City of Citrus Heights

Creek Corridor Trail Project

Background Analysis Summary Report

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Acknowledgments

Trail Advisory Group

June Russell
Oleta Lutz
Janet Botill
Gifford Massey
Beth Mann
Dan Allison
Doug Lent
Chris Holm
Evan Jacobs
Alta Tura
Sandy Warner-Riggs
Dave McLamb

Project Team

City of Citrus Heights
Casey Kempenaar
Rhonda Sherman
David Wheaton
Colleen McDuffee
Stuart Hodgkins
Chris Fallbeck
Dave Moranz

Sunrise Recreation and Park District
Dave Mitchell
Noe Villa

Orangevale Recreation and Park District
Greg Foell

Consultant Team
Kate Kirsh, Foothill Associates
Ed Armstrong, Foothill Associates
Michael Brewer, Foothill Associates
Brian Wright, Psomas,
Gladys Cornell, AIM Consulting
Ciara Zanze, AIM Consulting

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Project Overview

The Citrus Heights Creek Corridor Trail Project (CCTP) is a feasibility study of the major creek and SMUD Utility corridors within the City of Citrus Heights with the primary purpose of determining corridor suitability for multi-use trails (see Figure 1). Off-street, multi-use trails are desirable as a form of recreation and alternative transportation. Public use of trails improves health, reduces carbon emissions, increases appreciation for and understanding of natural resources, and reduces wear on local roadways by reducing vehicle miles traveled. Overall city goals for this project include the following:

- Improve mobility by creating new ways to travel between local destinations,
- Create Complete Streets designed for all users,
- Become more sustainable through improving air quality, reducing greenhouse gases and reducing traffic,
- Improve recreational opportunities,
- Enhance the natural environment through improving water quality, reducing flood risks and improving access to natural features, and
- Improve public health.

Additionally, the City of Citrus Heights has specific project goals and objectives for the CCTP. Goals are typically what you want to do, and objectives are how you are going to accomplish the goals. Specific goals involve connecting destinations to improving access, recreation and transportation choices, specifically:

- Provide improved connections to key destinations such as schools, shopping areas, neighborhoods, parks and other trail networks for pedestrians and cyclists,
- Improve access to the creek corridors for residents of all abilities,
- Increase the number of recreational facilities to more neighborhoods,
- Improve transportation choices in the City.

Objectives for these goals involve conducting this feasibility study, involving the community in the various projects, and revising policy documents to incorporate new trails, as follows:

- Evaluate the feasibility of optimizing the existing creek and utility corridors by creating a multi-use trail network,
- Engage the community to fit the project within the context of the community,
- Incorporate feasible trail segments into future policy documents, including the General Plan, the Pedestrian Master Plan, the Bikeway Master Plan, the Safe Routes to School Master Plan and the ADA Master Plan.

Additionally, The Citrus Heights General Plan includes the following polices related to trail-use:

- **Goal 29**: Plan, design, construct, and manage a Complete Streets transportation network that accommodates the needs of all mobility types, users, and ability levels.
- **Goal 34**: Preserve, protect, and enhance natural habitat areas, including creek and riparian corridors, oak woodlands, and wetlands

- **Goal 38**: Establish a system of creekside trails, passive open space, and parks for public use.
- **Goal 39**: Create open spaces in future urban development with natural features for public use and enjoyment.
- **Goal 59**: Ensure that ample and appropriate parks and recreation facilities and programs are available to all residents.

A multi-use trail is a trail that accommodates a range of transportation modes, including walking, jogging, biking, skateboarding, strollers, rollerblading, other non-motorized uses, and personal mobility devices

The suitability of a creek corridor for a multi-use trail is dependant upon both physical and social factors. Physical factors include landform, vegetation and hydrologic characteristics such as topography, floodplains, corridor width, and presence of sensitive flora or fauna. Social factors include land ownership patterns, presence or absence of existing informal trails, locations of desired destinations, regional connections, and community opinions about trails. A study of both physical and social factors is necessary to determine where trails should (or should not) be constructed in the future. This study will form the foundation for a long-range plan of trail development for the City of Citrus Heights.

A multi-use trail is typically a paved trail from 8-feet to 12-feet in width with 2-foot unpaved shoulders, physically separated from the street. Off-street trails are often preferred by trail users over on-street routes, possibly because they are thought to be more pleasant and safer, due to lower noise, distractions and potential for conflict with automobiles. Typical on-street routes include sidewalks and Class II and III bike lanes. A Class II bike lane consists of a striped, designated bikeway located on a street. A Class III bike route provides for shared use between bicycles, pedestrians and automobiles[1].

Creek corridors are often primary candidates for off-street trails at locations throughout the United States and the world. In a city that is largely built-out such as Citrus Heights, creek corridors and the SMUD corridor represent some of the only remaining large connected areas of open space. Land within the 100-year floodplain, which has typically been preserved and cannot be used for development, is often well suited for multi-use trails. Physical and social constraints noted above dictate the actual suitability based upon analysis factors developed within the broader study.

The City of Citrus Heights has over 20 miles of creek corridors within the city limits, consisting of Arcade Creek and its tributaries. Arcade, Cripple, and Brooktree are the three primary waterways, into which a number of other named and unnamed tributaries flow, including Coyle, Mariposa and San Juan creeks. Cripple joins Arcade Creek near the Greenback Lane bridge on the southwestern edge of the city, and Brooktree joins just outside the city limits. Arcade discharges into Steelhead Creek on the Ueda Parkway and thence into the Sacramento River near the confluence with the American River. The CCTP studied the three major creek systems and their primary tributaries, as well as the SMUD corridor from Wachtel Road to Tempo Park because this corridor forms an important link between the headwaters of Arcade and Cripple Creeks and is also a significant open space system within the city. The study also examined a portion of Orangevale through which the SMUD corridor passes.

[1] Caltrans Highway Design Manual, Section 1001.4. 2006.

The CCTP is divided into a number of phases, as follows:

1. Community Engagement and Stakeholder Facilitation
2. Background Analysis, including the following subtasks
   2.1. Preliminary Screening
   2.2. Opportunities Analysis
   2.3. Constraints Analysis
   2.4. Background Analysis Summary Report, and
3. Feasibility and Trail Alignment Analysis

This report, the result of Task 2.4, presents the results of the preliminary screening, fieldwork, and opportunities and constraints analysis. It will be followed by the Feasibility Report, which will combine the results of the Background Analysis with recommendations for specific trail alignments and priorities. The Feasibility Report will also discuss General Plan policies, goals and objectives related to trails as well as present more detailed cost estimates and discuss potential funding sources.

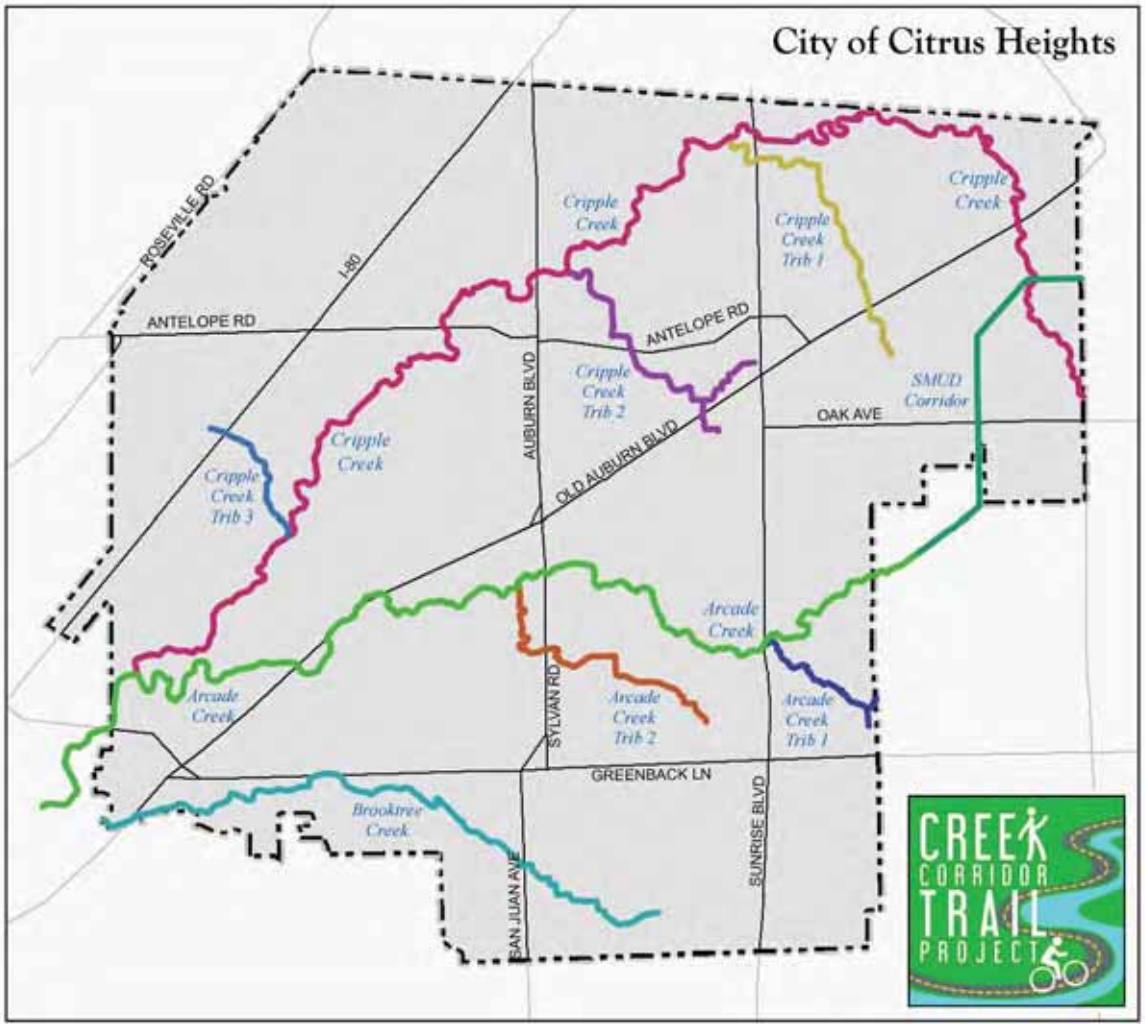

Figure 1 -- Study Area

Community Engagement Summary

The Creek Corridor Trail Project includes a robust community engagement program to gather community input throughout the process. The engagement program includes multiple ways of reaching out and involving the community throughout the process to ensure the final plan is community based and fits within the context of Citrus Heights. The following represents a summary of public engagement activities completed to date.

Trail Advisory Group Meetings (TAG)

A Trail Advisory Group (TAG) comprised of local stakeholders is assisting the project team to evaluate the creek and SMUD corridors for trail feasibility while ensuring any future trail system fits within the context of the community. The TAG was convened by the project team in order to include representatives from a variety of community groups and organizations. The TAG includes the following organizations:

- Neighborhood Association representatives (four representatives)
- Area 4 Agency on Aging
- San Juan Unified School District – Safe Routes to Schools
- Sacramento Area Bicycle Advocates
- WALK Sacramento
- Citrus Heights Regional Chamber of Commerce
- Sacramento Area Creeks Council
- Citrus Heights Neighborhood Watch
- Citrus Heights Collaborative

To date the project team has hosted three TAG meetings to receive input on opportunities and constraints, preliminary screening results, and potential trail segments. The first TAG meeting included an exercise to identify community values related to a trail system in Citrus Heights. The project team compiled the responses to develop the following community value goals, which were reviewed by the TAG:

- Create a system that is safe, accessible to all, and does not destroy the environment.
- Preserve the natural unspoiled beauty of the creek corridors by creating a trail that is the right size for the community.
- Avoid unfriendly or confusing trails and harm to wildlife.

The TAG has also participated in two field walks. The first field walk was held in Citrus Heights to view existing conditions and sites for potential trail segments. TAG members provided input on existing conditions and constraints. A second field walk was held in Folsom to view an established trail system and provide input on trail opportunities for Citrus Heights.

Stakeholder Interviews

In addition to holding Trail Advisory Group meetings, the project team met with other key stakeholders to gather input about the project. Interviews were conducted with SMUD, Citrus Heights and Roseville real estate professionals, and children participating in the Citrus Heights Police Activities League. Stakeholder interviews allowed the project team to collect more targeted information related to the stakeholder's expertise.

Community Workshop

On May 14th 2013 the project team hosted a community workshop that was attended by over 150 community members. The City utilized various outreach methods including over 8,500 direct mailers for residents along the Creek and SMUD corridors, news releases, website updates, the City's newsletter, etc. The purpose of the workshop was to introduce the project, its goals, and the public engagement process, and to obtain initial input from the community to help inform the feasibility study. The open house format workshop included various information stations where attendees could view graphics, maps, and other project information materials. Representatives from the City and the project consultant team were available to discuss the project and answer questions.

Figure 2 -- Community Workshop

Online Community Survey

An informal on-line survey was implemented early in the project to better understand the initial perspective of community members about the benefits and perceived issues related to a community trail network within Citrus Heights. The objective of an early survey was to inform the planning process and endeavor to fit the trail network within the community values and context of Citrus Heights. The survey received over 300 responses.

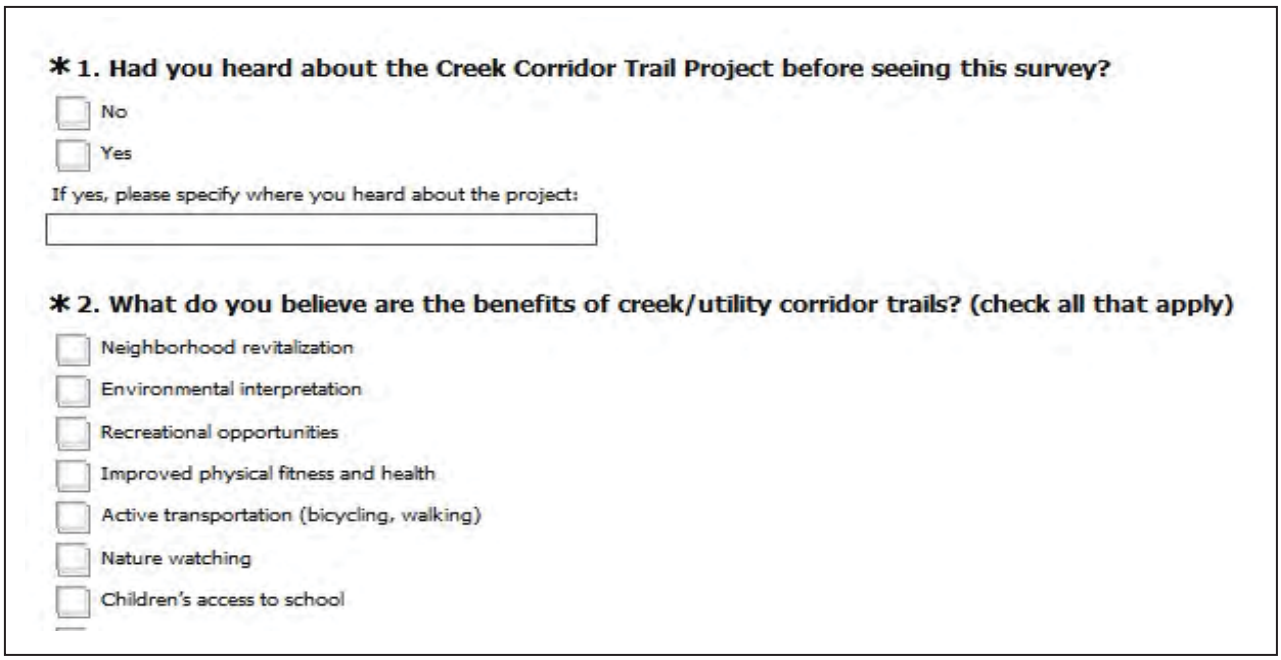

Figure 3 -- Sample Online Survey Questions

A highlight of survey results is included below:

Benefits of trails:
A substantial portion of respondents stated that a primary community benefit of trails is for recreational or fitness purposes. In addition, many respondents (more than 200) stated that trails would offer opportunities for nature watching.

- More than 75% cited trails provide recreational opportunities
- More than 70% cited improved physical fitness and health
- More than 60% cited nature watching

A secondary community benefit of trails identified in the survey was providing additional transportation options

- 71% selected trails provide opportunities for active (walking, bicycling) transportation
- More than 50% identified reduced exposure to auto traffic

Concerns of trails:
The biggest concern of trails that was cited was safety and security of nearby property owners and trail users. Also, correspondingly the third most selected concern (56%) was afterhour's activity. 70% cited safety and security for nearby property owners

- More than 60% cited safety and security for trail users

In addition, the survey allowed for respondents to add additional concerns. A substantial number of those comments included concerns about potential negative impacts to private property, including: the possibility of the City needing to secure large portion of private land for trail

access, potential increase of vandalism, decrease in privacy for homeowners and changing the rural experience in certain neighborhoods.

Trail usage:
Of the total survey respondents more than 80% said that they would use the trails daily, often or sometimes. 18% said that they would hardly ever or never use the trails.

Neighborhood Area Meetings

At outset of the project, project team members attended each of the 10 Citrus Heights Neighborhood Area meetings to provide an initial project introduction, explain the public engagement process and ways to stay informed and provide feedback. As the project has progressed, project team members have gone back to each Neighborhood Area meeting to provide more detailed information about potential trail alignments in each area and receive feedback from residents. Four TAG members represent neighborhood areas within the City and are tasked with reporting results to neighborhood associations and discussing the project with neighbors within their areas as well as reporting back to the TAG.

Preliminary Screening

In performing a suitability analysis on a large, complex system of creek corridors, a logical, repeatable system is needed to perform an initial classification of those corridors to support future decision making. The initial system utilized in the CCTP followed a process similar to that developed by Ian McHarg, sometimes called a McHargian Suitability Analysis, in which a number of factors are given ratings based upon their suitability for a pre-defined use, in this case a multi-use trail, and these ratings are overlaid or combined spatially to create a final "suitability" score[2]. McHarg utilized various shades of gray on map overlays made of acetate, which he then combined to determine suitabilities. Modern Geographic Information Systems (GIS) and spreadsheets allow greater sophistication in overlay analyses, but the essence remains the same.

This preliminary suitability analysis was the first attempt at identifying potential trail alignments and was utilized in initial planning and in examining actual conditions in the field. Field observations were used in combination with this analysis to develop the second suitability analysis in the opportunities and constraints assessment (discussed in detail in the next chapter).

Methodology

The creek and SMUD Corridor networks was divided and each segment was individually rated based on various physical characteristics. The initial screening criteria developed to analyze potential suitability of the creek corridors for trails included the following:

- numbers of structures present, left or right bank[3],
- percent of segment covered by trail easements,
- percent of segment covered by other (non-trail) easements,
- number of road crossings,
- percentage of segment covered by public land,
- presence of existing trails, both improved or informal
- connectivity to neighborhoods, destinations, roads, or other locations which would be desired by trail users, and
- natural condition of the corridor.

Each criteria were scored from least to most suitable for trails and the results then aggregated into a rating from Low to Very High. It is important to keep in mind that these ratings were preliminary based upon GIS data available at the time. They were used as a broad-brush filter to identify areas for future study or deserving of closer scrutiny during fieldwork.

Following the initial analysis, the Project Team performed fieldwork to closely examine the creek corridors for opportunities and constraints. Teams consisting of two professionals, an engineer and a landscape architect, visited locations where roads cross one of the creeks within the study area, or where a creek passes through a publicly owned parcel such as a park. City

[2] McHarg, 1969.

[3] Throughout this document, left and right refer to sides of the creek when looking downstream. Thus, for a segment of the creek that flows from east to west, the left bank is the south side and the right bank is the north side.

staff also conducted field visits and recorded observations. In some cases these visits coincided with fieldwork by the consultant team. In others, they were conducted independently and observations shared. Creek segments were walked and photographed where public land or easements were accessible from public rights-of-way. Opportunities and constraints for specific trail alignments were recorded, including road crossing alternatives, preferred bank locations, significant obstacles, areas where trails may need to cross the creek, presence of informal trails, locations that may require retaining walls, and other pertinent factors.

Findings

Appendix A presents the results of the preliminary screening. The main stem of Arcade Creek and the SMUD corridor generally had the highest ratings in preliminary screening, followed by Cripple Creek, Cripple Creek Tributary 1, Brooktree Creek, and the various remaining tributaries. The Arcade main stem generally rated High or Very High, except for the lower segment, which rated Moderate due to lack of public land or easements. The upper and lower segments of Cripple Creek also rated High or Very High, but the middle section rated Moderate due to ownership patterns.

Fieldwork generally followed the order of the preliminary screening ratings; however, as a result of preliminary screening and aerial photograph analysis, the drainage canals were eliminated from further consideration. The majority of fieldwork occurred during the months of March and April, 2013, with additional visits in May and July to gather additional data. Field investigations were limited to locations where roads crossed or were immediately adjacent to the creek, where public land or easements existed, or in a few instances where private property owners were encountered and granted access to their land. These observations provided a fairly comprehensive overview of opportunities and constraints along the corridors.

Opportunities and Constraints

Following the Preliminary Screening task, the Project Team held a multi-day work session to re-define the creek segments based upon the results of the fieldwork. These segments were then re-classified based upon new suitability factors derived from both the previous GIS analysis and the results of the fieldwork. These new suitability factors were ownership, natural resources, corridor width and topography.

Results of the background analysis scoring can be seen in Figure 16 and Appendix B.

Opportunities and constraints for trail alignment related to property ownership and natural resources are discussed in greater detail below. Corridor width and ownership are included in this section as part of a larger discussion on trail constructability, which includes geology, engineering challenges, creek crossings, road crossings, and flooding issues.

Property Ownership

Property ownership affects trail suitability in the following progression from most preferred to least:

1. Public ownership, City or SRPD land
2. Other public ownership,
3. Private ownership with trail/recreation easement,
4. Private ownership without trail/recreation easement.

The portion of the study area in public ownership is 46%. The majority of this is owned by SRPD or the City, with remaining ownership by Sacramento County[4], SMUD and a number of other agencies. The portion of the study area with trail/recreation easements is 11%, some of which overlaps with public ownership (primarily along Brooktree). The percentage of land in public ownership and easements for each waterway is shown in Table 1.

Table 1 -- Public Ownership and Easements

Creek	Public Ownership	Easement	Public Ownership or Easement
Arcade Creek			
Main Stem	53%	21%	74%
AT1	65%	0%	65%
AT2	23%	0%	23%

[4] In general, land owned by Sacramento County, Department of Water Resources, Department of Parks and Recreation, and other Departments, is in the process of being transferred to the City of Citrus Heights. This land is considered City property for purposes of this study.

Creek	Public Ownership	Easement	Public Ownership or Easement
Cripple Creek			
Main Stem	38%	9%	47%
CT1	35%	0%	35%
CT2	13%	0%	13%
CT3	69%	0%	69%
BrookTree			
Main Stem	58%	9%	58%[5]

As properties in Citrus Heights that include creek corridors are proposed for future development or redevelopment, the City may condition approvals with a requirement for a trail easement or fee title dedication of land for trails depending on the feasibility and priority of the potential trail segment.

In addition to easements specifically designated for trails and recreation, a number of other easements exist within the study area. Of these, utility easements are the most common and are usually compatible with trail usage. For example, SMUD generally supports the concept of trails within their easement included in the study area; however, they have specific design and approval criteria for any trails constructed within SMUD owned property or SMUD easements.

Public land ownership patterns varied for each of the main creeks: Public land was prevalent along the Arcade Creek main stem, with large sections in SRPD ownership through Tempo Park, Arcade Creek Park Preserve, Stock Ranch and other holdings. Lower and upper segments of the Cripple Creek main stem remain in public ownership; however, the majority of the middle watershed between Auburn Boulevard and Garry Oak Drive lies on privately owned land. Brooktree Creek was a mix of public and private ownership.

Natural Resources

The condition of natural resources within the corridor ranges widely from relatively undisturbed to heavily modified. In general, the stream channel in Arcade and Cripple Creeks has not been significantly engineered and remains largely in a natural state (though impacted by urbanization). Brooktree includes a segment in which the channel shape has been modified as well as armored with concrete. Creek channels on all three main branches have undergone incision, with the Arcade Creek main stem experiencing significant incision of 8 to 10 feet in some areas. This is particularly prevalent in lower segments and is due to the urbanization of the watershed which caused increased impervious surfacing, higher stormwater flows and greater erosive forces on creek bed and bank.

Cripple Creek has been less impacted, probably due to the larger lot residential patterns in its middle watershed and corresponding lower percentage of impervious surfacing. Brooktree Creek is significantly incised downstream of the concrete section, possibly due to the effects of

[5] Public ownership overlaps public easements on Brooktree.

sediment-hungry, high-velocity water exiting the armored segment, but lower volumes of flow have generally resulted in less incision than on the main stem. The main stem receives much of the runoff from the commercial areas around Greenback Lane between Fair Oaks Boulevard and Fountain Square Drive, which contribute significant amounts of runoff during storm events. The channels in the upper watersheds of all three main tributaries are generally less incised and in better ecological condition than the lower segments.

Widths of the open space corridor also vary widely, from less than 100-feet in several areas along the main stem to over 600-feet in Stock Ranch. Corridor widths generally grow wider as one moves from the upper to the lower watershed, which is expected since open space is usually set-aside based upon floodplain; however, width was a direct result of set-asides during development and thus varies according to land use, regulations in place at the time of development, market conditions and specific developer. The main stem generally has wider open space corridors than the tributaries, again likely related to flooding levels.

Riparian vegetation ranged from relatively open to sufficiently dense to prevent field crews from accessing some areas. Canopy coverage was generally related to corridor width, with wider corridors having more trees and undergrowth. As with corridor width, riparian condition was related to land use practices and open space set-asides.

Riparian vegetation is regulated by the California Department of Fish and Wildlife (CDFW), and native oaks greater than six inches diameter measured at breast height (DBH) are regulated by City of Citrus Heights. CDFW requires impacts to riparian vegetation to be mitigated by creation/enhancement of overall riparian habitat value either on-site or nearby. The City requires a tree permit for impacts to native oaks of 6” DBH or greater. Tree permits often require mitigation for impacts on an inch-for-inch basis. For example, trail construction that requires removal of a 10” diameter native oak would be required to plant 10 one inch oaks to make up for the impact. The City also protects non-oak trees greater than 19” DBH.

Constructability

Geology

Geology and soils are important factors to understand in determining suitability of an area for trails. Soil characteristics influence vegetation, erosion, slope stability, infiltration, stormwater runoff and requirements for retaining walls and bridge footings. If native soil is suitable for use as fill material, it can be used in trail construction to help meet ADA requirements. If it is not suitable, import of engineered fill may be needed. As with soils, the underlying geology also influences trail constructability. Geology determines wall and bridge footing depths, slope stability at depth and creek channel morphology. Due to higher stormwater discharge flows due to increased runoff from more impervious surfacing, many urban creeks, including Arcade Creek, have undergone a period of downcutting. This downcutting typically occurs until the underlying bedrock is reached, at which time excess erosive energy goes into channel widening until the creek reaches a new hydrologic balance based upon the increased flows.

All creeks, including those in urban areas, operate in a state of hydro-dynamic balance in which they move across their floodplains, eroding soils on the outside of meander bends and depositing it on point-bars on the inside of meanders further downstream. These erosive forces can create a

range of problems in an urban context such as unstable slopes, damage to private property and structures, changes in channel capacity, and impacts to riparian vegetation. This geomorphic regime also poses challenges for trail systems located along creeks, particularly when trails are in proximity to those outside bends and unstable slopes. Stabilization of meanders may be required, preferably through the use of bioremediation techniques but in some cases requiring rip-rap or other bank armoring. Geology and soils will determine the rates of erosion and deposition, the degree of slope instability, and the possible solutions.

Engineering Challenges

Due to the number of proposed trail alignments and varied nature of the terrain along each of the corridors, there is a diverse range of engineering challenges associated with each of the proposed trail corridors. These include the following:

- Location of trails within a floodplain and floodway
- Effects of geomorphology
- Creek crossings
- Geotechnical considerations
- Road crossings
- Terrain and physical constraints
- Utility impacts
- Visibility and safety
- Access and continuity

Floodplain and Floodway

A large portion of the proposed trail is located within the FEMA defined floodplain for Arcade Creek, Brooktree Creek and Cripple Creek. In several locations where the channel is not clearly defined the trail alignment will also be within a floodway. The Central Valley Flood Protection Board does not list these creeks within the project limits, and therefore they are not subject to the requirements of Title 23 Article 8. However the creeks are largely located within developed portions of the City of Citrus Heights and therefore any improvements proposed in the floodplain will need to be evaluated for impacts both upstream and downstream of the project segment.

In general the proposed trails will closely follow the existing terrain minimizing any fill and cut slopes where possible. Where excavation is required the fill and cut areas will be balanced as far as possible to minimize hydraulic impacts and therefore secondary impacts. Retaining walls and stabilized slopes will be used to minimize the project footprint. In environmentally sensitive areas, other methods will be considered to stabilize the slopes including laying back the slopes, minimizing disturbance of existing vegetation, use of bio-solutions and plantings.

Cut-off walls and rock slope protection will be used to protect trail integrity. Per the City's adopted design standards, where the profile of the trail will be more than one foot below the 10-year storm event water surface elevation, consideration will be given to constructing the trail of Portland cement concrete.

Effects of Geomorphology

The geomorphology of the creek also needs to be considered when evaluating the proposed alignment. As discussed previously, in general, the stream channel in Arcade and Cripple Creeks has not been significantly engineered and remains largely in a natural state. Brooktree includes a segment in which the creek bed and banks have been concrete lined. The existing creeks exhibit signs of creep and meandering through history. The susceptibility of the creek to erode and meander will be studied further as more detailed analysis of the proposed trail alignment proceeds. In some locations, where the velocity of the creek flow or type of material along the creek bank make it likely that creek meandering and erosion will occur, the trail will need to be setback further from the creek where feasible, or the creek bank may require stabilization. In these cases, biotechnical or minimally invasive engineering solutions such as erosion control mats, log-toe or rock-toe protection, or other vegetative techniques, should be preferred over riprap, concrete or other engineered hard structures.

Creek Crossings and Bridges

Implementation of creek trails would necessitate the construction or modification of numerous bridges, box culverts or pipe culverts to provide creek crossings throughout the alignments. In general the crossings will be designed to minimize hydraulic and environmental impacts to the creeks.

Prefabricated single span steel bridges or prefabricated wooden bridge structures supported on abutments located outside the floodway are proposed where feasible. The steel bridge structures are proposed to have a weathered steel finish to blend into the natural environment and minimize maintenance. Abutments would generally be placed on pile foundations, if scour is anticipated or slab footings. The soffit elevation would preferably be set 1 foot above the 100 year water surface elevation (WSE) to protect the integrity of the structure during the 100 year storm event; however as a minimum the bridge deck shall be set at the 10 year WSE and the bridge railings shall be designed to withstand the 100 year storm event.

In certain locations where the alignment passes under existing bridge structures, tie-back retaining walls would be constructed. This would avoid impacts to the existing bridge abutments and maintain the integrity of the existing structure. Where the existing overcrossing structure consists of box culverts, in some locations a new reinforced concrete box culvert is proposed alongside the existing culverts, approximately 2 feet above the existing flowline, to meet the minimum vertical clearance requirements of 10 feet and to keep the trail above the low flow water surface elevation. Where the physical constraints make meeting the 10 foot minimum vertical clearance requirements infeasible, consideration will be given to reduce this height to 8 feet and provide adequate signage for trail users.

At locations where constructing a bridge deck at the 10 year water surface elevation is not feasible, low flow bridge structures would be proposed. These structures would be designed to be inundated under the 10 year or 100 year storm event.

In certain locations, where physical constraints or terrain make providing access to a crane to place the prefabricated bridge structures in place infeasible, consideration of other bridge types, including assembled-in-place or cast-in-place may be appropriate.

In areas where steep cut banks present challenges to trail alignment, bank stabilization projects may impact the creek corridor less and be more affordable than creek crossings. Natural

stabilization methods such as geotextiles, willow stakes and fascines, or log or boulder revetments, are preferred over concrete or other hard-engineering structures.

Geotechnical Considerations

In general, the terrain is fairly gently sloping throughout the corridor; however, there are segments along Arcade Creek where the banks adjacent to the creek are fairly steep. Cut and fill slopes are anticipated to be a maximum allowable of 2:1 (horizontal:vertical). In some areas where the existing slopes are steep and the area is constrained, use of soil nail or tie-back walls will be considered. Other locations would require reinforced concrete retaining walls. Depending on the type of wall and location of these walls, an architectural facing may be applied to the walls to improve the aesthetic quality of the walls and allow them to blend more naturally into the surrounding environment.

Footings for walls are anticipated to be standard footings. Piles are anticipated to be required for most bridge structures and rock slope protection would be required to protect the approach fills and abutments.

Road Crossings

There are numerous road crossings proposed for each of the trail corridors. The alignments cross the full range of roadways from heavily traveled major arterials to two lane residential streets with occasional local traffic. In considering the most feasible crossing options, the following aspects are taken into account:

- Traffic volumes and speed
- Sight distance
- Number of lanes
- Width of the roadway
- Presence of median or two-way left-turn lane
- Continuity of the trail, both sides of the roadway
- Setting and surrounding land use
- Location of the crossing in relation to existing intersections
- Existing bridge or culvert type and dimensions

Grade separated crossings are generally preferred when they are feasible and not cost prohibitive. Overcrossing pedestrian structures provide an option when an undercrossing is not feasible due to the elevation of the road relative to the creek. These facilities are generally more costly, have greater visual impacts, and are more feasible when the roadway is below the level of the adjacent terrain.

Where the existing bridge structure or culvert can adequately accommodate or be modified to accommodate a new trail which meets the design standards, then this type of crossing is the preferred option, provided access can also be provided to the local road. Where the roadway is wide, consideration would be given to provide lights or incorporate natural lighting of the culvert or bridge structure for safety.

At-grade crossings are considered the preferred option for local residential streets or lightly traveled collector roads. These at-grade crossings would be signalized or non-signalized

depending on the type of facility and traffic volumes. In general any arterial or major collector would be signalized. The signal would be a pedestrian activated signal and could be a "HAWK" type facility. Where unsignalized facilities are proposed driver awareness could be enhanced using in-pavement lighting options, pavement markings, rapid flash beacons and raised median islands and sidewalk bulb-outs.

In some locations on arterial streets where an existing signalized at-grade crossing is located fairly close to the proposed trail crossing, and a grade-separated crossing does not appear feasible, consideration will be given to extending two-way paved pathways to the signalized intersection.

Where the trail is discontinuous on both side of the roadway, the trail is generally terminated at this location and trail users are encouraged to tie into the existing sidewalk and bikeway system if available.

Figure 4 -- HAWK Pedestrian Crossing Facility

Terrain and Physical Constraints

There are several areas indicated on the projects maps where the terrain adjacent to the creek and/or the creek banks themselves are very steep and the corridor is constrained. Most of the areas with steep terrain occur along Arcade Creek between Mariposa Avenue and Sayonara Drive. In addition there are several areas along all the creek corridors where the property boundaries are located in close proximity to the creek. For both of these scenarios, the proposed alignment requires several crossings of the creek.

In some areas where the existing slopes are steep and the area is constrained, use of retaining wall structures, including soil nail or tie-back walls may be appropriate. In other locations reinforced concrete retaining walls, wire mesh walls or gabion walls may be the most feasible option. Depending on the type of wall and location of these walls, an architectural facing may be applied to the walls to improve the aesthetic quality of the walls and allow them to blend more naturally into the surrounding environment.

Where constraints make constructing a 10 foot trail infeasible, the minimum paved width may be reduced to 8 feet, and the shoulders may be reduced.

Utility Impacts

There are several utilities along the corridor that would require relocation or modifications during construction of the proposed trail. Sewer trunk line runs along portions of the Cripple Creek corridor. Where the proposed trail alignment crosses or parallels the sewer line, adjustments to the grade of manholes may be needed. Numerous other facilities including water, telecommunications and gas lines may also require relocation and/or adjustments of valves and manholes to grade. In particular relocation of utilities may be required to provide adequate vertical clearance where the trail is proposed to pass under the major arterial roadways including Sunrise Blvd, Sayonara Drive, Sylvan Road, Van Maren Lane, Auburn Blvd, Indian River Drive and Greenback Lane along Arcade Creek.

Access and Connectivity

Access to the trail for all users would be a key element of its success. Neighborhood access would be achieved from local streets crossing the trail and where other trails or pathways connect to the proposed trail. Each street crossing would be identified and directional signs would be placed at street intersections identifying destinations and distances along the trail and within the surrounding community.

Trailheads (parking areas with a formal trail entrance) would serve all trail users. Existing parking areas at existing parks such as Tempo, Van Maren and Rusch Park, would serve as trailhead parking as well. They would provide information about the trail and may have trail user facilities like restrooms, trash receptacles, information kiosks, water fountains, and benches.

Visibility and Safety

The proposed trail would meet current geometric standards for a 20 mph design speed. Maximum grades steeper than 5% will be allowed for specific distances defined in the bikeway standards. Safety railings or barriers would be constructed where walls or steep drop offs occur adjacent to the trail. Lighting will be considered where the trail passes through bridge undercrossings and box culverts. Removable bollards, gates and signage may be used to prohibit unauthorized vehicles and to close the trail during high water levels. The trail would be officially closed from dusk to dawn.

The trails will be designed to maximize exposure to the eyes of the public and avoid areas where visibility is restricted. Several access points would be provided to all the trail segments to provide alternative route options to users.

In locations where significant pedestrian activity is anticipated, consideration would be given to widen the shoulders of the trail or create a separate unpaved pedestrian walking path provided there is adequate publicly owned property available and impacts are not significant.

Creek Crossings

Based on field reviews the proposed trail alignment has identified several creek crossings for each of the creek corridors and tributaries. The identified crossings included major crossings of Arcade Creek, Cripple Creek and Brooktree Creek and minor crossings of tributaries and drainage channels that feed these creeks. The 25 creek crossings under consideration are listed in Table 2 below.

Table 2 -- Creek Crossings

Creek	Crossing No.	Span Length	Type of Crossing
Arcade	A05-CC-1	80 ft	Bridge
	A05-CC-2	80 ft	Bridge
	A05-CC-3	60 ft	Bridge
	A05-CC-4	60 ft	Bridge
	A06-CC-1	60 ft	Bridge
	A07-CC-1	50 ft	Culvert
	A11-CC-1	60 ft	Bridge

Creek	Crossing No.	Span Length	Type of Crossing
	A12-CC-1	80 ft	Bridge
	A13-CC-1	80 ft	Bridge
	A14-CC-1	80 ft	Bridge
	A14-CC-2	80 ft	Bridge
	A18-CC-1	50 ft	Culvert
	A18-CC-2	80 ft	Bridge
	A18-CC-3	80 ft	Bridge
Brooktree	B5-CC-1	50 ft	Culvert
	B6-CC-1	60 ft	Bridge
	B6-CC-2	60 ft	Bridge
	B12-CC-1	60 ft	Bridge
Cripple	C05-CC-1	50 ft	Culvert
	C07-CC-1	50 ft	Culvert
	C12-CC-1	60 ft	Bridge
	C17-CC-1	80 ft	Bridge
	C20-CC-1	80 ft	Bridge
	C24-CC-1	80 ft	Bridge
	C24-CC-2	80 ft	Bridge

Bridge Structures

As discussed previously, in general for longer spans bridges shall be prefabricated single span steel or wooden bridges supported on abutments located outside the floodway. The steel bridge structures are proposed to be a weathered steel finish to blend into the natural environment and reduce maintenance requirements. The soffit elevation would preferably be set 1 ft above the 100 yr water surface elevation (WSE) to protect the integrity of the structure during the 100 yr storm event, however as a minimum the bridge deck shall be set at the 10 year WSE and the bridge railings shall be designed to withstand the 100 year storm event.

Figure 5 -- Prefabricated Truss Bridge

The following design criteria apply to the proposed bridges:

- Bridges should be at least as wide as the paved path and a minimum of 12 feet clear between railings. Narrower Bridges of 8 to 10-feet wide may be used if spans are short, expected volume is low, or other design constraints preclude a wider bridge.
- Bridge railings shall be a minimum of 48 inches in height
- Decking material shall be firm and stable
- Certain bridges may be required to accommodate fire and maintenance vehicles with a gross vehicle weight of 30,000 pounds where it is determined that fire access using the bridge will be required.
- The bridge deck shall be designed as a minimum to be above the 10-year water surface elevation.
- Where the soffit of the bridge is less than 1 foot above the 100-year water surface elevation (WSE) line, a hydraulic analysis is required to ensure no increase will occur in the water surface elevation.
- The bridge will be designed to minimize impacts to the existing creek and environment
- The bridge will be designed to not impede fish passage or constrict the floodway.

Where construction of a bridge above the 10 yr water surface elevation is not deemed feasible, low flow bridges, culverts or weirs will be considered, provided such improvements do not result in a significant increase in the water surface elevation. Reinforced or pre-stressed concrete slab bridges are recommended for low flow options. Bridge railings should be designed to "break away" or to withstand flood flows, with hydraulic modeling assuming the railings assumed to be solid obstructions to creek flow.

Culvert Structures

Where drainage channels or seasonal streams would allow the construction of box culverts or drainage culverts, consideration of placing these facilities is an option. Close coordination with environmental staff and review of environmental studies will be required to determine the feasibility of disturbing the existing drainage channel. Such culvert structures would generally

be precast reinforced concrete box culverts or reinforced concrete pipes which could be placed efficiently and with minimal disturbance.

Road Crossings

The proposed trails encompass a significant portion of Citrus Heights resulting in numerous roadway crossings throughout the study area. Based on the proposed trail alignment, the path would cross these either at-grade or below-grade under existing bridges or through existing or new box culverts.

The recommended roadway crossing types are based on established industry standards, the California MUTCD, preliminary field investigations, and experience on similar existing facilities. The proposed crossing treatments can be broken into five categories:

- No crossing, where trail is discontinuous
- Non-signalized at-grade crossings
- Directed toward adjacent intersection or crossing
- Signalized at-grade crossings
- Grade separated crossings

The recommended roadway crossing for each corridor is provided in Table 3 through Table 6. Locations of roadway crossings are shown in Figure 6 through Figure 9.

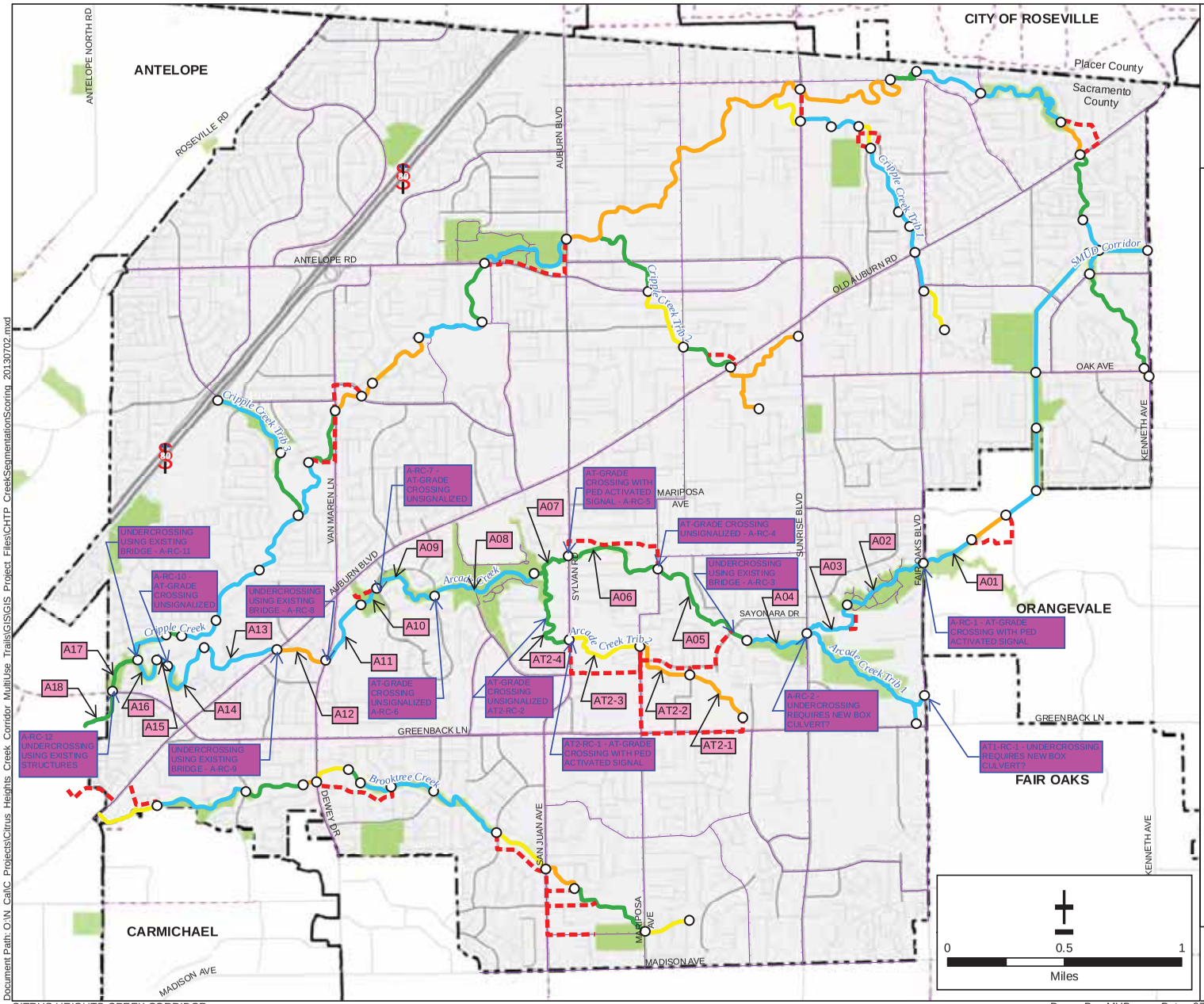

FIGURE 6

LEGEND

Scoring Segmentation

- Begin/End Point

Future Study Score

- High Priority
- Moderate Priority
- Low Priority
- No Future Study

Other Routes

- Alternate Route
- Bike Lane/Trail (Existing and Proposed)
- Neighboring Community Bike Routes

Jurisdictions

- City of Citrus Heights
- Other Communities
- County Boundary
- SRPD/ORPD Parks

GRADE CROSSINGS FOR ARCADE CREEK

NOTE ON MAP USE:
Preliminary scoring results are only intended to focus further study efforts and in no way represent the final assessment of trail feasibility for any particular creek corridor.

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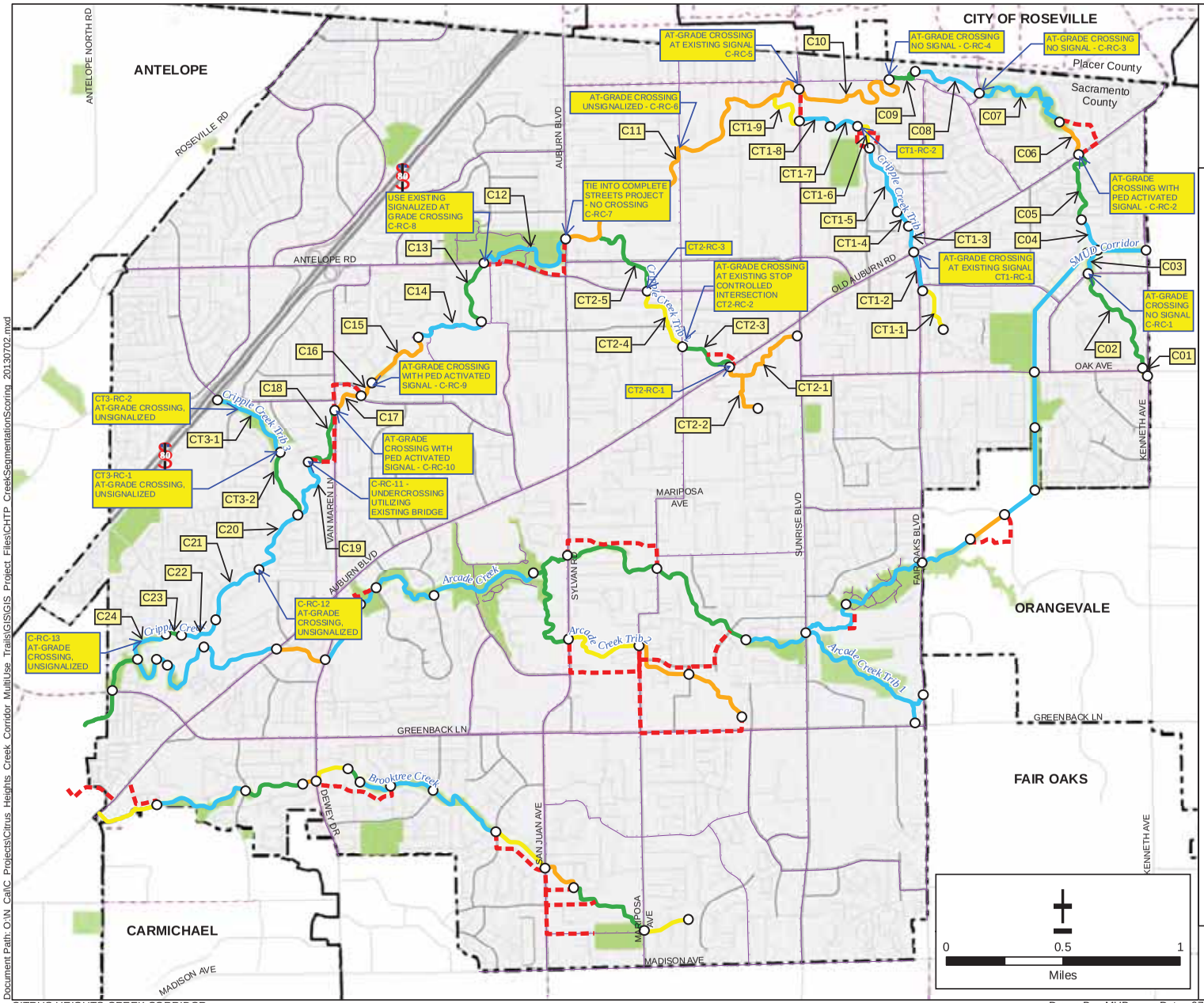

FIGURE 7

LEGEND

Scoring Segmentation

- Begin/End Point

Future Study Score

- High Priority
- Moderate Priority
- Low Priority
- No Future Study

Other Routes

- Alternate Route
- Bike Lane/Trail (Existing and Proposed)
- Neighboring Community Bike Routes

Jurisdictions

- City of Citrus Heights
- Other Communities
- County Boundary
- SRPD/ORPD Parks

GRADE CROSSINGS FOR CRIPPLE CREEK

NOTE ON MAP USE:
Preliminary scoring results are only intended to focus further study efforts and in no way represent the final assessment of trail feasibility for any particular creek corridor.

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CITRUS HEIGHTS CREEK CORRIDOR

Drawn By: MUB Date: 07/02/2013 Document Name: CHTP_CreekSegmentationScoring_20130702

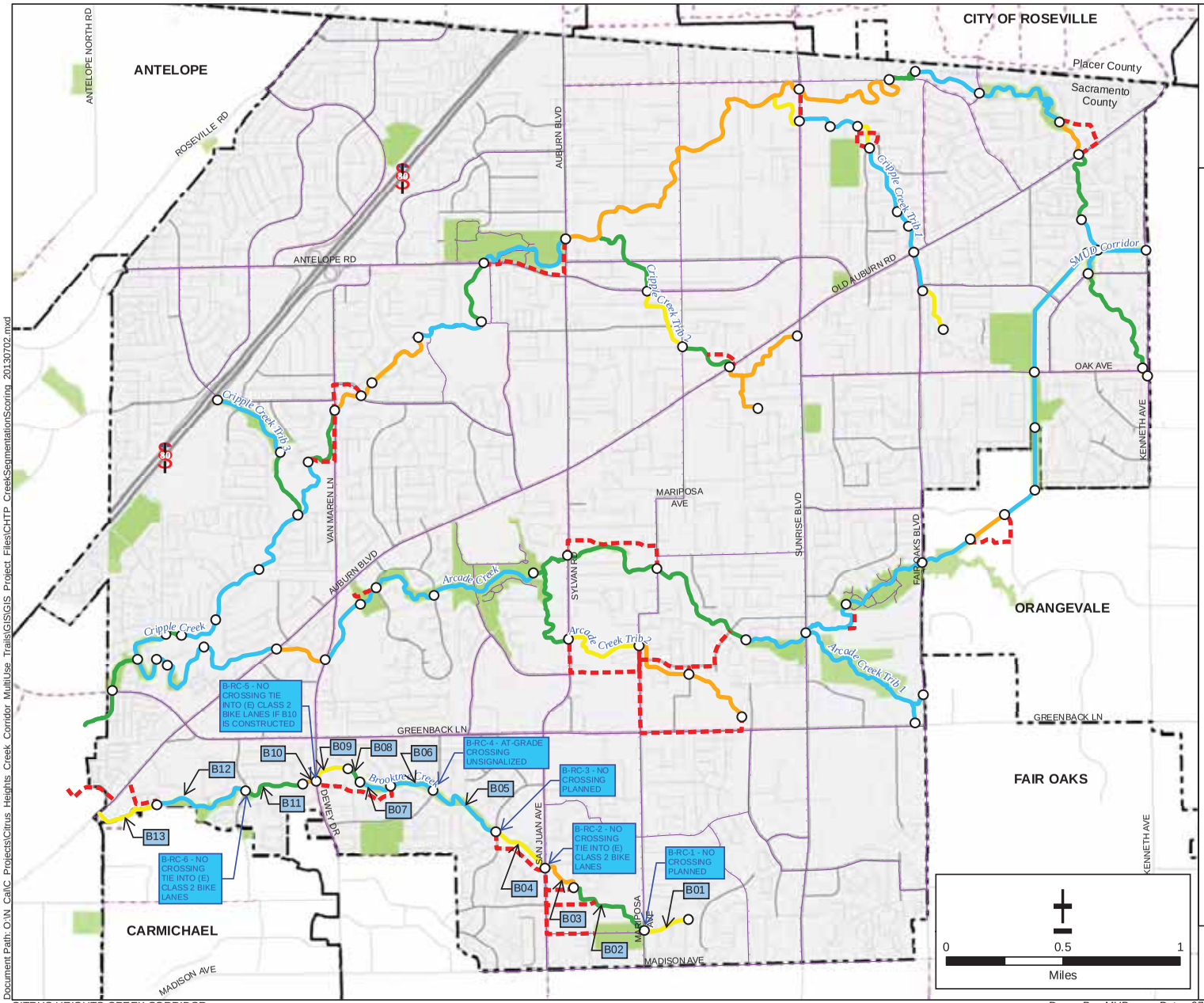

FIGURE 8

LEGEND

Scoring Segmentation

- Begin/End Point

Future Study Score

- High Priority
- Moderate Priority
- Low Priority
- No Future Study

Other Routes

- Alternate Route
- Bike Lane/Trail (Existing and Proposed)
- Neighboring Community Bike Routes

Jurisdictions

- City of Citrus Heights
- Other Communities
- County Boundary
- SRPD/ORPD Parks

GRADE CROSSINGS FOR BROOKTREE CREEK

NOTE ON MAP USE:
Preliminary scoring results are only intended to focus further study efforts and in no way represent the final assessment of trail feasibility for any particular creek corridor.

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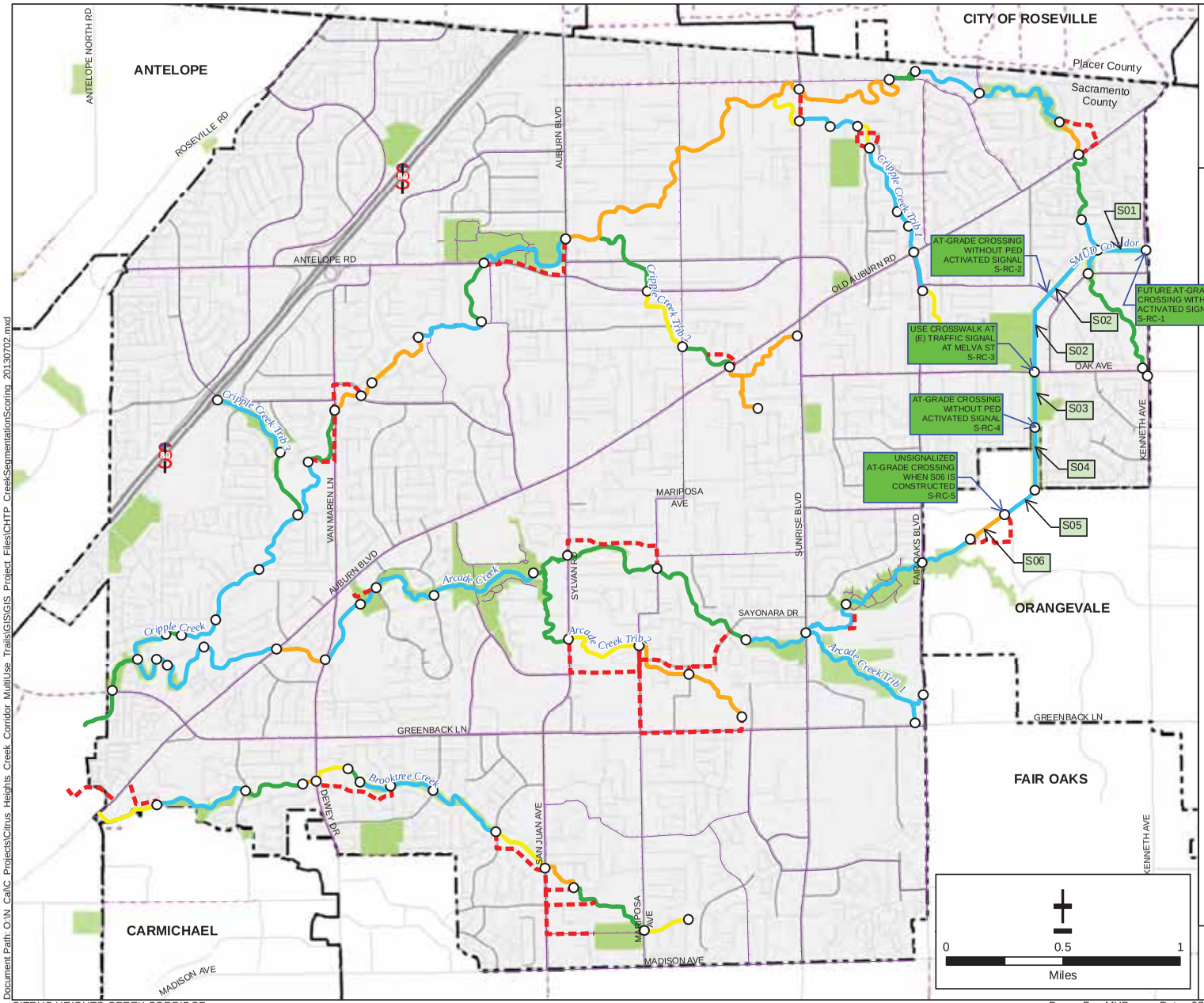

FIGURE 9

LEGEND

Scoring Segmentation

- Begin/End Point

Future Study Score

- High Priority
- Moderate Priority
- Low Priority
- No Future Study

Other Routes

- Alternate Route
- Bike Lane/Trail (Existing and Proposed)
- Neighboring Community Bike Routes

Jurisdictions

- City of Citrus Heights
- Other Communities
- County Boundary
- SRPD/ORPD Parks

GRADE CROSSINGS FOR SMUD CORRIDOR

NOTE ON MAP USE:
Preliminary scoring results are only intended to focus further study efforts and in no way represent the final assessment of trail feasibility for any particular creek corridor.

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Table 3 – Recommended Roadway Crossings (Arcade Creek Corridor)

Corridor	Roadway/ Street Name	Crossing No.	Designation	Lane Designation Median	Roadway Width	Posted Speed	Approximate Average Daily Traffic (ADT)	Recommended Crossing Type Alternative Crossing Type
Arcade Creek Corridor	Fair Oaks Blvd	A-RC-1	Major Collector	BL/1NB/TWLTL/1SB/BL TWLTL	60 ft	40 mph	16,800	Recommended: At-grade pedestrian activated signal and median island Alternative: Grade separated undercrossing south of existing culvert structure
	Sunrise Blvd	A-RC-2	Arterial (Complete Streets)	BL/2NB/Median/2SB/BL Raised Median	82 ft	40 mph	41,887	Recommended: Undercrossing utilizing existing bridge structure Alternative: Redirect users via two-way paved pathway to existing signal at Sayonara Dr Future Alternative: Overcrossing structure since the proposed undercrossing will not meet 10' clearance
	Sayonara Dr	A-RC-3	Local	BL/1NB/1SB/BL No Median	36 ft	25 mph	1,500 (Est.)	Recommended: Undercrossing utilizing existing bridge structure Alternative: At-grade unsignalized crossing
	Mariposa Ave	A-RC-4	Local	BL/1NB/1SB/BL No Median	36 ft	30 mph	4,010	Recommended: At-grade unsignalized crossing Alternative: Undercrossing utilizing existing bridge structure
	Sylvan Road	A-RC-5	Arterial	BL/2NB/TWLTL/2SB/BL TWLTL	66 ft	40 mph	28,400	Recommended: Undercrossing utilizing existing bridge structure Alternative: At-grade pedestrian activated signal and median island
	Crosswoods Dr (East)	A-RC-6	Local	1NB/1SB No Median	42 ft	25 mph	1,500 (Est.)	Recommended: At-grade unsignalized crossing Alternative: Undercrossing requiring construction of new reinforced box culvert structure
	Crosswoods Dr (West)	A-RC-7	Local	1NB/1SB No Median	44 ft	25 mph	1,500 (Est.)	Recommended: At-grade unsignalized crossing Alternative: Undercrossing requiring construction of new reinforced box culvert structure
	Van Maren Lane	A-RC-8	Arterial	BL/2NB/2SB/BL TWLTL/Striped Median	58 ft	35 mph	13,621	Recommended: Undercrossing utilizing existing bridge structure Alternative: At-grade pedestrian activated signal and median island
	Auburn Blvd	A-RC-9	Arterial	2NB/TWLTL/2SB TWLTL/Striped Median	62 ft	40 mph	23,900	Recommended: Undercrossing utilizing existing bridge structure Alternative: Redirect users via two-way paved pathway to existing signal at St Ives Ln/Halifax St
	Matheny Way	A-RC-10	Local	1NB/1SB No Median	36 ft	25 mph	750 (Est.)	Recommended: At-grade unsignalized crossing Alternative: At-grade pedestrian activated signal
	Indian River Dr	A-RC-11	Local	BL/1NB/1SB/BL No Median	40 ft	25 mph	1,500 (Est.)	Recommended: Undercrossing utilizing existing bridge structure Alternative: At-grade pedestrian activated signal
	Greenback Lane	A-RC-12	Arterial (Complete Streets)	BL/3WB/Median/3EB/BL Raised Median	90 ft	40 mph	49,796	Recommended: Undercrossing utilizing existing bridge structure Alternative: Redirect users via two-way paved pathway to existing signal at Indian River Dr
Arcade Creek Tributary 1	Fair Oaks Blvd	AT1-RC-1	Major Collector	BL/1NB/1SB/BL No Median	38 ft	40 mph	16,800	Recommended: Construct reinforced concrete box culvert undercrossing if warranted by projected users Alternative: Redirect users via two-way paved path & Class 2 BL to signal at Greenback Lane
Arcade Creek Tributary 2	Sylvan Road	AT2-RC-1	Arterial	BL/2NB/Median/2SB/BL Raised Median	66 ft	40 mph	28,400	Recommended: Redirect users via two-way paved path & Class 2 BL to signal at Stock Ranch Rd Alternative: At-grade pedestrian activated signal and median island
Arcade Creek Tributary 2	Woodside Dr	AT2-RC-2	Local	1WB/1EB No Median	30 ft	25 mph	130	Recommended: At-grade unsignalized crossing Alternative: At-grade pedestrian activated signal

Legend: NB – Northbound Lane, SB – Southbound Lane, EB – Eastbound Lane, WB – Westbound Lane
TWLTL – Two-Way Left-Turn Lane
BL – Bike Lane, BL(F) – Future Bike Lane

Table 4 -- Recommended Roadway Crossings (Brooktree Creek Corridor)

Corridor	Roadway/ Street Name	Crossing No.	Designation	Lane Designation	Roadway Width	Posted Speed	ADT	Recommended Crossing Type
				Median				Alternative Crossing Type
Brooktree Creek Corridor	Mariposa Ave	B-RC-1	Local	BL/1NB/1SB/BL	42 ft	30 mph	3,012	Recommended: No crossing proposed, trail terminates at this location. Users connect to Class 2 BL
				No Median				Alternative: Not applicable
	San Juan Ave	B-RC-2	Arterial	BL/2NB/TWLTL/2SB/BL	64 ft	40 mph	23,711	Recommended: Redirect users via on street facilities & sidewalks from Spicer to signal at Chesline Dr
				TWLTL				Alternative: Not applicable
	Sperry Dr	B-RC-3	Local	1NB/1SB	42 ft	25 mph	3,046	Recommended: No crossing proposed, trail reverts to on street facility. Users directed to Spicer Dr
				No Median				Alternative: Not applicable
	Brooktree Dr	B-RC-4	Local	1NB/1SB	42 ft	25 mph	1,242	Recommended: At-grade unsignalized crossing
				No Median				Alternative: At-grade pedestrian activated signal
	Dewey Dr	B-RC-5	Arterial	BL/2NB/TWLTL/2SB/BL	64 ft	40 mph	20,998	Recommended: No crossing proposed, trail reverts to on street facility. Users directed to Greenleaf Dr where consideration will be given to provide a pedestrian crossing.
				TWLTL				Alternative: At-grade pedestrian activated signal and median island
	Parkoaks Dr	B-RC-6	Local	1NB/1SB	42 ft	25 mph	2,353	Recommended: At-grade unsignalized crossing
				No Median				Alternative: If segment to the east is not constructed then no crossing is recommended

Legend: NB – Northbound Lane, SB – Southbound Lane, EB – Eastbound Lane, WB – Westbound Lane
TWLTL – Two-Way Left-Turn Lane
BL – Bike Lane, BL(F) – Future Bike Lane

Table 5 -- Recommended Roadway Crossings (Cripple Creek Corridor)

Corridor	Roadway/ Street Name	Crossing No.	Designation	Lane Designation	Roadway Width	Posted Speed	ADT	Recommended Crossing Type
				Median				Alternative Crossing Type
Cripple Creek Corridor	Olivine Ave	C-RC-1	Local	1WB/1EB	42 ft	25 mph	1,500 (Est.)	Recommended: At-grade unsignalized crossing
				No Median				Alternative: At-grade pedestrian activated signal
	Old Auburn Rd	C-RC-2	Major Collector	BL/1NB/1SB/BL	36 ft	25 mph	14,300	Recommended: At-grade pedestrian activated signal, if trail is continued to the east
				No Median				Alternative: Redirect users via two-way paved pathway to existing signal at Twin Oaks Ave
	Crestmont Dr	C-RC-3	Local	1NB/1SB	40 ft	25 mph	2,148	Recommended: At-grade unsignalized crossing
				No Median				Alternative: At-grade pedestrian activated signal
	Twin Oaks Ave	C-RC-4	Local	BL(F)/1WB/1EB/BL(F)	34 ft	25 mph	3,162	Recommended: No crossing until trail to the west is built
				No Median				Alternative: Direct users to future on-street facilities along Twin Oaks Ave
	Sunrise Blvd	C-RC-5	Arterial (Complete Streets)	BL/2NB/TWLTL/2SB/BL	74 ft	40 mph	35,052	Recommended: Redirect users via two-way paved pathway to existing signal at Twin Oaks Ave
				TWLTL				Alternative: At-grade pedestrian activated signal with median
	Mariposa Ave	C-RC-6	Local	1NB/1SB	36 ft	25 mph	2,923	Recommended: At-grade unsignalized crossing if trail is constructed along this segment
				No Median				Alternative: At-grade pedestrian activated signal
	Auburn Blvd	C-RC-7	Arterial (Complete Streets)	BL/2NB/TWLTL/2SB/BL	68 ft	40 mph	24,537	Recommended: Redirect users via two-way paved pathway to existing signal at Grand Oaks Blvd
				TWLTL				Alternative: No crossing if trail to east is not constructed. Tie into existing complete streets facilities.
	Antelope Rd	C-RC-8	Arterial	BL/2WB/TWLTL/2EB/BL	68 ft	40 mph	29,832	Recommended: Use existing signal at Lauppe Lane
				TWLTL				Alternative: None.
	Calvin Dr	C-RC-9	Local	1WB/1EB	42 ft	25 mph	1,500 (Est.)	Recommended: At-grade pedestrian activated signal due to sight distance
				No Median				Alternative: At-grade unsignalized crossing
	Van Maren Lane	C-RC-10	Major Collector	BL/1NB/1SB/BL	40 ft	35 mph	13,600	Recommended: At-grade pedestrian activated signal, if trail is continued to the east
				No Median				Alternative: No crossing, direct users to Calvin Drive intersection
	Bridgemont Way	C-RC-11	Local	1WB/1EB	30 ft	25 mph	500 (Est.)	Recommended: Undercrossing utilizing existing bridge structure
				No Median				Alternative: At-grade unsignalized crossing
	Oak Lakes Lane	C-RC-12	Local	1WB/1EB	26 ft	25 mph	3,000 (Est.)	Recommended: At-grade unsignalized crossing
				No Median				Alternative: At-grade pedestrian activated signal
	Broken Bow Dr	C-RC-13	Local	1WB/1EB	26 ft	25 mph	200 (Est.)	Recommended: At-grade unsignalized crossing
				No Median				Alternative: At-grade pedestrian activated signal

Legend: NB – Northbound Lane, SB – Southbound Lane, EB – Eastbound Lane, WB – Westbound Lane
TWLTL – Two-Way Left-Turn Lane
BL – Bike Lane, BL(F) – Future Bike Lane

Recommended Roadway Crossings (Cripple Creek, CONT.)

Corridor	Roadway/ Street Name	Crossing No.	Designation	Lane Designation Median	Roadway Width	Posted Speed	ADT	Recommended Crossing Type Alternative Crossing Type
Cripple Creek Tributary 1	Old Auburn Road	CT1-RC-1	Major Collector	BL/2WB/TWLTL/1EB/BL TWLTL	54 ft	35 mph	14,300	Recommended: Use existing traffic signal at Fair Oaks Blvd. Alternative: None
Cripple Creek Tributary 1	Shimmer River Lane	CT1-RC-2	Local	1NB/1SB No Median	26 ft	25 mph	1,500 (Est.)	Recommended: At-grade unsignalized crossing Alternative: None
Cripple Creek Tributary 1	Glen Tree Dr	CT1-RC-3	Local	1WB/1EB No Median	26 ft	25 mph	1,500 (Est.)	Recommended: At-grade unsignalized crossing Alternative: None
Cripple Creek Tributary 2	Old Auburn Rd	CT2-RC-1	Major Collector	BL/1NB/1SB/BL No Median	36 ft	40 mph	17,623	Recommended: No crossing proposed since trail is discontinued to the south Alternative: None
Cripple Creek Tributary 2	Mariposa Ave	CT2-RC-2	Local	1WB/1EB No Median	26 ft	25 mph	2,923	Recommended: Users directed to existing stop controlled at-grade crossing at Cook Ave Alternative: None
Cripple Creek Tributary 2	Antelope Road	CT2-RC-3	Arterial	BL/2WB/TWLTL/2EB/BL TWLTL	66 ft	40 mph	23,700	Recommended: No crossing proposed since trail is discontinued to the south. Alternative: None
Cripple Creek Tributary 3	Twin Park Dr	CT3-RC-1	Local	1WB/1EB No Median	26 ft	25 mph	500 (Est.)	Recommended: At-grade unsignalized crossing Alternative: At-grade pedestrian activated signal
Cripple Creek Tributary 3	Navion Dr	CT3-RC-2	Local	1NB/1SB No Median	36 ft	25 mph	2,000 (Est.)	Recommended: At-grade unsignalized crossing Alternative: At-grade pedestrian activated signal

Legend: NB – Northbound Lane, SB – Southbound Lane, EB – Eastbound Lane, WB – Westbound Lane
TWLTL – Two-Way Left-Turn Lane
BL – Bike Lane, BL(F) – Future Bike Lane

Table 6 -- Recommended Roadway Crossings (SMUD Corridor)

Corridor	Roadway/ Street Name	Crossing No.	Designation	Lane Designation Median	Roadway Width	Posted Speed	ADT	Recommended Crossing Type Alternative Crossing Type
SMUD CORRIDOR	Wachtel Way	S-RC-1	Major Collector	BL/1NB/1SB/BL No Median	36 ft	25 mph	6,545	Recommended: No crossing at this time. Trail ties into existing on-street facilities. Alternative: If trail is extended eastwards by Sacramento County recommend pedestrian activated signal
	Villa Oak Dr	S-RC-2	Local	1WB/1EB No Median	48 ft	25 mph	2,000 (Est.)	Recommended: At-grade unsignalized crossing Alternative: None
	Oak Ave	S-RC-3	Major Collector	BL/1WB/TWLTL/1EB/BL TWLTL	60 ft	40 mph	11,231	Recommended: Redirect or tie into existing traffic signal at Melva St. Alternative: None
	Streng Ave	S-RC-4	Local	1EB/1WB No Median	26 ft	25 mph	1,000 (Est.)	Recommended: At-grade unsignalized crossing Alternative: None
	Woodmore Oak Dr	S-RC-5	Local	BL/1NB/1SB/BL No Median	42 ft	30 mph	4,453	Recommended: No crossing at this time until Segment S06 is constructed. Alternative: At-grade unsignalized crossing

Legend: NB – Northbound Lane, SB – Southbound Lane, EB – Eastbound Lane, WB – Westbound Lane
TWLTL – Two-Way Left-Turn Lane
BL – Bike Lane, BL(F) – Future Bike Lane

Grade Separated Crossings

Grade separated crossings proposed for the project are mainly undercrossings. Overcrossings are generally considered less feasible options than bridge or culvert structures. In addition the existing terrain relative to the roadway elevation would require extended ramps to meet the maximum 5% grade requirements and it is anticipated that trail users may then use alternatives means to cross the roadway.

Bridge Undercrossings

Several bridges exist along the creek corridor in particular along portions of Arcade and Cripple Creek. These bridges vary in width, span length and vertical clearance. In general the height to the soffit varies between 8 and 12 ft from the existing low flow channel. The current minimum vertical clearance Caltrans design standard for a trail is 10 ft, however it is anticipated that this standard may need to be lowered to 8 ft in some locations to allow use of the existing undercrossings. Additional signage will be placed warning users of the reduced vertical clearance.

Any trail construction will require excavation of the existing embankment and use of the existing abutment walls or in some instances new tie-back retaining walls, to avoid impacts to the existing abutments. As illustrated below, depending on the location of the creek relative to the proposed trail, the creek side edge of the trail would require protection against erosion in the form of rock slope protection or a cut-off retaining wall. The proposed improvements would be designed to not reduce the cross sectional area under the bridge structure thereby minimizing any hydraulic impacts. The majority of the bridges include utilities attached to the side of the bridge which may require relocation to obtain the necessary clearance.

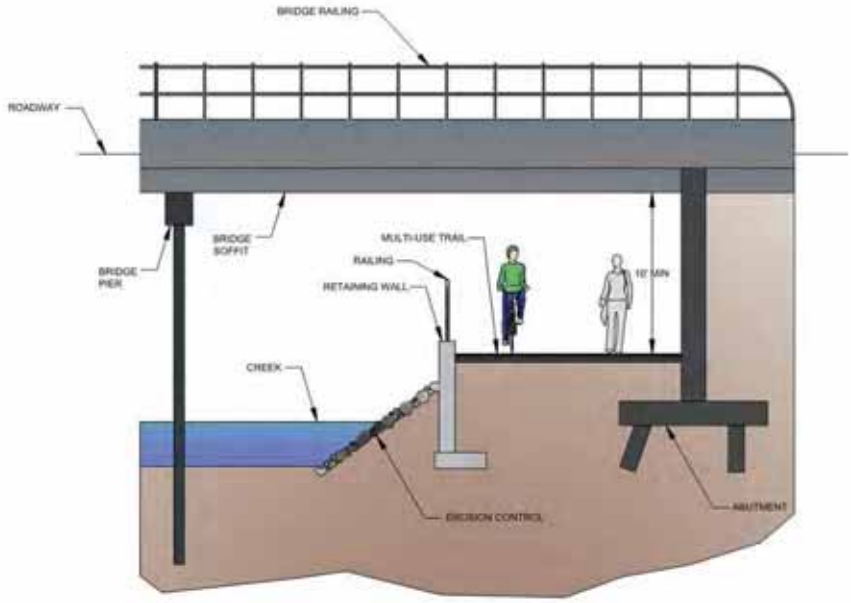

Figure 10 -- Bridge Undercrossing

Culvert Undercrossings

Several reinforced concrete box culvert structures exist along the creek corridors. These culverts are single boxes or combination of two and three units and vary in width, length and height. The height of the culvert and/or the elevation of the roadway relative to the low flow channel, dictate whether it is feasible to use the existing box culvert(s) to accommodate the proposed trail. Most of the culverts do not provide the minimum 10 ft vertical clearance and the flow line is set at or below the creek low flow elevation making their use during a 2 yr storm event infeasible. The illustration below shows the construction of a new culvert adjacent to the existing structure set slightly above the low flow elevation, making the trail passable during smaller storm events.

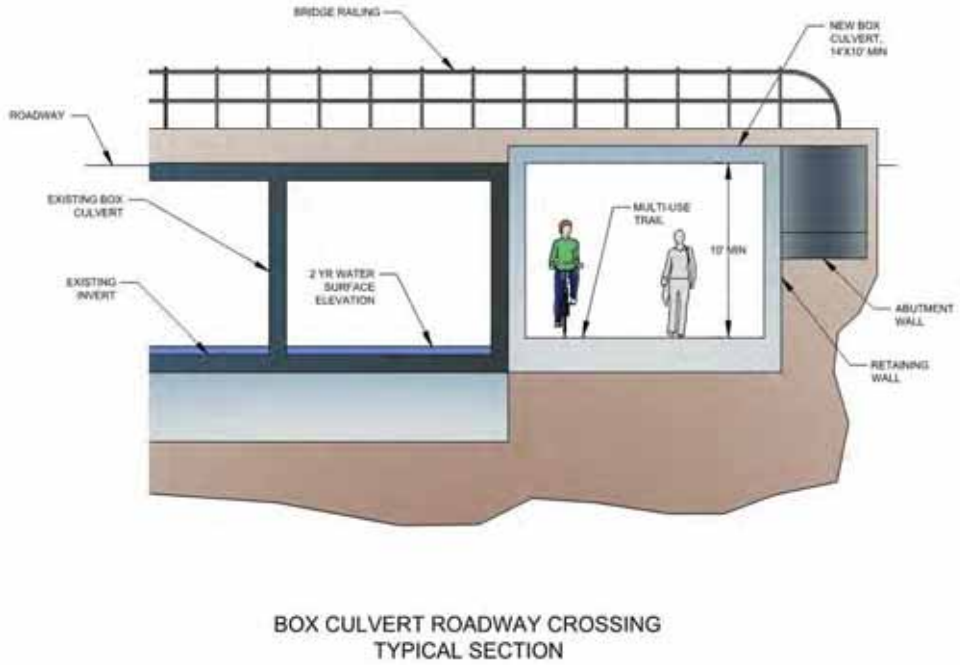

Figure 11 -- Box Culvert Undercrossing Option

Where it is not possible to meet the 10 foot vertical clearance requirement, other options of reducing the minimum vertical clearance standard to 8 feet, placing porous surface at the base of the culverts, or lowering one of the existing culverts to pass the low flow, will be considered.

At-Grade Crossing Options

The majority of the more than 45 road crossings considered as part of this project will be at-grade crossings. Proposed grade crossing options include use of existing traffic signals and crosswalks, new pedestrian activated signals and crosswalks, unsignalized mid-block crossings, redirecting trail users via two-way pathways to an adjacent signalized intersection and crosswalk.

Each of these will be discussed in more detail below.

Existing Traffic Signal and Crosswalks

In locations where the trail alignment enters the crossing roadway near or at an existing signalized intersection, existing signalized crosswalks are proposed for crossing roadways. Minor improvements would be anticipated at some intersections to bring the existing signal up to current design standards to meet ADA requirements. This work may include upgrading curb ramps, modifications to the signals to include countdown signal heads and vibro-tactile pedestrian push buttons, and incorporating Type D detector loops immediately behind the limit line for bicycles.

Figure 12 -- Existing Signalized Intersection

Pedestrian Activated Signal (At-Grade Crossing)

In locations where the proposed road crossing occurs and existing traffic volumes are moderate, primarily on collectors and major residential streets and grade separation is determined to be infeasible, a new pedestrian activated traffic signal is proposed. The grade crossing will need to comply with the requirements set forth in the latest edition of the California MUTCD. To reduce the length of the crosswalk, sidewalk bulbouts may be feasible provided these improvements do not impact drainage, parking or existing on-street bicycle facilities.

Several factors need to be taken into account when contemplating this option including:

- Traffic volumes – where ADT traffic volumes exceed 20,000 vehicles per day (vpd) use of grade separation should be considered
- Speed – where 85th percentile speeds exceed 40 mph consideration of traffic calming measures may be warranted
- Number of lanes – where only two lanes of traffic consideration may be given to unsignalized crossings; where more than four lanes this type of crossing is considered infeasible
- Width of roadway - may determine the need for signalization or construction of a refuge island
- Presence of a median - may provide pedestrian refuge area
- Location of nearest existing intersection or crosswalk – may reduce the need for a new crossing and may make crossing undesirable due to impacts on traffic flow

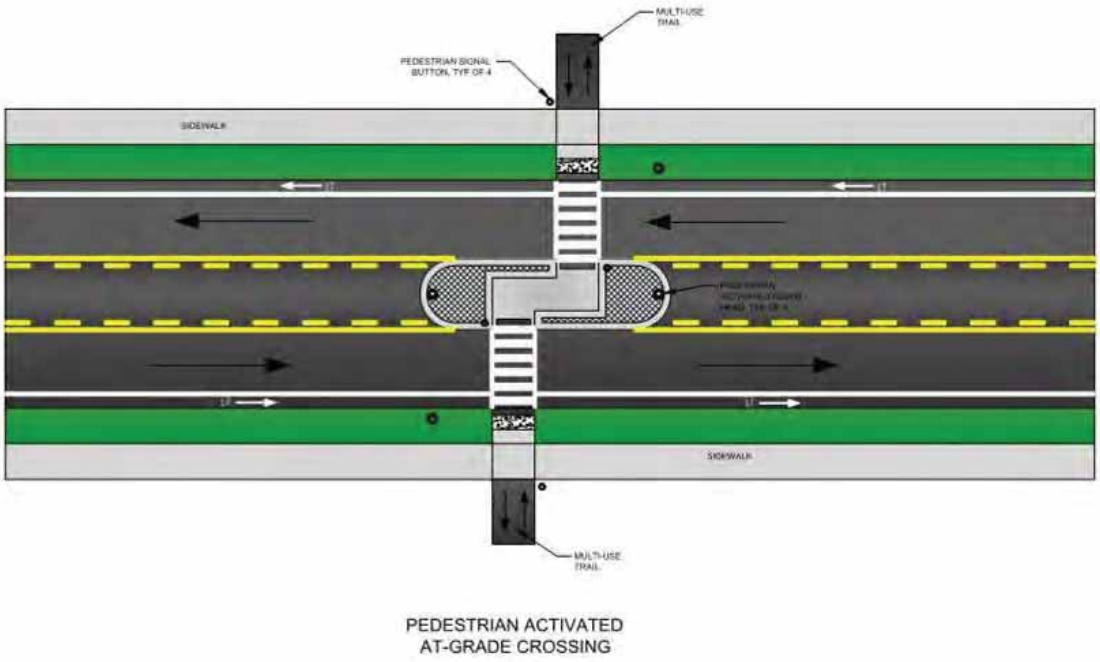

Figure 13 -- Pedestrian Activated Signal

Unsignalized At-Grade Crossings

In locations where the proposed road crossing occurs and existing traffic volumes are low, primarily on local streets in residential areas and grade separation is determined to be infeasible, a new unsignalized at-grade crossing is proposed. The grade crossing will need to comply with the requirements set forth in the latest edition of the California MUTCD. To reduce the length of the crosswalk, sidewalk bulbouts may be feasible provided these improvements do not impact drainage, parking or existing on-street

bicycle facilities. Driver awareness could be enhanced using in pavement lighting options, pavement markings, rapid flash beacons and raised median islands and/or sidewalk bulbouts.

Several factors need to be taken into account when contemplating this option including:

- Traffic volumes – where ADT traffic volumes exceed 5,000 vpd consideration of signalized crossing is warranted
- Speed – where 85th percentile speeds exceed 30 mph consideration of traffic calming measures or signalization may be warranted
- Number of lanes – where more than two lanes existing consideration may be given to signalized crossings
- Width of roadway - may determine the need for signalization or construction of a refuge island
- Presence of a median - may provide pedestrian refuge area
- Location of nearest existing intersection or crosswalk – may reduce the need for a new crossing and may make crossing undesirable due to impacts on traffic flow
- Sight distance – where the proposed crossing is located on a curve with poor sight distance consideration of signalized crossing is warranted

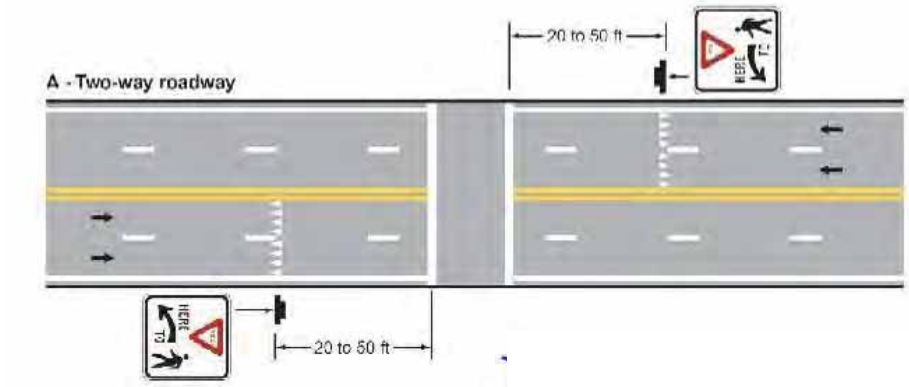

Figure 14 -- Unsignalized At-Grade Pedestrian Crossing

Redirection of Trail Users to Existing Intersection Crossings

This type of treatment option is considered feasible where the proposed road crossing occurs fairly close to an existing signalized intersection and placing a new crossing is likely to impact existing traffic flow and increase delay, and grade separation is determined to be infeasible.

Several factors need to be taken into account when contemplating this option including:

- Availability of right-of-way – impacts to private property may make this option infeasible
- Impacts to utilities – if significant utilities will need to be relocated this may make this option economically infeasible

- Environmental impacts – if significant environmental impacts would occur as a result of the proposed improvements this option may be considered infeasible
- Distance to nearest existing crossing and presence of driveways – where the distance to the nearest driveway will make use of this facility limited or where driveways may pose a safety concern consideration may be given to other options

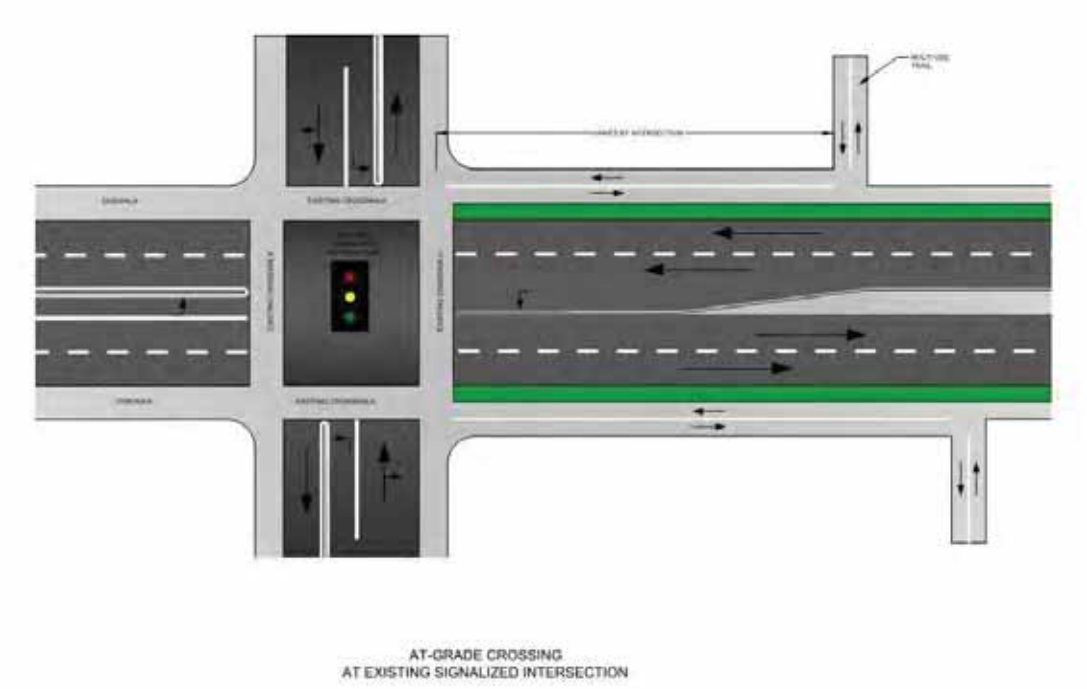

Figure 15 -- Parallel Path to Next Signalized Crossing

Costs

Trail construction costs have four primary components: 1) planning, design, environmental compliance and permitting 2) property/easement acquisition; ; 3) actual construction costs, and 4) maintenance. Each of these categories are discussed briefly below and will be dealt with in greater detail in the Feasibility Report.

Property/Easement Acquisition

In order to locate a trail in areas where trails are desired but public access is not already secured, either through public ownership or a trail/recreation easement, the land must be purchased either through acquisition of fee-title or a trail easement. Any future land acquisition required for trail development must occur at going market rates. A thorough market analysis was not done as a part of this study, but a brief examination of undeveloped land sales in the Citrus Heights area from March 2013 to July 2013 indicated that prices ranged from a low of $127,622 per acre to a high of $428,553 per acre, with an average sales price of $244,644 per acre. Easement acquisition values are lower than fee-title acquisitions and should be calculated based upon the proposed

easement impact on the beneficial interests remaining with the landowner. Easement value should not exceed the underlying fee-simple value (Allen, 2001).

Planning, Design, Environmental Compliance and Permitting

Costs to plan and design the trail include engineering, geotechnical, landscape architectural, and other professional fees. Environmental compliance includes preparation of the CEQA and/or NEPA (if federal funding is utilized) documents. Permits required to construct a trail within a creek corridor may include the following:

- a Water Quality Certification, regulated by the Clean Water Act Sections 401 and available through the State Water Resources Control Board;
- an Individual or Nationwide permit, regulated by the Clean Water Act Section 404 and obtained through the US Army Corps of Engineers;
- a Section 7 or 10 Consultation with the U.S. Fish and Wildlife Agency and/or the National Marine Fisheries Service, if sensitive species are present, regulated by the Endangered Species Act; and
- a Streambed Alteration Agreement, regulated by Section 1600 of the state fish and game code and obtained through the California Department of Fish and Wildlife, to name a few.

Additionally, as previously discussed, a tree removal permit from the City of Citrus Heights may be needed if native oaks over 6 inches DBH or other trees over 19" DBH are to be removed, and CDFW may require a riparian mitigation plan if native riparian vegetation will be impacted. Projects such as bridges within a designated floodway will require a FEMA Conditional Letter of Map Revision (CLOMR), submitted prior to construction, and a Letter of Map Revision (LOMR) following construction.

These costs can vary widely depending upon impacts to the creek channel and riparian corridor, length of trail, degree of wetland impacts, degree of channel modification, if any, engineering challenges, road and creek crossings, and other factors. Costs can typically be approximated at 20-30% of the total project construction budget.

Construction

As with permitting costs, construction costs can vary widely based upon proposed improvements, market prices and site conditions and constraints. Some of the major costs include construction of the trail itself, road crossings, creek crossings, retaining walls and earthwork. Additionally, parking facilities at staging areas can be a significant cost. Other potential costs include interpretive and directional signage, educational play equipment, exercise stations, benches and trash receptacles, tree and shrub planting, temporary or permanent irrigation, culverts and minor bridges over drainages, erosion control, and wetland mitigation costs.

Table 7 illustrates some of the more common major construction costs in a trail project.

Table 7 – Typical Trail Construction Costs in 2013

Item	Cost	
Concrete Trail, 12' wide, w/DG shoulders	$785,000	per mile
Asphalt Trail, 10' wide, w/DG shoulders	$390,000	per mile
Concrete Trail, 8' wide, w/DG shoulders	$532,000	per mile
40' x 8' Bridge, w/ abutments	$70,000	EA
60' x 14' Bridge, w/abutments	$105,000	EA
80' x 14' Bridge, w/abutments	$140,000	EA
Street Crossing, overpass	$750,000	EA
Street Crossing, on-demand light	$60,000	EA
Street Crossing, flashing lights	$40,000	EA
Street Crossing, painted/textured walk	$20,000	EA
Grading	$9,500	per 100 CY
Retaining wall, boulder	$75,000	per 100' of 10' high wall
Lighting, pole mounted, motion activated	$218,300	per mile
Tree removal	$7,500	per 10 trees

Maintenance

Maintenance costs for trails depend upon a number of factors, including surfacing, ease of access for maintenance crews, vegetation density surrounding the trail, proximity of the trail to the creek and floodway and the number of creek crossings. Costs typically range from $3,000 to $4,000 per mile per year for basic maintenance on a 10-foot wide Class I trail. Basic maintenance includes inspections, sweeping, trash removal, tree and shrub pruning, mowing and basic repair. In addition to basic maintenance, trails require additional period maintenance such as signage repair, invasive species management, drainage repair, graffiti control, lighting repair (for areas of lit trails), and others. Asphalt trails should be slurry sealed every 7 to 10 years.

Trail maintenance may be combined with some types of creek corridor maintenance such as removal of hazard trees and repair of erosion hot-spots to reduce total maintenance costs within the creek corridor.

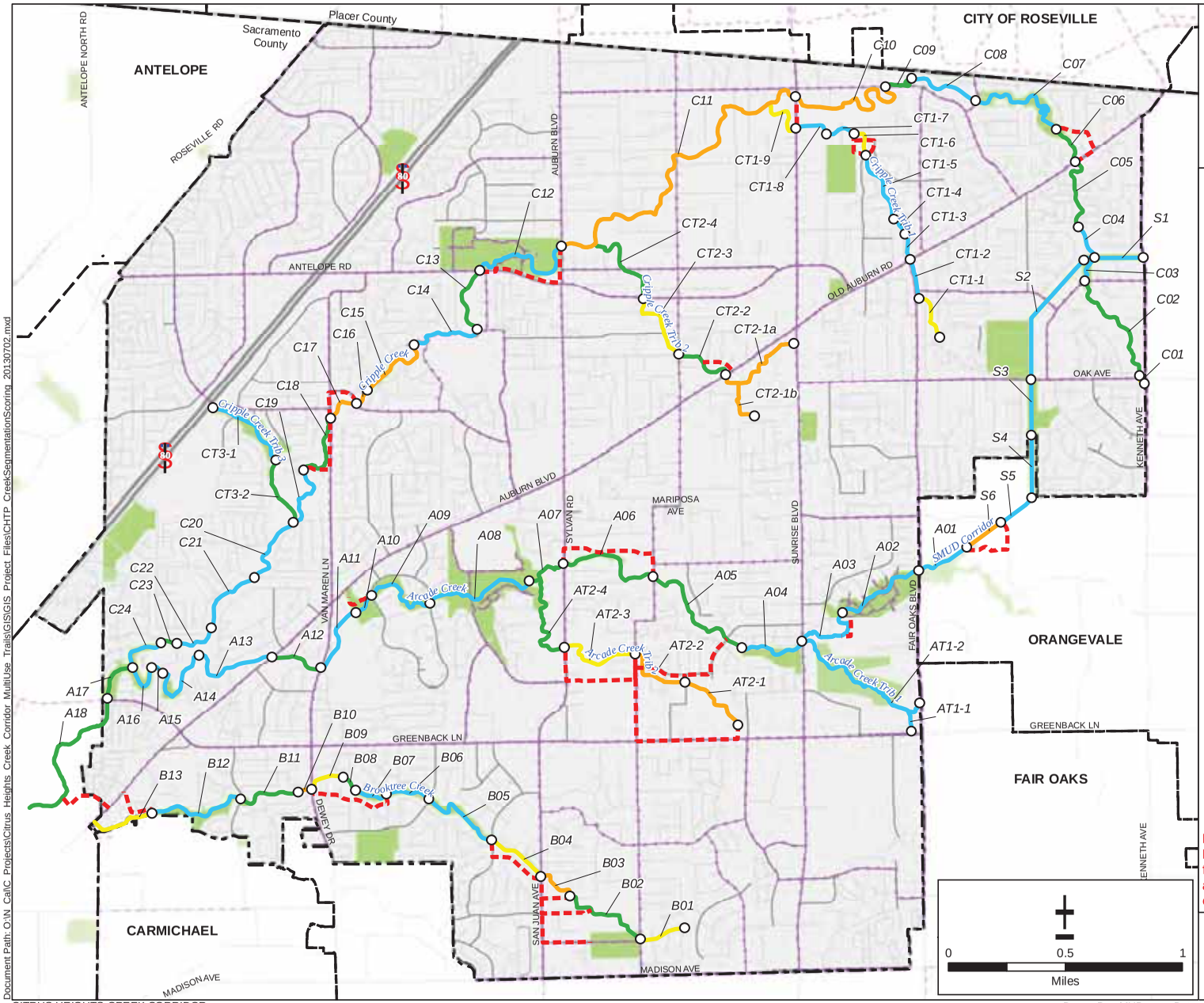

FIGURE 16

LEGEND

Scoring Segmentation

- Begin/End Point

Priority for Further Study

- High
- Moderate
- Low
- No Further Study

Other Routes

- Alternate Route
- Bike Lane/Trail (Existing and Proposed)
- Neighboring Community Bike Routes

Jurisdictions

- City of Citrus Heights
- Other Communities
- County Boundary
- SRPD/ORPD Parks

NOTE ON MAP USE:
Preliminary scoring results are only intended to focus further study efforts and in no way represent the final assessment of trail feasibility for any particular creek corridor.

FOOTHILL ASSOCIATES
ENVIRONMENTAL CONSULTING + PLANNING + LANDSCAPE ARCHITECTURE
PSOMAS

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CITRUS HEIGHTS CREEK CORRIDOR

Drawn By: MUB Date: 07/11/2013 Document Name: CHTP_CreekSegmentationScoring_20130702

Creek Segment Summaries

The remainder of this report presents the results of the opportunities and constraints analysis for each segment. Each of the pages in this section includes an aerial photograph of the segment, including a key map; start and end point locations, segment length, number of proposed creek crossings, number of road crossings; a discussion of the opportunities and constraints within that segment and example photographs. This information can be cross-referenced to the scoring map presented in Figure 16 and the tables in Appendix B for additional detail.

As discussed earlier, the Background Analysis Report presents a detailed analysis of the technical feasibility of locating a trail within the creek corridor. It presents the results of the analysis of the existing conditions within the creek corridors, including opportunities such as location of public land and trail easements, sufficient corridor width, and suitable topography, and constraints such as private land, sensitive natural resources, unsuitable terrain, and others. The follow-on the Feasibility Report, which will be prepared over the next several months, will be a more comprehensive examination of trail locations, priorities, key destinations, costs and other factors related to trail construction.

Figure 17 presents an overview of creek segment locations.

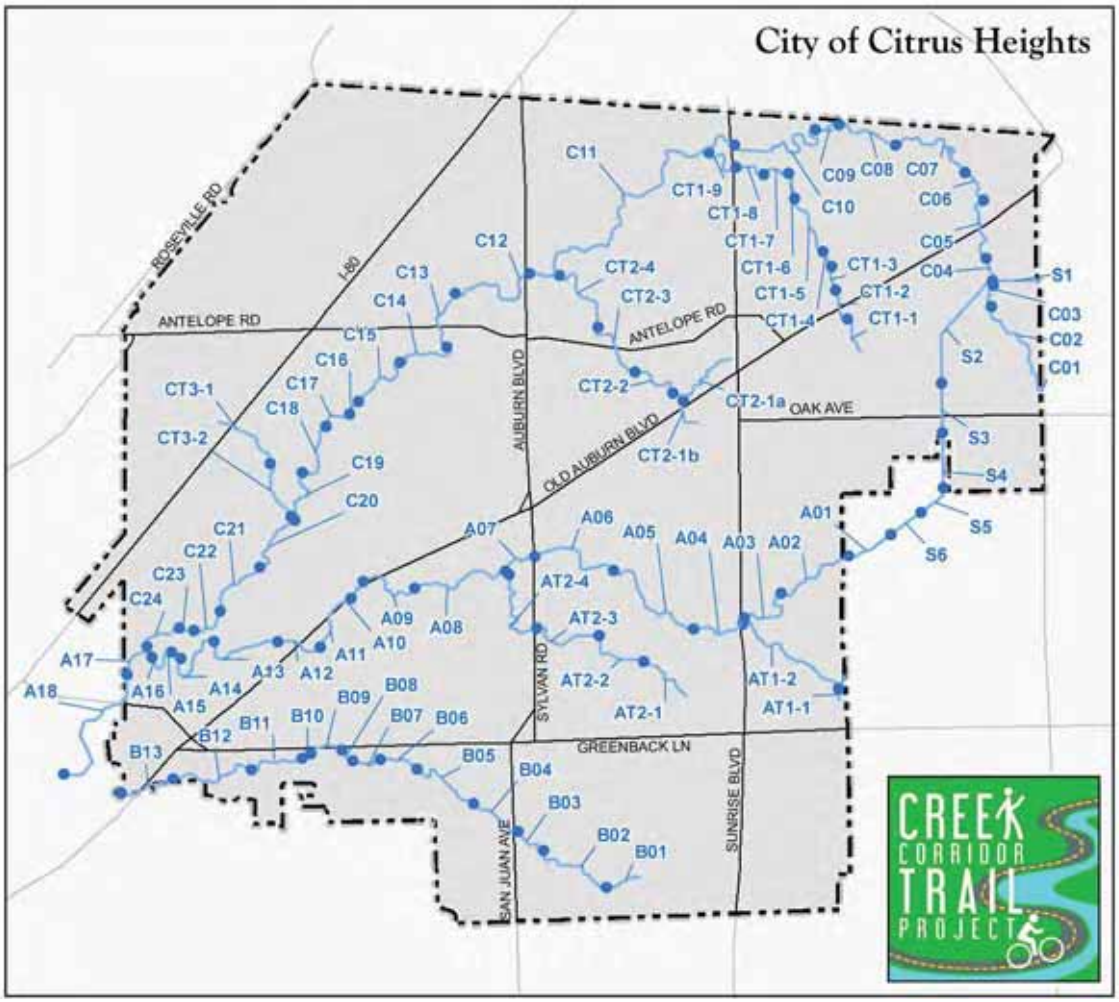
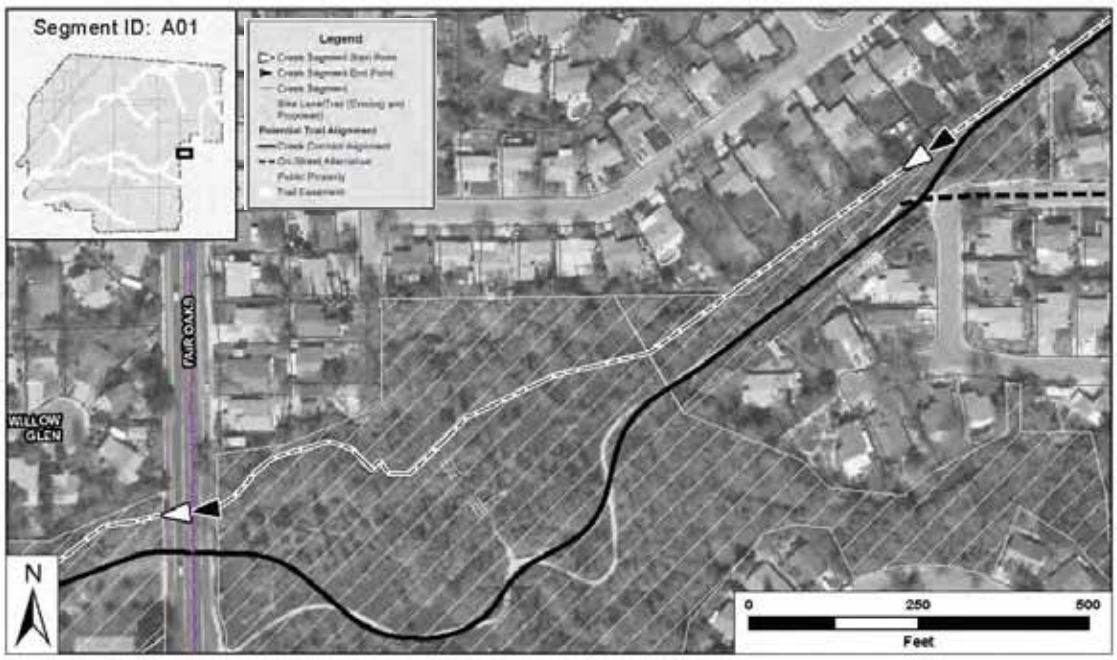


Figure 17 -- Creek Segment Overview Map



Subwatershed: Arcade Creek
Segment ID: A01
Length: 1299'
Potential for Future Study: High

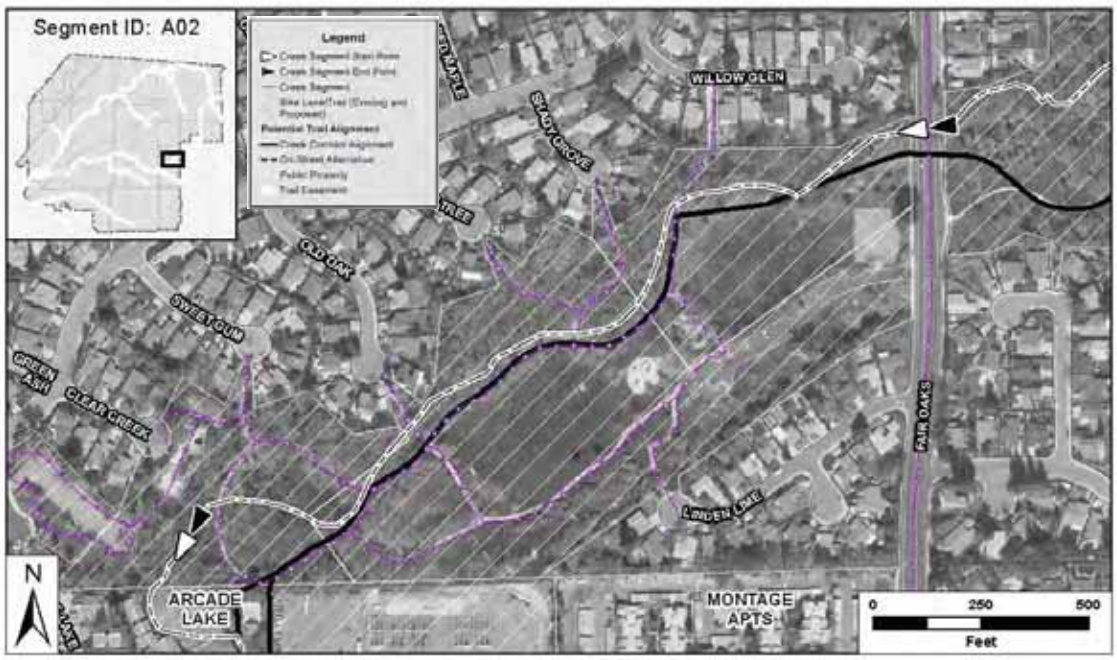
Start: Highwood Way Cul-de-sac
End: Fair Oaks Blvd
Number of Road Crossings[6]: 1
No. Potential Creek Crossings[7]: 0

Discussion:

This segment lies within Sundance Park, which is owned and operated by the Orangevale Recreation and Park District (ORPD). Existing trails follow the creek through this segment, but are unpaved and do not meet Class I standard minimums. Quality of natural resources in this segment is high. Topography is generally flat. The corridor ranges from 400 feet to over 500 feet near Fair Oaks, narrowing to around 62 feet at its east end.

ORPD would need to either upgrade the trail or manage uses within these segments consistent with existing trails. Existing bridge would need upgrading or replacement to bring it up to Class I standards. The existing trail connection at Highwood Way presents an opportunity to connect to the SMUD easement through on-street routes.

[6] Where a road corresponds to the segment end point, the crossing is attributable to the upstream segment.
[7] Bridges listed are those required for the main trail. Additional bridges may be necessary to connect to surrounding communities (i.e. the existing bridge on A01 connects to the community to the north).

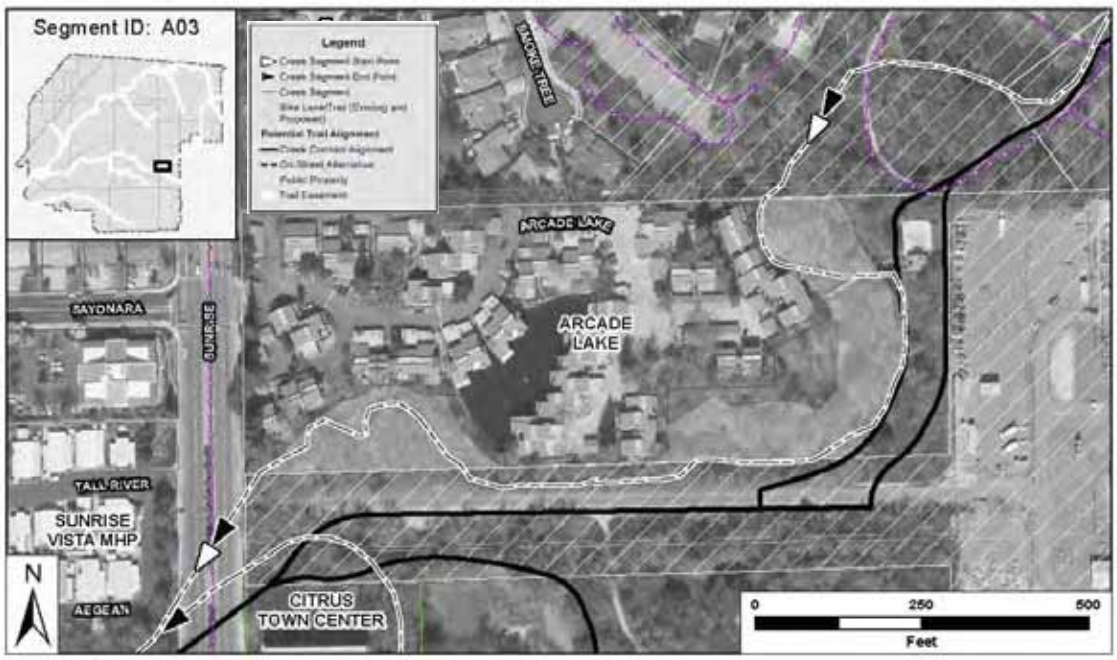


Subwatershed: Arcade Creek
Segment ID: A02
Length: 2210'
Potential for Future Study: High

Start: Fair Oaks Blvd
End: Tempo Park Existing Trail
Number of Road Crossings: 0
No. Potential Creek Crossings: 0 - 1

Discussion:

This segment lies within Tempo Park, which is owned and operated by Sunrise Recreation and Park District (SRPD). Existing trails within the park are paved, though less than the standard Class I minimum width of 8'. Quality of natural resources is high, with a healthy riparian buffer around the creek. The open space corridor is wide, encompassing the entire park, generally 400 to 600 feet. Slopes present few constraints to trail construction. Trails may need upgrading to remain consistent with remainder of trail network. Numerous connections to the northern neighborhood are in place, typically these connections to existing cul-de-sacs are low-flow crossings. Recommend upgrading these crossings to bridges. A connection is also needed to from the existing creek side trail to Fair Oaks Boulevard.



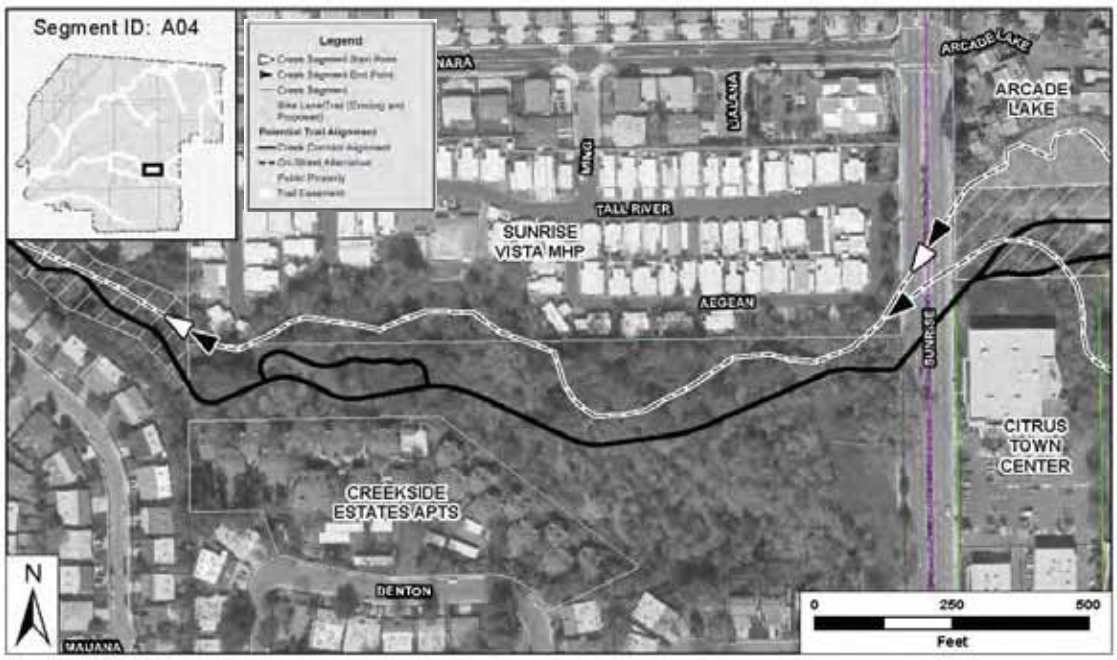
Subwatershed: Arcade Creek
Segment ID: A03
Length: 1897'
Potential for Future Study: High

Start: Tempo Park Existing Trail
End: Sunrise Blvd
Number of Road Crossings: 1
No. Potential Creek Crossings: 0 - 3

Discussion:

This segment runs from Sunrise Boulvard to Tempo Park through an area occupied by a SMUD substation. Land is either owned by the public or covered by a trail easement. The largest challenge for this segment is the trail crossing of Sunrise Boulevard. The most economic practical alternative is probably via an on-street routing to the traffic light at Sayonara Drive. An undercrossing could be feasible, but would require a lengthy tunnel that may be considered undesirable by trail users.

In addition to the crossing, the SMUD station forms a barrier between Sunrise and Tempo Park. There is sufficient room between the SMUD station and the creek to locate a trail; however, a recreational outbuilding and pool belonging to the adjacent residential complex presents an additional challenge. A trail easement exists on the residential complex property that would avoid this outbuilding, but utilizing it would require two bridges. An additional bridge might be required to cross a tributary to Arcade Creek (AC-T2) if an undercrossing were utilized. An undercrossing would also require an easement to be purchased from the adjacent landowner. Natural resources, corridor width and topography all rated moderate-high for this segment.



Subwatershed: Arcade Creek
Segment ID: AC04
Length: 1597'
Potential for Future Study: High

Start: Sunrise Boulevard
End: Sayonara Drive
Number of Road Crossings: 0
No. Potential Creek Crossings: 0

Discussion:

This segment runs through the Arcade Creek Park Preserve, currently under development by the SRPD. The Park Preserve will contain a Class I multi-use trail from Sayonara to Sunrise with several 6-foot wide branching pedestrian paths and other recreational amenities. Two bridges are planned to cross the creek. The Class I connection will generally be 12' wide with 2' shoulders; however, it narrows to 8' wide with 2' shoulders on the western end of the park due to topographic constraints. All of the land is in public ownership. Natural resources, corridor width and topography rated high-moderate for this segment. Additional native vegetation, greater development encroachment on the creek and steeper slopes led to the less suitable ratings in these areas.

Subwatershed: Arcade Creek
Segment ID: A05
Length: 3068'
Potential for Future Study: Moderate

Start: Sayonara Drive
End: Mariposa Avenue
Number of Road Crossings: 2
No. Potential Creek Crossings: 4

Discussion:

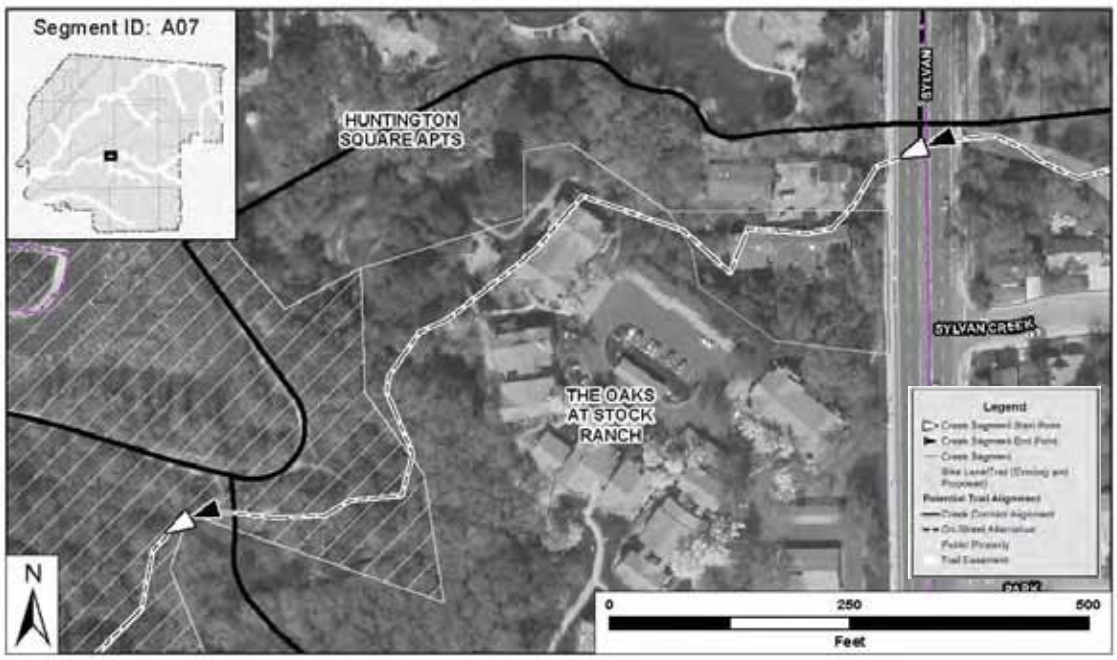
This section of the main stem runs between Sayonara and Mariposa. Ownership of the open space in this segment is either public or includes a trail easement. Natural resources and topography rated low-moderate in this segment due to steep banks and heavy native vegetation growth. Corridor width rated high-moderate, generally trending around 150-feet but opening up to over 400-feet east of Mariposa. Several creek crossings would likely be needed to avoid constraints.

Subwatershed: Arcade Creek
Segment ID: A06
Length: 2568'
Potential for Future Study: Moderate

Start: Mariposa Avenue
End: Sylvan Road
Number of Road Crossings: 1
No. Potential Creek Crossings: 1

Discussion:

The segment between Mariposa and Sylvan is primarily privately owned. Although much of it contains public trail easements, they may not be located in the areas most suitable for trails. As in the upstream segment, vegetation is dense and banks are steep. Corridor width is similar to that upstream, generally ranging from 150 to 300 feet, though constrained at the east end by a residence relatively close to the creek.



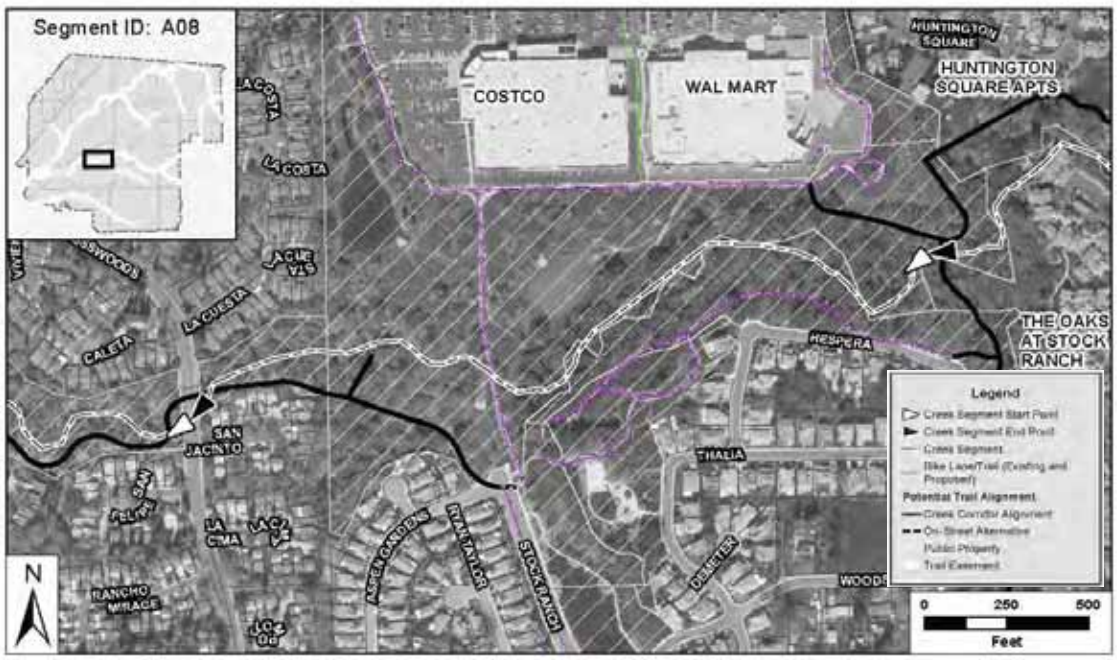
Subwatershed: Arcade Creek
Segment ID: A07
Length: 1092'
Potential for Future Study: Moderate

Start: Sylvan Road
End: Confluence with AC-T1
Number of Road Crossings: 0
No. Potential Creek Crossings: 1

Discussion:

Much of this segment is privately owned, with the exception of the western portion within Stock Ranch. Easement or fee title purchases would be required from adjacent property. Natural resources, corridor width and topography scored high-moderate. Some areas have heavy vegetation. Existing development west of Sylvan and north of the creek maintains the creekside in a managed state, with concrete trails and lawn. Existing informal trail connects private development to Stock Ranch.

No opportunities on south side of creek for trails due to encroaching development.



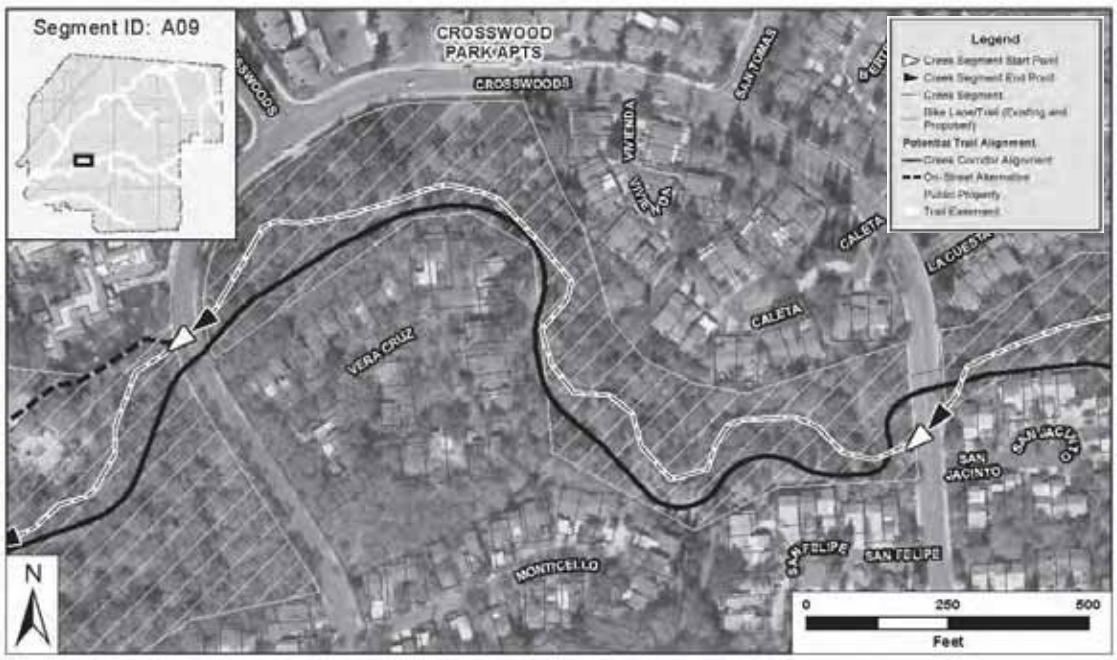
Subwatershed: Arcade Creek
Segment ID: A08
Length: 2750'
Potential for Future Study: High

Start: Confluence with AC-T1
End: Crosswoods Circle east bridge
Number of Road Crossings: 1
No. Potential Creek Crossings: 0[8]

Discussion:

This segment scored high in all categories. SRPD owns and maintains these parcels and natural resource constraints are low. Corridor width ranges from 600 to 800 feet within Stock Ranch to just over 100 feet at Crosswoods Circle. Slopes are generally gentle. Existing paved trails form much of this segment through Stock Ranch. The existing bridge can be utilized to transition the trail to the south side of the creek west of the preserve. An existing SRPD parcel connects Crosswoods Circle to the Stock Ranch site. Potential opportunity for a scenic overlook spur trail west of the existing bridge.

[8] Segment utilizes existing crossing at Stock Ranch



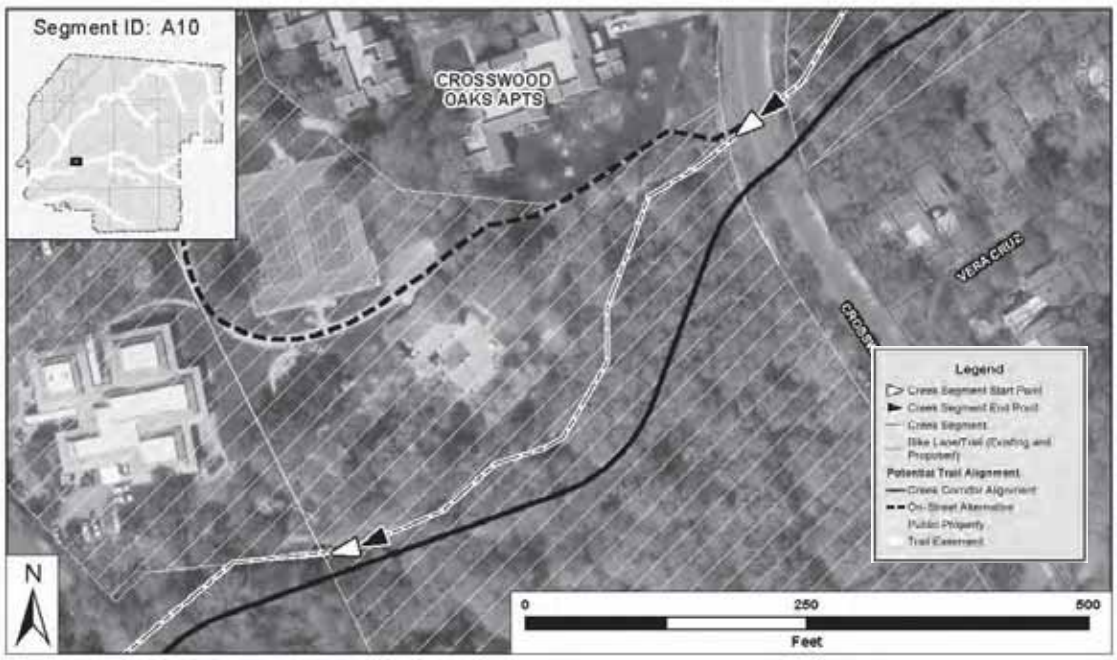
Subwatershed: Arcade Creek
Segment ID: A09
Length: 1894'
Potential for Future Study: High

Start: Crosswoods Circle east bridge
End: Crosswoods Circle west bridge
Number of Road Crossings: 1
No. Potential Creek Crossings: 0 - 2

Discussion:

As with the upstream segment, SRPD owns and manages the land within the creek corridor. Corridor width is generally approximately 200-feet. Crosswoods Circle crosses the creek on both ends using open-bottom culverts. This segment has some informal trails. The south bank on the west end of the segment is broad and flat and appears to be actively managed for vegetation control. Some areas within the segment will require more care in siting trails to minimize riparian vegetation impacts. One or more bridges may be needed to avoid proximity to undercut banks, homes and dense vegetation.

The upstream end of this segment joins a heavily used informal trail connecting to Stock Ranch.



Subwatershed: Arcade Creek
Segment ID: A10
Length: 560’
Potential for Future Study: High

Start: Crosswoods Circle west bridge
End: Crosswoods Park west boundary
Number of Road Crossings: 0
No. Potential Creek Crossings: 0

Discussion:

This short segment primarily runs adjacent to Crosswoods Park on land owned by SRPD. Trail feasibility ranked high for corridor width and topography and high-moderate for natural resources due to somewhat dense native riparian vegetation.

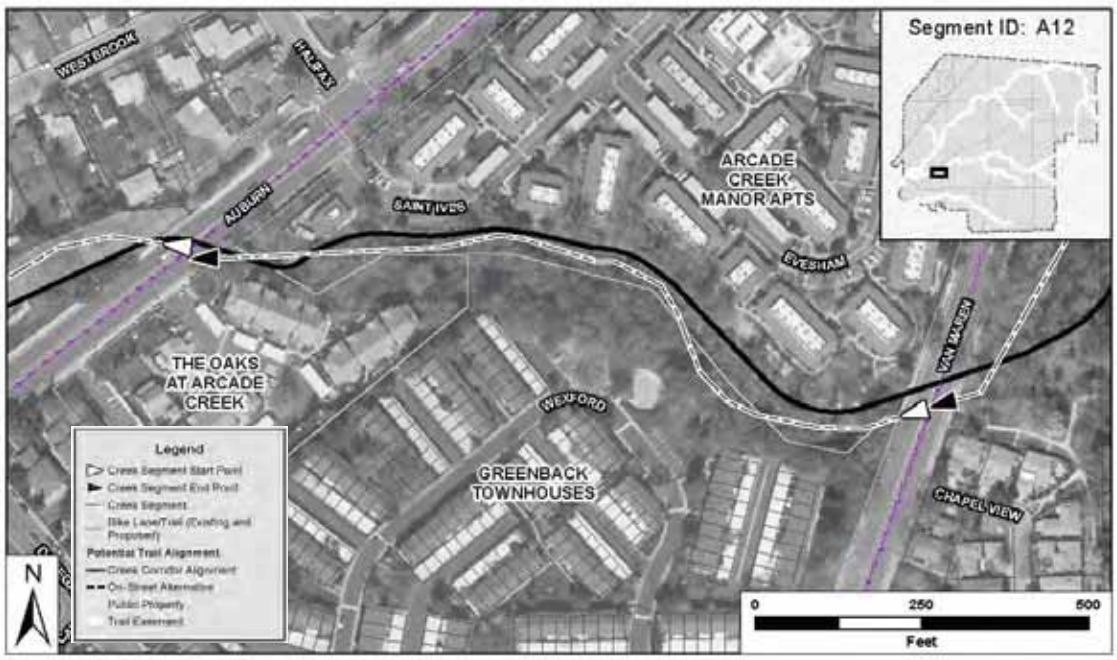
Existing paved trails at Crosswoods Park connect to bike lanes along Auburn Boulevard, which provides an alternate route in the event that access cannot be obtained for the downstream segment through the Christ the King Retreat Center (Segment A11).

Subwatershed: Arcade Creek
Segment ID: A11
Length: 1662'
Potential for Future Study: High

Start: Crosswoods Park west boundary
End: Van Maren Lane
Number of Road Crossings: 1
No. Potential Creek Crossings: 1

Discussion:

This segment primarily crosses through the Christ the King Passionist Retreat Center. A small section of public land on the north could provide access to the library parking lot, which could double as an access node; however, both Van Maren and Auburn Boulevard are heavily travelled routes, and the preferred alternative would be to secure access through the Church property. Topography presents few challenges and the corridor ranges around 500-feet wide. Dense native riparian vegetation presents some challenges, but these are not insurmountable.



Subwatershed: Arcade Creek
Segment ID: A12
Length: 1239'
Potential for Future Study: Moderate

Start: Van Maren Lane
End: Auburn Boulevard
Number of Road Crossings: 1
No. Potential Creek Crossings: 1

Discussion:

This segment of creek runs through three fully-developed private parcels. Trail alignment is possible on both sides of the creek, but would require retaining walls, tree removal and widening of the existing bench on the left bank and significant retaining walls and two bridge crossings if located on the right bank. Topographic constraints are moderate and vegetation constraints are moderate to high. Corridor width ranges from just under 100 feet at the narrowest to around 200 feet at the widest. Existing walkways follow the creek on the right bank, which may be slightly preferable than the left due to vegetation and topographic constraints.

Subwatershed: Arcade Creek
Segment ID: A13
Length: 2147'
Potential for Future Study: High

Start: Auburn Boulevard
End: Matheny Way cul-de-sac, E. end
Number of Road Crossings: 0
No. Potential Creek Crossings: 1

Discussion:

Public easement on east two-thirds of segment is generally adequate, except adjacent to A&A Stepping Stone storage yard. May require negotiation of right-of-way easement or significant retaining wall. Corridor width in this is about 100-feet. Landscape is open and maintained adjacent to the professional complex on Auburn Boulevard.

Western one-third of segment has a trail easement on the north bank, which would require a bridge to cross in the vicinity of the stone yard. Width is adequate and topographic and vegetation constraints are few. Public trail easement connects to end of Matheny Way cul-de-sac. Opportunities for trail alignment appear to be greater on the south side of the creek; however, easement does not extend on the south side beyond the stone yard.

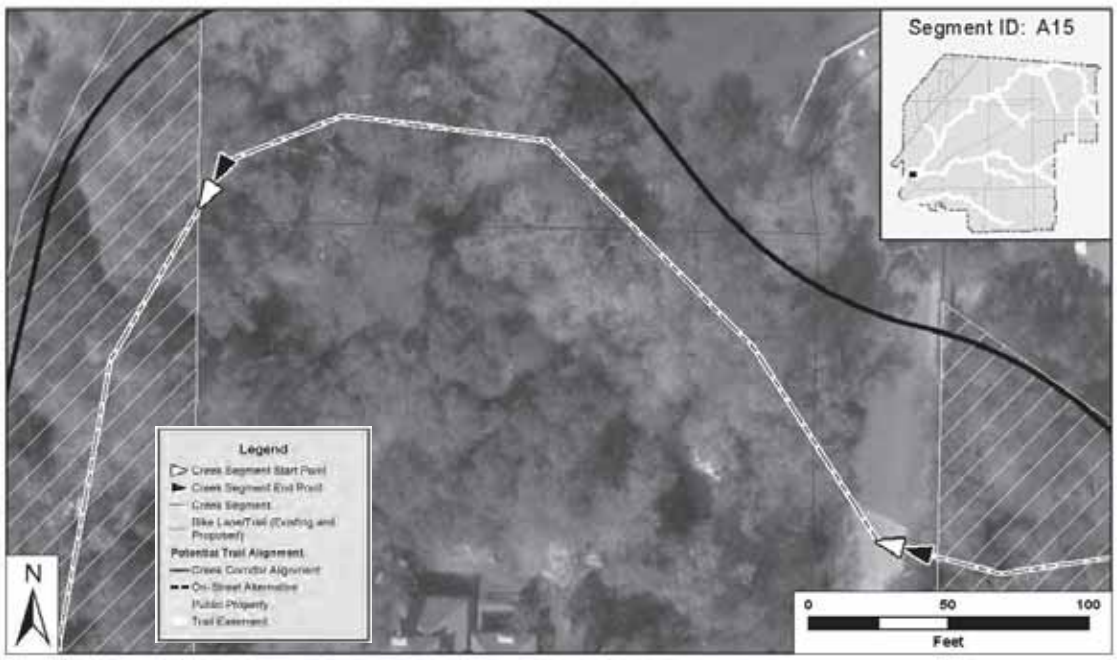
Potential connection runs north from this segment to the Cripple Creek corridor.

Subwatershed: Arcade Creek
Segment ID: A14
Length: 1953'
Potential for Future Study: High

Start: Matheny Way cul-de-sac, E. end
End: Matheny Way
Number of Road Crossings: 1
No. Potential Creek Crossings: 2

Discussion:

Left bank offers more trail opportunities due to corridor width and topography; however, public ownership is on right bank; therefore, preferred alignment is on the right. Two bridges may be required to accomplish a northern alignment. It may be desirable to provide trail connection to the neighboring residential neighborhood and commercial buildings.

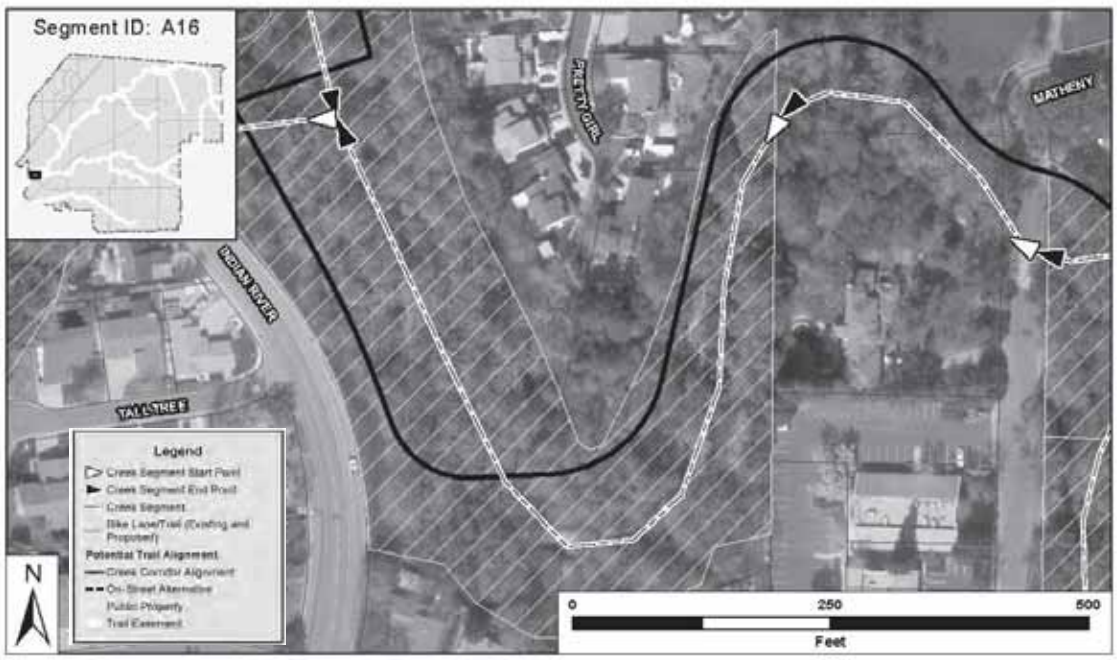


Subwatershed: Arcade Creek
Segment ID: A15
Length: 323'
Potential for Future Study: High

Start: Matheny Way
End: Matheny Way Park Site, E. boundary
Number of Road Crossings: 0
No. Potential Creek Crossings: 0

Discussion:

Locating a trail in this segment would require purchase of land or easements. Both sides of creek are privately owned. Corridor width and topography are adequate. Natural resource limitations are not significant. Potential alignment would be located on the right (north) bank.

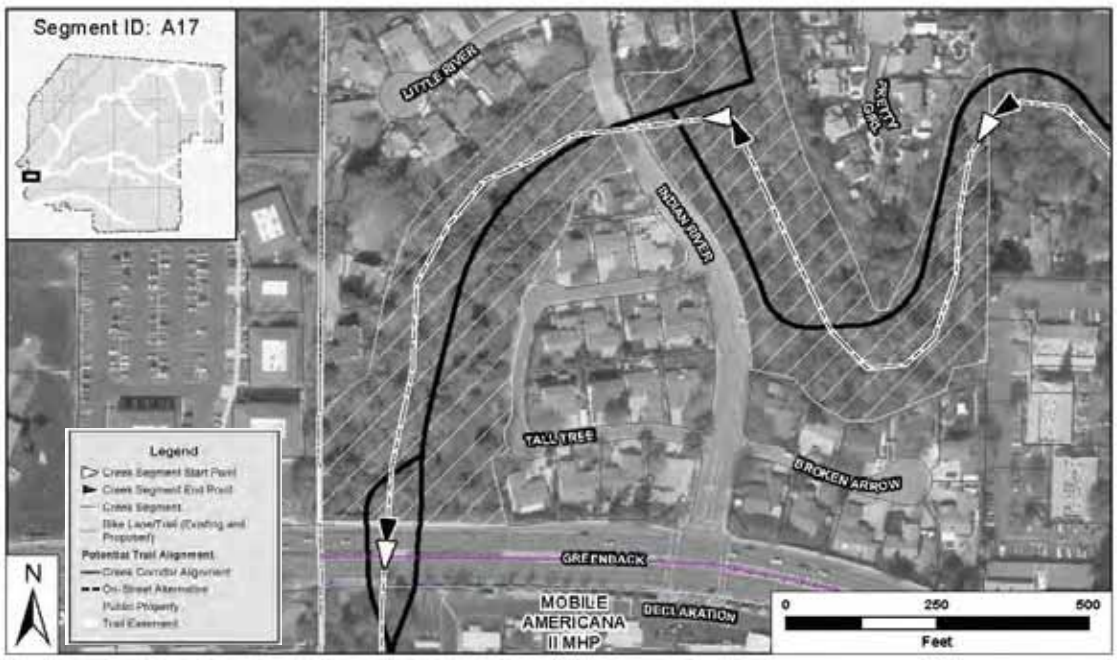


Subwatershed: Arcade Creek
Segment ID: A16
Length: 987'
Potential for Future Study: High

Start: Matheny Way Park Site, E. boundary
End: Confluence with Cripple Creek
Number of Road Crossings: 0
No. Potential Creek Crossings: 0 - 1

Discussion:

Property is owned and managed by SRPD. Corridor width ranges from 200 to 300 feet. Topographic constraints are minimal. Alignment could occur on either side, though impacts to riparian vegetation would be lesser on the left bank. A left bank alignment would also take advantage of open space access paralleling Indian River Drive with potential for on-street parking and provide an opportunity for an overlook, but it would also require an additional bridge over the creek. The Matheny Way Park Site is a future open space park in SRPD's Master Plan. This park would include trails and passive recreation opportunities consistent with a Class I trail system in this area. The trail in this segment would connect into a Cripple Creek trail system.



Subwatershed: Arcade Creek
Segment ID: A17
Length: 1073'
Potential for Future Study: High

Start: Confluence with Cripple Creek
End: Greenback Lane
Number of Road Crossings: 2
No. Potential Creek Crossings: 0

Discussion:

Property in this segment owned by SRPD. Steep grades on right bank and proximity of existing residential structures favor left bank for trail alignment. Few constraints on left side. Corridor width is around 200 feet. Impacts to mature riparian vegetation should be avoidable. Greenback Lane crossing presents challenges.

Subwatershed: Arcade Creek
Segment ID: A18
Length: 1185'
Potential for Future Study: Moderate

Start: Greenback Lane
End: Devecchi Avenue/Rosebud Lane
Number of Road Crossings: 0
No. Potential Creek Crossings: 3

Discussion:

Private property through two medium density residential complexes would require easement. Corridor width is generally adequate. Topography generally feasible, but steep areas near Greenback may require retaining walls. Existing informal trails exist in this segment. Connection to Brooktree Creek may require bridges and easement connecting to Devecchi Avenue.

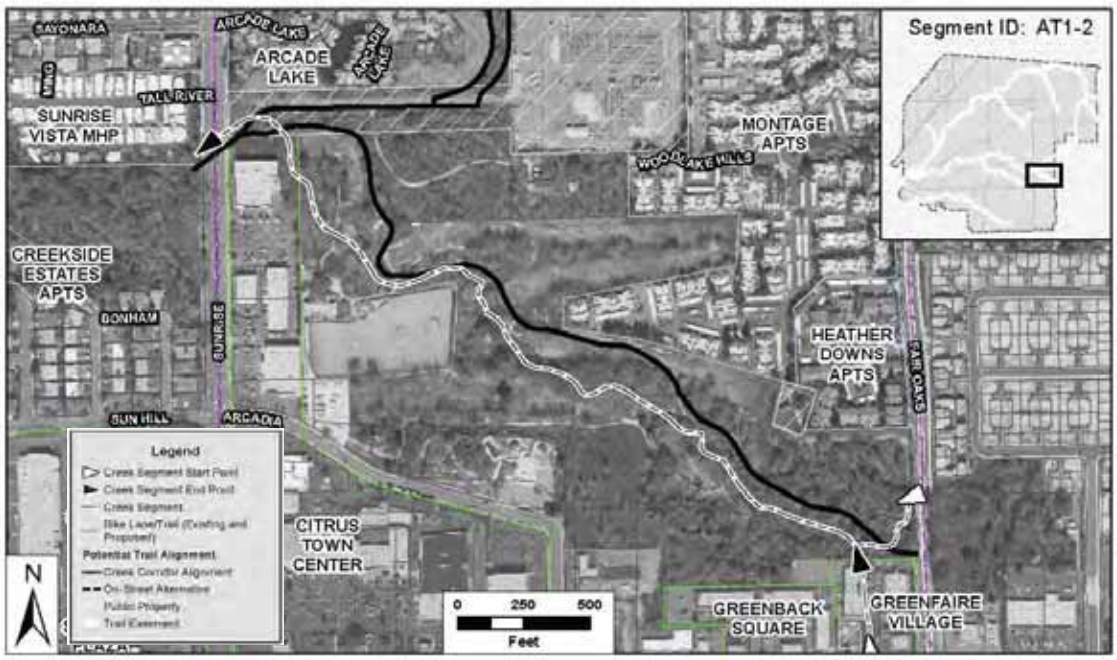
Subwatershed: Arcade Creek
Segment ID: AT1-1
Length: 540'
Potential for Future Study: High

Start: Brando Loop
End: Fair Oaks Boulvard
Number of Road Crossings: 1
No. Potential Creek Crossings: 0

Discussion:

This short segment is between Fair Oaks Boulevard and Brando Loop. Corridor width and topography are adequate. Vegetation presents no significant constraints. This segment is outside Citrus Heights city limits. County land is identified as Park/Greenbelt. This segment would provide access to the trail system for homes within the new development between Greenback and Woodlake Hills, as well as existing homes along Woodlake Hills.

An existing 66" corrugated metal pipe under the roadway is insufficient for crossing under Fair Oaks. While it possibly could be replaced with pipe having greater clearance, it is unlikely to meet the 10 foot standard for Class I trails.

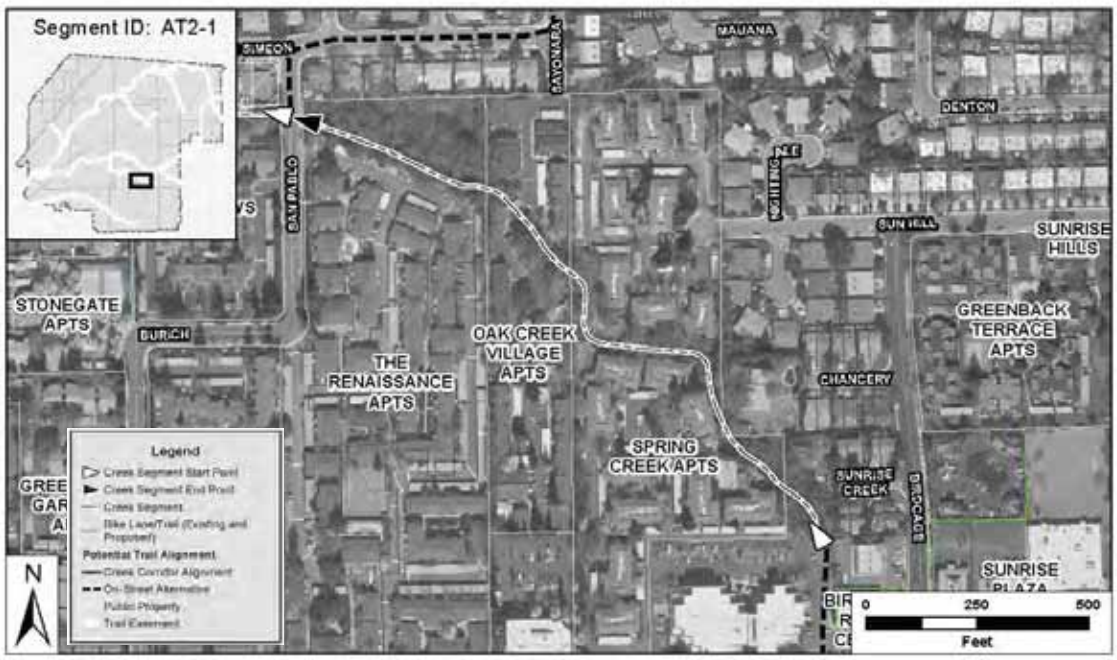


Subwatershed: Arcade Creek
Segment ID: AT1-2
Length: 3819'
Potential for Future Study: High

Start: Fair Oaks Boulevard
End: Confluence with Main Stem
Number of Road Crossings: 2
No. Potential Creek Crossings: 0 - 2

Discussion:

This segment flows through private property under a single ownership. Existing uses include a golf course, which has cleared areas that would minimize trail impacts on native vegetation. This area has informal trails throughout. Corridor is wide, 400+ feet, and generally flat. Evidence was found of homeless encampments in this segment during fieldwork.

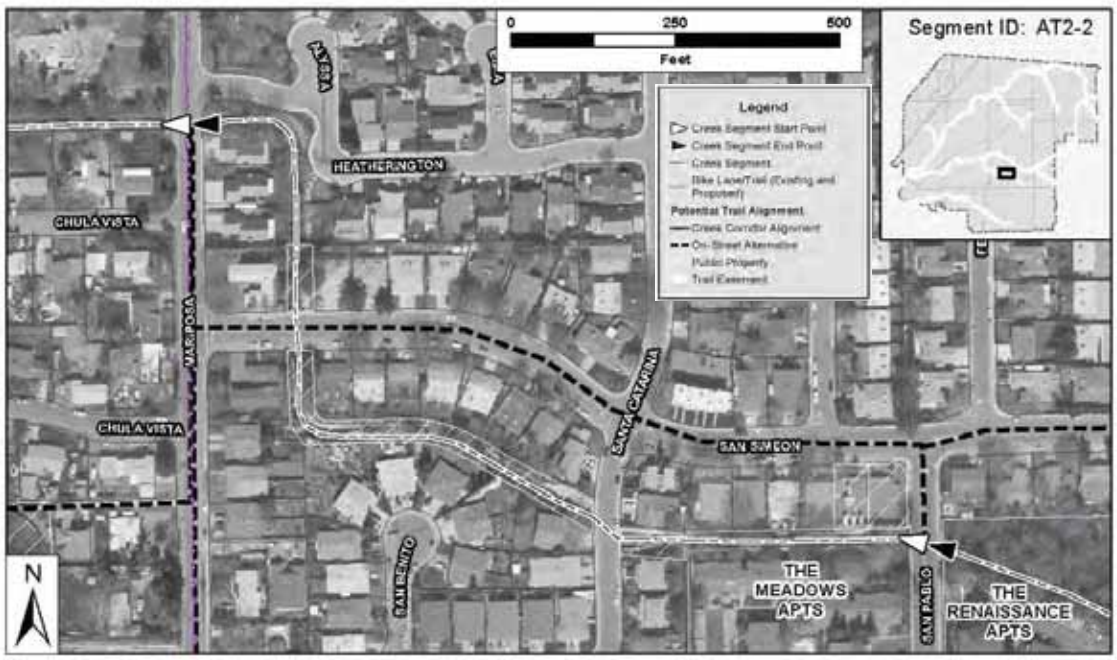


Subwatershed: Arcade Creek
Segment ID: AT2-1
Length: 1695'
Potential for Future Study: Low

Start: Birdcage Street
End: San Pablo Drive
Number of Road Crossings: 1
No. Potential Creek Crossings: 0

Discussion:

Property is privately owned. Corridor is narrow, typically less than 100 feet, with steep banks. Channel lined with concrete in areas. Existing bridge connects gated, multi-family residential on both sides of the creek (the Renaissance Apartment complex). Mature trees throughout.

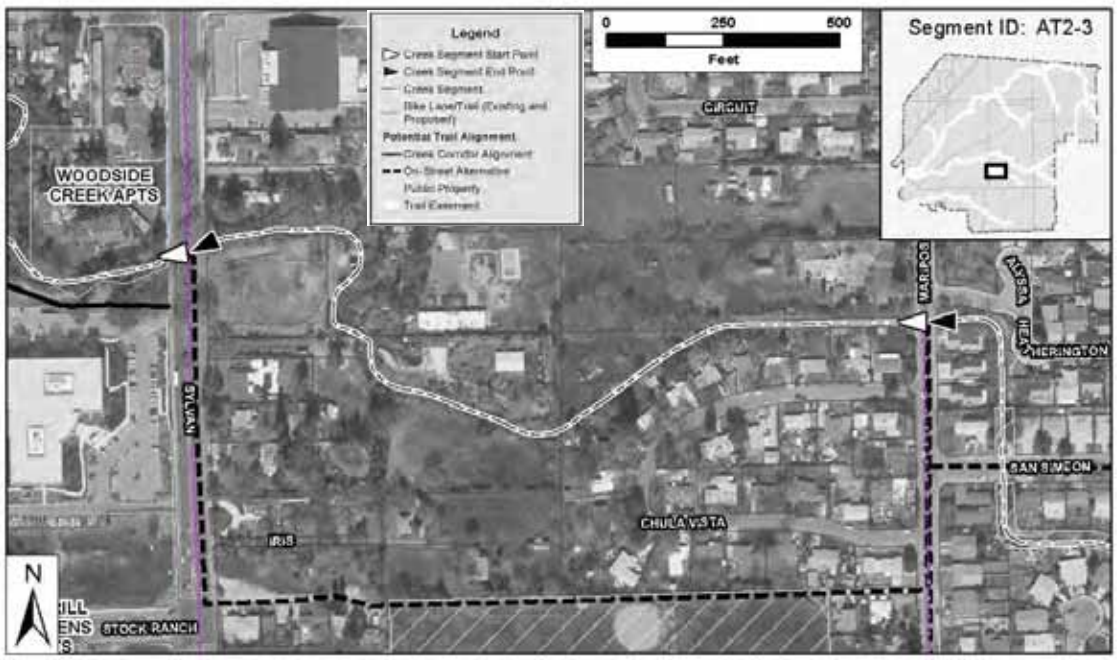


Subwatershed: Arcade Creek
Segment ID: AT2-2
Length: 1600'
Potential for Future Study: Low

Start: San Pablo Drive
End: Mariposa Avenue
Number of Road Crossings: 3
No. Potential Creek Crossings: 0

Discussion:

Corridor width very narrow (generally less than 50 feet). Both public and private property in this segment. Channel is lined with concrete. Inadequate room exists for trail.



Subwatershed: Arcade Creek
Segment ID: AT2-3
Length: 2016'
Potential for Future Study: None

Start: Mariposa Avenue
End: Sylvan Road
Number of Road Crossings: NA
No. Potential Creek Crossings: NA

Discussion:

This segment lies entirely within private properties. Corridor is very narrow in places, constrained by homes and other structures. Channel is concrete lined at upstream end. Trail infeasible due primarily to encroachment, although multiple bridges might allow avoidance of structures. Alternative access to school property could utilize private drive across from Stock Ranch Road with negotiated easement.

Subwatershed: Arcade Creek
Segment ID: AT2-4
Length: 2528'
Potential for Future Study: Moderate

Start: Sylvan Road
End: Confluence with Main Stem
Number of Road Crossings: 1
No. Potential Creek Crossings: 0

Discussion:

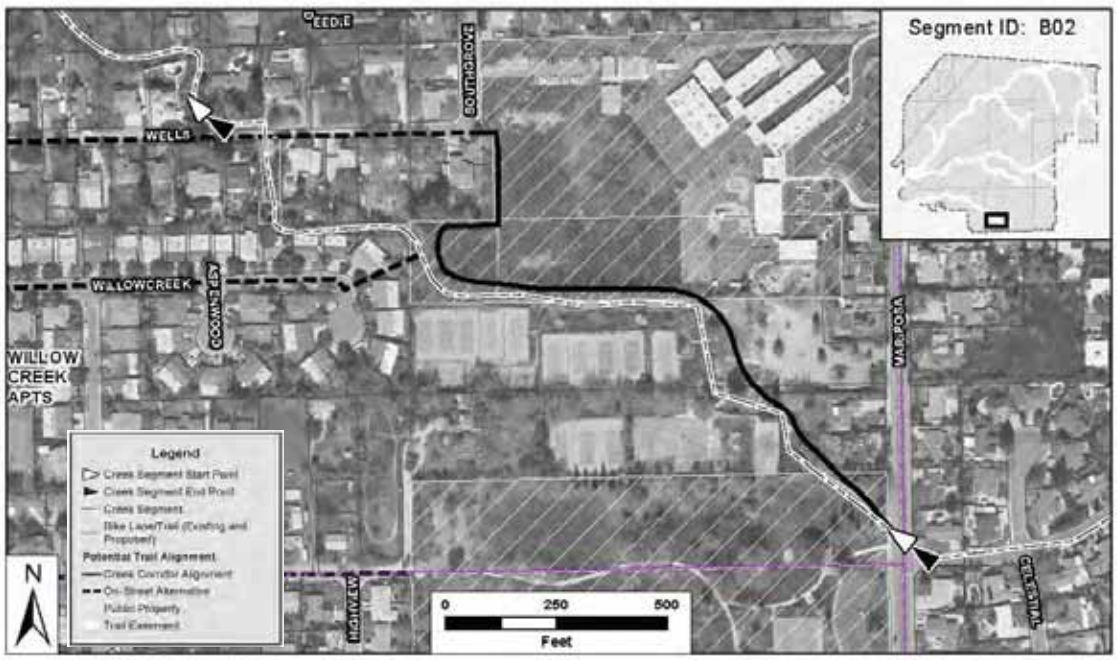
This segment passes through private property until it enters Stock Ranch Nature Preserve near its confluence with the main stem. The corridor is wide with many informal trails north of Woodside Drive. Vegetation impacts could be moderate and require mitigation. Alignment would require easements or fee-title purchase. A steep cut bank south of Woodside may require armoring or a retaining wall. Topographic constraints are low, with the exception of the cut-bank area. A bridge would be necessary within Stock Ranch Nature Preserve to cross the main stem.

Subwatershed: Brooktree Creek
Segment ID: B01
Length: N/A
Potential for Future Study: None

Start: Capricorn Drive
End: Mariposa Avenue
Number of Road Crossings: N/A
No. Potential Creek Crossings: N/A

Discussion:

Segment completely underground. No corridor remains.



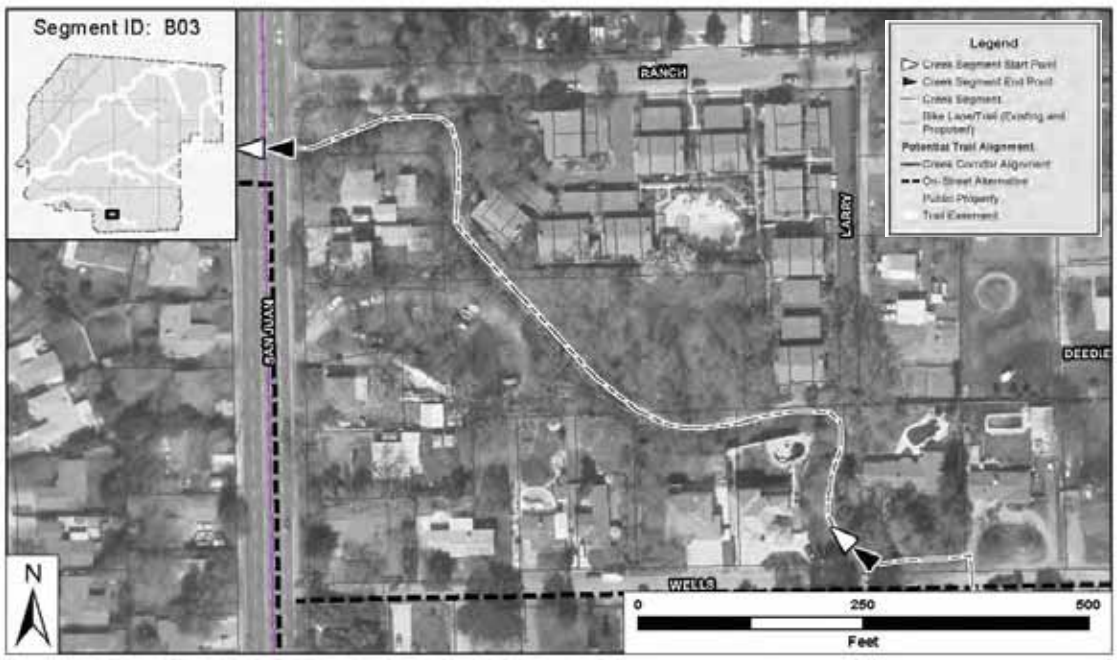
Subwatershed: Brooktree Creek
Segment ID: B02
Length: 2209'
Potential for Future Study: Moderate

Start: Mariposa Avenue
End: Wells Avenue
Number of Road Crossings:
No. Potential Creek Crossings:

Discussion:

Corridor is very narrow, approximately 60-feet in some areas; however, a trail is feasible if access can be secured between the Skycrest Elementary School property and the Sacramento County parcel adjacent to Wells Avenue. The trail would be close to private property structures and would require access through four parcels (approximately 300 feet).

Alternate route follows Mariposa to San Juan Park to Kalamazoo Drive utilizing existing trails through San Juan Park.



Subwatershed: Brooktree Creek
Segment ID: B03
Length: 1000'
Potential for Future Study: Low

Start: Wells Avenue
End: San Juan Avenue
Number of Road Crossings: 1
No. Potential Creek Crossings: 0

Discussion:

Channel is concrete lined. Property is privately owned. Corridor is very narrow to impassable, though some areas are wide enough for a trail.

Subwatershed: Brooktree Creek
Segment ID: B04
Length: 1468'
Potential for Future Study: None

Start: San Juan Avenue
End: Sperry Drive
Number of Road Crossings: NA
No. Potential Creek Crossings: NA

Discussion:

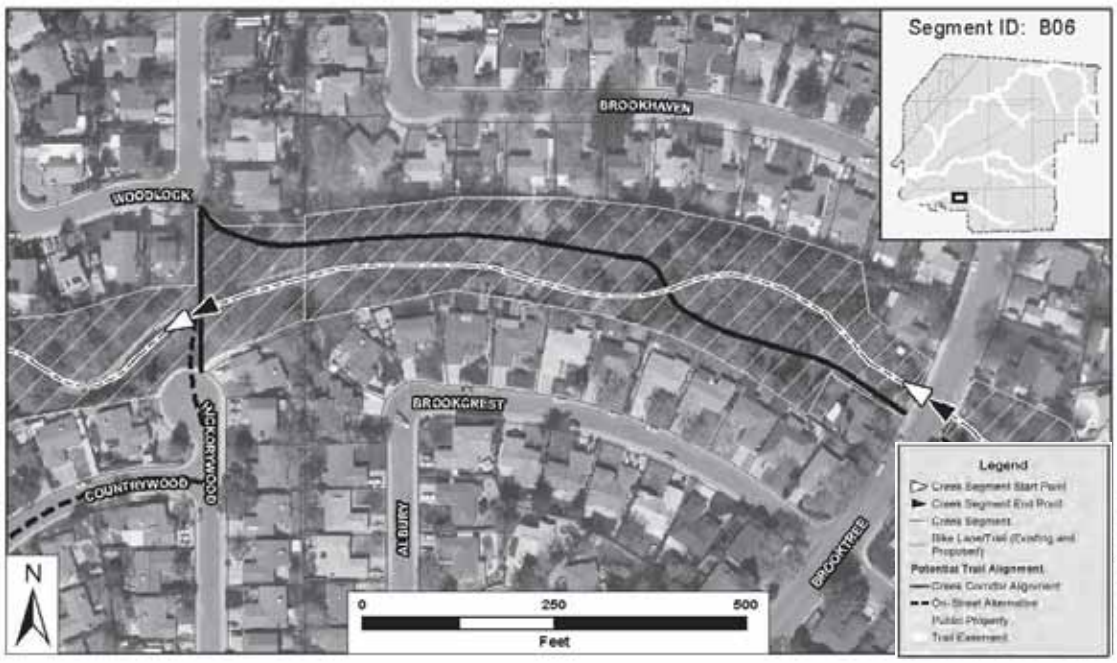
Public ownership is creek channel & short maintenance road only. No adequate area for trail. Channel is concrete lined. Private property fences abut channel.

Subwatershed: Brooktree Creek
Segment ID: B05
Length: 2045'
Potential for Future Study: High

Start: Sperry Drive
End: Brooktree Drive
Number of Road Crossings: 1
No. Potential Creek Crossings: 1

Discussion:

Corridor is owned by SRPD. Existing informal trail leads from El Sol Way to Brooktree Drive. Corridor width generally over 100 feet. Topographic constraints are slight. Some riparian impacts would be necessary but could be mitigated. One bridge crossing would likely be needed. Open space along south side of El Sol Way provides opportunity for off-street trail paralleling the roadway.

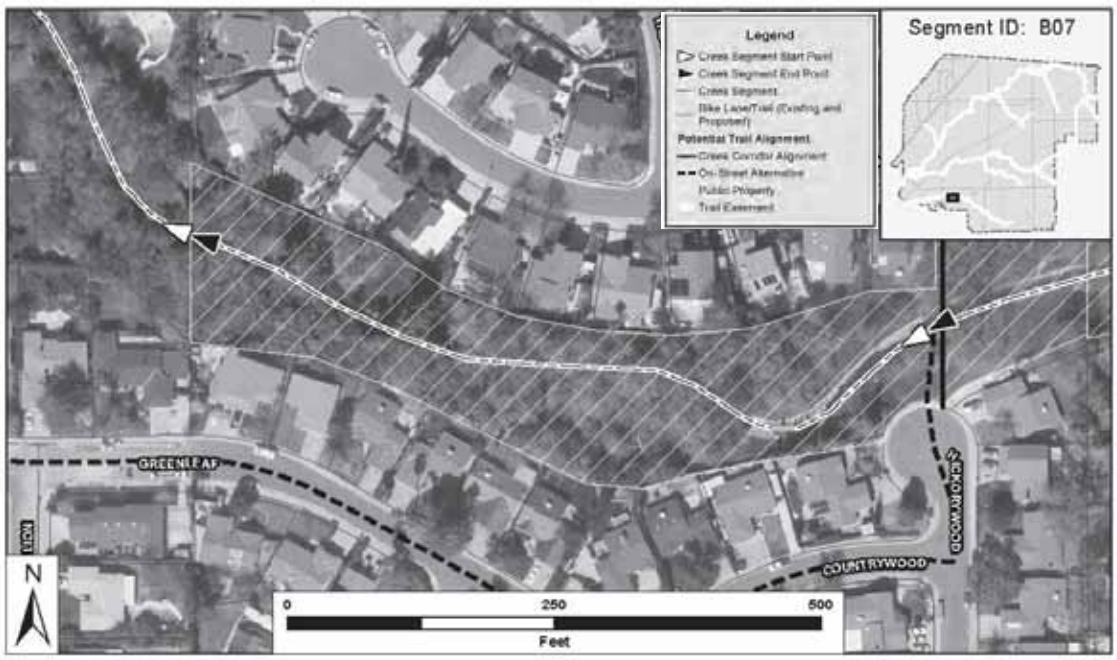


Subwatershed: Brooktree Creek
Segment ID: B06
Length: 1036'
Potential for Future Study: High

Start: Brooktree Drive
End: Hickorywood Way
Number of Road Crossings: 1
No. Potential Creek Crossings: 2

Discussion:

Existing informal trail runs from Brooktree Drive to Hickorywood Way, continuing onto upstream segment with an additional neighborhood connection to Woodlock Way. Land is owned by SRPD and the City of Citrus Heights. Two bridges would likely be needed in this segment to follow the informal path and avoid proximity to private properties. The majority of the channel is concrete lined. Corridor width ranges from 100 to 150 feet. Maintenance road on east end provides access to creek.

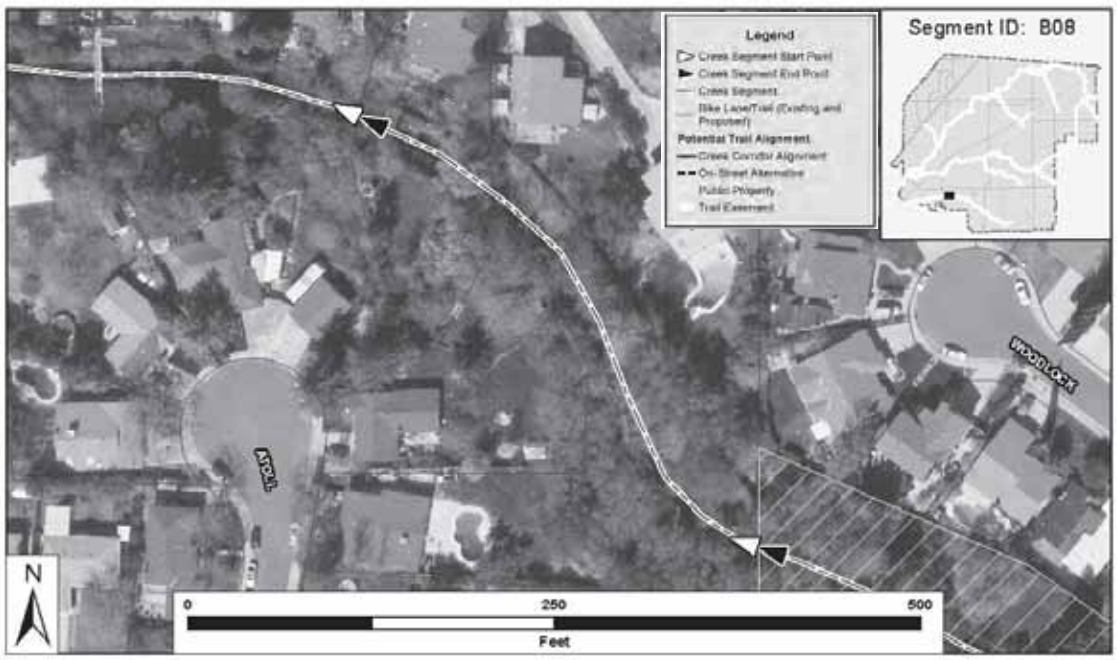


Subwatershed: Brooktree Creek
Segment ID: B07
Length: 762’
Potential for Future Study: High

Start: Hickorywood Way
End: SRPD parcel, west boundary
Number of Road Crossings: 0
No. Potential Creek Crossings: 0

Discussion:

This segment passes through public land owned by SRPD. Corridor width is adequate, and a topographic bench adjacent to the concrete-lined channel would support a trail. This segment has local recreational value, even though potential to connect west of Dewey is questionable due to property ownership and narrow corridor constraints in B08 and B09.



Subwatershed: Brooktree Creek
Segment ID: B08
Length: 417'
Potential for Future Study: Moderate

Start: SRPD Parcel, west boundary
End: Atoll Court
Number of Road Crossings: 0
No. Potential Creek Crossings: 0

Discussion:

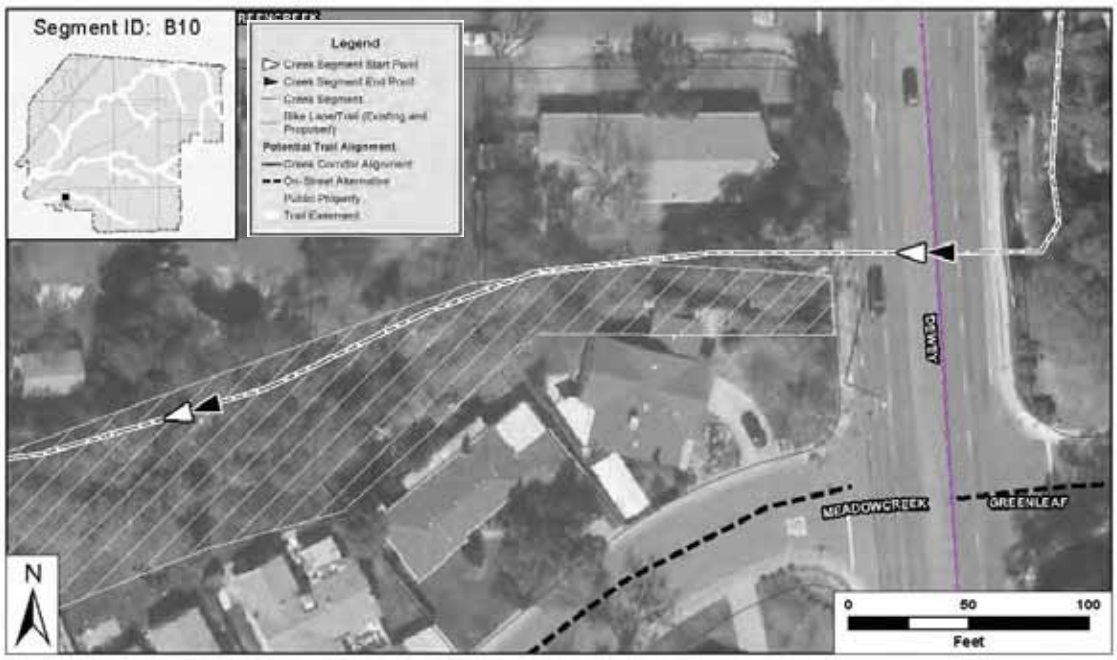
Segment is on private land. Width and topography would support a trail; however no access exists to the west. Channel is concrete-lined. Parcel is heavily wooded.

Subwatershed: Brooktree Creek
Segment ID: B09
Length: 910'
Potential for Future Study: None

Start: Atoll Court
End: Dewey Drive
Number of Road Crossings: N/A
No. Potential Creek Crossings: N/A

Discussion:

Land is private. Channel is concrete lined. Corridor is narrow, and banks are steep. Minimal opportunity for trail.



Subwatershed: Brooktree Creek
Segment ID: B10
Length: 318'
Potential for Future Study: Low

Start: Dewey
End: 325' west of Dewey
Number of Road Crossings: 1[9]
No. Potential Creek Crossings: 0

Discussion:

This segment encompasses about 350 feet of public land owned by the City. The channel is concrete-lined. Residential fenced backyards abut the narrow channel with few opportunities to locate a trail.

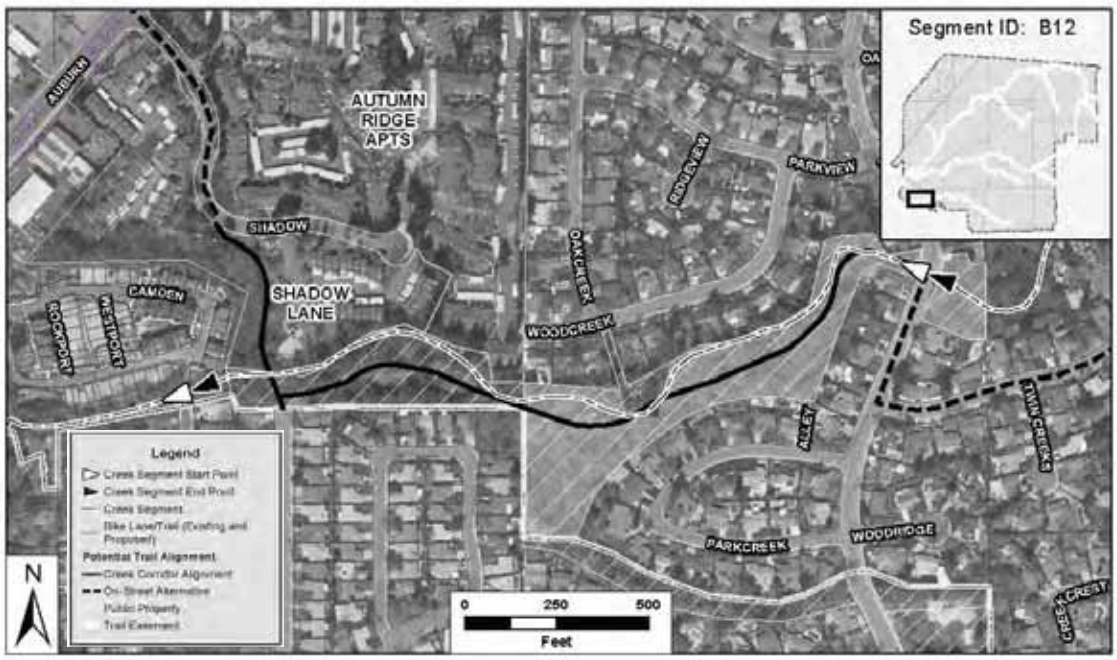
[9] Road crossing at upstream end is attributed to this segment, because upstream segment (B09) is unfeasible for trail.

Subwatershed: Brooktree Creek
Segment ID: B11
Length: 1486'
Potential for Future Study: Moderate

Start: 325' west of Dewey
End: Park Oaks Drive
Number of Road Crossings: 1
No. Potential Creek Crossings: 0

Discussion:

This segment consists primarily of private land, with SRPD owned parcel on west end adjacent to Park Oaks Drive. Width and topography are adequate for trail, and the corridor is wooded; however, constraints on adjacent upstream segment (B10) make this segment useful solely for neighborhood recreational purposes, unless the City purchased a residential parcel (or portion thereof) in segment B10 to connect into Meadowcreek Way or Glencreek Court.



Subwatershed: Brooktree Creek
Segment ID: B12
Length: 2336'
Potential for Future Study: High

Start: Park Oaks Drive
End: Higgins Street
Number of Road Crossings: 0
No. Potential Creek Crossings: 1

Discussion:

All but the westernmost 100-feet of this segment is within Shadowcreek Park, which is owned and operated by SRPD. Existing unpaved trails run throughout the park. Corridor width ranges from approximately 70-feet near Higgins to over 200-feet in several areas. Topography is generally conducive to trails, except for the easternmost 100-feet downstream of Park Oaks Drive, where an outside meander bend is undercutting the bank adjacent to a residential lot at 6017 Park Oaks Drive. A retaining wall would be needed in this location to support a trail; however, some form of bank stabilization will be required anyways, and the solution should be designed to accommodate a trail. Three existing low-flow crossings should be upgraded as part of a Multi-use trail connection through the park.

Subwatershed: Brooktree Creek
Segment ID: B13
Length: 1495'
Potential for Future Study: None

Start: Higgins Street
End: Auburn Boulvard
Number of Road Crossings: NA
No. Potential Creek Crossings: NA

Discussion:

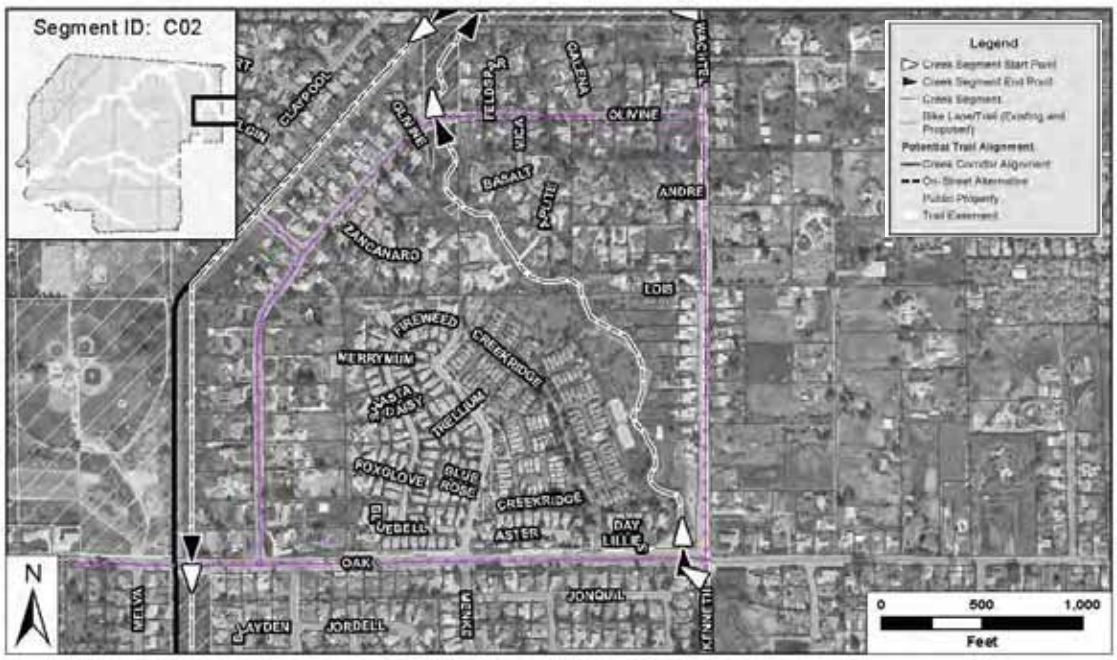
Corridor is narrow with steep banks. Land is privately owned. Riparian is densely wooded. Very limited opportunities for trail. On-street routes include Camden Circle (private) or Shadow Lane providing access to Auburn Boulevard, which would require a new bridge at Woodleigh Drive.

Subwatershed: Cripple Creek
Segment ID: C01
Length: 234’
Potential for Future Study: None

Start: Oak Avenue
End: Olivine Avenue
Number of Road Crossings: N/A
No. Potential Creek Crossings: N/A

Discussion:

Segment is completely underground below street and private parcel. Corridor resumes upstream of Wachtel Way outside of city limits.

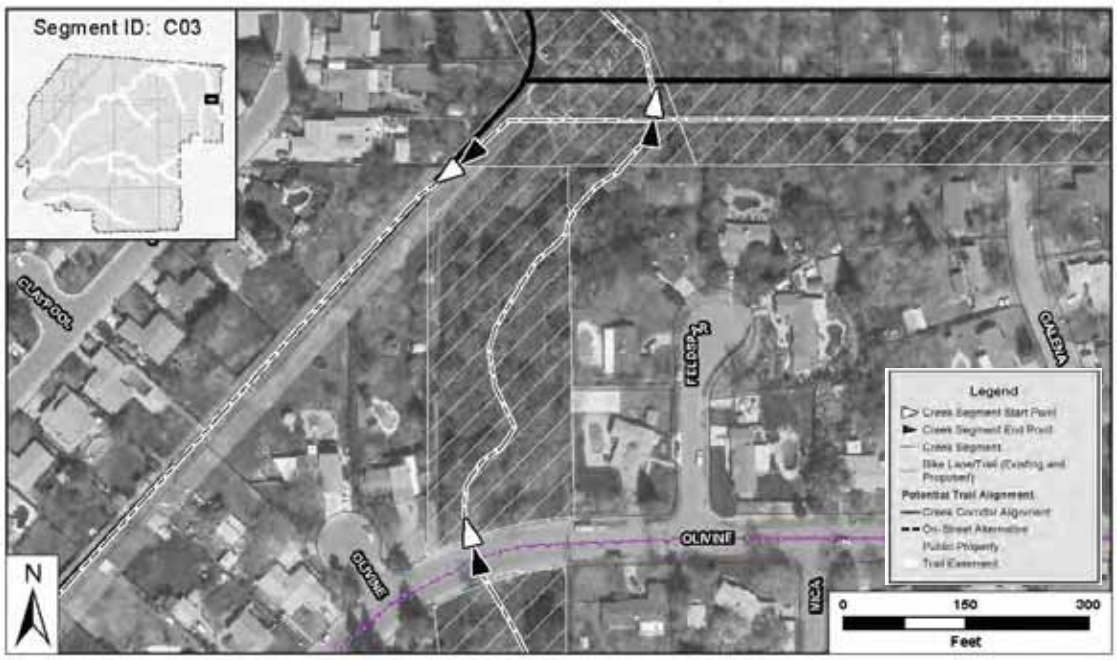


Subwatershed: Cripple Creek
Segment ID: C02
Length: 2871'
Potential for Future Study: Moderate

Start: Oak Avenue
End: Olivine Avenue
Number of Road Crossings: 2
No. Potential Creek Crossings: 0

Discussion:

Public access easement is on one quarter of the segment. The remainder is privately owned, but most structures are relatively far from the creek. Segment is heavily wooded, with some existing informal trails. Minor topographic constraints. Trails in this segment could be a useful neighborhood amenity, with increasing benefit once ORPD constructs upstream segments. Easements would be required between Lois Lane and Olivine Way in proximity to existing homes.

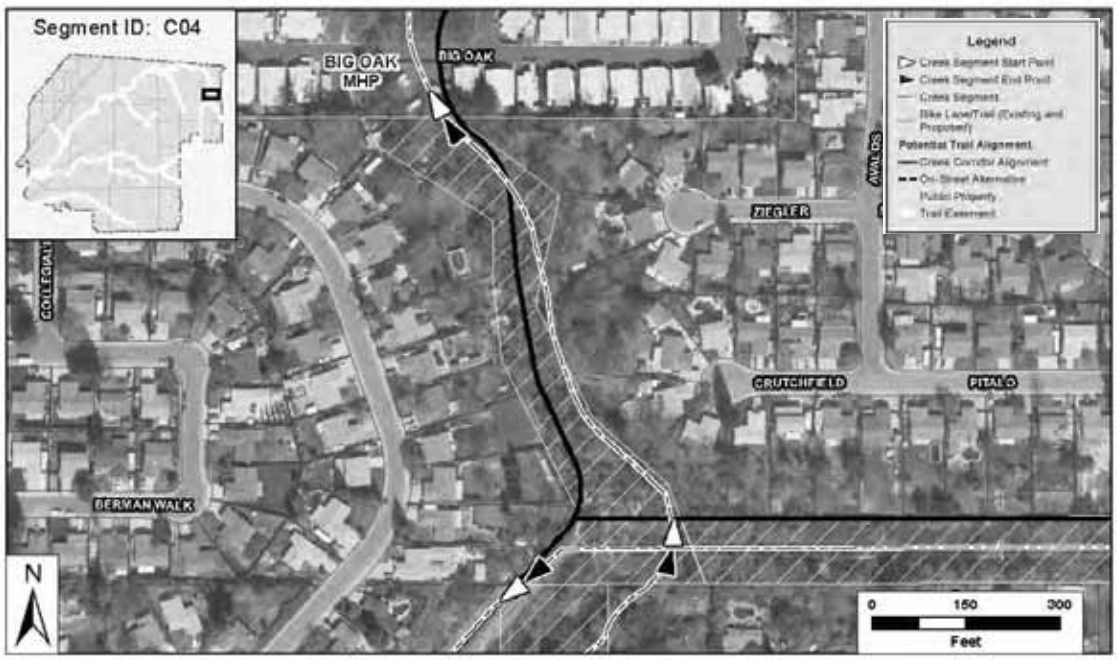


Subwatershed: Cripple Creek
Segment ID: C03
Length: 629'
Potential for Future Study: High

Start: Olivine Avenue
End: SMUD Corridor
Number of Road Crossings: 0
No. Potential Creek Crossings: 0

Discussion:

Land is publicly owned by SRPD or the City with existing informal trails west of the creek. Topography is flat. Corridor width is roughly 100-feet. Riparian vegetation is dense, but utilizing the existing informal trail alignment would minimize impacts. This segment forms an important connector to both Cripple Creek and the SMUD corridor for Hidden Meadows, Farmette Hills, and Creekridge neighborhoods.



Subwatershed: Cripple Creek
Segment ID: C04
Length: 811’
Potential for Future Study: High

Start: SMUD Corridor
End: City Parcel, North boundary
Number of Road Crossings: 0
No. Potential Creek Crossings: 0

Discussion:

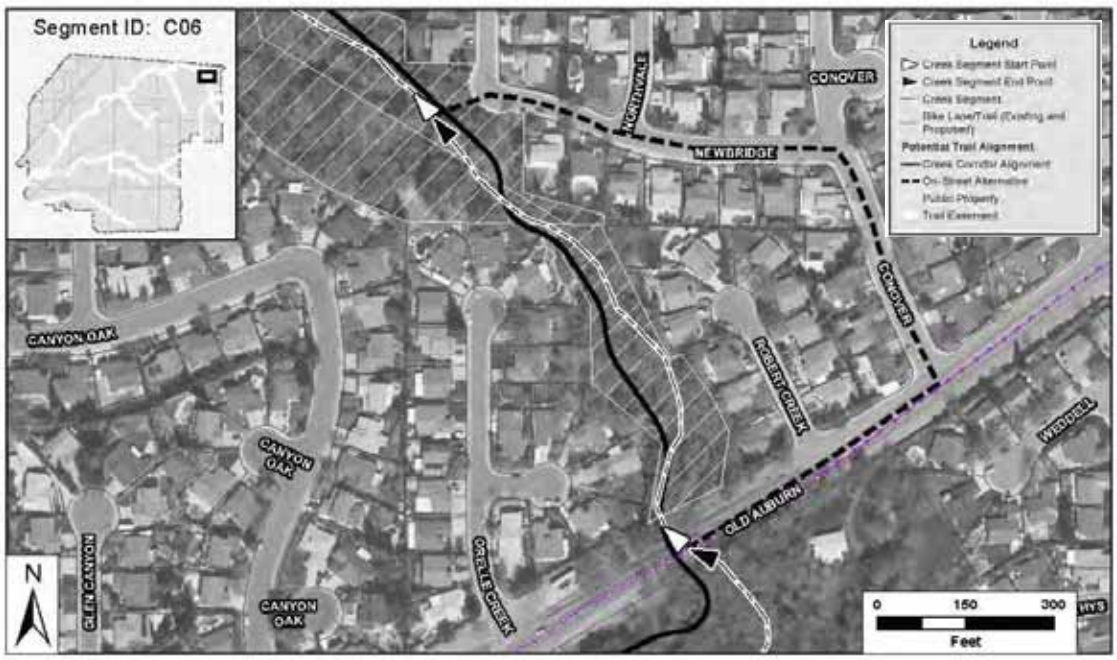
Land is in public ownership on both sides of the creek. Corridor width is adequate (60 feet minimum). Heavily wooded with occasional openings. Few topographic constraints. Trail in this segment would be of limited value, primarily functioning as a local recreational resource, unless connection could be made through downstream segment to Big Oak Drive to Old Auburn Road.

Subwatershed: Cripple Creek
Segment ID: C05
Length: 1892’
Potential for Future Study: Moderate

Start: City. Parcel, N. boundary
End: Old Auburn Road
Number of Road Crossings: 4
No. Potential Creek Crossings: 1

Discussion:

This segment flows through private land owned by two landowners: the Big Oak Mobile Home Park and Auburn Oaks Village. Segment within Big Oak is maintained in dedicated, landscaped open space. Segment within Auburn Knolls Estates is identified as common area. Stream banks in this segment are moderately steep. Connection to upstream segment would require ROW/acquisition through an RV storage yard within the mobile home park and Auburn Oaks Village.



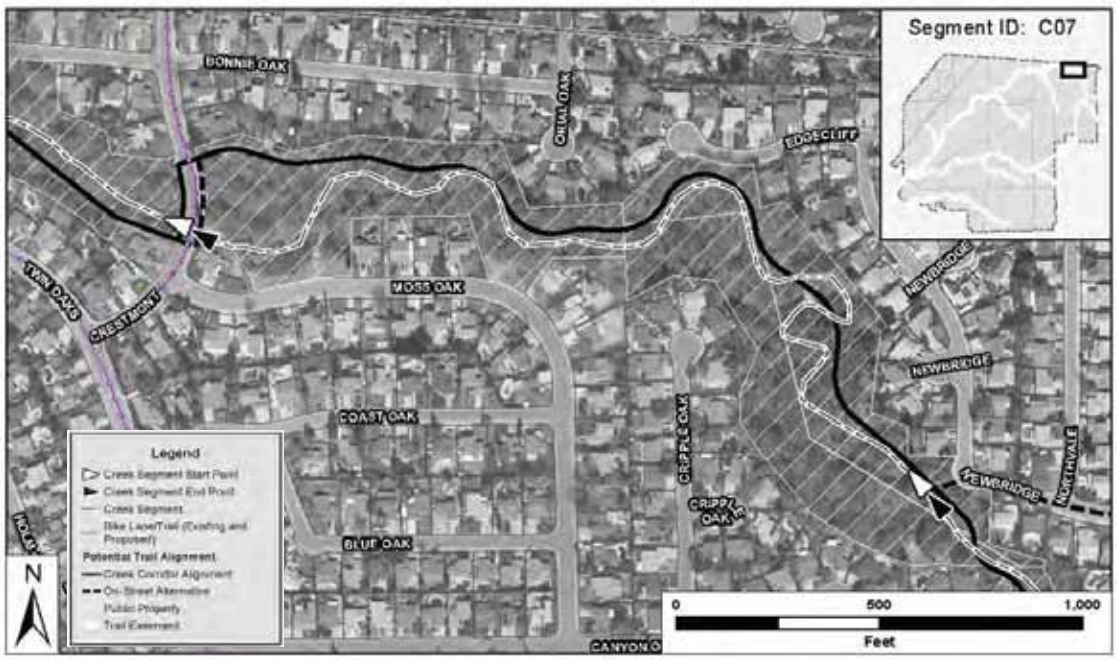
Subwatershed: Cripple Creek
Segment ID: C06
Length: 934'
Potential for Future Study: Moderate

Start: Old Auburn Road
End: Newbridge Way
Number of Road Crossings: 0
No. Potential Creek Crossings: 0 - 2

Discussion:

This segment is publicly owned by the City. Creek banks are steep and area is heavily wooded, but trail appears feasible with two or more crossings and retaining walls. Alternate on-street route would follow Old Auburn to Conover to Newbridge.

The City will be constructing a multi-use trail parallel to Old Auburn Road in 2014, providing connectivity to this segment.



Subwatershed: Cripple Creek
Segment ID: C07
Length: 3065'
Potential for Future Study: High

Start: Newbridge Way
End: Crestmont Avenue
Number of Road Crossings: 1
No. Potential Creek Crossings: 1

Discussion:

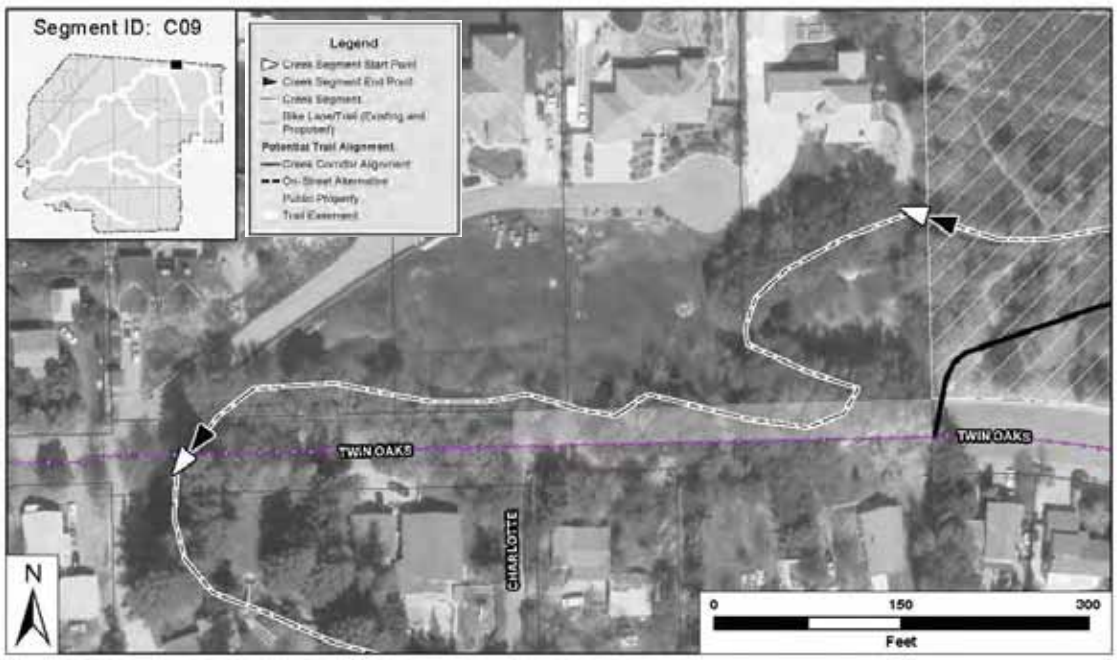
Land within this segment is publicly owned by SRPD and the City. Existing informal trails run through this segment, crossing the creek twice. Topography is generally flat, and tree impacts could be minimized by utilizing much of the existing trail. Crossings could be avoided or minimized by locating the trail on the right bank. Corridor width ranges from 100 to 250 feet. Informal recreational uses, including a BMX bike course, were in evidence at the time of the field visit.

Subwatershed: Cripple Creek
Segment ID: C08
Length: 1670'
Potential for Future Study: High

Start: Crestmont
End: Dept. Water Res. parcel, W. boundary
Number of Road Crossings: 0
No. Potential Creek Crossings: 0

Discussion:

Land is publicly owned by the Department of Water Resources. Existing trails run from Crestmont to Twin Oaks. Generally few topographic or vegetation constraints except for outside meander bend adjacent to Twin Oaks, which could require retaining wall. Corridor ranges from 150 to 300 feet wide.



Subwatershed: Cripple Creek
Segment ID: C09
Length: 875'
Potential for Future Study: Moderate

Start: Dpt. of Water Res. Parcel W. boundary.
End: Twin Oaks Avenue
Number of Road Crossings: 1
No. Potential Creek Crossings: 0

Discussion:

An Irrevocable Offer of Dedication (IOD) connects the gap in Twin Oaks Avenue along right bank of creek. This area is currently being used as private drive. A Class I bike path is identified as proposed in the City's Bikeway Master Plan connecting the east and west sides of Twin Oaks Avenue. The development of C08 would need to consider the alignment of the proposed Class I bike path identified in the City's Bikeway Master Plan.

The creek meanders close to road easement. Any trail development would need to consider design to accommodate existing driveway providing access to Twin Oaks Avenue. A potential exists for trail alignment along private open space on left bank but would require easement/fee title purchase, as well as one pedestrian/bike bridge.

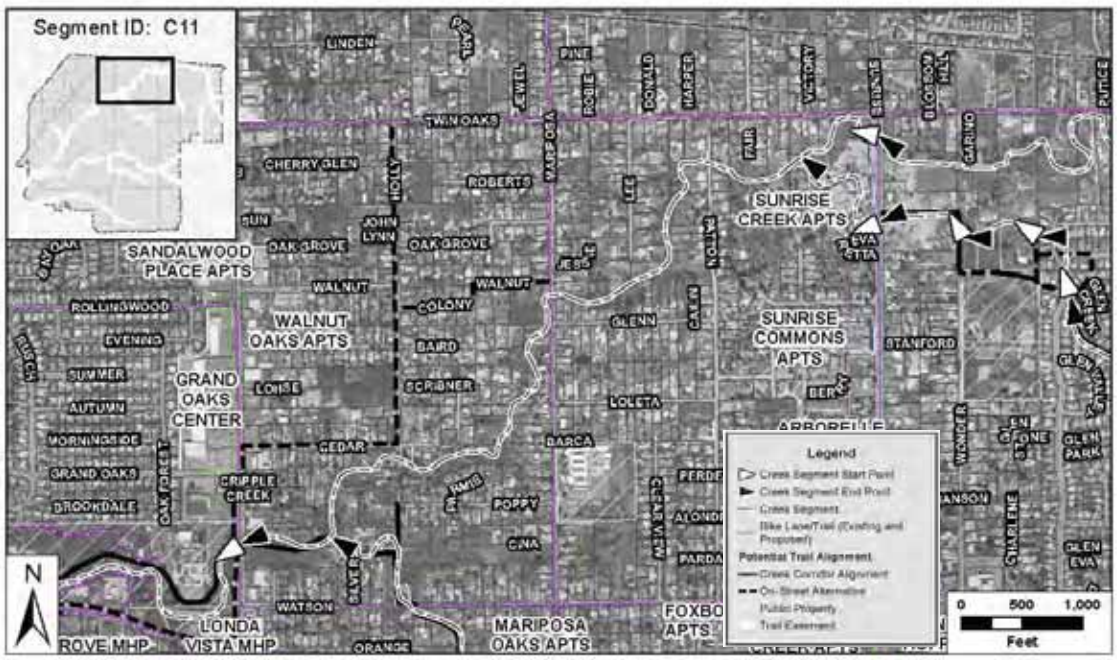
Subwatershed: Cripple Creek
Segment ID: C10
Length: 3799'
Potential for Future Study: Low

Start: Twin Oaks Avenue
End: Sunrise Boulvard
Number of Road Crossings: 3
No. Potential Creek Crossings: 0

Discussion:

This long segment runs entirely through private property. Many lots are large with ample undeveloped area in creek corridor, but several crossing would be needed to avoid proximity to homes. Land is generally flat with few topographic constraints. Riparian area is heavily wooded for about two thirds of the segment. While a trail seems impractical through this area due to the many rural home sites, the City could consider some mechanism for purchase of future trail rights.

Alternate on-street route is Twin Oaks.



Subwatershed: Cripple Creek
Segment ID: C11
Length: 8361'
Potential for Future Study: Low

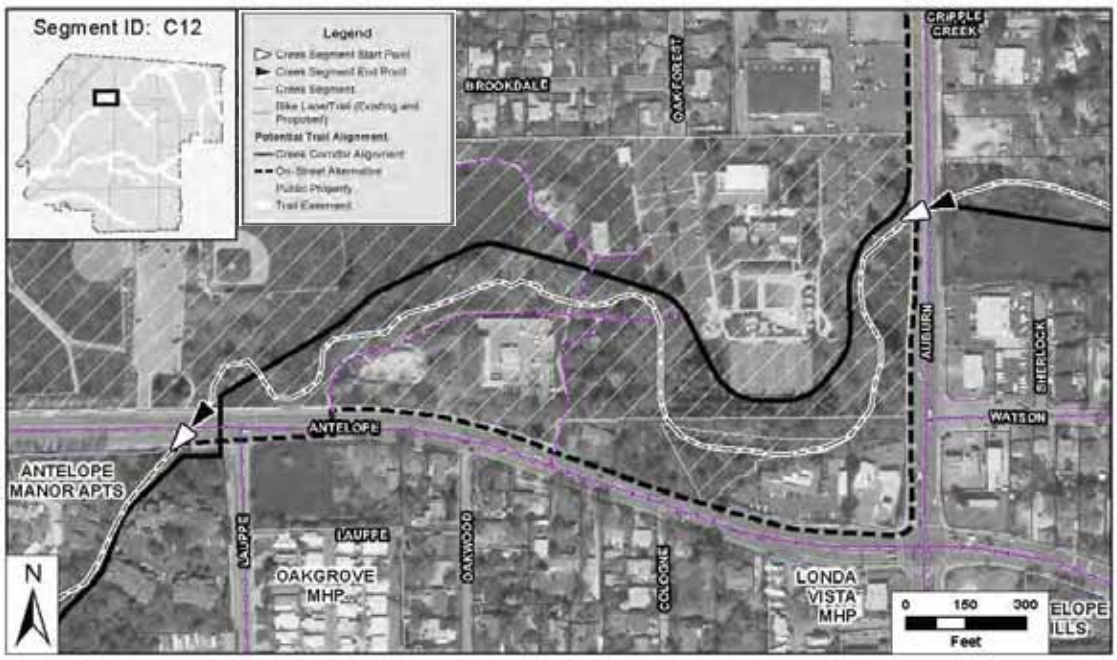
Start: Sunrise Boulevard
End: Auburn Boulevard
Number of Road Crossings: 7
No. Potential Creek Crossings: 0[10]

Discussion:

The land in this segment is entirely privately owned except for two very short public access easements and two small publicly owned parcels. Many of the private properties are large lots with ample undeveloped areas in the creek corridor, but several crossings would likely be needed to avoid proximity to residences. One property has improvements on both sides of the creek. Topography is generally flat. Natural resources constraints are moderate. As with the upstream segment, the City may want to consider some mechanism for future purchase of easement.

Alternate on-street route is Twin Oaks.

[10] Creek crossings in this segment would depend upon the City's ability to secure trail easements through private property. Multiple crossings may be needed.



Subwatershed: Cripple Creek
Segment ID: C12
Length: 2926'
Potential for Future Study: High

Start: Auburn Boulevard
End: Antelope Road
Number of Road Crossings: 1
No. Potential Creek Crossings: 1

Discussion:

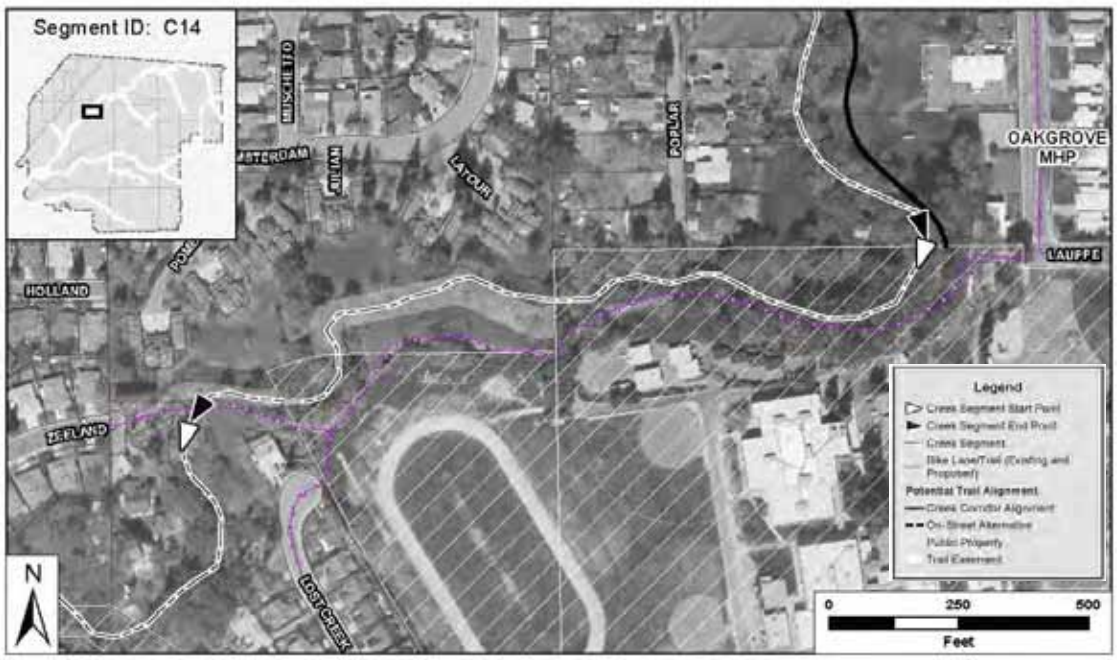
Entire segment lies within Rusch Park, which is owned and operated by SRPD. While existing trails within Rusch could be utilized, they do not meet Class I width requirements, and the existing bridge over the creek is of inadequate width. Uses would need to be managed consistent with existing trails, or a new Class I trail would need to be built. Corridor is very wide through the park, except where it passes between the main parking lot and the creek. A retaining wall or reconfiguration of parking/fire access would be needed in that area. Preferred alignment is on right bank to minimize grading and tree impacts. A new bridge would be needed to cross the creek on the downstream end near Antelope Road, due to constriction between creek channel and Antelope upstream of that point.

Subwatershed: Cripple Creek
Segment ID: C13
Length: 1657'
Potential for Future Study: Low

Start: Antelope Road
End: Mesa Verde HS Class I trail (east end)
Number of Road Crossings: 0
No. Potential Creek Crossings: 0

Discussion:

This segment runs entirely through private property, though, except for a residential complex, development has not occurred in proximity to the creek on the left (east) bank. Riparian corridor is heavily wooded. An easement would be required for any future trail development.



Subwatershed: Cripple Creek
Segment ID: C14
Length: 1742'
Potential for Future Study: High

Start: Mesa Verde HS Class I Trail (east end)
End: Mesa Verde Class I Trail (west end)
Number of Road Crossings: 0
No. Potential Creek Crossings: 0

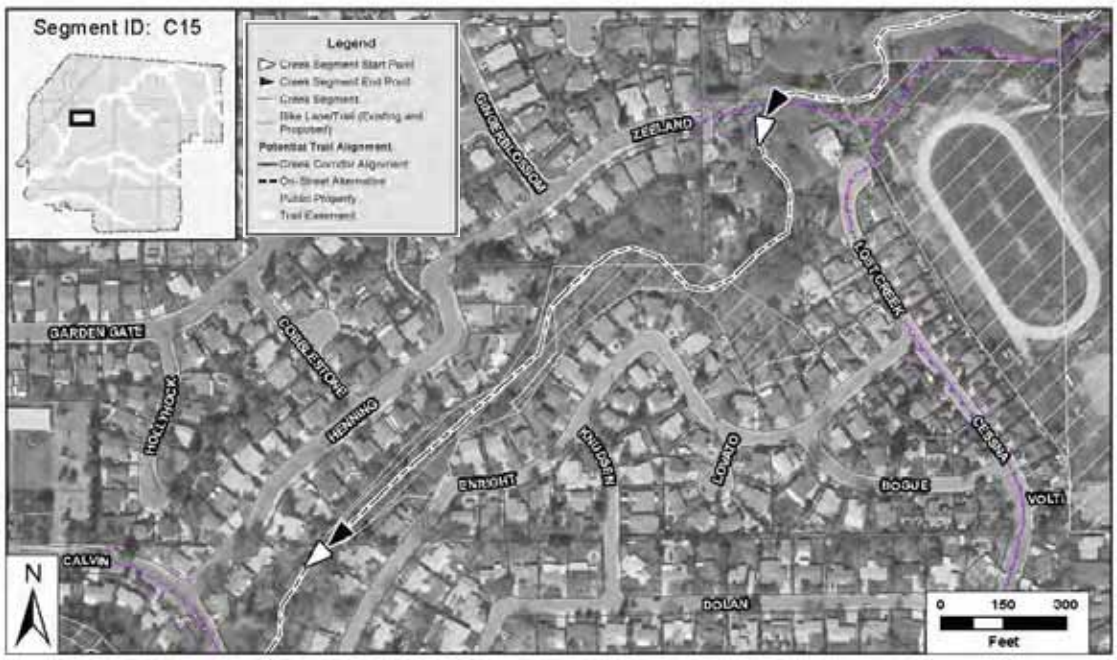
Discussion:

A Class I trail is identified as proposed in the City's Bicycle Master Plan along Cripple Creek between Zeeland Drive and Lauppe Lane. Specific trail alignment and design is currently under development for the proposed Class I.

The final alignment fo the southern portion of segment C-13 will need to consider the alignment of the proposed Class I Bike Path.

The eastern portion includes steep banks requiring retaining walls, impacts to riparian vegetation, and the existing informal (earthen) trail. This subsegment requires additional design considerations and is not part of the current trail development project.

Informal trails are already in use throughout this segment.

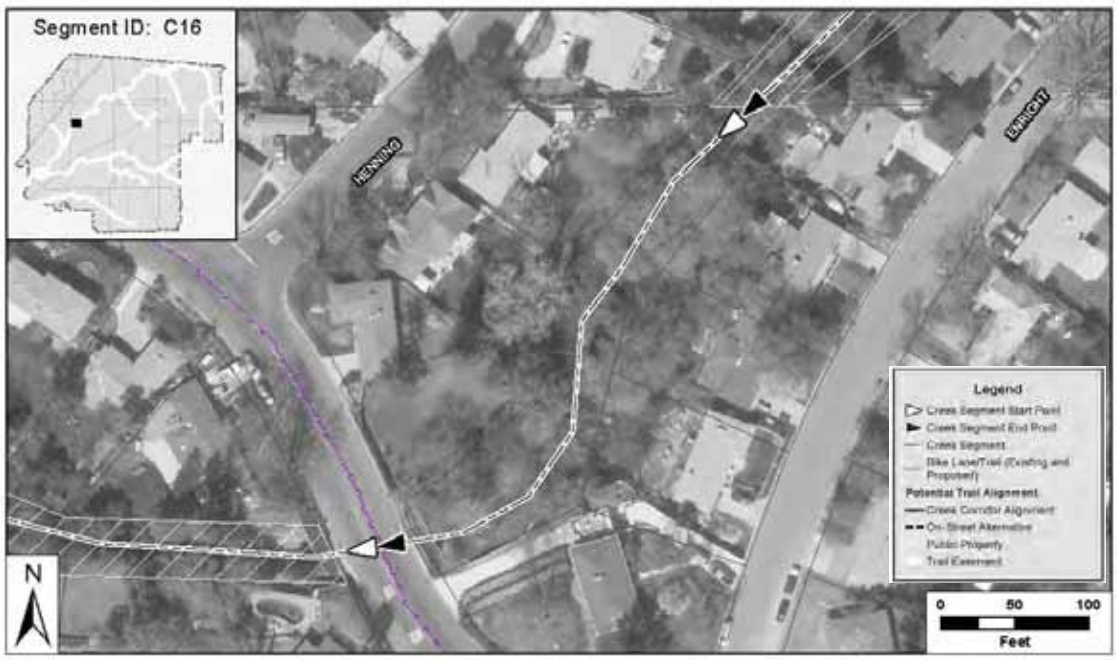


Subwatershed: Cripple Creek
Segment ID: C15
Length: 1802'
Potential for Future Study: Low

Start: Mesa Verde HS Class I trail (west end)
End: City parcel, west boundary
Number of Road Crossings: 0
No. Potential Creek Crossings: 0

Discussion:

This land is mostly public property. Approximately 470 feet of upstream end are privately held and would require easement or purchase. Access point on Enright is heavily wooded. Corridor is narrow and steep in places. On-street alternative to this segment is Zeeland Drive to Henning Street to Calvin Drive.



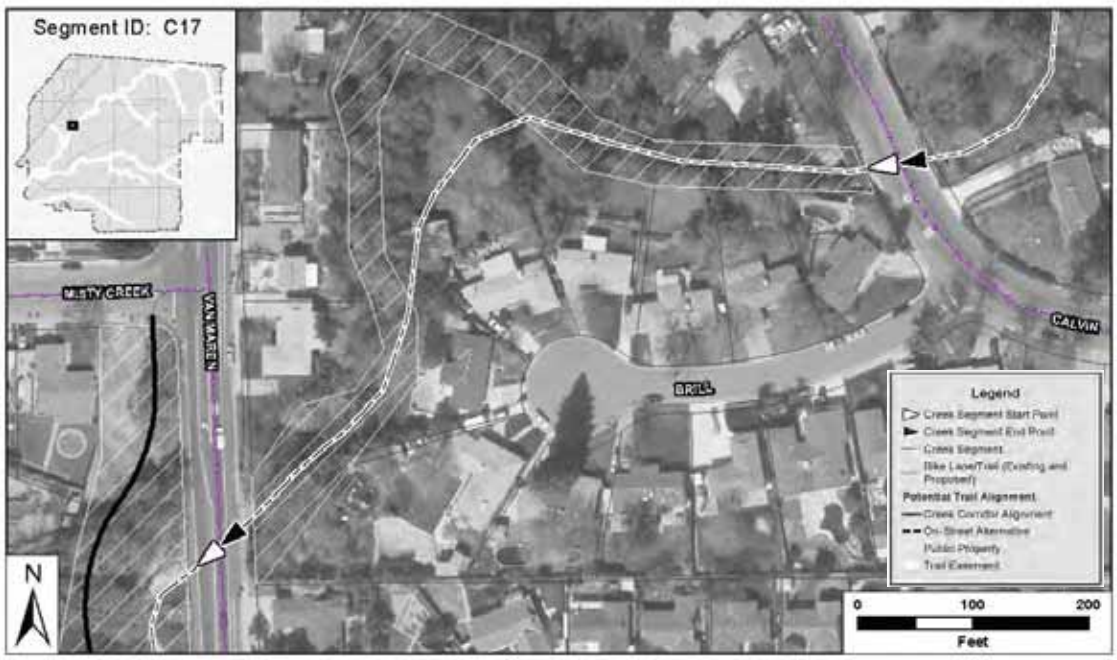
Subwatershed: Cripple Creek

Segment ID: C16
Length: 415'
Potential for Future Study: Low

Start: Sacramento Co. Dept of Parks and Recreation parcel, W. boundary
End: Calvin Drive
Number of Road Crossings: 1
No. Potential Creek Crossings: 0

Discussion:

This short segment is all private property and would require easements or purchase. An existing bench on left bank would accommodate a trail with minimal grading. On-street alternative to this segment is Zeeland to Henning to Calvin.



Subwatershed: Cripple Creek
Segment ID: C17
Length: 808'
Potential for Future Study: Low

Start: Calvin Drive
End: Van Maren Lane
Number of Road Crossings: 1
No. Potential Creek Crossings: 1

Discussion:

A public easement runs through this segment; however, the corridor is narrow (less than 70-feet at the pinch point) with fences near top of bank and steep topography. Riparian canopy is moderately dense. On-street alternative is Calvin to Van Maren.

Subwatershed: Cripple Creek
Segment ID: C18
Length: 1723'
Potential for Future Study: Moderate

Start: Van Maren Lane
End: Bridgemont Way
Number of Road Crossings: 1
No. Potential Creek Crossings: 0 - 1

Discussion:

Segment runs through public property. Trail near Bridgemont Way could pose some grading challenges. Alignment would likely be on right (west) bank due to topographic constraints. Bridge needed on downstream end to cross from left to right bank. Dense riparian vegetation poses some constraints and may require mitigation. Corridor width ranges from 100 to over 300 feet.

Subwatershed: Cripple Creek
Segment ID: C19
Length: 1635'
Potential for Future Study: High

Start: Bridgemont Way
End: Confl. w/ C-T3 near Ranchhouse Drive
Number of Road Crossings: 1 (private)
No. Potential Creek Crossings: 0

Discussion:

This segment includes a small portion of public land with the majority in private ownership held by two landowners, one of which is the Church of Jesus Christ of Latter-day Saints, who operate a facility spanning the creek. The corridor is largely undeveloped except for the church's parking lot on the left bank and a small amphitheater structure on the right. The church also maintains a bridge over the creek from the parking lot to the amphitheater area. Trails in this area would be located within the 100-year floodplain, outside the developable area of this site, and would be sited to minimize impacts to existing uses and structures. Fencing and vegetation could be incorporated as needed to control access and visual privacy.

A bridge would be needed at the confluence to cross CT3 and a trail junction with the C-T3 trail would occur just downstream of this point.

Subwatershed: Cripple Creek
Segment ID: C20
Length: 1820'
Potential for Future Study: High

Start: Confluence with C-T3
End: Oak Lakes Lane
Number of Road Crossings: 1
No. Potential Creek Crossings: 1 (trib)

Discussion:

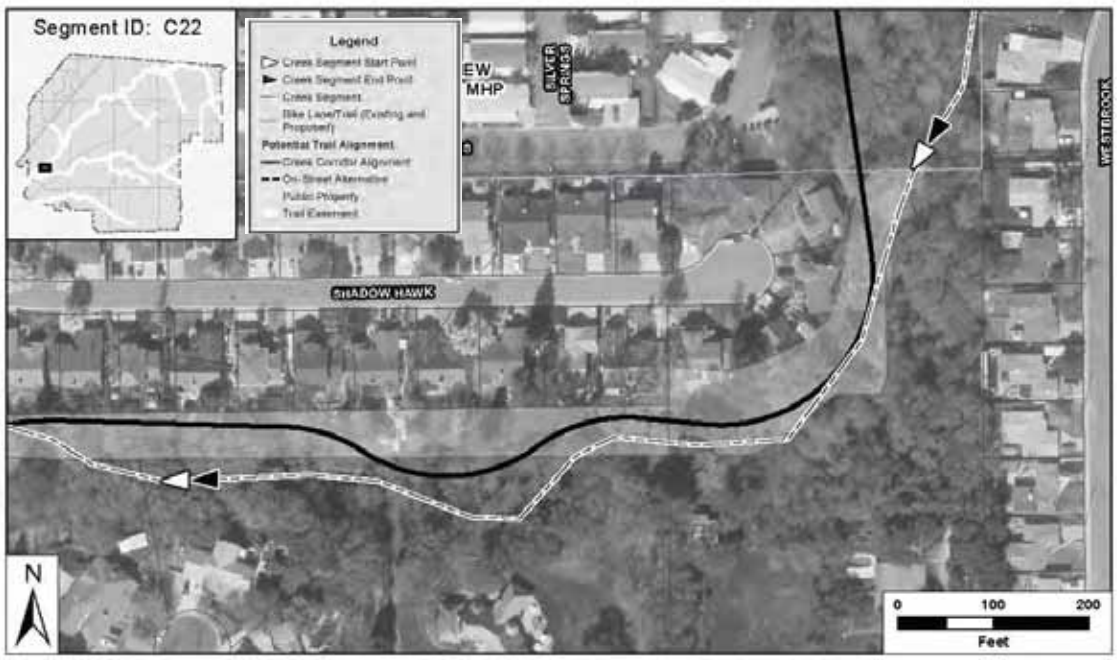
Segment occupies a single private parcel that is designated as a floodplain and maintained as open space. A narrow sliver of land owned by Sacramento County could provide access from near Cowboy Way to Oak Lakes Lane and avoid the need for a second easement on the adjacent property. Topography adequate for trail on left bank, except for one area adjacent to Campfire Way that may need a retaining wall. Corridor width varies from 250 to over 600 feet. Some areas of dense riparian vegetation may need mitigation.

Subwatershed: Cripple Creek
Segment ID: C21
Length: 1682’
Potential for Future Study: High

Start: Oak Lakes Lane
End: Public Access Easement, N. boundary
Number of Road Crossings: 0
No. Potential Creek Crossings: 0

Discussion:

This segment runs through private open space and floodplain area maintained by the surrounding mobile home park. The corridor is approximately 230 feet wide and relatively flat. Riparian vegetation along the creek is dense, but the adjacent open space is well maintained and adequate for a trail. This would require acquisition of an easement or other method of access for trail development.



Subwatershed: Cripple Creek
Segment ID: C22
Length: 1018'
Potential for Future Study: High

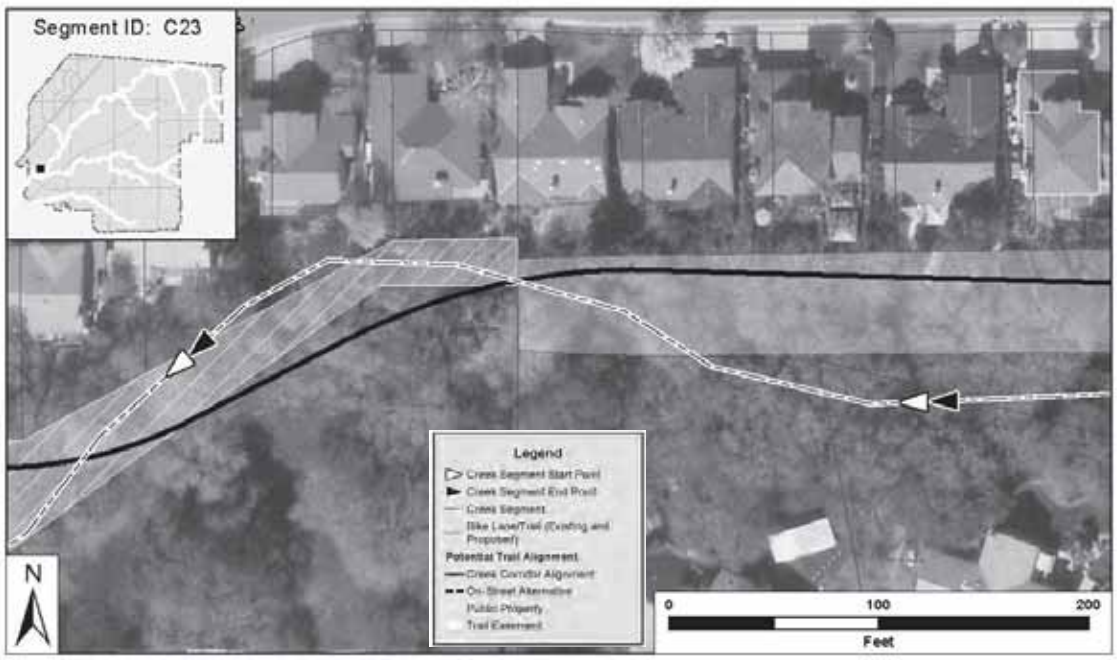
Start: Public Access Easement, N. boundary
End: Mi Court
Number of Road Crossings: 0
No. Potential Creek Crossings: 0 - 1

Discussion:

This segment passes through private property with a public access easement on the right bank. The easement area is suitable for a trail, with some vegetation and topographic constraints. The corridor width is around 100-feet.

The rear yards of homes on Shadow Hawk Drive are in close proximity to the potential trail location. The top of bank is relatively close to the properties, and some landscaping and vegetation improvements appear to be within the easement. Fencing and vegetation could be used to control access and screen views into private properties.

The left bank is also feasible for a trail, although no easement exists in this area, and bridges would be required to cross on the east and west ends of this segment.



Subwatershed: Cripple Creek
Segment ID: C23

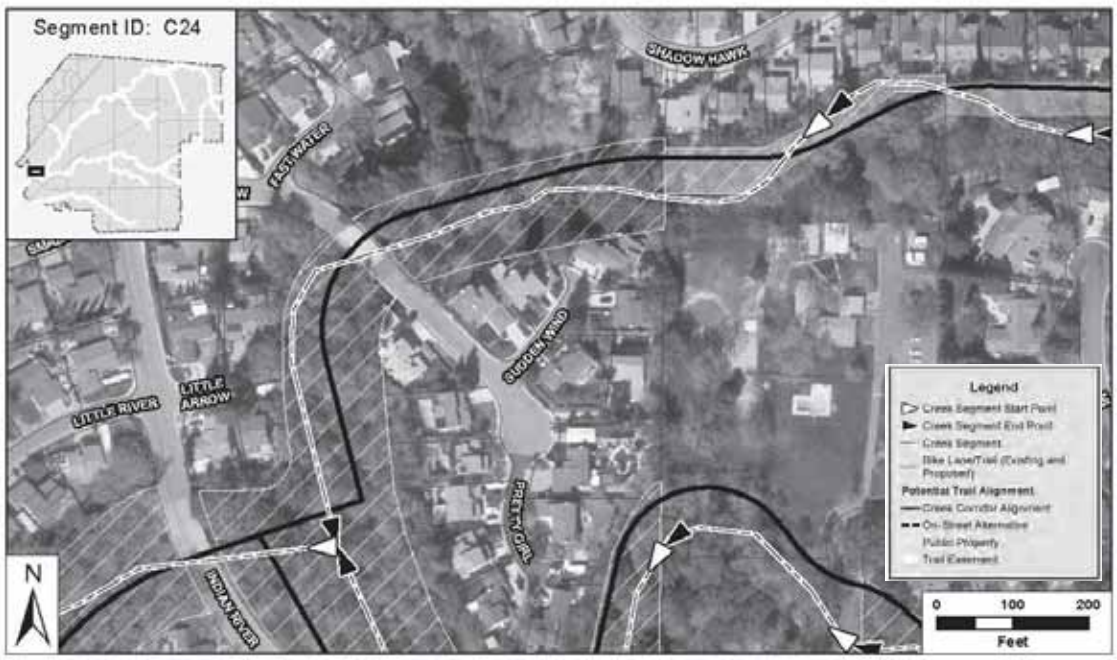
Length: 380'
Potential for Future Study: Moderate

Start: Mi Court
End: 160 ft downstream of east boundary of SRPD parcel
Number of Road Crossings: 0
No. Potential Creek Crossings: 0 - 1

Discussion:

The upstream segment is private ownership with public access easement on right bank of creek. Downstream, a narrow strip of public land, owned and managed by SRPD, is also on the right bank. Narrow width of shelf, steep banks and proximity to residence imposes constraints. A trail may require a bridge across to the left bank onto private property for 2 lots to avoid constraints an easement would be required. Canopy on left bank is open.

As can be seen in the segment figure, an approximately 50-foot wide public trail easement existing throughout this segment on the right (north) bank of the creek. This existing easement should provide sufficient room to locate a trail without significant impacts to vegetation or other natural resources.



Subwatershed: Cripple Creek

Segment ID: C24
Length: 1116'
Potential for Future Study: High

Start: 160 ft downstream of east boundary of SRPD property
End: Confluence with Arcade Creek
Number of Road Crossings: 1
No. Potential Creek Crossings: 2

Discussion:

Land is owned and managed by SRPD as a future park site for Matheny Way Park. Topography and vegetation favor right bank for trail. Corridor width is approximately 150 feet.

Subwatershed: Cripple Creek
Segment ID: CT1-1
Length: 1153'
Potential for Future Study: None

Start: Heritage Meadow Lane
End: Villa Oaks Drive
Number of Road Crossings: NA
No. Potential Creek Crossings: NA

Discussion:

Within this segment, a narrow area of public ownership at the downstream end is too steep for a trail. Otherwise, land is privately owned, and homes and yards are close to the creek. Unimproved areas are heavily wooded. Corridor is generally less than 60-feet wide.

Subwatershed: Cripple Creek
Segment ID: CT1-2
Length: 902’
Potential for Future Study: High

Start: Villa Oaks Drive
End: Old Auburn Road
Number of Road Crossings: 2
No. Potential Creek Crossings: 0

Discussion:

Land is either part of street parcel or owned by the City. Left (west) bank is preferred due to private residential development on right. Adequate width for trail parallel to Fair Oaks. Few topographic constraints. Construction would require regrade/realignment of road culvert/swale. Trail is redundant with existing on-street bike routes on Fair Oaks but would make for a more enjoyable experience, which could encourage greater usage.

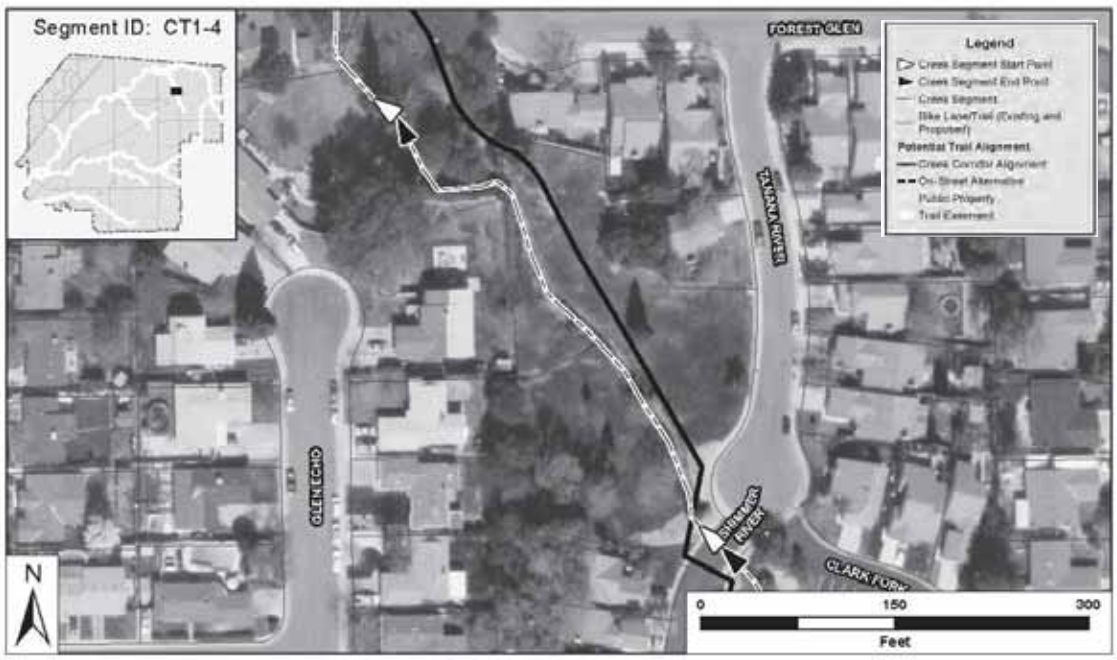
Subwatershed: Cripple Creek
Segment ID: CT1-3
Length: 618'
Potential for Future Study: High

Start: Old Auburn Road
End: Shimmer River Lane
Number of Road Crossings: 1
No. Potential Creek Crossings: 1 (@ road)

Discussion:

Segment flows through a privately owned common area. Adequate width (approximately 130') and open area for trail parallel to Shimmer River Lane. Minimal trees would be impacted.

An existing Emergency Access road provides access to Old Auburn Road. An easement would be required for any future trail development parallel to Simmer River Lane.



Subwatershed: Cripple Creek
Segment ID: CT1-4
Length: 453'
Potential for Future Study: High

Start: Shimmer River Lane
End: Forest Glen Way
Number of Road Crossings: 0
No. Potential Creek Crossings: 0

Discussion:

This short segment runs through privately owned and maintained common area adjacent to Shimmer River Lane. Topographic and vegetation constraints are minor. Corridor width is adequate. An easement would be required for any future trail development.

Subwatershed: Cripple Creek
Segment ID: CT1-5
Length: 1707'
Potential for Future Study: High

Start: Forest Glen Way
End: Glen Tree Drive
Number of Road Crossings: 1
No. Potential Creek Crossings: 0

Discussion:

The first third of segment is in a privately owned common area. Remainder is public property owned and managed by City, consisting of a maintenance road on the right bank, above a concrete channel. Available width for trail on private land varies depending upon side of bank and vegetation. Width on public land is sufficient for trail, which could also function as the access road.

Subwatershed: Cripple Creek
Segment ID: CT1-6
Length: 708'
Potential for Future Study: None

Start: Glen Tree Drive
End: City W. boundary
Number of Road Crossings: NA
No. Potential Creek Crossings: NA

Discussion:

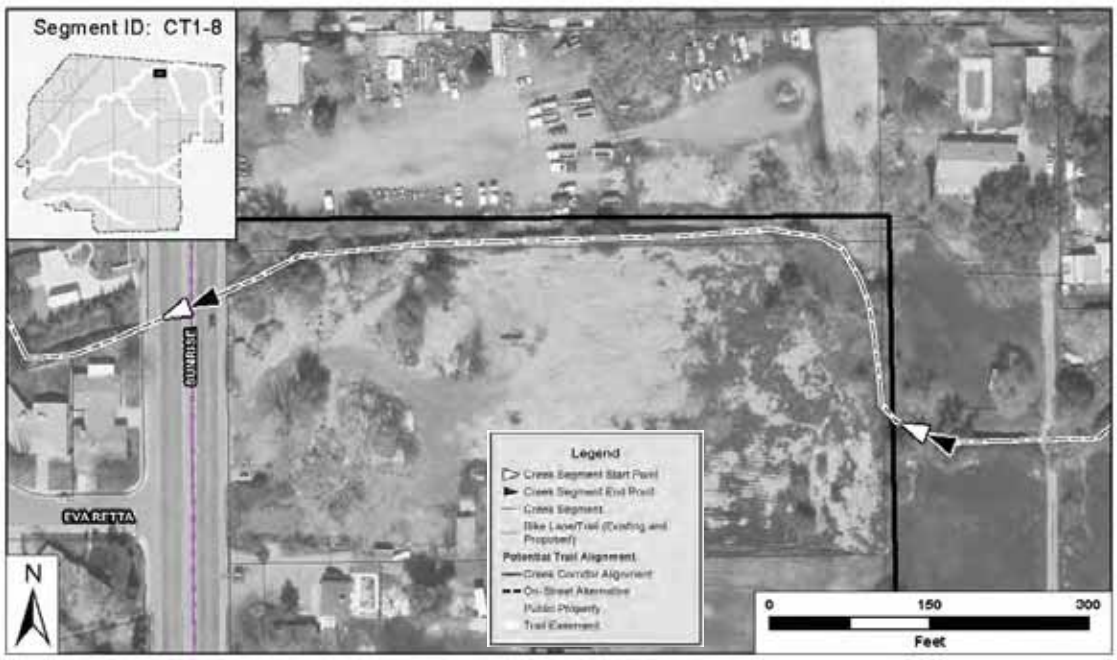
Although this segment flows through public land owned and managed by the City, space between concrete channel and private property is insufficient for trail. An alternate routing for trails on upstream segments may be on-street from Glen Tree Drive to Glen Arbor Way and through Madera Park.

Subwatershed: Cripple Creek
Segment ID: CT1-7
Length: 710'
Potential for Future Study: High

Start: City Property W. boundary
End: Wonder Street
Number of Road Crossings: 2
No. Potential Creek Crossings: 0

Discussion:

This segment flows through 2 large private parcels with no development within the creek corridor. Corridor width and topography are adequate. The left bank has open areas where a trail would have minimal impact to trees. Even though this segment is feasible, the upstream segment is impassable, therefore, an alternate routing to connect to upstream segments would likely follow the east side of the eastern parcel to Garryanna Drive. Another alternate route through Madera Park has already been discussed in the data sheet for the upstream segment (CT1-6).

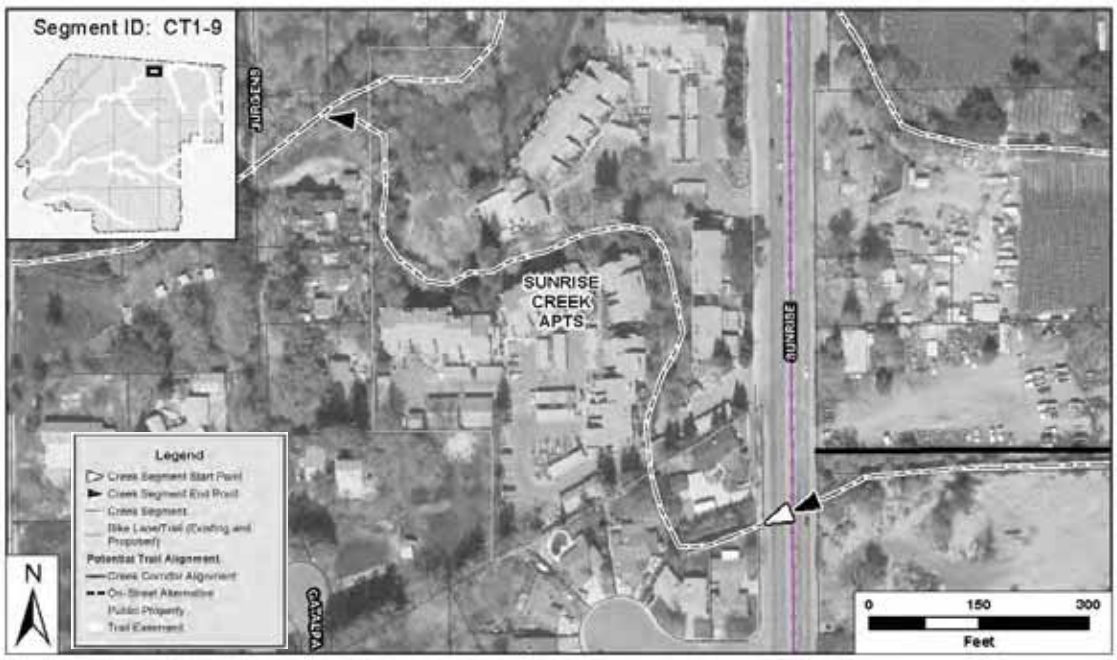


Subwatershed: Cripple Creek
Segment ID: CT1-8
Length: 836’
Potential for Future Study: High

Start: Wonder Street
End: Sunrise Boulevard
Number of Road Crossings: 1
No. Potential Creek Crossings: 0

Discussion:

The creek in this segment flows through a single large private parcel with no development on the left bank. A senior care facility is currently proposed for the site. The development includes a creekside setback without development consistent with the City’s Zoning Code. Topographic constraints are minimal. Future development of this parcel could accommodate a trail easement to connect in through Madera Park, provided an easement could also be acquired on the eastern end of the adjacent parcel to the south.

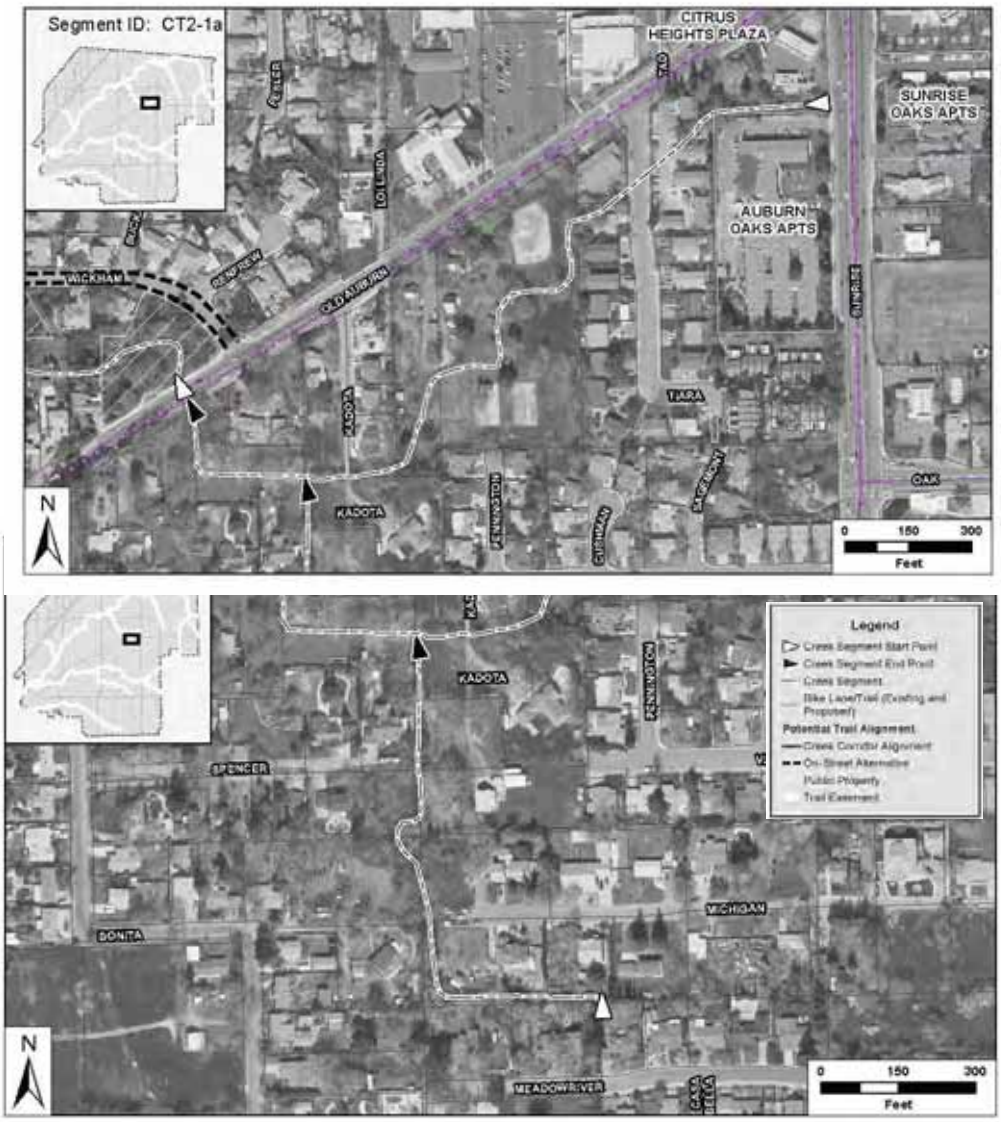


Subwatershed: Cripple Creek
Segment ID: CT1-9
Length: 1257'
Potential for Future Study: None

Start: Sunrise Boulevard
End: Confluence with Main Stem
Number of Road Crossings: NA
No. Potential Creek Crossings: NA

Discussion:

This segment includes multiple private parcels with development very near the creek. The area is steep, narrow and heavily wooded. Opportunities for trails are very limited.



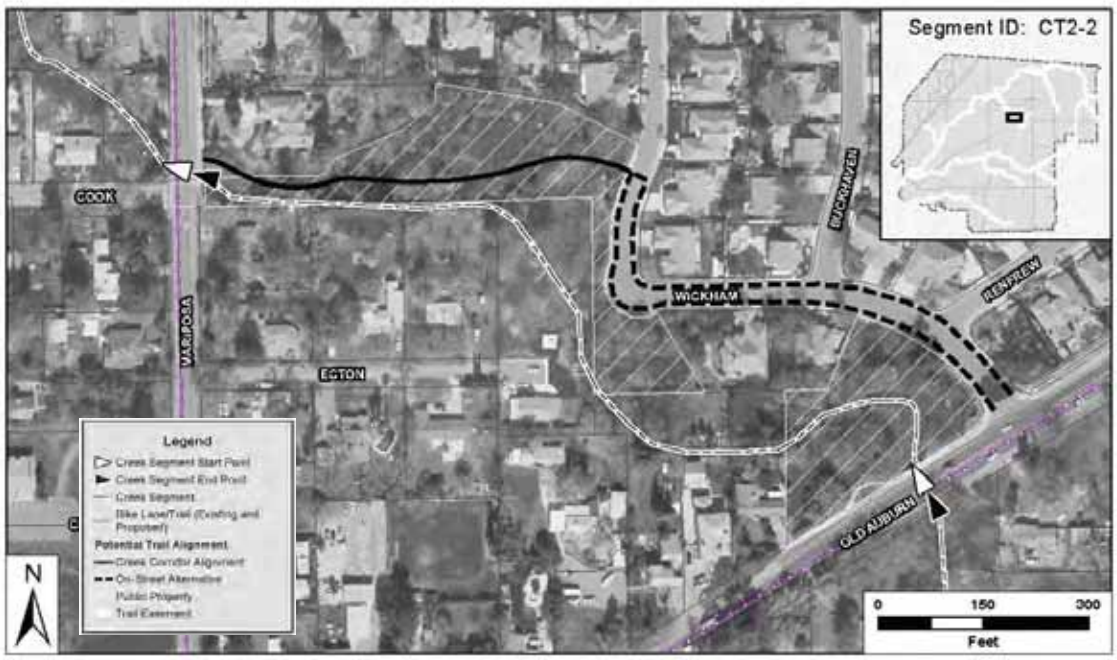
Subwatershed: Cripple Creek
Segment ID: C2-1a & b
Length: 2240'
Potential for Future Study: Low

Start: Headwaters of sub-tributaries 1 & 2
End: Old Auburn Road
Number of Road Crossings: 3
No. Potential Creek Crossings: multiple[11]

Discussion:

Sub-tributaries flow through private land with an irregular mix of small and large lots. Topographic constraints are minimal. Several structures are fully or partially within the corridor, and multiple lots have landscaped within the study area. Numerous crossing would be needed to avoid impacts to private property improvements. Sub-tributary 2 is heavily wooded.

[11] Creek crossings are dependant upon future agreements with property owners, which are not known at this time.



Subwatershed: Cripple Creek
Segment ID: CT2-2
Length: 1395'
Potential for Future Study: Moderate

Start: Old Auburn Road
End: Mariposa Avenue
Number of Road Crossings: 1
No. Potential Creek Crossings: 0 - 1

Discussion:

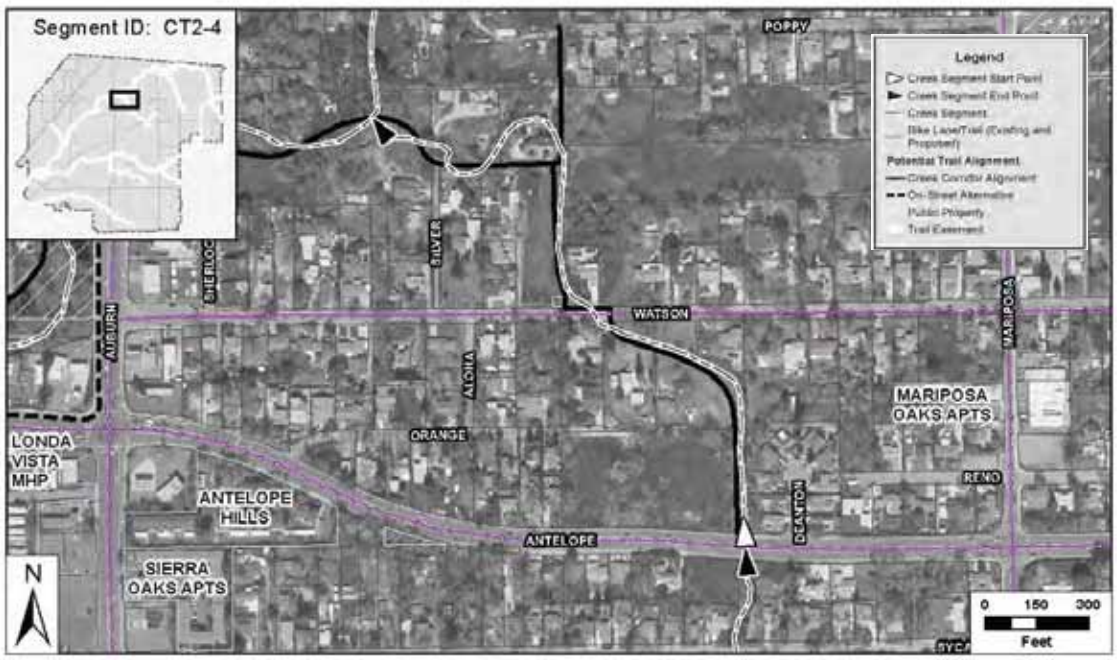
Approximately half of this segment is in public ownership by the County Department of Water Resources. Private homes are near the creek at the beginning and end of the segment. An informal trail connects Mariposa Avenue to Wickham Drive. May need bridge at downstream end to connect with Mariposa while avoiding private property impacts.

Subwatershed: Cripple Creek
Segment ID: C2-3
Length: 1792'
Potential for Future Study: None

Start: Mariposa Avenue
End: Antelope Road
Number of Road Crossings: NA
No. Potential Creek Crossings: NA

Discussion:

Property within this segment is privately owned with many structures and landscape improvements within the corridor. The majority of flat land within the segment has been improved for private use. The remainder is wooded with topographic constraints. The channel and/or banks have been armored with concrete or gabions in some sections of this segment.



Subwatershed: Cripple Creek
Segment ID: CT2-4
Length: 2245'
Potential for Future Study: Moderate

Start: Antelope Road
End: Confluence with Main Stem
Number of Road Crossings: 1
No. Potential Creek Crossings: multiple[12]

Discussion:

Land is privately owned, but lots are generally large and undeveloped adjacent to the creek. Segment would require easements and multiple crossings. No significant topographic constraints.

[12] Creek crossings are dependant upon future agreements with property owners, which are not known at this time.

Subwatershed: Cripple Creek
Segment ID: CT3-1
Length: 2019'
Potential for Future Study: High

Start: US 80
End: Twin Park Drive
Number of Road Crossings: 2
No. Potential Creek Crossings: 0

Discussion:

Segment is in public ownership: primarily Twin Creeks Park, owned by SRPD, with the remaining small segment owned by the City. A paved connection exists from just outside the corridor at Rollingside Court to Starflower Drive. Informal trails run throughout. Riparian vegetation is dense in some areas will likely require mitigation. Corridor width generally good, but near to homes in three locations. An over- or under-crossing of I-80 is planned at this location in the City's 2008 Bikeway Master Plan (Citrus Heights 2008) to connect to the northwest portion of the City.

Subwatershed: Cripple Creek
Segment ID: CT3-2
Length: 1624'
Potential for Future Study: Moderate

Start: Twin Park Drive
End: Confluence with Main Stem
Number of Road Crossings: 0
No. Potential Creek Crossings: 0

Discussion:

Two-thirds of this segment is in private ownership, but it flows through only three parcels that are largely undeveloped. One of these is the Church of Jesus Christ of Latter Day Saints discussed earlier in segment C19. The Church maintains some improvements on this portion of their property, including a bridge over the tributary. The other two privately owned parcels are north and south of the Church property. The north parcel has a residence on its eastern end. The south parcel is undeveloped open space. The parcel adjacent to Twin Parks Drive on the downstream side, encompassing approximately 460 feet of this segment, is owned by the City.

Subwatershed: SMUD Corridor
Segment ID: S1
Length: 1353'
Potential for Future Study: High

Start: Wachtel Way
End: City, W. boundary
Number of Road Crossings: 1
No. Potential Creek Crossings: 0

Discussion:

Parcels are owned by City and SRPD. Existing informal trails run throughout. Adequate width exists for Class I trails without impacting existing trees. Trails are generally consistent with SMUD's corridor guidelines, however specific trail alignments would require SMUD approval.

Subwatershed: SMUD Corridor
Segment ID: S2
Length: 3152’
Potential for Future Study: High

Start: City Parcel, W. boundary
End: Oak Avenue
Number of Road Crossings: 1
No. Potential Creek Crossings: 0

Discussion:

A public trail easement runs the entirety of this segment; however, several private yards block access with fences and other improvements. Most of this occurs northeast of Villa Oak Drive. Width and topography are adequate for a Class I trail. This segment could utilize trails within C-Bar-C Park, or a trail could be located on the east side of the park following the trail easement.

Subwatershed: SMUD Corridor
Segment ID: S3
Length: 1260'
Potential for Future Study: High

Start: Oak Avenue
End: Streng Avenue
Number of Road Crossings: 1
No. Potential Creek Crossings: 0

Discussion:

Land within this segment is publicly owned and managed by SRPD as part of Northwoods Park. Existing informal trails run throughout. Trees and sparse. Minor landscaping encroachments have occurred on some parcels. As in all trails within the SMUD corridor, specific trail alignments would require the approval of SMUD.

Subwatershed: SMUD Corridor
Segment ID: S4
Length: 1260'
Potential for Future Study: High

Start: Streng Avenue
End: ORPD Parcel, S. boundary
Number of Road Crossings: 0
No. Potential Creek Crossings: 0

Discussion:

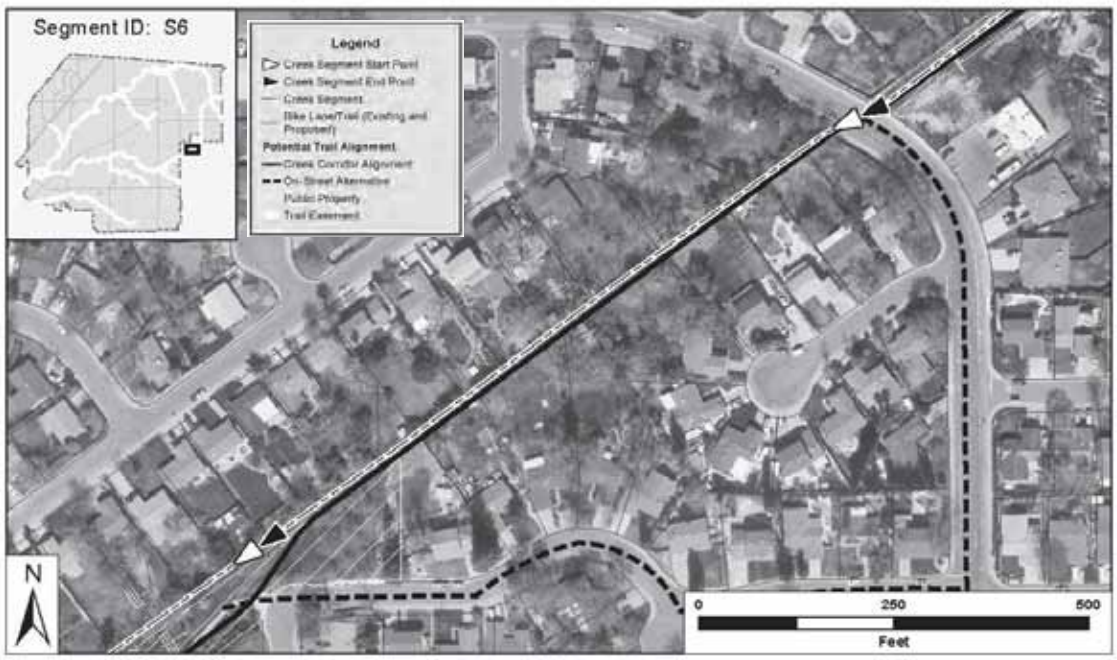
Property is in public ownership by ORPD. Existing trails continue through this area. Corridor is wide (approximately 180 feet) and trees are sparse.

Subwatershed: SMUD Corridor
Segment ID: S5
Length: 896'
Potential for Future Study: High

Start: ORPD Parcel, S. boundary
End: Woodmore Oaks
Number of Road Crossings: 1
No. Potential Creek Crossings: 0

Discussion:

This segment is almost entirely on public land owned by Sacramento County, except for three private parcels at the north end. ORPD is in the process of acquiring easements through these parcels. The corridor is relatively narrow, approximately 25 feet between backyard fences, but more than sufficient for a 12-foot trail and 2 to 4 foot shoulders. Topographic constraints are minor and little sensitive vegetation exists.



Subwatershed: SMUD Corridor
Segment ID: S6
Length: 950'
Potential for Future Study: Low

Start: Woodmore Oaks
End: Highwood Way
Number of Road Crossings: 0
No. Potential Creek Crossings: 0

Discussion:

Corridor is almost entirely private parcels with fences and structures occupying the corridor in most places. Many large landscaping trees occur in backyards. On-street alternate route is Woodmore Oaks Drive to Highwood Way to Sundance Park.

Appendix A – Preliminary Rating Matrix

Appendix A
Preliminary Screening Scores

Segment ID	Length Feet	Structures Right Score 1 = <100 ft 2 = <300 ft 3 = <500 ft 4 = <700 ft 5 = ≥700 ft	Structures Left Score 1 = <100 ft 2 = <300 ft 3 = <500 ft 4 = <700 ft 5 = ≥700 ft	Trail Easement % 0 = <10% 1 = <20% 2 = <40% 3 = <60% 4 = <80% 5 = ≥80%	Other Easement % 0 = <10% 1 = <20% 2 = <40% 3 = <60% 4 = <80% 5 = ≥80%	Intersections 1 = <1000 ft 2 = <1500 ft 3 = <2000 ft 4 = <2500 ft 5 = ≥2500 ft	Public Land % 0 = <10% 1 = <20% 2 = <40% 3 = <60% 4 = <80% 5 = >80%	Existing Trail Use 5 = Improved 3 = Informal 0 = None	Connectivity 4 = Very High 3 = High 2 = Moderate 1 = Limited	Corridor Condition 5 = All Natural Area 3 = Mostly Natural Area 1 = Limited Natural Area -3 = Mostly Developed -5 = All Developed	Score Sum of All Scores	Category Very High = >30 High = > 20 Mod = > 10 Low = <= 10
Arcade Creek Reach 0	1,176	2	2	0	0	2	0	3	1	5	15	Moderate
Arcade Creek Reach 1	6,484	2	4	3	3	4	3	3	2	5	29	High
Arcade Creek Reach 2	9,197	4	3	0	5	4	4	5	4	5	34	Very High
Arcade Creek Reach 3	7,233	2	2	3	2	4	3	3	4	5	28	High
Arcade Creek Reach 4	4,106	2	5	2	3	5	5	5	4	5	36	Very High
Arcade Creek Trib 1a	2,528	4	5	0	4	2	2	3	2	5	27	High
Arcade Creek Trib 1b	2,016	2	2	0	4	4	0	0	2	1	15	Moderate
Arcade Creek Trib 1c	3,295	2	2	0	3	1	2	0	1	-5	6	Low
Arcade Creek Trib 2a	4,301	5	5	0	4	5	0	0	2	3	24	High
Arcade Creek Trib 2b	1,182	4	3	0	3	1	0	0	1	-5	7	Low
Brooktree Creek Reach 1	5,636	2	2	2	3	3	3	5	3	5	28	High
Brooktree Creek Reach 2	6,638	2	2	0	2	4	5	3	2	3	23	High
Brooktree Creek Reach 3	4,278	3	2	0	2	1	2	3	2	-3	12	Moderate
Cripple Creek Reach 1	9,387	2	5	2	2	4	2	3	2	5	27	High
Cripple Creek Reach 2	6,423	2	3	2	3	5	3	3	4	3	28	High
Cripple Creek Reach 3	2,926	3	2	0	0	2	5	5	2	3	22	High
Cripple Creek Reach 4	8,357	5	3	0	2	2	0	0	1	3	16	Moderate
Cripple Creek Reach 5	10,343	4	5	0	2	5	3	5	2	5	31	Very High
Cripple Creek Reach 6	6,437	5	5	2	3	2	2	5	2	5	31	Very High
Cripple Creek Trib 1	3,643	2	5	0	2	2	4	3	3	5	26	High
Cripple Creek Trib 2a	2,245	2	3	0	2	2	0	0	1	3	13	Moderate
Cripple Creek Trib 2b	3,187	2	2	0	4	1	2	3	2	1	17	Moderate
Cripple Creek Trib 2c	3,347	2	2	0	2	3	0	0	1	1	11	Moderate
Cripple Creek Trib 3a	1,257	2	1	0	0	2	0	0	1	1	7	Low
Cripple Creek Trib 3b	5,032	2	2	0	2	1	2	0	2	1	12	Moderate
Cripple Creek Trib 3c	2,056	1	2	0	2	2	4	0	1	3	15	Moderate
Drainage Canal Reach 1	3,262	2	4	3	3	3	3	3	1	1	23	High
Drainage Canal Reach 2	1,202	2	2	0	0	2	0	0	1	-5	2	Low
SMUD Corridor Reach 1	5,765	3	3	3	5	3	3	5	4	1	30	High
SMUD Corridor Reach 2	4,561	3	3	0	3	4	4	5	4	1	27	High

Appendix B – Background Analysis Scoring Matrix

Creek	Segment_ID	BMP_Description	EMP_Description	OwnershipScore	NatResourcesScore	CorrWidthScore	Topo_Score	Feas_Score
Arcade Creek	A01	Highwood Way Cul-de-sac	Fair Oaks Blvd	4	4	4	4	16
Arcade Creek	A02	Fair Oaks Blvd	Tempo Park Existing Trail	4	4	4	4	16
Arcade Creek	A03	Tempo Park Existing Trail	Sunrise Blvd	4	3	3	3	13
Arcade Creek	A04	Sunrise Blvd	Sayonara Dr	4	3	3	3	13
Arcade Creek	A05	Sayonara Dr	Mariposa Ave	4	2	3	2	11
Arcade Creek	A06	Mariposa Ave	Sylvan Rd	2	3	3	4	12
Arcade Creek	A07	Sylvan Rd	Confluence w/Arcade Trib 1	2	3	3	3	11
Arcade Creek	A08	Confluence w/Arcade Trib 1	Crosswoods Circle East	4	4	4	4	16
Arcade Creek	A09	Crosswoods Circle East	Crosswoods Circle West	4	3	3	4	14
Arcade Creek	A10	Crosswoods Circle West	W Bndry Crosswoods Park	4	3	4	4	15
Arcade Creek	A11	W Bndry Crosswoods Park	Van Maren Ln	3	2	4	4	13
Arcade Creek	A12	Van Maren Ln	Auburn Blvd	3	2	2	3	10
Arcade Creek	A13	Auburn Blvd	E End Matheny Way Cul-de-sac Road Easement	3	3	3	4	13
Arcade Creek	A14	E End Matheny Way Cul-de-sac Road Easement	Matheny Way	4	4	3	4	15
Arcade Creek	A15	Matheny Way	E Boundary Matheny Way Park Site	2	4	4	4	14
Arcade Creek	A16	E Boundary Matheny Way Park Site	Confluence w/Cripple Cr	4	4	4	3	15
Arcade Creek	A17	Confluence w/Cripple Cr	Greenback Ln	4	2	3	3	12
Arcade Creek	A18	Greenback Ln	Devecchi Ave/Rosebud Ln	2	3	3	3	11

Creek	Segment_ID	BMP_Description	EMP_Description	OwnershipScore	NatResourcesScore	CorrWidthScore	Topo_Score	Feas_Score
Arcade Creek Trib 1	AT2-1	Birdcage St	San Pablo Dr	2	3	2	2	9
Arcade Creek Trib 1	AT2-2	San Pablo Dr	Mariposa Ave	1	3	1	1	6
Arcade Creek Trib 1	AT2-3	Mariposa Ave	Sylvan Rd	1	2	1	1	5
Arcade Creek Trib 1	AT2-4	Sylvan Rd	Confluence w/Main Stem Arcade Cr	3	2	4	3	12
Arcade Creek Trib 2	AT1-1	Brando Lp	Fair Oaks Blvd	4	4	4	4	16
Arcade Creek Trib 2	AT1-2	Fair Oaks Blvd	Confluence with Main Stem	3	3	4	4	14
Brooktree Creek	B01	Capricorn Dr	Mariposa Ave	0	0	0	0	0
Brooktree Creek	B02	Mariposa Ave	Wells Ave	3	3	3	3	12
Brooktree Creek	B03	Wells Ave	San Juan Ave	1	2	2	3	8
Brooktree Creek	B04	San Juan Ave	Sperry Dr	1	1	1	1	4
Brooktree Creek	B05	Sperry Dr	Brooktree Dr	4	3	4	4	15
Brooktree Creek	B06	Brooktree Dr	Hickorywood Way	4	2	4	4	14
Brooktree Creek	B07	Hickorywood Way	W bndry of SRPD Parcel	4	3	4	4	15
Brooktree Creek	B08	W bndry of SRPD Parcel	Atoll Ct	1	2	4	4	11
Brooktree Creek	B09	Atoll Ct	Dewey Dr	1	2	1	1	5
Brooktree Creek	B10	Dewey Dr	West 325 Feet/Sac Co Parcel	4	2	1	1	8
Brooktree Creek	B11	West 325 Feet/Sac Co Parcel	Park Oaks Dr	2	2	4	4	12
Brooktree Creek	B12	Park Oaks Dr	Higgins St	4	3	4	4	15

Creek	Segment_ID	BMP_Description	EMP_Description	OwnershipScore	NatResourcesScore	CorrWidthScore	Topo_Score	Feas_Score
Brooktree Creek	B13	Higgins St	Auburn Blvd	1	1	1	1	4
Cripple Creek	C01	Wachtel Way	Oak Ave	0	0	0	0	0
Cripple Creek	C02	Oak Ave	Olivine Ave	2	2	4	4	12
Cripple Creek	C03	Olivine Ave	SMUD Corridor Centerline	4	3	4	4	15
Cripple Creek	C04	SMUD Corridor Centerline	Sacramento County Parcel North Boundary	4	2	4	4	14
Cripple Creek	C05	Sacramento County Parcel North Boundary	Old Auburn Rd	1	2	4	3	10
Cripple Creek	C06	Old Auburn Rd	Newbridge Way	4	2	2	2	10
Cripple Creek	C07	Newbridge Way	Crestmont Ave	4	3	4	4	15
Cripple Creek	C08	Crestmont Ave	Dept. Water Resources Parcel West Boundary	4	4	4	4	16
Cripple Creek	C09	Dept. Water Resources Parcel West Boundary	Twin Oaks Ave	3	3	2	4	12
Cripple Creek	C10	Twin Oaks Ave	Sunrise Blvd	1	2	2	4	9
Cripple Creek	C11	Sunrise Blvd	Auburn Blvd	1	1	3	4	9
Cripple Creek	C12	Auburn Blvd	Antelope Rd	4	3	4	4	15
Cripple Creek	C13	Antelope Rd	Mira Loma High School Class 1 Trail (East End)	2	1	3	3	9
Cripple Creek	C14	Mira Loma High School Class 1 Trail (East End)	Mira Loma High School Class 1 Trail (West End)	4	4	4	4	16
Cripple Creek	C15	Mira Loma High School Class 1 Trail (West End)	SRPD Parcel West Boundary	4	1	2	2	9
Cripple Creek	C16	SRPD Parcel West Boundary	Calvin Dr	1	2	2	3	8

Creek	Segment_ID	BMP_Description	EMP_Description	OwnershipScore	NatResourcesScore	CorrWidthScore	Topo_Score	Feas_Score
Cripple Creek	C17	Calvin Dr	Van Maren Ln	2	2	1	1	6
Cripple Creek	C18	Van Maren Ln	Bridgemont Way	4	2	3	3	12
Cripple Creek	C19	Bridgemont Way	Confluence with Cripple Cr Tributary 3	3	3	4	3	13
Cripple Creek	C20	Confluence with Cripple Cr Tributary 3	Oak Lakes Ln	3	3	4	3	13
Cripple Creek	C21	Oak Lakes Ln	North Boundary Public Access Easement	3	3	4	4	14
Cripple Creek	C22	North Boundary Public Access Easement	Mi Ct	4	3	3	3	13
Cripple Creek	C23	Mi Ct	SRPD Parcel 160 ft downstream of East Boundary	3	3	2	3	11
Cripple Creek	C24	SRPD Parcel 160 ft downstream of East Boundary	Confluence with Arcade Cr	4	3	4	4	15
Cripple Creek Trib 1	CT3-1	US 80	Twin Park Dr	4	2	3	4	13
Cripple Creek Trib 1	CT3-2	Twin Park Dr	Confluence with Cripple Creek	3	2	3	4	12
Cripple Creek Trib 2	CT2-1	Headwaters of Subtributaries 1 and 2	Old Auburn Rd	1	2	1	4	8
Cripple Creek Trib 2	CT2-2	Old Auburn Rd	Mariposa Ave	3	2	3	3	11
Cripple Creek Trib 2	CT2-3	Mariposa Ave	Antelope Rd	1	1	1	1	4
Cripple Creek Trib 2	CT2-4	Antelope Rd	Confluence with Main Stem Cripple Cr	2	3	2	4	11
Cripple Creek Trib 3	CT1-1	Heritage Meadow Ln	Villa Oaks Dr	1	1	1	1	4
Cripple Creek Trib 3	CT1-2	Villa Oaks Dr	Old Auburn Rd	4	3	4	4	15
Cripple Creek Trib 3	CT1-3	Old Auburn Rd	Shimmer River Ln	3	3	4	4	14

Creek	Segment_ID	BMP_Description	EMP_Description	OwnershipScore	NatResourcesScore	CorrWidthScore	Topo_Score	Feas_Score
Cripple Creek Trib 3	CT1-4	Shimmer River Ln	Forest Glen Way	3	3	4	4	14
Cripple Creek Trib 3	CT1-5	Forest Glen Way	Glen Tree Dr	3	3	3	4	13
Cripple Creek Trib 3	CT1-6	Glen Tree Dr	Dept. of Water Resources Parcel West Boundary	1	1	1	1	4
Cripple Creek Trib 3	CT1-7	Dept. of Water Resources Parcel West Boundary	Wonder St	2	3	4	4	13
Cripple Creek Trib 3	CT1-8	Wonder St	Sunrise Blvd	2	4	4	4	14
Cripple Creek Trib 3	CT1-9	Sunrise Blvd	Confluence with Main Stem Cripple Cr	1	1	1	1	4
SMUD Corridor	S1	Wachtel Way	Sacramento County Parcel West Boundary	4	4	4	4	16
SMUD Corridor	S2	Sacramento County Parcel West Boundary	Oak Ave	3	4	4	4	15
SMUD Corridor	S3	Oak Ave	Streng Ave	4	4	4	4	16
SMUD Corridor	S4	Streng Ave	ORPD Parcel South Boundary	4	4	4	4	16
SMUD Corridor	S5	ORPD Parcel South Boundary	Woodmore Oaks	3	4	4	4	15
SMUD Corridor	S6	Woodmore Oaks	Highwood Way	1	1	1	4	7