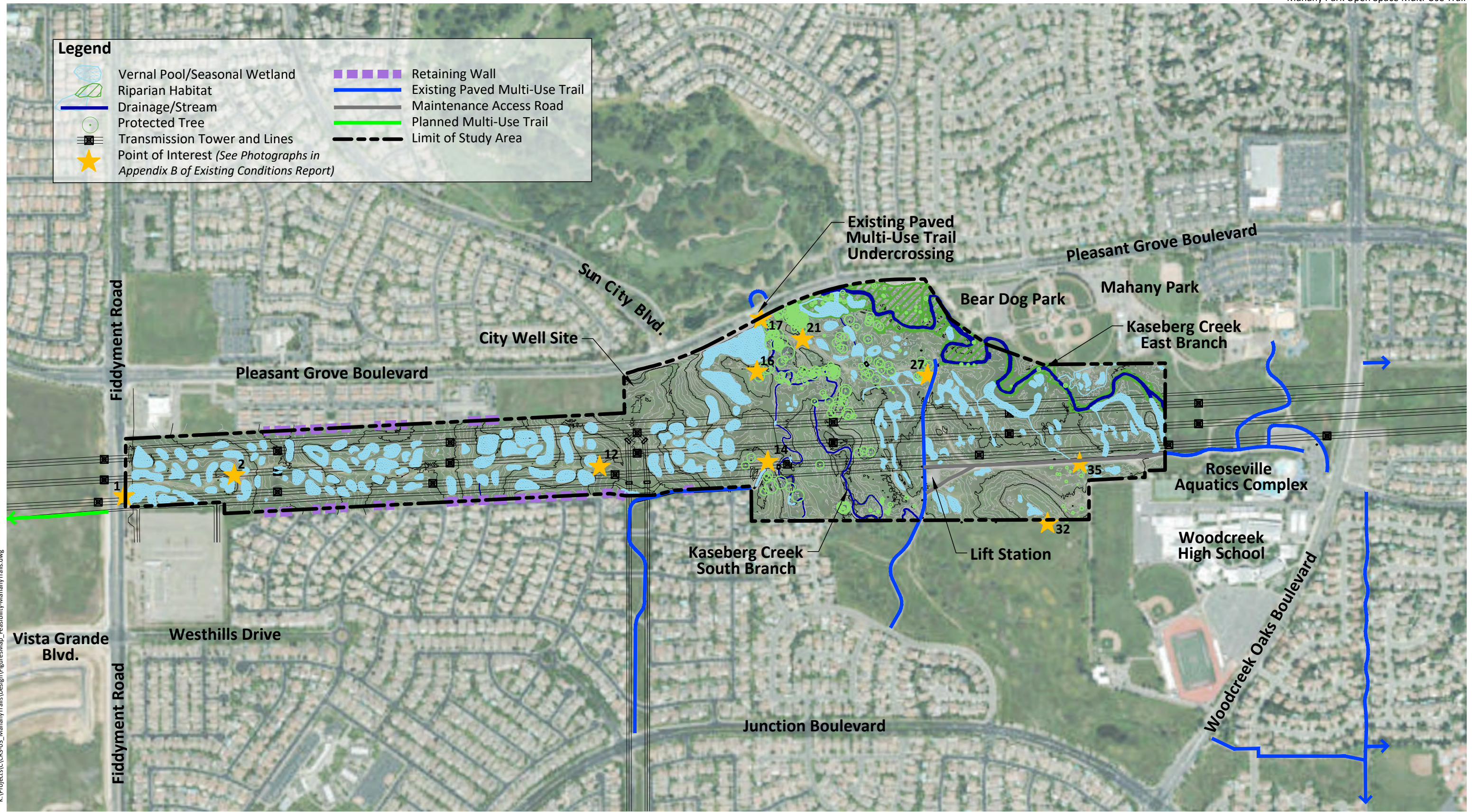


The Study Area is home to many species; including acorn woodpeckers.

The location of sensitive habitats is an important constraint to trail design. Impacts to them should be avoided to the greatest extent possible to be consistent with the City’s goals for preservation of natural resources as established in the 2035 General Plan, Open Space and Conservation Element, and the requirements of the OSPOMP. However, sensitive habitats also provide opportunities for scenic views, public education, and providing shade for trail users.

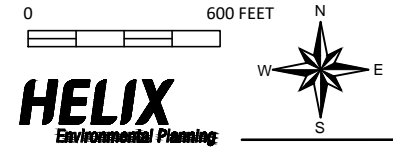
Legend

	Vernal Pool/Seasonal Wetland		Retaining Wall
	Riparian Habitat		Existing Paved Multi-Use Trail
	Drainage/Stream		Maintenance Access Road
	Protected Tree		Planned Multi-Use Trail
	Transmission Tower and Lines		Limit of Study Area
	Point of Interest (See Photographs in Appendix B of Existing Conditions Report)		



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0 600 FEET



HELIX
Environmental Planning

Opportunities and Constraints

Figure 4

2.1.3 Design Guidelines

Due to the utilities and protected natural resources in the Study Area, additional design requirements apply to the project. In addition to the City Standards, design of the trail must also be consistent with the OSPOMP and access and setback requirements of the various utility companies. Since the design guidelines vary between agencies, shared improvements such as gates and access roads should be designed to meet the most stringent requirements. The applicable design guidelines are included in Section 4.0 of the Existing Conditions Report (Appendix A) and summarized below.

- Trail shall be 10 feet wide with a minimum 2-foot-wide graded shoulder and one shoulder shall consist of class II aggregate base and the other of decomposed granite.
- Trail segments serving as maintenance roads must be a minimum of three-inch-thick asphalt over eight-inch-thick aggregate base.
- Post and cable fence must be a minimum of three feet from paved surface.
- Width of access points for maintenance vehicles shall be at least 20 feet.
- No excavation within 10 feet of any SMUD structure.
- Creek crossings must not increase flood elevation by more than one-tenth of a foot.
- Safety and directional signs are required. Interpretive signs may be installed as appropriate.

2.2 REGULATORY AGENCY COORDINATION

Many of the sensitive biological resources are regulated by state and federal agencies. Federally-protected species are regulated by the U.S. Fish and Wildlife Service (USFWS). The U.S. Army Corps of Engineers (USACE) regulates creeks and certain other wetlands that are subject to Federal law. The California Department of Fish and Wildlife (CDFW) regulates creeks, riparian areas, and species protected by the state of California. Creeks, seasonal wetlands, vernal pools, and other water bodies are regulated by the Regional Water Quality Control Board (RWQCB). Consultation and permits from these agencies are required prior to impacting a regulated resource. As part of the preliminary design process, these agencies were contacted to determine if the conceptual design was feasible, identify any agency concerns or standards pertaining to design of the trail, and review the permit process. A summary of the discussions with the regulatory agencies is included in Appendix C.

Since the majority of the site was established to protect the vernal pool habitat and because vernal pools are subject to regulation as a wetland and as habitat for special-status species, avoiding or minimizing impacts to vernal pools is a prime concern for the agencies described above. Minimizing impacts includes avoiding direct impacts caused by constructing the trail through a pool and minimizing indirect impacts, such as changing the drainage patterns around vernal pools with grading and paving. To minimize impacts to this sensitive habitat, the trail should be located away from the pools whenever possible.

Creek crossings were another major point of concern to regulatory agencies because there is the potential to impact water bodies and riparian habitat. Constructing a bridge that completely spans the channel, rather than installing a pipe or box culvert is one way to minimize impacts to these resources. The trail should also be kept outside of the riparian habitat whenever possible.

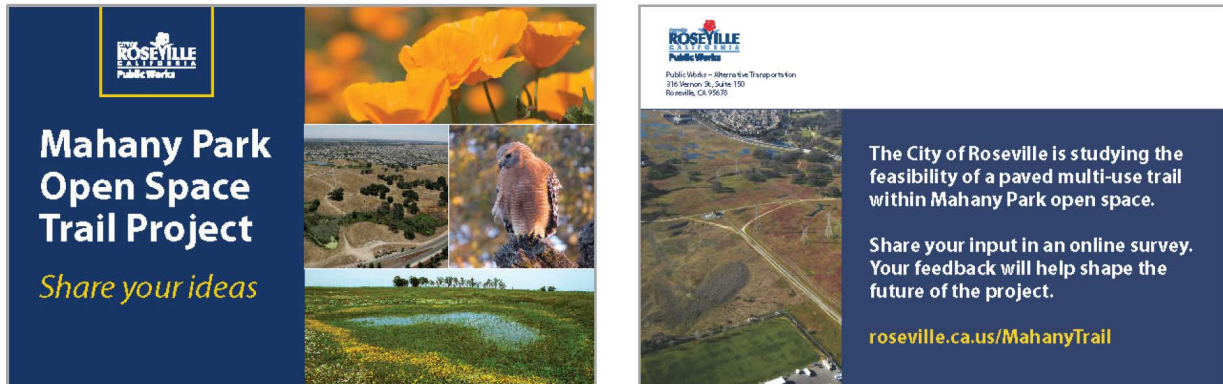
If special-status species, as described in Section 2.1.2.2, are found in the Study Area in the future, there may be additional design requirements to avoid or minimize impacts to them. Recommendations for additional studies and permits are discussed further in Section 4.

2.3 PUBLIC ENGAGEMENT

Public engagement was an important part of the project that directly influenced the development of the recommended trail alignment. Due to social distancing requirements caused by the COVID-19 pandemic, all outreach efforts were virtual. Members of the public were informed about the project and opportunities to provide their input through the City’s social media, e-mail lists, and [project website](#); signs posted in the Study Area; a local TV news story; and direct mailing to local residents. In lieu of in-person workshops, two online surveys were developed to inform and engage the public in the process of developing a recommended trail alignment.

2.3.1 First Online Survey

The purpose of the first online survey was to introduce the project, share the reasons why it is being done, and gather information on how respondents currently access and use the Study Area and how they would like to access and use it. The survey also gathered information about preferred trail amenities, and views about the pros and cons of a paved multi-use trail in the Study Area. The survey was available online from May 26, 2020 to June 12, 2020. It was publicized by the City through email to more than 48,000 recipients, social media (Facebook, Twitter, Instagram, and Nextdoor) resulting in more than 27,000 impressions, and direct mailing to more than 7,500 households in the neighborhoods surrounding the Study Area. Informational signs with the survey website were also placed around the Study Area. Additionally, the City shared an informational video on its YouTube, social media, website, and e-mail channels and ABC 10 aired a news story about the project. A total of 1,306 responses were received.



Front

Back

Postcard mailed to residences within a half-mile of the Study Area notifying them of the first online survey.



Social media post used to publicize the first online survey.



Informational signs posted around the open space to advertise the first online survey.

The results of the first online survey indicated that the existing gravel access road on the east and the gate and dirt path at Fiddymment Road are the two most-used access points, followed by Mahany Park’s parking lot, Silverado Oaks Urban Reserve on the south, Pleasant Grove Boulevard bicycle/pedestrian underpass, and Pleasant Grove Boulevard by Bear Dog Park. The most desired access points are the existing gravel maintenance road on the east, the dirt path at Fiddymment Road, and Bear Dog Park on Pleasant Grove Boulevard. The most used and most desired access points are shown on Figure 6 of the Existing Conditions Report (Appendix A). There was strong support for including trash cans, benches, dog waste stations, and directional, wayfinding, and educational signs in the project as well as significant interest in exercise stations. Overall, there was strong support for the concept of a paved trail, with almost half the respondents indicating they have no concerns; however respondents expressed a desire to retain dirt trails for aesthetic and recreation purposes. Additionally, there was concern that improved access from the surrounding neighborhood may lead to increased traffic. A summary of the first online survey is included in Appendix D of the Existing Conditions Report (Appendix A).

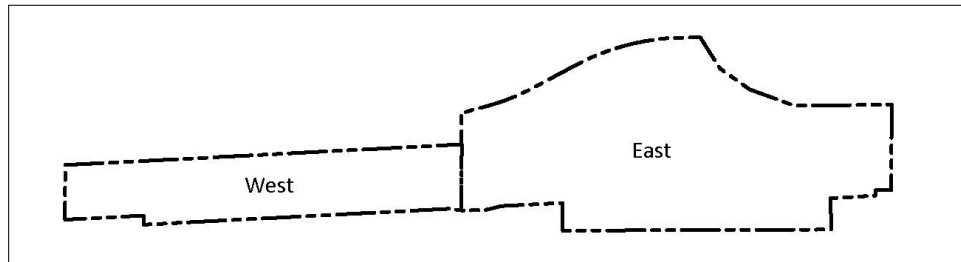
The results of the first online survey were used to develop potential trail alignment options. Many of the suggested amenities have been included in the conceptual design, as discussed in Section 3.3. Additionally, the desire to retain dirt paths led to the consideration of expanded shoulders along the proposed trail. Potential off-site parking locations at the west end of the Study Area were considered to address concerns about increased traffic in residential neighborhoods.

2.3.2 Second Online Survey

The purpose of the second online survey was to present the options for a trail alignment through the Study Area and gather feedback to inform a final recommendation. The trail alignment options presented in the survey were developed based on the opportunities and constraints and biological resources reports, results of the first online survey, regulatory agency coordination, and City goals and policies.

To simplify the presentation of the alignment options, the Study Area was split into east and west sections (Figure 5). Three alignment options were developed for the western half of the Study Area and two alignment options were developed for the eastern half of the Study Area. Any of the western options could be used with either of the eastern alignment options.

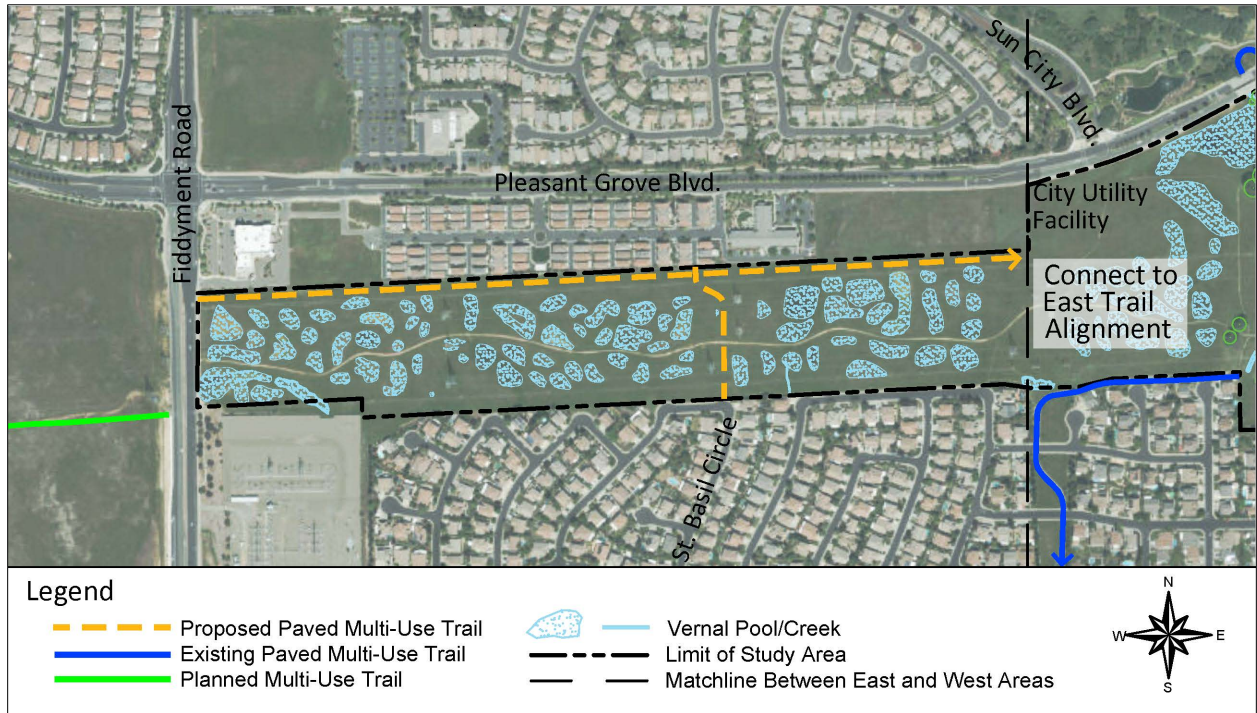
Figure 5
STUDY AREA SECTIONS



2.3.2.1 Western Area Options

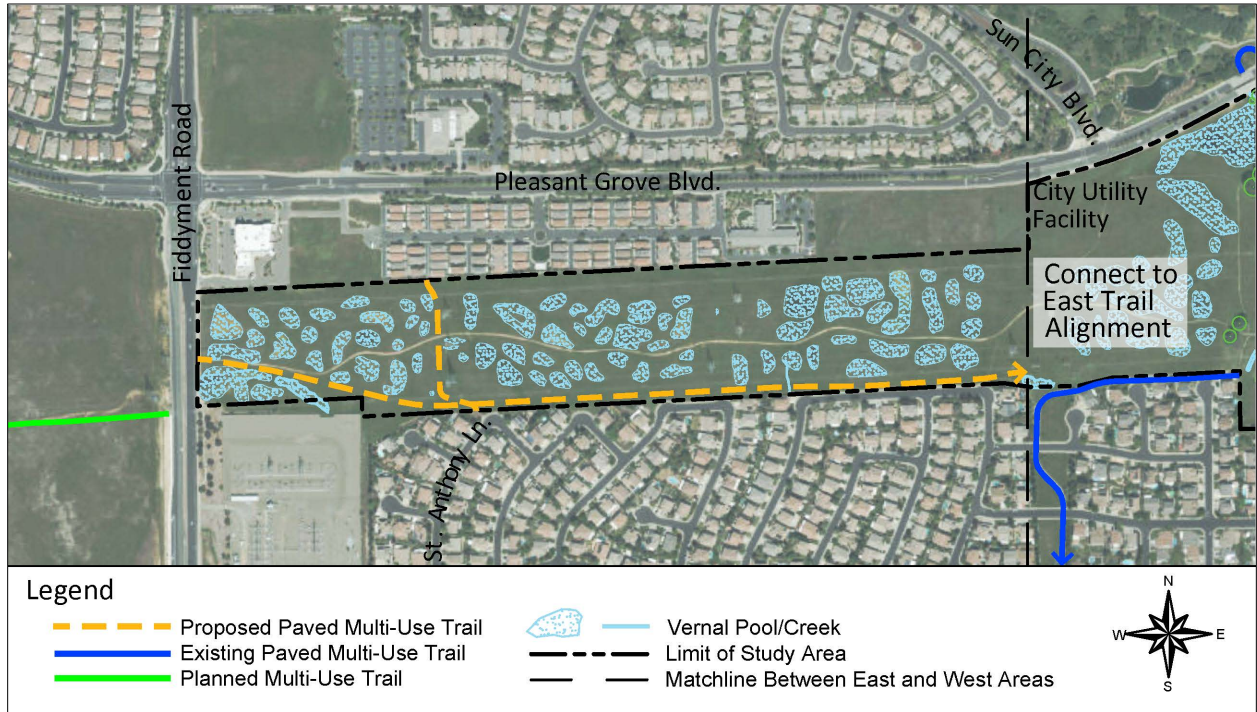
Western Option A (Figure 6) located the proposed trail along the northern edge of the Study Area between the utility lines and the northern property boundary. This option included a connection between the residential developments to the north and south of the Study Area at Saint Basil Circle. This option provides a connection to Fiddymont Road closest to the existing signalized intersection with Pleasant Grove Boulevard.

Figure 6
WESTERN OPTION A



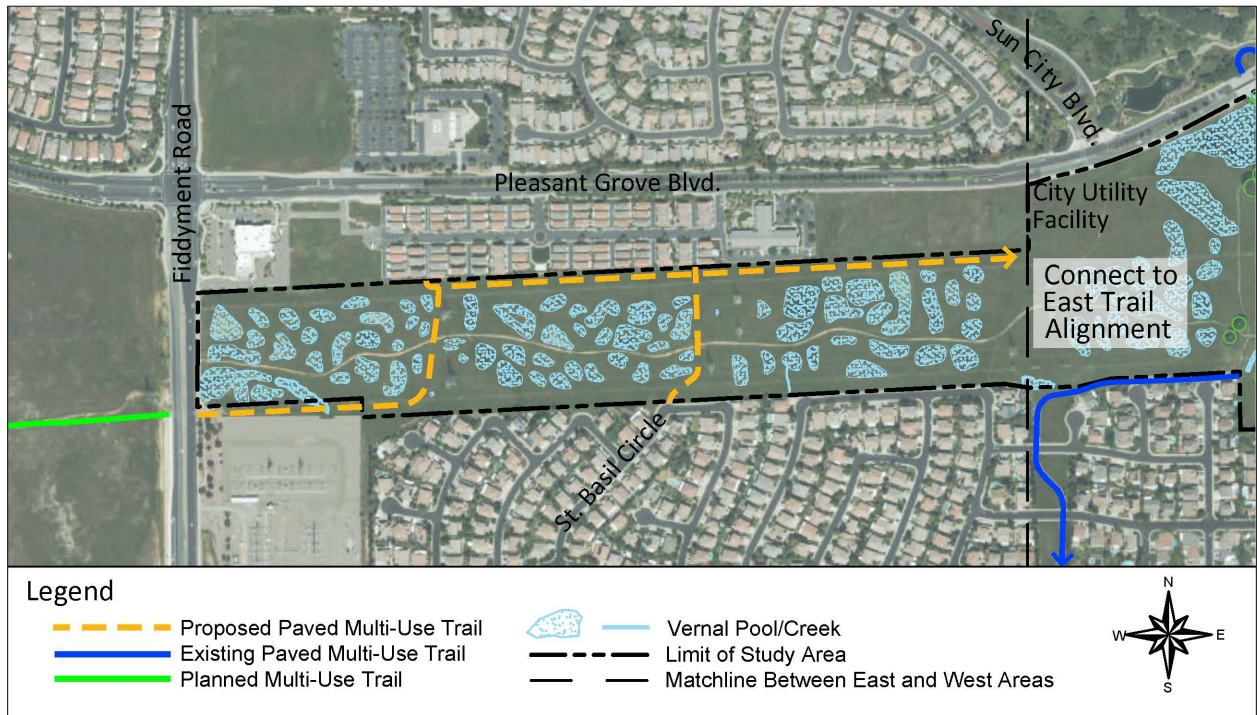
Western Option B (Figure 7) located the proposed trail mostly along the southern edge of the Study Area, veering north through the vernal pool complex for the final 900 feet to meet Fiddymment Road at the existing gate near the center of the western property line. This option included a connection between the residential developments to the north and south of the Study Area at Saint Anthony Lane.

Figure 7
WESTERN OPTION B



Western Option C (Figure 8) located the majority of the proposed trail along the northern boundary, before curving south through the vernal pool complex to extend along the southern boundary for the western 800 feet. It also includes two connections between the residential developments to the north and to the south of the Study Area. This option connects to Fiddymment Road directly across from the planned trail in the Sierra Vista Specific Plan and would require a mid-block crossing on Fiddymment Road. Although this option provides the most direct connection to the City’s bikeway network, the southern connection to Fiddymment Road would require construction on the City-owned parcel to the south and will directly impact a vernal pool.

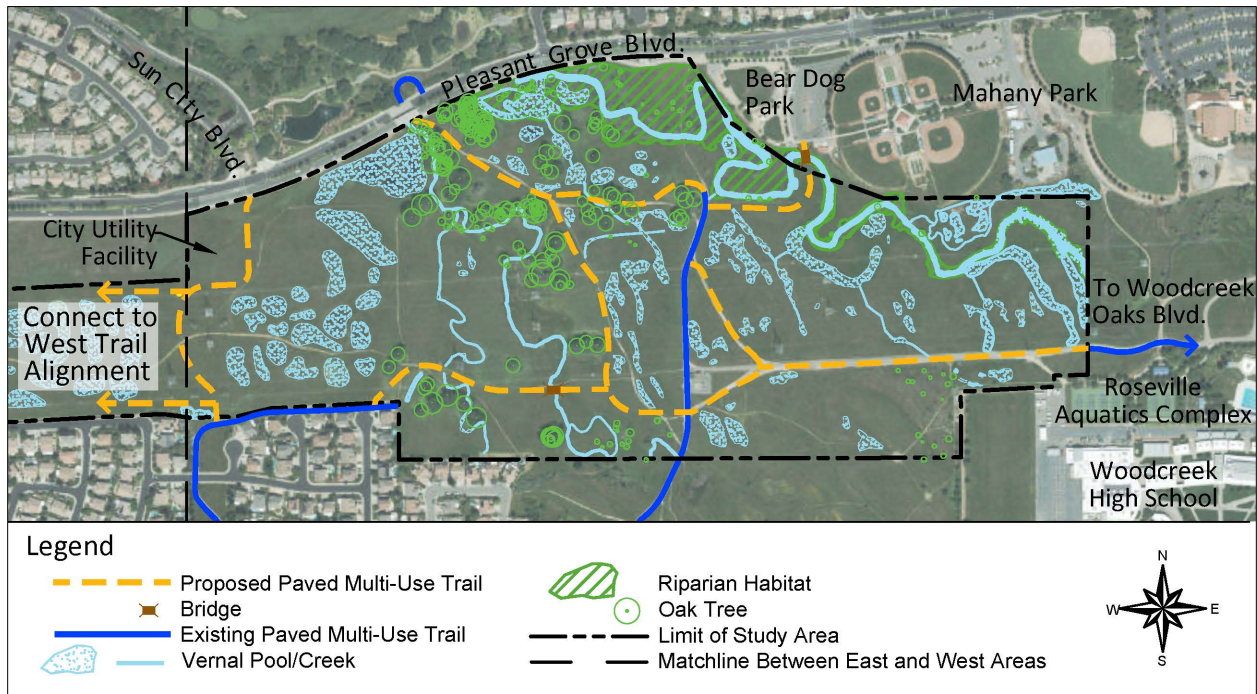
Figure 8
WESTERN OPTION C



2.3.2.2 Eastern Area Options

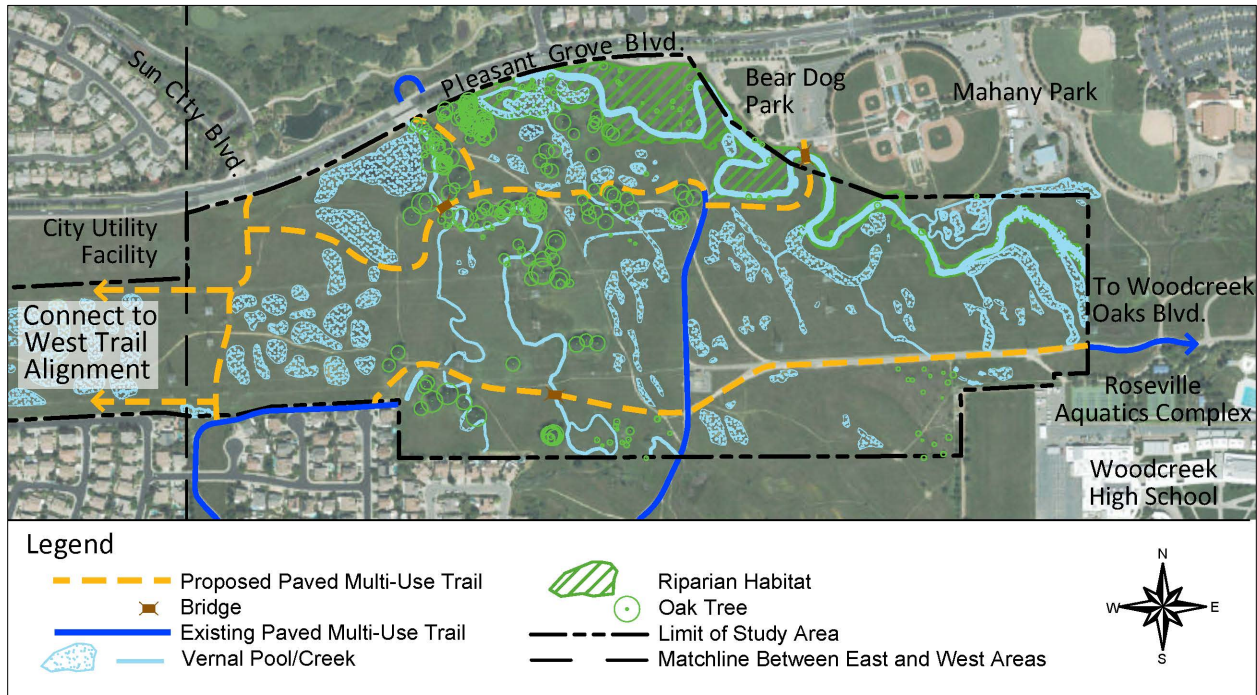
Eastern Option A (Figure 9) proposed a small loop trail in the eastern third of the Study Area consisting of the existing multi-use trail and one of the largest existing dirt paths. This option includes a bridge over Kaseberg Creek for a year-round connection to Bear Dog Park, connections to the existing multi-use trails adjoining the Study Area, and connections to the signalized intersection of Sun City Boulevard and Pleasant Grove Boulevard. This option includes a second bridge over the seasonal creek to allow year-round use of the trail.

Figure 9
EASTERN OPTION A



Eastern Option B (Figure 10) proposed an approximately one-mile loop trail connecting the existing multi-use trails in and adjacent to the Study Area. A new trail segment connects the signalized intersection of Sun City Boulevard and Pleasant Grove Boulevard and the existing greenbelt bike trail just south of the Study Area. This north-south segment is connected to the existing multi-use trail in the Study Area by two trail segments to form a loop. This option includes three new bridges allowing year around use of the trail network through the Study Area. This option also includes a connection to Bear Dog Park and all the existing multi-use trails adjoining the Study Area.

Figure 10
EASTERN OPTION B



The second online survey was available between October 31 and November 13, 2020. The survey was publicized via the City’s existing communication links, including emails to almost 55,000 recipients, newsletters, social media (Facebook, Twitter, Instagram, and Nextdoor), and lawn signs with the website address that were placed along paths in the Study Area and in the neighboring community directing people to the survey. This outreach effort resulted more than 15,200 impressions. A total of 326 survey responses were received. The summary of the responses to the second virtual survey is included in Appendix D.

Overall, respondents preferred Western Option A, which locates the trail along the north boundary of the site, due to its connection to Fiddymont Road and the location of the north-south connection to residential neighborhoods. There was also significant interest in Western Option C due to the potential mid-block crossing connection to trails in the Sierra Vista Specific Plan Area. However, this option also generated concerns about increased costs and longer schedule due to environmental impacts because of the trail’s proximity to vernal pools.

Eastern Option B, which provides the longer loop trail, and includes areas of shaded trail through the oak woodlands, was slightly preferred over Eastern Option A.

The survey format also encouraged written comments from survey participants. Common issues of concern included safety in crossing Fiddymment Road and other larger streets, potential disruptions or increase in parking/traffic in nearby neighborhoods, impacts to natural resources, and the desire for continued use of the existing dirt paths. Respondents also noted suggestions for other trail amenities, including privacy fences, benches, dog waste stations, exercise stations, bathrooms, directional and educational signage, and shade.

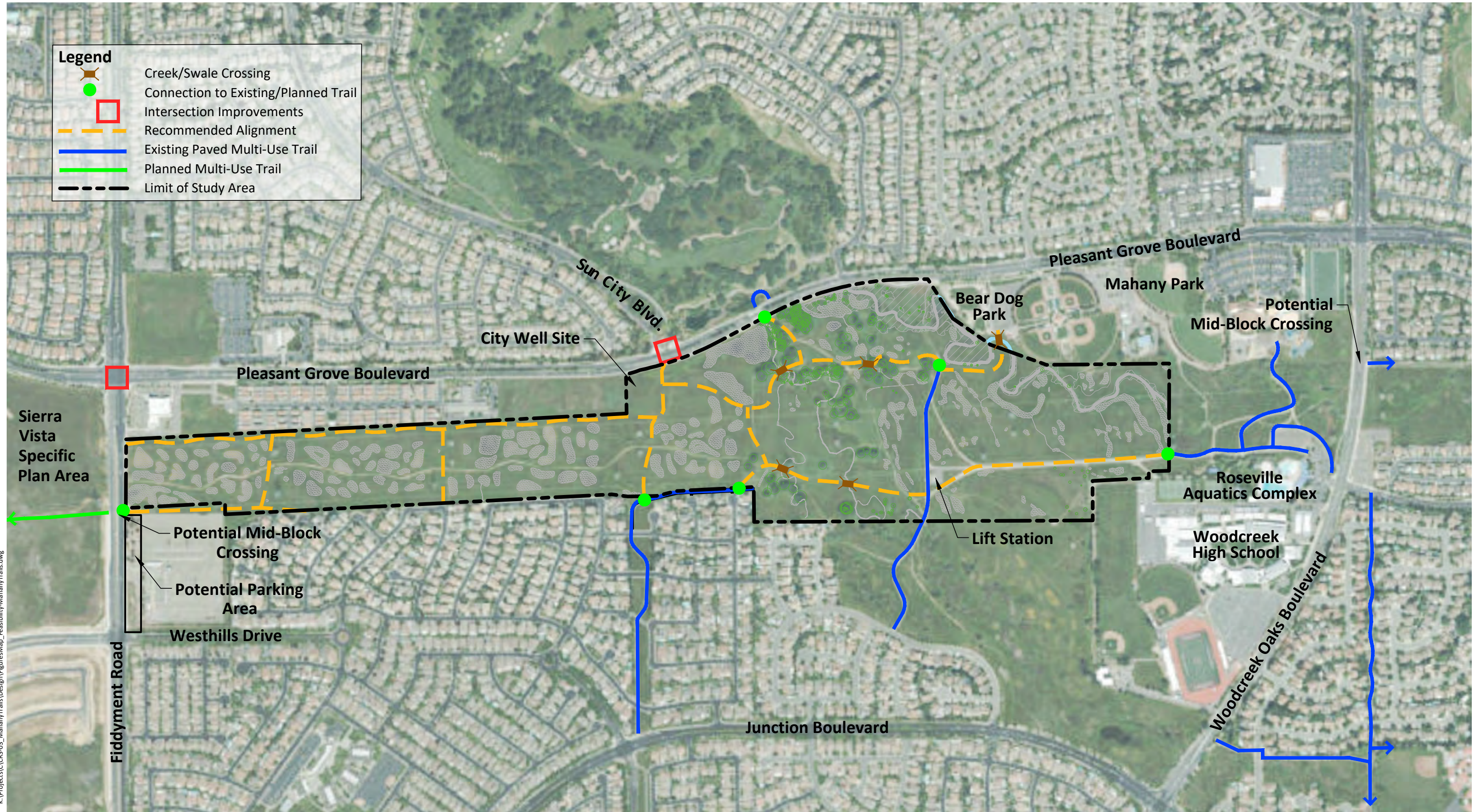
3.0 RECOMMENDED PROJECT

The recommended project was developed using information from existing planning documents; site assessments resulting in the Biological Resources and Opportunities and Constraints Reports; interviews with stakeholders; a robust public engagement program including two online, interactive surveys; consultation with regulatory agencies; and ongoing coordination with City departments. These efforts identified a recommended project which will:

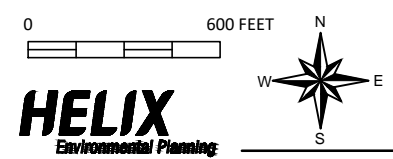
- Provide multiple, connections to the surrounding neighborhoods, schools, trails, roads, and parks;
- Provide permanent all-weather crossings of creeks in the Study Area to allow safe use year-round;
- Protect natural resources, including vernal pool habitat;
- Maintain required access for existing utilities;
- Close gaps in the trail and bikeway system to provide safe, convenient bicycle/pedestrian connections to recreational, educational and employment opportunities for people of all ages, abilities, and incomes; and
- Include a variety of amenities along the trail.

3.1 ALIGNMENT

The recommended alignment (Figure 11) combines elements of multiple options presented in the second online survey. It addresses gaps in the existing bikeway system with approximately 2.4 miles of new trail connecting to all of the existing multi-use trails. The recommended alignment provides access through the open space preserve while protecting sensitive habitats and provides opportunities for users to learn more about why it is important to protect these areas. It provides safe, convenient bicycle/pedestrian connections to recreational, educational, and employment opportunities for people of all ages, abilities, and incomes.



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HELIX
Environmental Planning

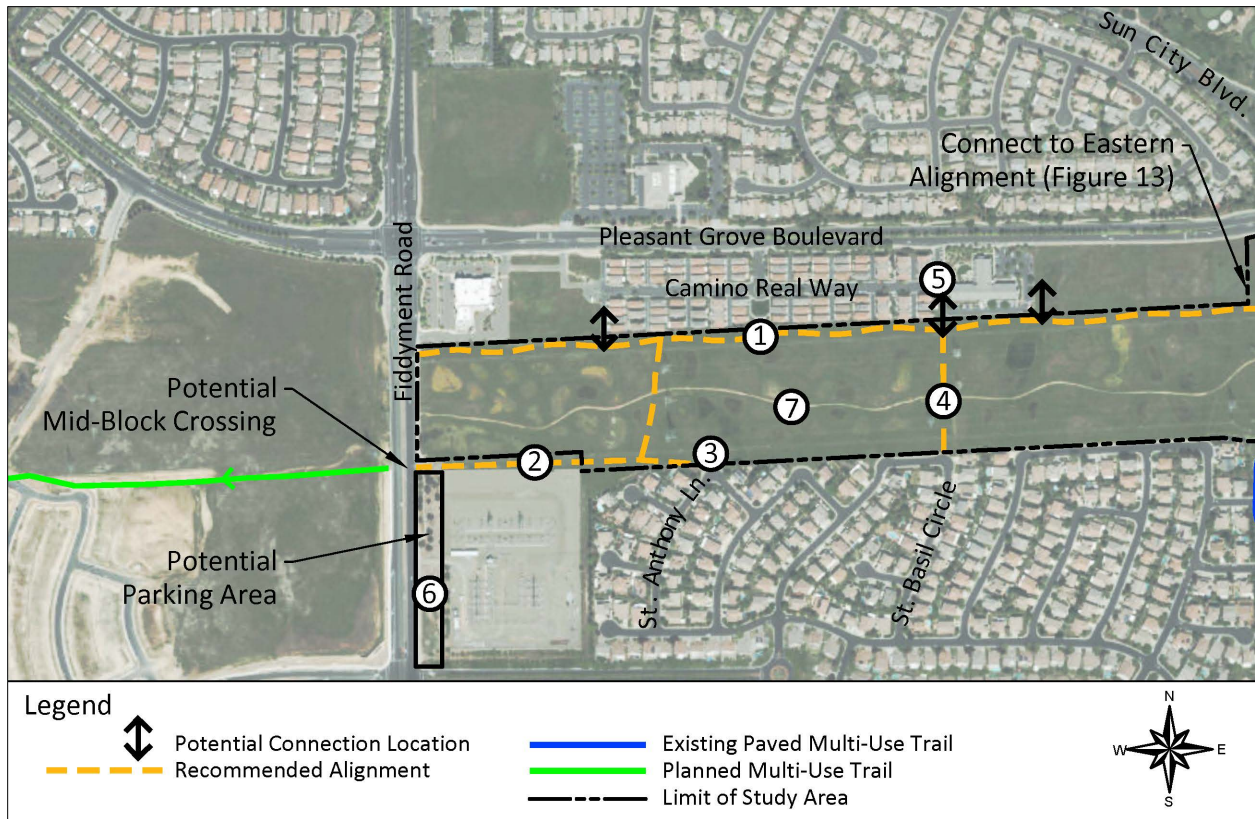
Recommended Trail Alignment

Figure 11

3.1.1 Recommended Western Alignment

The recommended western alignment combines elements of Western Options A and C. Key features of the recommended alignment in this area are shown in Figure 12 and described below.

Figure 12
RECOMMENDED WESTERN ALIGNMENT



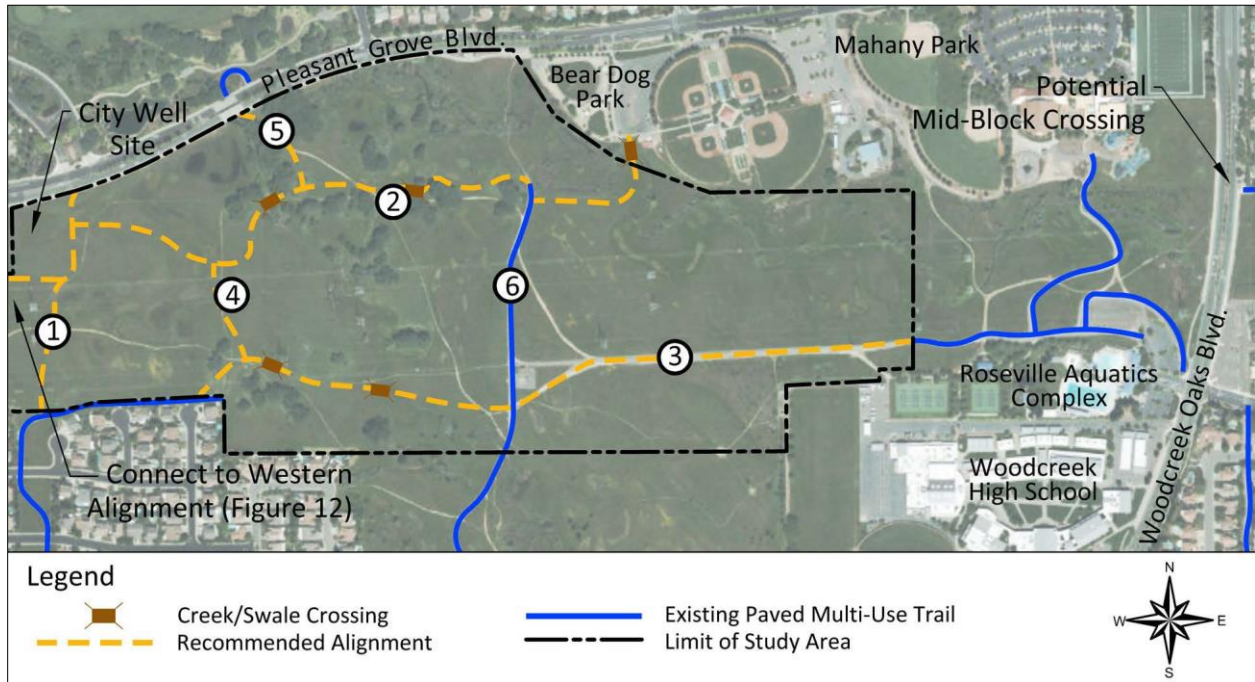
1. The recommended trail alignment meanders between the existing utility lines and the northern property boundary of the Study Area. This alignment places the majority of the trail away from vernal pools and overhead utility lines. Additionally, the width of the area allows the trail to be set back from adjacent residences to the north. The trail meanders gently through the area to provide interest for users, a concern expressed in the second online survey. This trail segment offers a connection to Fiddymment Road close to the Pleasant Grove Boulevard intersection to facilitate active transportation connections between neighborhoods, schools, recreational and employment opportunities in west Roseville.
2. This trail segment crosses through the vernal pool complex and runs along the wall adjacent to the existing electrical substation to Fiddymment Road. This location was chosen to take advantage of a break in the vernal pool complex and minimize locating the trail directly adjacent to residences south of the Study Area. This segment will connect with the planned trail in the Sierra Vista Specific Plan area on the east side of Fiddymment Road and will require safety improvements to provide a mid-block crossing.

3. A short trail segment connects the segment described in #2 with Saint Anthony Lane to provide access to the bikeway network from this neighborhood.
4. This trail segment connects the northern trail segment to the neighborhoods in the south. This location was chosen to take advantage of a break in the vernal pool complex, in order to minimize impacts to this habitat, and to provide evenly spaced access to the bikeway network.
5. An access point to the neighborhoods north of the Study Area is needed to provide a connection to the bikeway network, but its exact location has not been determined. Potential connection locations are limited by a number of retaining walls located along the northern boundary of the Study Area. A possible location is an extension of the trail segment described in #4. This location is also located near the Eskaton senior living facility which may facilitate access to the open space for residents with limited mobility. Another possible location is at the west end of Camino Real Way, however there are concerns that either of these connections would worsen already limited parking availability in the neighborhood to the north. Alternately, it may be feasible to include a trail access point with a future project on the currently undeveloped property between Pleasant Grove Boulevard and the recommended trail alignment.
6. This area has been identified as potential off-street parking on City-owned property along Fiddymont Road. This area could provide a parking option on the west end of the Study Area, reducing the potential for people to park in the nearby residential neighborhoods.
7. The dirt path which meanders through the center of the west half of the Study Area, encroaches on the vernal pool complex and is not recommended for improvement as a formal trail, or for continued use. This dirt path should be restored to grassland to reduce impacts to sensitive habitat and special-status species, consistent with the OSPOMP.

3.1.2 Recommended Eastern Alignment

The recommended eastern alignment provides “loop” trails that connect existing trails and many of the most heavily used access points. This design modified Eastern Option B by adding a second short connection between the north and south sides of the loop. Key features of the recommended alignment in this area are shown in Figure 13 and described below.

Figure 13
RECOMMENDED EASTERN ALIGNMENT



1. This trail segment extends the existing multi-use trail from the neighborhood to the south through the vernal pool preserve to the Sun City Boulevard intersection. This central north-south segment is a vital connection in the bikeway network because it connects to the west area trail that leads to Fiddymont Road, to Pleasant Grove Boulevard and the Sun City neighborhood to the north, and to the two trails that form the loop in the east side of the Study Area. This trail segment provides opportunities for education and rest areas with good views across the vernal pool landscape. A City well site is being explored next to this trail segment. Future trail construction will require coordination with the City’s Environmental Utilities department to explore funding opportunities for a shared access facility.
2. The northern trail segment winds around seasonal wetlands and through oak woodlands on the way to Bear Dog Park, which was identified through the public engagement process as one of the most desired access points to the Study Area. This segment creates permanent crossings over the seasonal creek, a small seasonal swale, and Kaseberg Creek and also provides segments of shaded trails, which were identified as highly desired by participants in the public engagement process. The location of this trail segment provides unique opportunities for educational opportunities relating to the oak woodlands, creeks, and riparian habitat.

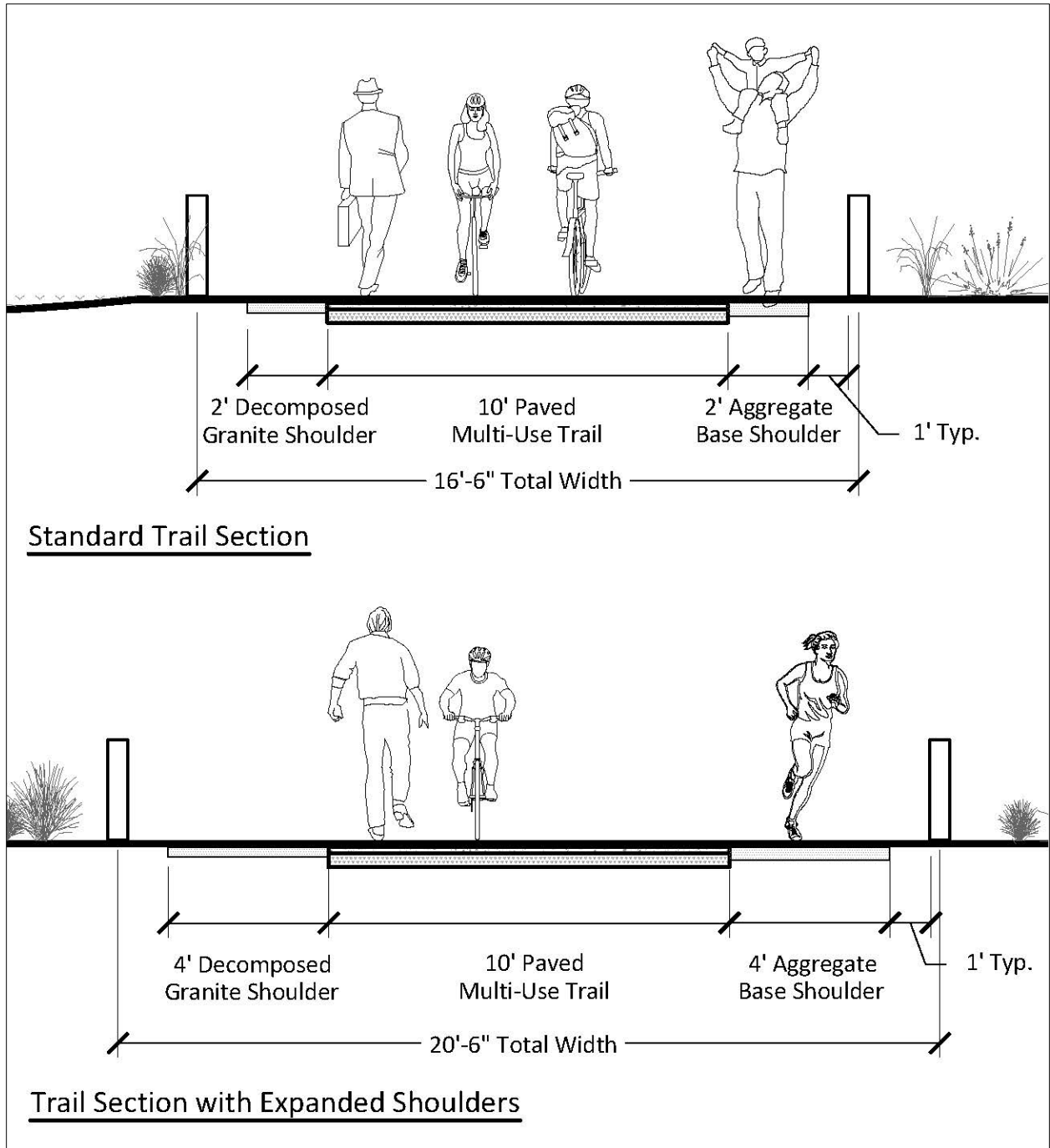
3. The southern trail segment starts at the end of the existing multi-use trail that currently provides connections to Woodcreek High School, the Roseville Aquatic Center, and the eastern portion of Mahany Park. This segment will pave the existing gravel maintenance road and includes two creek crossings, thereby providing year-round access through the site. This connection also provides access to the City bikeway network east of Woodcreek Oaks Boulevard.
4. A short spur trail connects the northern and southern trails (#2 and #3) before they cross the seasonal drainages, forming an inner loop. This short connector trail between the north and south trails provides users with options for length of trail they wish to travel.
5. This trail segment connects northern trail segment (#2) to the existing Pleasant Grove Boulevard undercrossing. This is an important connection because it provides access to the wide sidewalks and Class II bike lanes on the north side of Pleasant Grove Boulevard
6. Trail segments #2 and #3 connect with the existing multi-use trail that runs north/south through the Silverado Oaks Preserve.

3.2 TRAIL DESIGN

The trail will generally use the City Standard trail design in accordance with the current City *Design and Construction Standards*. All of the constructed trails will consist of a ten-foot wide paved trail with one aggregate base shoulder and one decomposed granite shoulder. In response to public comments indicating a desire to retain dirt trails, wider shoulders may be used in some areas to provide additional areas of unpaved trail. Figure 14 shows typical trail sections.

The City Standards refer to Caltrans standards for design speed, turning radii, and other engineering design requirements. The standard design speed for multi-use trails is 20 mph, which requires a minimum radius of 90 feet and stopping distance of 125 feet. Additionally, any areas steeper than 4% for more than 500 feet require design using a design speed of 30 mph and stopping distance of 230 feet (Caltrans 2019). Although the recommended alignment incorporated these standards to the greatest extent possible, site constraints such as steep slopes near creek channels and locations of protected oak trees, create areas where the design standards cannot be met. Areas that exceed 5% slope or do not comply with minimum radius standards and therefore will require additional consideration during project design are shown in Appendix E. Countermeasures, such as warning signs and striping, will be required on any trail sections that do not meet the design standards.

Figure 14
TYPICAL TRAIL SECTIONS



3.2.1 Pavement Materials

Although the current City Standard for trails outside of flood zones is asphalt paving, concrete; permeable asphalt; permeable concrete; or stabilized decomposed granite or #9 crushed gravel may be considered for some trail sections. Although other materials are more expensive to install than standard asphalt, they may provide other benefits that balance the life-cycle cost. Pavement materials options should be explored during preliminary engineering. Key design considerations of these materials are summarized in Table 1 (FHWA 2012 and 2015).

**Table 1
PAVEMENT MATERIALS OPTIONS**

Material	Pro	Con	Estimated Cost per LF of Trail
Standard Asphalt	<ul style="list-style-type: none"> City Standard material Can be resurfaced Standard paint markings can be used 	<ul style="list-style-type: none"> Requires periodic resurfacing 	\$30
Pervious Asphalt	<ul style="list-style-type: none"> Reduced runoff may reduce impacts on vernal pool and creek hydrology Less ponding makes safer to use in rain 	<ul style="list-style-type: none"> Cannot be resurfaced by seal coating or crack sealing Requires regular vacuuming to maintain permeability Paint pavement markings should be limited to retain permeability Requires specialized installation 	\$60
Standard Concrete	<ul style="list-style-type: none"> Longer lifespan than asphalt paving Currently used in floodprone areas of City bikeways Standard paint markings can be used 	<ul style="list-style-type: none"> Less flexible than asphalt Cracks or uneven sections are hard to repair and can cause a safety hazard 	\$130
Pervious Concrete	<ul style="list-style-type: none"> Longer lifespan than asphalt Reduced runoff may reduce impacts on vernal pool and creek hydrology Less ponding makes safer to use in rain 	<ul style="list-style-type: none"> Requires regular vacuuming to maintain permeability Paint pavement markings should be limited to retain permeability Requires specialized installation 	\$190
Decomposed Granite	<ul style="list-style-type: none"> Provides softer, more natural surface for running and mountain biking Reduced runoff may reduce impacts on vernal pool and creek hydrology 	<ul style="list-style-type: none"> High maintenance costs for washout and weed control Easily rutted in wet weather 	\$135
Stabilized Crushed Gravel	<ul style="list-style-type: none"> Provides softer, more natural surface for running and mountain biking Reduced runoff may reduce impacts on vernal pool and creek hydrology 	<ul style="list-style-type: none"> May be rutted in wet weather Requires weed control 	\$150

3.2.1.1 Lift Station Access

There is an existing lift station on the eastern end of the site at the end of the existing gravel maintenance road (Figure 4). The recommended trail segment between the existing parking lots at the Aquatics Center to the east and the lift station, which is currently a gravel maintenance road, should be engineered to accommodate heavy construction vehicles. Access and clearance requirements in this area should be confirmed with City Environmental Utilities staff during preliminary engineering.

3.2.2 Creek and Swale Crossings

In order to allow safe year-round trail use and maintain the existing hydrology, permanent crossings of creeks and swales will be constructed. Swales are small depressions where water flows but that do not have a defined bed and bank, they often connect vernal pools and seasonal wetlands. These crossing structures may be large bridges across the seasonal and perennial creeks or small pipes that allow water to flow under the trail from one wetland to another. Based on the creeks and wetlands mapped in the Existing Conditions Report, five crossings will be required for the recommended alignment (Figure 11).

It is anticipated that three larger creek crossings will be necessary to provide year-round use of the proposed trail. The crossings of the larger creeks can be either bridges or open-bottom culverts. Bridges can span a long distance and be installed entirely outside of the creek channel, which can reduce environmental impacts and avoid or minimize the need for permits from regulatory agencies, but often cost more to construct. An open-bottom culvert is typically a three-sided concrete box with no bottom, which allows the native streambed to be preserved. Culverts are often installed within the stream channel, requiring permits from regulatory agencies, but may also span over the channel similar to a bridge. One crossing is planned to use a large existing pipe culvert through which the western seasonal drainage flows. The final crossing is expected to be a new small pipe culvert over a seasonal swale. The exact design and material of crossings will be determined during preliminary engineering and should consider construction, maintenance, and permitting costs as well as the requirements of the Flood Ordinance. Additionally, the large existing pipe culvert should be investigated further during preliminary engineering to verify its ability to support a paved trail.



Existing bridge over seasonal creek in the Silverado Oaks Open Space just south of the Study Area.

3.2.3 Connections to Existing and Planned Bikeway System

3.2.3.1 Planned and Existing Bikeways

The recommended alignment connects to all five of the existing multi-use trails that enter the Study Area and provides important bicycle/pedestrian connections from surrounding residential areas to transit stops, employment, education, and recreation opportunities (Figure 11). Additionally, the trail

will connect to the planned multi-use trail in the Sierra Vista Specific Plan area by way of a mid-block crossing, which is discussed below.

3.2.3.2 Road Crossings

The recommended alignment will connect with Fiddymment Road at two locations (Figure 11). The northern connection is located closest to the intersection with Pleasant Grove Boulevard and provides access for people desiring to travel to the neighborhoods to the north and west. Intersection improvements to facilitate bicycle traffic that should be considered during preliminary engineering, include:

- High-visibility bike lanes;
- Widening sidewalks to 10-feet wide between Study Area and Fiddymment Road/Pleasant Grove Boulevard intersection to allow shared use in both directions;
- Leaning rails, if compatible with right turn pocket; and
- Bicycle signal improvements.



Example of intersection improvements for bicyclists.

The southern connection aligns with the future multi-use trail in the Sierra Vista Specific Plan Area. Due to the high volume and speed of traffic on Fiddymment Road, this southern connection is not feasible without a mid-block crossing. Due to the overhead utility lines in the area, this crossing is expected to be an at-grade crossing and should include:

- High-visibility crosswalks;
- Pedestrian hybrid beacon or pedestrian signal;
- Crossing warning signs;
- Warning signage and stop lines; and
- Adequate nighttime lighting (Fehr and Peers 2020).



View of mid-block crossing location on Fiddymment Road looking toward the Sierra Vista Specific Plan Area.

The recommended alignment connects to Pleasant Grove Boulevard at the existing signalized intersection with Sun City Boulevard (Figure 11). Although there is an existing crosswalk at this location, the addition of intersection improvements to facilitate bike crossings should be investigated further during preliminary engineering. This connection is intended to be an access point for local residents taking advantage of the existing crosswalk at the intersection rather than an access point for regional users, no parking is provided at this location.

The recommended alignment also connects to the existing bicycle/pedestrian undercrossing of Pleasant Grove Boulevard (Figure 11), which provides access to the sidewalk and Class II bike lane on the north side of the street. Currently, there is a driveway apron that allows access between the undercrossing

and the westbound bike lane. A connection from the undercrossing to the eastbound bike lane on Pleasant Grove Boulevard was not considered at this location due to the steep existing grades and surrounding biological resources, but the eastbound bike lane will be accessible at the Sun City Boulevard intersection. Additionally, high-visibility bike lanes along Pleasant Grove Boulevard should be considered during preliminary engineering.

Although the Study Area does not extend to Woodcreek Oaks Boulevard, it will form a major link between the trail system east of Woodcreek Oaks Boulevard and the western portion of the City, potentially increasing the amount of trail-user traffic crossing this road. Currently the multi-use trail connects to the signalized intersection at McAnally Drive and trail users return to the trail system to the east by using the sidewalk (Figure 11). A dirt trail and wooden bridge connect the gravel parking area in Mahany Park to Woodcreek Oaks in a direct crossing from this trail. However, if east-west through-traffic increases, there may be increased demand for a more direct at-grade mid-block crossing between Mahany Park and the eastern trail system across Woodcreek Oaks Boulevard. This crossing would require similar improvements to those described above for a Fiddymont Road crossing.

3.2.4 Restoration

There are currently many user-created dirt paths through the Study Area. Eliminating use of the trails by educating and redirecting users to the new paved trails with post and cable fencing and signage may be sufficient for some of the smaller trails to naturally revegetate without further intervention. However, due to the compacted soil and width of the larger trails, it may be necessary for more active restoration to be completed in some areas. Active restoration may include tilling the soil to reduce compaction and seeding with native plants. Any restoration activities should be completed in accordance with the OSPOMP.



Large dirt paths through the vernal pool complex should be restored.

3.3 TRAIL AMENITIES

Survey respondents expressed interest in a variety of improvements and amenities in addition to multi-use paved trails. Benches, trash cans, dog waste stations, and signage are all amenities requested by survey participants that are compatible with a trail through the open space preserve. Shade, safety lighting, and parking are amenities that should be considered in selected areas, but may not be appropriate additions throughout the Study Area. Some improvements suggested by survey participants, such as additional restrooms, drinking fountains, dirt mountain bike trails, and basketball courts are not recommended for inclusion in the project due to the Study Area’s designation as an open space, its proximity to developed recreation facilities, and lack of utility



Existing bench along gravel access road near Woodcreek High School.

connections. The City may consider these improvements at other locations. All trail amenities should be designed in accordance with the current City Standards.

3.3.1 Benches

The results of both outreach surveys indicated a strong desire from the public for benches and other resting points along the trails. Design best practices recommend placing benches at approximately 1/4-mile intervals or a slow 10-minute walk along trails. Additionally, benches should be placed at points of interest to take advantage of good views or significant natural features and at trail intersections or other natural congregation points. Whenever possible benches should be placed to take advantage of shade provided by existing trees or include with a roof or canopy to provide shade.

3.3.2 Trash Stations

Providing trash cans is an important aspect of reducing littering within the open space preserve. The site is heavily used for walking dogs and is located near the dog park, so dog waste bag dispensers should be placed with trash cans, at trail entrances and intersections. They should be well-separated from benches, wayfinding, and interpretive signs to minimize noxious smells at stopping points.

3.3.3 Signage

3.3.3.1 Share the Trail Etiquette Guidelines

In 2010, staff from the Alternative Transportation, Engineering, Parks, Open Space, Police, Fire, City Attorney and Risk Management Departments/Divisions met to review the nature of complaints related to trail use, and trail etiquette guidelines from other jurisdictions.

Share the Trail Etiquette Guidelines resulted from this collaborative effort, along with consideration of trail behaviors and results from a widely circulated public opinion survey. Share the Trail Etiquette Guidelines are a detailed list of recommendations for trail users developed to reduce trail user conflict. The guidelines, which were incorporated into a “Share the Trail” sign and trail markings, are:

- Use the trail responsibly,
- Don’t block the trail,
- Keep dogs under control – 6’ leash maximum,
- Travel at a safe speed,
- Pass with care,
- Bicyclists keep right except to pass, and
- Pedestrians keep left to face oncoming bicyclists.



Trail Etiquette sign.

In addition to the signs and markings placed on the trail, Share the Trail education is communicated in the following ways:

- City website www.roseville.ca.us/sharethetrail.
- Video posted to websites, shown on COR-TV, shared on social media channels, in email newsletters, and at special events.
- Handouts distributed to the public at special events, on trails by Police Department representatives and City maintenance crews at parks, City facilities, and local bike shops.
- Parks, Trails & Bikeways Map.

In addition to the signs and markings developed for Share the Trail Etiquette guidelines, additional signage to inform trail users about sensitive habitats will be necessary and may include:

- Habitat Restoration Area – Stay on Trail
- Open Space Preserve – Stay on Trail
- Dogs Must be on Leash – 6’ Maximum (Roseville Municipal Code 8.02.240)

Share the Trail Etiquette Guidelines and guidelines for preserving and/or restoring open space habitats and sensitive areas will be part of the final project design.



Informational trail signs and pavement markings.

3.3.3.2 Interpretive Signs

Interpretive trail signs provide self-guided education opportunities for trail users of all ages and abilities to develop a connection and appreciation for the surrounding landscape. Interpretive signs may describe the animals, plants, creeks, and plants that surround trails and can instill an appreciation of a natural habitat along with a renewed respect for preserving it and inspire people to make choices that preserve and improve their City. Due to the many natural resources, sensitive habitats, utilities and history in the study area, there is great potential for educational opportunities. Interpretive signs to educate and inform trail users should be developed and incorporated into trail design in coordination with the City’s Utility Exploration Center, nearby schools and in coordination with the City’s existing interpretive sign programs. Interpretive signage topics may include:



Example of interpretive sign.

- Natural habitats on site: Vernal pools, oak woodland, annual grassland, riparian woodlands, and the importance of open space preserves to plants and wildlife in an urban area.
- Plants and wildlife: Rare or unique species found here; what you can do to protect wildlife and keep it wild.
- Creeks and their watersheds: Water cycle and the watershed that runs through the City flows to the Sacramento River and ultimately to the ocean.

- Importance of your choices: How decisions made at home affects natural habitats and water quality.
- Storm water: Where does water go, how is it treated, what pollutants are a problem, how you can help keep storm water clean.
- Electrical power grid – Where to the lines run; how does the substation work, power line safety, renewable energy, what’s that buzzing sound?
- Recycled water: How wastewater is handled, why this is a valuable resource, how you can help keep treatment costs low.

3.3.3.3 Wayfinding Signs

Wayfinding signs provide guidance to visitors to help them navigate the trail system. Site-specific wayfinding signs provide a map of the trail network within the Study Area and connections to local roads and the City’s bikeway network. Wayfinding signs should be placed at major intersections within the Study Area and at the connections to trails that extend offsite.

3.3.4 Trees and Shaded Trails

In addition to the desire for shaded benches described above, many people expressed desire for more shade along the trails. Due to the proximity of overhead utility lines and vernal pools, adding trees is likely not feasible in the western half of the Study Area. There is some potential for tree planting in the eastern half of the Study Area outside of the utility easements. Any planting should be consistent with the OSPOMP which requires that only native species should be planted in the Study Area. Current guidelines restrict tree height to ten to fifteen feet at maturity, depending on the utility, within an electrical transmission line easement, so oak tree planting is not feasible on much of the Study Area. In areas where trees can be planted, they should be placed on the south or west side of the trail or bench for maximum shade impact. Planting for shade could also provide planting locations for mitigation oak trees, however this would require ongoing maintenance to ensure establishment of the mitigation trees. There is no irrigation connection currently available on the site, therefore mitigation planting would likely require hand watering for three to five years during establishment. The final determination of whether mitigation trees or other native landscape is installed will be made during preliminary engineering.

3.3.5 Lighting

Although often desired for security and to allow safe trail use at night, artificial lighting can also have negative effects. Artificial lighting at night may impact plants and wildlife by interfering with their natural circadian rhythms. Installing new lighting can also be disruptive to adjacent residents. Due to the Study Area designation as an open space preserve, lighting should be kept to the minimum required for safety and security. To further reduce impacts from artificial lighting, motion-controlled lights that brighten when a trail user approaches, should be considered. Solar-powered LED lights provide a viable option for installing lights in areas without an electrical supply. The exact type and location of lighting along the trail will be determined during preliminary engineering.

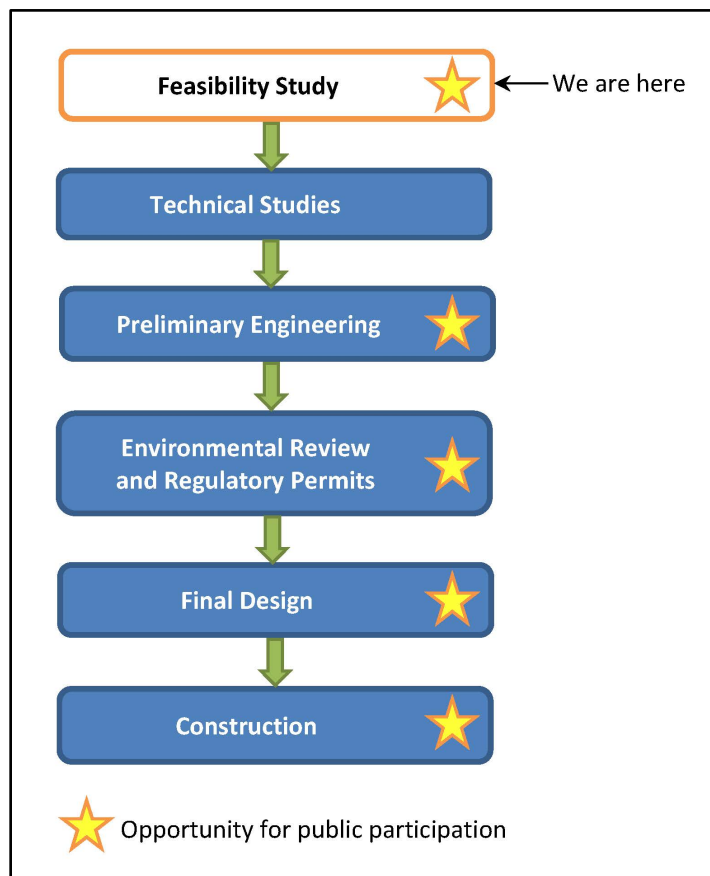
3.3.6 Parking

Although no new parking is proposed within the Study Area, there may be a need for additional parking if use of the Study Area increases. The majority of the existing public parking is at the east end of the Study Area at Mahany Park and the Roseville Aquatic Complex. There is no public parking on the west end of the Study Area. To provide parking facilities along Fiddymment Road, the City could investigate a joint use agreement with the CVS shopping center immediately north of the Study Area. There may also be sufficient space to develop off-street parking between Fiddymment Road and the electrical substation (Figure 13).

4.0 NEXT STEPS

This study represents the first step in constructing multi-use trails through the Study Area. Prior to construction, additional planning and design will be required. Responses received through the public engagement process indicated there is a strong for trail users and nearby residents to be kept informed and engaged in the next steps leading to trail construction. Additional opportunities for public input and participation will occur throughout the design process, as shown in Figure 15 and discussed in the appropriate sections below. Estimated costs for planning, design, and construction are included in Section 4.6.

Figure 15
NEXT STEPS*



* Dependent on funding

4.1 TECHNICAL STUDIES

Technical studies provide detailed information that are critical to design decisions and the environmental review process. Although a biological constraints report was prepared as part of this study, the report should be updated to reflect current conditions before environmental review for the project begins. Focused biological resource surveys and a formal aquatic resource delineation report may be required. Additionally, a cultural resources evaluation is expected to be needed. An assessment

of existing transportation conditions around the Study Area, which provided general recommendations for safety improvements to existing roads (see Section 3.2.3.2), was prepared for this study (Fehr and Peers 2020), however, additional in-depth traffic studies are required for development of mid-block crossings and site-specific recommendations. Geotechnical studies will also be required as a basis for engineering design of the creek crossings. These studies typically take two to three months to complete and should be done prior to the start of preliminary design, so study results and recommendations can be integrated into the design.

4.2 PRELIMINARY ENGINEERING

Design will begin with preliminary engineering, when the final alignment, trail materials, amenities, bridges, and overall project footprint will be determined based on project budget and City priorities. For this project, preliminary engineering will also include additional public outreach, particularly regarding connections with adjoining neighborhoods. As part of the preliminary engineering design requirements for the various utilities (WAPA, SMUD, PG&E, Roseville Electric, City sewer and storm water departments) should be confirmed. The decision to construct one or both of the recommended connections to Fiddymont Road will be made during this phase. Although costly, the mid-block crossing provides a direct connection to the City bikeway network and improved safety, which could help this project score higher in the competitive grant process. Preliminary engineering must be completed to facilitate environmental review and regulatory permitting. Preliminary engineering is expected to take three to six months.

4.3 ENVIRONMENTAL REVIEW

Although a trail through the Study Area has been conceptually reviewed in previous documents, a project specific environmental review will be required to ensure compliance with the California Environmental Quality Act (CEQA). This will include a public review and comment period. Based on the size and the potential environmental impacts of the project, an Initial Study will be necessary to determine if a Mitigated Negative Declaration will be appropriate, or if a more in-depth environmental review is necessary. If federal funds are used to construct the project, then a National Environmental Protection Act (NEPA) evaluation will also be required.

The environmental review process can begin once preliminary design is complete (see Section 4.5). However, if design changes later result in impacts outside of the project scope considered in the environmental review, a supplemental review may be required. The environmental review process for a project of this size typically take six to nine months to complete.

4.4 REGULATORY PERMITS

As discussed in Section 2.2, permits from the California Department of Fish and Wildlife, U.S. Fish and Wildlife Service, Regional Water Quality Control Board, U.S. Army Corps of Engineers, may be required prior to construction of any improvement that will impact a protected aquatic feature, habitat, or special-status species.

- CDFW: Since the project will construct trail through riparian habitat, a Lake and Streambed Alteration agreement will likely be required even if the creek crossings do not directly impact the channel. Additionally, if special-status species are discovered on site during the additional biological resource surveys an Incidental Take Permit may be required.

- USFWS: Since the proposed alignment directly impacts a vernal pool, coordination with the USFWS will be required. Additionally, if special-status species are discovered on site during the additional biological resource surveys an Incidental Take Permit may be required.
- RWQCB: Since the proposed alignment directly impacts a vernal pool, a permit from this agency will be required. This permit will also cover any project impacts to areas within the creek channels.
- USACE: If the bridges are designed to avoid all impacts to jurisdictional waters by spanning the channel completely and existing regulations are still applicable, no permit from this agency is anticipated to be required.

The regulatory permit process may take six months to a year, or longer, depending on the type and extents of resources impacted. This process can be started concurrently with the environmental review process at the time a stable project description and adequate design information is available, but the CEQA or NEPA documents must be complete prior to the issuance of regulatory permits. Each permit will likely include mitigation requirements that should be integrated into the final construction documents. The costs and benefits of avoiding impacts to jurisdictional features should be evaluated during the preliminary design phase of construction documents to determine the best project design.

4.5 FINAL DESIGN

Following completion of the preliminary engineering, environmental review and regulatory permitting, full construction documents consisting of plans, specifications, and estimates will be prepared in accordance with City Standards. The construction documents will include information on trail alignment and design, site grading, creek crossings, benches/rest areas, signage, connections to existing trails, midblock crossings, and any other improvements included in the project such as parking, planting, or lighting, as well as measures for protection of sensitive habitats and erosion control measures. Improvement plans must be submitted to WAPA and SMUD independently for approval prior to construction. Review of plans in relation to Roseville Electric, sewer, and water will be completed as part of the standard City plan review process. The City will include public review and comment opportunities in the plan review process. The final design process typically requires nine months to a year to complete. Environmental review and regulatory permitting should be completed prior to the completion of final construction documents so that appropriate avoidance and mitigation measures can be integrated into the project.

4.6 CONSTRUCTION

Although construction will be primarily completed by a contractor, there are opportunities for community involvement, including installation of benches, dog waste stations, small community-built bridges, or tree planting. Additionally, there may be opportunities for community members to “adopt” a creek or trail segment following construction. Construction is anticipated to be completed in approximately 6 months, but the schedule will depend on weather conditions and the details of the final design. The cost to construct the trail will depend on which paving materials are selected, the extent of expanded shoulders, site amenities, and materials costs at the time of construction. Overall, the construction cost of the trail is expected range between approximately \$275 per linear foot, if standard asphalt and shoulders are used, to \$460 per linear foot, if pervious materials and expanded shoulders are selected.

**Table 2
CONSTRUCTION COST ESTIMATE**

Item	Quantity	Unit	Unit Price	Total Cost
Paved Trail	12,625	LF		
Standard Asphalt			\$30	\$378,750
Pervious Asphalt			\$60	\$757,500
Standard Concrete			\$130	\$1,641,250
Pervious Concrete			\$190	\$2,398,750
Decomposed Granite Shoulder	12,625	LF		
Standard 2' width			\$27	\$340,875
Expanded 4' width			\$54	\$681,750
Aggregate Base Shoulder	12,625	LF		
Standard 2' width			\$2.50	\$31,563
Expanded 4' width			\$5	\$63,125
Striping	12,625	LF	\$9	\$113,625
Post and Cable Fence	25,250	LF	\$30	\$757,500
Bridges (3 total)	1	EA	\$250,000	\$250,000
Rest node	11	EA	\$6,500	\$71,500
Trash Station		EA	\$3,800	\$41,800
Informational Signs	20	EA	\$300	\$6,000
Interpretive/Wayfinding Signs	15	EA	\$1,400	\$21,000
At-grade mid-block crossing	1	EA	\$350,000	\$350,000
Miscellaneous Construction Costs				\$1,100,000

The estimates shown in Table 2 are based on the following City design standards and assumptions:

- Paved trails are ten feet wide.
- Standard asphalt paved trail includes two inches of asphalt over four inches of Class II aggregate base.
- Pervious asphalt paved trail includes three inches of pervious asphalt over six inches of pervious base.
- Standard concrete paved trail includes four inches of concrete over four inches of Class II aggregate base.
- Pervious concrete paved trail includes four inches of pervious concrete over six inches of pervious base.
- Aggregate base shoulder is four inches deep. (2 feet wide per City Standard, additional cost for wider shoulders).
- Decomposed granite shoulders are 3 inches deep and stabilized with organic binder. (2 feet wide per City Standard, additional cost for wider shoulders).
- Bridges include two 20-foot long and one 30-foot long, 10-foot wide metal pre-fabricated bridge with concrete abutments. The cost for a pipe culvert for the swale crossing is included in miscellaneous construction costs.
- Rest node includes City Standard bench installed on 5' x 11' three-inch deep decomposed granite pad, and standard 4' x 12' fabric shade shelter.

- Trash Station includes and trash can with dog waste bag dispenser installed on 5' x 5' three-inch deep decomposed granite pad.
- Interpretive and wayfinding signs will be 24" x 36", mounted on a standard single-post pedestal. Costs of signs includes 6' x 6' three-inch deep decomposed granite pad.
- Miscellaneous construction costs for items not specifically included in table, such as mobilization, grading, and erosion control, is estimated as the median of 30% of itemized costs.

4.7 FUNDING

As shown in Table 3, the total estimated cost to implement the complete project is between \$4.3 million and \$6.7 million. This includes approximately \$865,000 for planning, permitting, and design and \$3,400,000 to \$5,800,000 in construction costs, depending on materials.

**Table 3
IMPLEMENTATION COST ESTIMATE**

Step	Estimated Cost
Technical Studies	
Biological Resources Assessment and Special-Status Species Surveys	\$16,000
Aquatic Resource Delineation	\$10,000
Cultural Resources Assessment	\$12,000
Traffic Study	\$40,000
Geotechnical Study	\$20,000
Preliminary Engineering	\$60,000
Public Engagement	\$85,000
Environmental Review ¹	
CEQA Document	\$40,000
NEPA Document Support ¹	\$25,000
Regulatory Permits ²	
CDFW SAA	\$9,000
RWQCB Permit	\$8,000
USFWS Consultation	\$12,000
Mitigation Fees ³	\$30,000
Final Design	\$500,000
Construction	\$3,430,000 - \$5,820,000
Total Project Cost	\$4,297,000 - \$6,697,000

¹ Assumes Caltrans or other lead agency prepares NEPA document with technical study support from applicant.

² Assumes crossings fully span creeks, one vernal pool is directly impacted, and no additional special-status species identified in technical studies. Actual regulatory permits required will depend on project design and regulatory requirements at the time.

³ Assumes 5:1 mitigation for impacts to 0.02 acres of vernal pool at rate of \$300,000 per acre and any impacts to riparian habitat will be mitigated on site as part of project design. Actual mitigation requirements will be determined as part of the regulatory permitting process.

Funding has not been identified for the next steps required for trail construction. If directed by City Council, staff will pursue funding through various competitive federal, state, and regional grant programs and local sources over the next several years to complete the project. General Fund and Measure B funds are not used for multi-use trail construction. Transportation, sustainability, and recreation-related grants are typically funded through annual appropriation bills, bond measures, or fee

programs. Some programs are cyclical, with additional rounds of funding becoming available over time, while other programs end once their funds are distributed. Lists of potential grant opportunities are listed on the State of California’s website (www.grants.ca.gov) and Sacramento Area Council of Governments (SACOG) website (<https://www.sacog.org/statewide-funding-opportunities>). Grant applications are typically competitive and eligible projects, application requirements, and scoring criteria may change over time as grant funding is renewed. Potential funding sources that may be pursued for this project include:

- Active Transportation Program (ATP) – The goal of this state program is to increase biking and walking trips, improve safety and mobility of non-motorized users, reduce greenhouse gas emissions, and enhance public health. ATP funds are administered through Caltrans and SACOG. No matching funds are required.
- Recreation Trails Program (RTP), non-motorized trails – This federally funded program is administered through the California Department of Parks and Recreation Office of Grants and Local Services. This grant program requires that the applicant match at least 12% of the total project cost. Eligible projects must be listed on the state or local transportation improvement plan. This program is currently only funded through fiscal year 2020.
- Affordable Housing and Sustainable Communities Grant Program – This program administered by the California Strategic Growth Council funds projects that allow residents to drive less by making sure housing, jobs, and key destinations are accessible by walking, biking, and transit. This program requires matching funds.
- Congestion Mitigation and Air Quality (CMAQ) Program – This program is funded by the Federal government and administered locally by the Placer County Transportation Planning Agency (PCTPA). The purpose of the program is to fund transportation projects designed to reduce traffic congestion and improve air quality.
- Transportation Development Act (TDA) – This program creates the Local Transportation Fund with revenue derived from ¼% of the state retail sales tax. These funds may be used for a wide variety of transportation projects, including bicycle and pedestrian facilities.
- Habitat Conservation Fund – This state grant program is administered through the California Department of Parks and Recreation Office of Grants and Local Services. Eligible projects include nature interpretation programs to bring urban residents into park and wildlife areas and protection of various plant and animal species. Matching funds are required.
- Wildlife Conservation Board Public Access Program – This program is administered by the Wildlife Conservation Board with the goal to increase public access to wildlife-oriented activities, including ADA trails, interpretive signs, and bird observation areas.
- Habitat Enhancement and Restoration Program – This program run by the California Habitat Conservation Board funds projects that provide assistance for the restoration and enhancement of fish and wildlife resources. No matching funds are required.
- PeopleForBikes Community Grant Program – This program, funded by the non-profit PeopleForBikes, supports bicycle infrastructure projects that make it easier and safer for people of all ages and abilities to ride. The grant limit is \$10,000 and matching funding is required. This grant is typically directed to community-based non-profits for smaller projects.

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