Tahquitz Creek Trail Master Plan

Prepared For:
The City of Palm Springs
Parks & Recreation
Department

Prepared By:
Alta Planning + Design
with RBF Consulting

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ACKNOWLEDGEMENTS

Deep appreciation to the neighborhood groups and community members who continue to work tirelessly to bring the vision of the Tahquitz Creek Trail to fruition.

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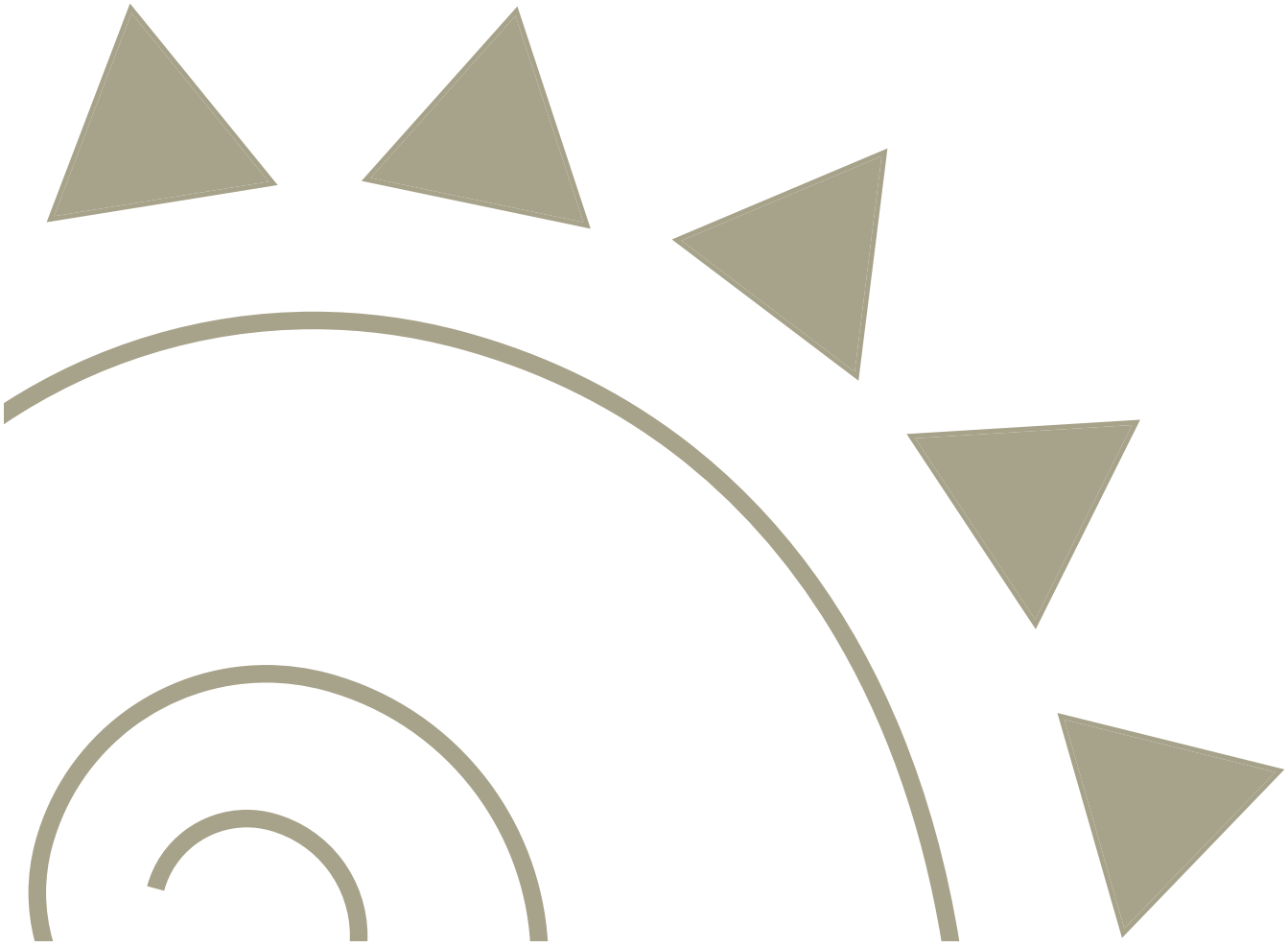


Background

The Tahquitz Creek is a unique resource within the Coachella Valley. Historically, a natural creek system, it extends coolness, water, vegetation and wildlife into the desert valley. These features make it a natural gathering place in both the past and present, for the Cahuilla Indians, western settlers and new generations of Palm Springs dwellers and visitors. As the development of the City of Palm Springs occurred, the need for efficient stormwater conveyance expanded. Already an essential functioning part of the watershed, the capacity of the Creek was expanded and channelized in the early 1980s.

A cyclist enjoys the existing path along Tahquitz Creek

A much loved treasure, the Creek is already an established recreation corridor. People can be found at all times of the year, walking, jogging, riding bicycles, walking dogs, and horseback riding along the Creek. A group called the Tahquitz Creek Yacht Club was established in 2006 to ensure that the Creek is a safe and enjoyable setting for all. They have actively worked to establish partnerships that support the Creek. In conjunction with the Tahquitz River Estates, Deepwell Estates, Warm Sands and Historic Tennis Club Neighborhood Organizations, they have also crafted a vision statement encompassing their goals and hopes for the Creek. See attachment: "Tahquitz Creek Parkway: project Background, Goals, Plans and Accomplishments."

The City of Palm Springs recognizes the value of a Tahquitz Creek Trail in relation to the larger trail system and is managing the master plan process. Alta Planning + Design, a consulting firm specializing in bicycle and pedestrian design, was retained to provide master planning services for the trail.

Vision Statement

The purpose of the Tahquitz Creek Trail Master Plan is to provide a rich and varied recreational experience for residents and visitors of Palm Springs, while enhancing the beauty and function of the Creek. The design shall respect the area's unique regional context including: history, culture and the natural environment. In their own words, community members envision the Creek as:

"A place that would be the nexus of a community pathway system connecting people to downtown and other parts of the City, mountain trail heads, Tahquitz Canyon, and perhaps one day all the way to the Salton Sea."

The Creek is a likely nexus as it is a confluence or place of convergence between the mountains and the desert, the natural and the built environments, and the area's rich history and desires for its future.

Road runners are a common site along the Tahquitz Creek Channel

Goals and Objectives

Conversations with the City, stakeholders and members of the community helped shape the goals for the master plan. Primary goals and their corresponding objectives, or means of meeting each goal, include:

1. Create a scenic and enjoyable desert greenway along the Tahquitz Creek.

- Enhance the natural qualities of the creek system.
- Provide a forum for community interaction and trail stewardship.
- Secure formal adoption of the trail as a City parkway.

2. Create visual access to the creek trail as well as connections to the larger trail system and area destinations.

- Augment opportunities to visibly showcase the unique creek environment.
- Provide bicycle and pedestrian connections to: City-loop Trail System and Coachella Valley Trail System, mountain trails, downtown, commercial centers, neighborhoods, education and cultural centers including the Tahquitz Canyon Visitors Center.
- Consider opportunities to connect the north and south sides of the Creek.

3. Provide a safe, comfortable and engaging experience for a variety of trail users.

- Build a trail or trail system that will accommodate a diversity of users: pedestrians, bicyclists, dog walkers, families, and equestrians, while respecting ADA guidelines.
- Include amenities that will ensure a comfortable and engaging experience: shade, small gathering nodes, interpretive elements, public art, gateways, way-finding information, trail rules and regulations and trash receptacles.
- Minimize safety hazards for all user groups.

4. Highlight the local context: history, culture and natural environment.

- Enhance and interpret local history and culture: Agua Caliente, western settlement, mid-century recreation capital.
- Seek educational opportunities through student engagement and stewardship.
- Enhance and interpret the natural environment: local watershed, desert, mountains, native flora and fauna.
- Landscape with low water-use, desert adapted, wildlife friendly, native or near native plant materials.

The Tahquitz Canyon Visitor Center

5. Respect the functional role of the Tahquitz Creek.

- Coordinate with Riverside County Flood Control on operating requirements.
- Do not negatively impact the capacity of the Creek's floodway.
- Recognize the shared goal of improving water quality and seek means to achieve this.

Trail Design Standards

The following provides recommended design guidelines for the Tahquitz Creek Trail that are consistent with the guidelines currently observed in California and in the United States. Ultimately, the trail must be designed to meet both the operational needs of the Riverside Flood Control District as well as the safety of trail users. The challenge is to find ways of accommodating both uses with minimum compromises related to safety or function.

Planning, design, and implementation standards in this document are derived from the following sources:

- AASHTO, *Guide for the Development of Bicycle Facilities,* 1999.
- U.S. Department of Transportation (USDOT), Federal Highway Administration (FHWA), Manual of Uniform Traffic *Control Devices (MUTCD),* 2000.
- USDOT, FHWA, Conflicts on Multiple-Use Trails: Synthesis of the Literature and State of the Practice, 1994.
- Caltrans: Highway Design Manual (Chapter 1000: Bikeway Planning and Design), 2006.
- Institute of Transportation Engineers (ITE), Design and Safety of Pedestrian Facilities, 1994.
- U.S. Department of Agriculture, Forest Service, Technology & Development Program in cooperation with USDOT, *FHWA, Equestrian Design Guidebook for Trails, Trailheads and Campgrounds,* 2007.
- Gene Wood, Recreational Horse Trails in Rural and Wildland Areas: Design, Construction, and Maintenance, 2007.
- California Equestrian Trails & Land Coalition, Generic Safety Guidelines for Multi-Use Trails, 2005.
- Town of Apple Valley, Adopted Multi-Use and Equestrian Trails Standards, 2005.
- U.S. Department of Agriculture, Forest Service Trail Accessibility Guidelines, 2006.

The sources listed above provide details on many aspects of trail design, but a) may contain recommendations that conflict with each other; b) are not, in most cases, officially recognized “requirements”; and c) do not cover all conditions on most trails. All design guidelines must be supplemented in the application to specific situations by the professional judgments of the trail designers and engineers.

Multi-Use Trail Design

The Tahquitz Creek Multi-Use Trail will accommodate a wide range of users including pedestrians, persons in wheelchairs and bicyclists of varied abilities including family cycling. Equestrian use and trail design standards are addressed in a separate section of this document.

According to AASHTO and Caltrans design standards, two-way multi-use paths should be designed to be a minimum of eight feet in width. Eight foot wide sections should be reserved for pinch points that have physical or environmental constraints. Twelve feet of width is the preferred recommendation as it also allows room for maintenance vehicles. Paved paths less than 12' have been found to break up along the edges due to vehicle loads. At a minimum, two foot clear shoulders should edge the trail.

Since the Tahquitz Creek Trail is being planned as a multi-use trail, a hard surface should be used. Concrete, while more expensive than asphalt, is the hardest of all trail surfaces and lasts the longest. However, joggers and runners prefer surfaces such as asphalt or decomposed granite due to its relative "softness". While most asphalt is black, dyes (such as reddish pigments) can be added to increase the aesthetic value of the trail itself.

Assumptions regarding multi-use trail design include:

- Minimum tread width: 8 feet, a minimum of 12 feet will be recommended wherever maintenance vehicles are anticipated to need access.
- Typical shoulder width of trail: 2 feet.
- Typical setback from edge of tread to obstructions and buildings 3 feet.

Multi-Use Trail

Users: Bicyclists, Pedestrians, Wheelchair users, and Maintenance vehicles. Some equestrian activity.

Preferred Multi-Use Trail Width: 12’ with 2’ shoulders

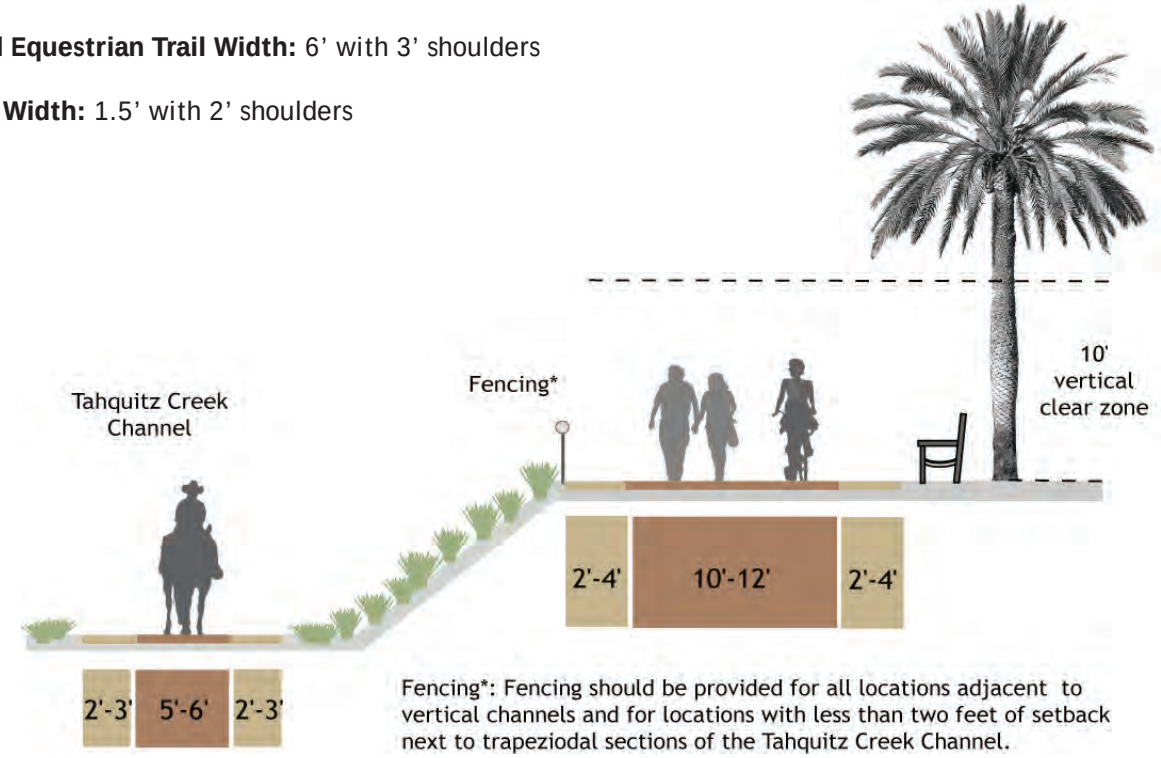
Minimum Width: 8’, 10’ preferred

Equestrian Trail

Users: Primarily equestrians.

Preferred Equestrian Trail Width: 6’ with 3’ shoulders

Minimum Width: 1.5’ with 2’ shoulders



Example Typical Equestrian and Multi-Use Trail Cross Sections

Striping

A yellow centerline stripe is standard for multi-use paths in several cities, especially at blind corners, high traffic areas, intersection approaches and/or where nighttime riding is expected with limited lighting. Some trail design professionals believe that yellow center lines give trails the appearance of being a roadway and thus are oftentimes not recommended except in the special circumstances listed above.

Signs

On trails expecting multiple types of users, trail regulation and etiquette signs are recommended. In addition, warning signs informing users of approaching intersections and crossings of driveways enhance safety.

Layout

Bike path, bike lane, and bike route signing and markings should generally follow the guidelines as developed in the Manual on Uniform Traffic Control Devices (MUTCD). This includes advisory, warning, directional, and informational signs for bicyclists, pedestrians, and motorists. All signs shall be retro-reflective on shared-use paths. Lateral sign clearance shall be a minimum of three feet and a maximum of six feet from the near edge of the sign to the near edge of the path. Mounting height shall be between four and five feet from the bottom edge of the sign to the path surface level. The final striping, marking, and signing plan for the Tahquitz Creek Trail will be resolved in the full design phase of the trail, and should be reviewed and approved by a licensed traffic engineer or civil engineer. This will be most important at locations where there are poor sight lines from the trail to cross-traffic (either pedestrian or motor vehicle).

Traffic Control

Crossing features for all roadways include warning signs for both vehicles and trail users. Adequate warning distance is based on vehicle speeds and line of sight. Signs should be highly visible; catching the attention of motorists accustomed to roadway signs may require additional alerting devices such as a flashing light, roadway striping, or changes in pavement texture. Signs oriented towards trail users must include a standard stop sign and pavement marking, sometimes combined with other features such as bollards or a kink in the trail to slow bicyclists. Care must be taken not to place too many signs at crossings lest they overwhelm the user and lose their impact.

A bicycle and pedestrian crossing warning sign

Directional and Way-finding

Directional or way-finding signs may be useful for trail users and motorists alike. For motorists, a sign reading “Bicycle Trail Xing” along with a Tahquitz Creek Trail emblem or logo helps both warn and promote use of the trail itself. For trail users, directional signs and street names at crossings help direct people to destinations.

Directional signs should impart a unique theme so trail users know which trail they are following and where it goes. The theme may be conveyed in a variety of ways: engraved stone, medallions, bollards, and mile markers. A central information installation at trailheads and major crossroads also helps users find their way and acknowledge the rules of the trail. They are also useful for interpretive education about plant and animal life, ecosystems, local history and culture.
While trail sign placement should be tailored to each unique situation, a general rule of thumb is to place signs every ¼ mile and at all trail-roadway intersections.

Trail / Roadway Crossings

It is highly desirable to minimize the number of roadway crossings that occur. As a general rule, when crossings are required, they should occur at established pedestrian crossings, or at locations completely away from the influence of intersections.

Trail approaches at roadways should always have Stop or Yield signs to minimize conflicts with autos. Bike crossing stencils may be placed in advance of trail crossings to alert motorists. Curb ramps should be designed to accommodate the range and number of users.

When considering a proposed off-street multi-use path and required at-grade crossings of roadways, it is important to remember two items: 1) trail users will be enjoying an auto-free experience and may enter into an intersection unexpectedly; and 2) motorists may not anticipate bicyclists riding out from a perpendicular trail into the roadway. However, in most cases, an at-grade trail can be properly designed to a reasonable degree of safety and meet existing traffic engineering standards.

Evaluation of multi-use trail crossings should involve an analysis of vehicular traffic patterns, as well as the behavior of trail users. This includes traffic speeds (85th percentile), street width, traffic volumes (average daily traffic and peak hour traffic), line of sight, and trail user profile (age distribution, range of mobility, destinations). A traffic safety study should be conducted as part of the actual civil engineering design of the proposed crossings to determine the most appropriate design features. This study would identify the most appropriate crossing options given available information, which must be verified and/or refined through the actual engineering and construction document stage.

Like most trails in built urban areas, the Tahquitz Creek Trail must cross roadways at certain points. These roadway crossings may be designed at-, below-, or above-grade. At-grade crossings create potential conflicts between trail users and motorists. However, well-designed crossings have not historically posed a safety problem, as evidenced by the thousands of successful trails around the United States with at-grade crossings. Designing safe at-grade crossings is a key to safe implementation of the Tahquitz Creek Trail. Trail-roadway crossings should comply with the AASHTO[1], Caltrans[2], and MUTCD[3] and any local standards that may apply.

Virtually all roadway crossings fit into one of four basic categories:

Type 1: Unprotected/Marked
Unprotected/marked crossings include trail crossings of residential, collector, and sometimes major arterial streets or railroad tracks.

Type 2: Route Users to Existing Intersection
Trails that emerge near existing intersections may be routed to these locations, provided that sufficient protection is provided at the existing intersection.

Type 3: Signalized/Controlled
Trail crossings that require signals or other control measures due to traffic volumes, speeds, and trail usage.

Type 4: Grade-Separated
Bridges or under-crossings provide the maximum level of safety but also generally are the most expensive and have right-of-way, maintenance, and other public safety considerations.

The existing Type 1 crossing of Sunrise Way at North Riverside Drive includes striping and advance warning signs

1 American Association of State Highway and Traffic Officials
2 California Department of Transportation
3 Manual on Uniform Traffic Control Devices

Basic Crossing Prototypes

Intersection approaches are based on established standards, published technical reports, and the experiences from existing facilities. Virtually all crossings fit into one of four basic categories:

Type 1: Unprotected/Marked Crossings

An unprotected crossing (Type 1) consists of a crosswalk, signing, and often no other devices to slow or stop traffic. The approach to designing crossings at mid-block locations depends on an evaluation of vehicular traffic, line of sight, trail traffic, use patterns, vehicle speed, road type and width, and other safety issues such as the proximity of schools. The following thresholds recommend where unprotected crossings may be acceptable:

Type 1 Crossing

- Install crosswalks at all trail-roadway crossings
- Maximum traffic volumes:
  - Up to 15,000 ADT on two-lane roads, preferably with a median.
  - Up to 12,000 ADT on four-lane roads with median.
- Maximum travel speed
  - 35 mi/h
- Minimum line of sight:
  - 25 mi/h zone: 250 feet
  - 35 mi/h zone: 350 feet
  - 45 mi/h zone: 450 feet

On two lane residential and collector roads below 15,000 ADT with average vehicle speeds of 35 mi/h or less, crosswalks and warning signs (“Bike Xing”) should be provided to warn motorists, and stop signs and slowing techniques (bollards/geometry) should be used on the trail approach. Care should be taken to keep vegetation and other obstacles out of the sight line for motorists and trail users. Engineering studies should be done to determine the appropriate level of traffic control and design.

A flashing yellow beacon or embedded pavement lights, may be used with a marked crosswalk, preferably one that is activated by the trail user rather than operating continuously. Some jurisdictions have successfully used flashing lights activated by motion detectors on the trail, triggering the lights as trail users approach the intersection. This equipment, while slightly more expensive, informs motorists about the presence of trail users. This type of added warning would be especially important at locations with restricted sight distance.

Type 2: Route Users to Existing Intersection

Crossings within 250 feet of an existing signalized intersection with pedestrian crosswalks are often diverted to the signalized intersection for safety purposes. For this option to be effective, barriers and signs may be needed to direct trail users to the signalized crossings. In most cases, signal modifications would be made to add pedestrian detection and to comply with ADA recommendations. In many cases, such as on most community trails parallel to roadways, crossings are simply part of the existing intersection and are not a significant obstacle for trail users.

Type 3: Signalized/Controlled Crossings

New signalized crossings are recommended for crossings more than 250 feet from an existing signalized intersection and where 85th percentile travel speeds are 40 mi/h and above and/or ADT exceeds 15,000 vehicles. Each crossing, regardless of traffic speed or volume, requires additional review by a registered engineer to identify sight lines, potential impacts on traffic progression, timing with adjacent signals, capacity and safety.

Type 3 Crossing

Trail signals are normally activated by push buttons, but also may be triggered by motion detectors or weight sensors. The maximum delay for activation of the signal should be two minutes, with minimum crossing times determined by the width of the street. The signals may rest on flashing yellow or green for motorists when not activated, and should be supplemented by standard advanced warning signs. Typical costs for a signalized crossing range from $150,000 to $250,000.

Type 4: Grade-Separated Crossings

Grade-separated crossings are needed where ADT exceeds 25,000 vehicles, and 85th percentile speeds exceed 45 mi/h. Safety is a major concern with both over crossings and under crossings. When designed properly, grade-separated crossings practically eliminate any safety concerns related to crossing a roadway.

Type 4 Grade-Separated Undercrossing

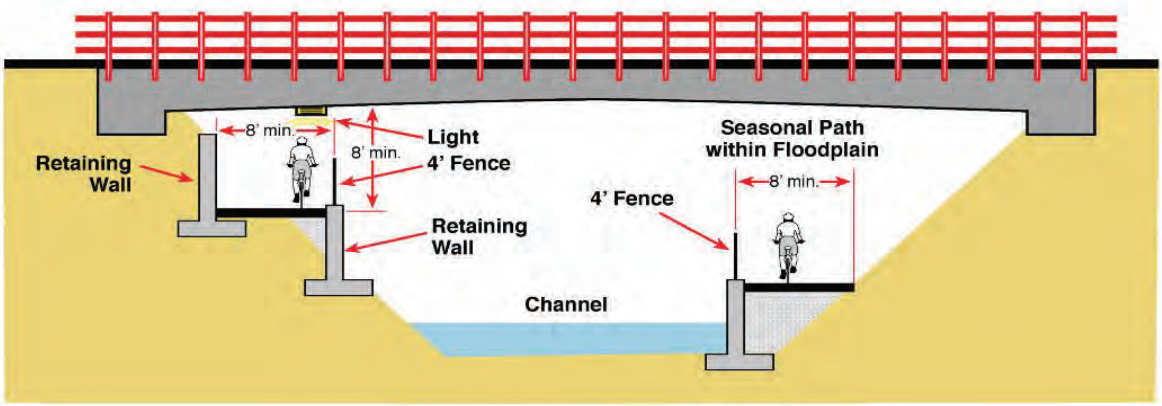
Grade-separated crossing approaches should minimize the out-of-direction travel required by the trail user, so that users don't alternatively attempt to dart across the roadway. Under crossings, like parking garages, have the reputation of being places where crimes occur, but these safety concerns can be addressed through design.

An under crossing can be designed to be spacious, well-lit, equipped with emergency cell phones at each end, and completely visible for its entire length prior to entering. For cyclists and pedestrians, vertical clearance should be kept to a minimum of 8' (10' for equestrians).

Type 4 Overcrossing

Any recommended under crossings should be designed so that they do not decrease the flood capacity of the channel, and they should also provide at least eight feet of vertical clearance although ten is preferred. This would require 360 linear feet or ramps on either side of the over crossing, since the ramps should comply with ADA (Americans with Disabilities) grade requirements[4].

4 According to the ADA, running grades on ramps should be less than 5% (1:20)



Example bicycle and pedestrian undercrossing design.
(Note: To accommodate equestrians, vertical clearance would need to be a minimum of 10'.)

Creek Crossings

New crossings of Tahquitz Creek may be considered with the preferred alignment. The crossings of the creek can be made most efficiently and inexpensively with the use of a pre-fabricated bicycle/pedestrian bridge. Pre-fabricated steel bridges are typically less expensive than cast-in-place or pre-cast concrete bridges. The width of the creek channel bottom ranges from 50 to 104' in width and would not require extensive approach ramps since the creek is sunken below the grade of the trail.

Example of a pre-fabricated trail bridge located over a channelized creek

Design Speed

The minimum design speed for bike paths is 20 miles per hour, except on sections where there are long downgrades (steeper than 4%, and longer than 500 feet - not applicable). Speed bumps or other surface irregularities or obstacles should never be used to slow bicycles. Slower speeds may be posted for areas that anticipate equestrian usage.

Lateral Clearance on Horizontal Curves

Stopping sight distance on horizontal curves and lateral clearance can be calculated using the equations in the AASHTO Guide, 2003. Sight distance is generally not expected to pose a problem on the Tahquitz Creek Trail.

Vertical Clearance

A ten foot vertical clearance should be maintained on multi-use trails. This area should be free from tree limbs and any other obstructions that may interfere with pathway use.

Gradients

Steep grades should be avoided on any multi-use trail, with 5% the recommended maximum gradient. Steeper grades can be tolerated for short distances (up to about 500 feet).

Drainage
A 2% cross slope will resolve most drainage issues on a bike path, except along cut sections where uphill water must be collected in a ditch and directed to a catch basin, where the water can be directed under the trail in a drainage pipe of suitable dimensions. No sharp curves are anticipated along the trail.

Bollards
Bollards at trail intersections and entrances are sometimes used to prevent vehicles from entering. Bollards should be located adjacent to the trail with a removable center bollard for emergency and maintenance access. Bollards should not be located in the travel lanes. Bollards should be designed to be visible to bicyclists and others, especially at nighttime, with reflective materials and appropriate striping.

Equestrian Trail Design
Trails reserved exclusively for equestrians are also called bridle trails, bridle paths, or bridleways. The needs of equestrian trail users are unique. As with any trail design, the design of an equestrian trail facility should respond to the setting, needs of the trail users, level of use, and safety issues.

Less developed or rural equestrian trail settings include: rivers, open spaces, and drainages among others. Safety concerns for riders in rural settings involve: visibility, interactions with other trail users and natural hazards. Urban settings include developed or congested areas. Equestrian trails in urban settings oftentimes accommodate multiple user groups including pedestrians and cyclists. While the above safety considerations apply to trails in urban areas, they are also more likely to interact with roadways and motorized vehicles.

Equestrians include youth, elders, leisure riders, professional riders, organized groups, novices, and people with disabilities. Riders may recreate individually or in groups for pleasure, exercise or challenge. While some equestrians prefer wide, gentle trails, others seek a technically challenging route.
Walkers, hikers, and cyclists often share trail corridors with equestrians. In areas where conflicts seem likely, efforts are made to physically separate the different user groups. Horses have a natural flight instinct when startled. Fast moving and quiet cyclists, approaching a horse from behind, are a valid concern for riders. Design that considers the interactions of all trail users is essential for a successful design.

Trail facilities should provide enough space so that a horse feels at ease. Horses prefer to travel away from walls or barriers that they cannot see through or over and are most comfortable traveling in the tread that other stock have traveled.

Site Distance
The added height of equestrians allows them to see farther than on the ground trail users. Trails that intersect with roadways are subject to AASHTO guidelines with respect to sight and stopping distance. A walking horse generally travels at a rate of two and a half to four miles per hour. A trot is approximately eight miles per hour. The ideal sighting distance should be 100 ft. for every 10 mph of average traffic speed. The minimum sighting distance should be 200 feet.

Trail Width
Horizontal trail clearance will vary based on the trail setting. USDA/FHWA suggested widths for a standard single-track horse trails are listed below.

Suggested widths and clearance for a standard, single-track horse trail.
Source: USDA/FHWA Equestrian Design Guidebook for Trails, Trailheads, and Campgrounds

Trail element	**Low development (feet)**	**Moderate development (feet)**	**High development (feet)**
Tread width	1.5 to 2	3 to 6	8 to 12
Clearing width (horizontal)	5.5 to 8 (Tread plus 2' to 3' each side)	9 to 12 (Tread plus 3' each side)	14 to 18 (Tread plus 3' each side)
Vertical clearance (vertical)	10	10 to 12	10 to 12

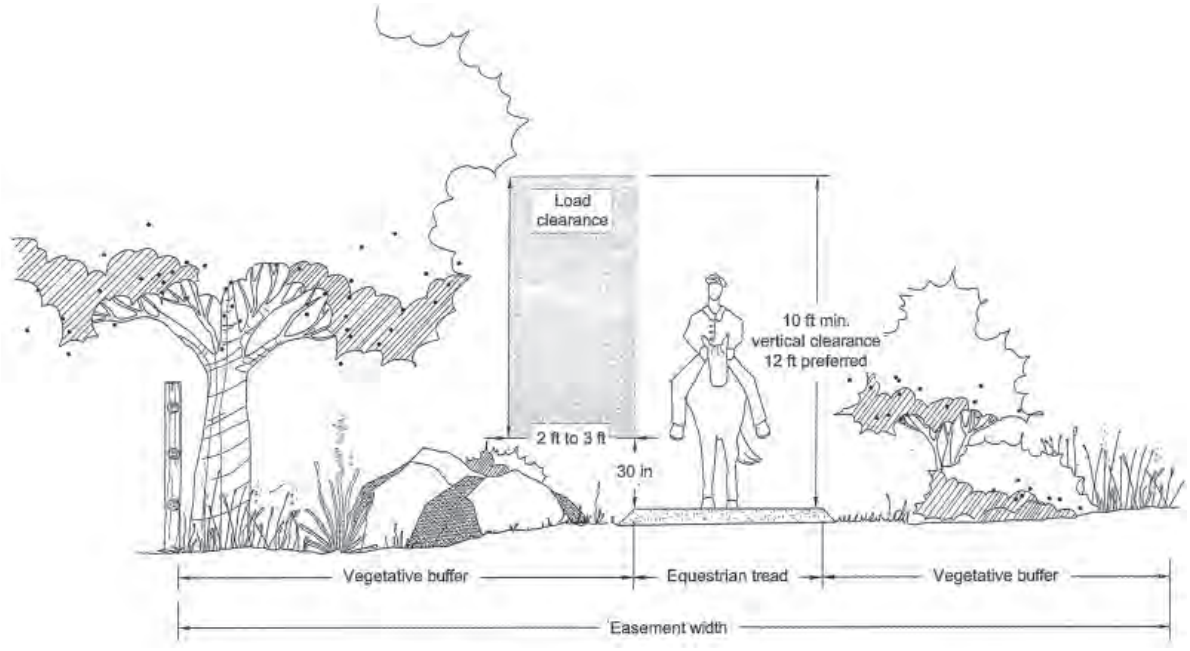
A horse on a single-track requires a minimum of 1.5 feet of tread width with four feet horizontal clear width to accommodate horse and rider. Horses will often travel eighteen inches from a trail edge or tread surface. Single track treads vary from 1.5 feet in wild areas to eight feet in urban areas. Many double-tracked equestrian trails are designed to be five to six feet wide with a two foot clear or shy distance on each side of the tread. A double-track tread allows for equestrians to ride side by side while also providing a comfortable passing distance. This is a common configuration for moderately developed trails in rural settings. In developed areas, double-track treads are often eight to twelve feet wide.

Vertical Clearance

Low vertical clearance presents a potential safety hazard for riders when their horse needs maneuvering space. A horse with rider is nearly eight feet in height. Clearance of physical barriers including: bridges, underpasses, and vegetation should extend at least ten feet above the surface tread with twelve feet preferred.

Trail Surface

Trail tread or surface should be relatively stable. While it may or may not be paved, a trail surface should be solid, obstacle free and should stay in place. Appropriate trail surfaces include: compacted native soil, decomposed granite or crushed fine material. Hard surfaces, such as asphalt are not amenable to equestrians.



An equestrian-only trail.
Source: USDA/FHWA, Equestrian Design Guidebook for Trails, Trailheads, and Campgrounds

Grade
Grade or steepness determines how challenging a trail is. Trails that are comfortable for equestrians are ones that accommodate all trail users. While horses can easily negotiate grades up to ten or twenty per cent, steeper running grades result in faster water run-off and erosion problems. Following contours helps reduce erosion problems and minimize maintenance needs. A two per cent cross slope or crowned tread and periodic grade reversals along running slopes will minimize standing surface water.

Trails Adjacent to Roadways
When equestrian activity occurs near roadways, there is a chance that a vehicle may startle a horse. In areas with moderate development, physical separation and barriers are recommended. Vegetation used to screen traffic will help make the trail animal more comfortable.

Multiple Users
Unless designated otherwise, recreation trails are shared-use trails meaning that they are open to use by pedestrians, cyclists and equestrians. Multi-use trails may be designed to have a single tread for all users or multiple treads to separate uses that might conflict. Pedestrians and riders are often compatible as they both accept unpaved surfaces and move at relatively slow speeds. Bicyclists and horses may have conflicts. Road cyclists prefer a hard, smooth surface which is not appropriate for equine. The faster speed and quiet operating nature of cyclists and natural flight reaction of horses lead many trail designers to recommend separating those on bikes from equestrians. As the number of trail users goes up, so does the demand for separate treads to reduce conflicts.

Separation
There are many means of separating trail users including: time, distance, screening, and barriers.

In corridors where adequate right-of-way is available, trail users may be separated by physical space. Vegetated buffers or barriers have successfully been used in many trail scenarios. Elevation changes are another means of effectively separating trail users. Differing surfaces suitable to each user group, also help create a visual separation and clarity of where each user group should be. When trail corridors are constrained, the approach is often to locate the two different trail surfaces side by side with no separation. Oftentimes, an expanded trail shoulder serves the role of the equestrian facility.

An example of a trail system that clearly separates trail users

Barriers
When barriers are considered necessary, options include: walls, fences, railings and bollards. The accepted height for most equestrian barriers is fifty-four inches. Solid barriers significantly limit an animal's peripheral vision and sense of security and thus are not recommended. When solid walls are necessary, vegetation should be used to soften the structure's appearance.

Railings or safety barriers are recommended when a trail occurs within six feet of a steep slope (more than 3:1) with a vertical grade change or drop off of more than thirty inches.

When bollards are used to deter vehicular access, five foot horizontal spacing is recommended for equestrian passage. In areas where motorcycles or ATVs are anticipated, bollard spacing would need to be closer. In this situation, separate horse specific gateways are utilized.

An example of crushed fine surface material and visually permeable fencing on an equestrian trail

Trail Etiquette

The education of trail users is a critical part of creating a safe trail environment for all trail users. Not everyone understands the innate flight sense of a horse, so guidelines should be clearly posted at trail access points.

A commonly used multi-use trail etiquette sign

Yielding the right-of-way is a courtesy and yet a necessary part of a safe trail experience involving multiple trail users. Trail right-of-way information should be posted at trail access points and along the trail. The message must be clear and easy to understand. The most common trail etiquette systems involve yielding of cyclists to pedestrians and equestrians and the yielding of pedestrians to equestrians.

Vocal warnings, also help horses acclimate to other trail users. Calling out and talking helps a horse recognize cyclists as humans and thus a non-threat.

Equestrian Roadway Crossings

Equestrian trails often intersect roadways. When equestrians cross a roadway, designing for safety is essential. Push-button signal actuators mounted at elevated heights for riders (between six and eight feet above the ground), enable equestrians to stop cross traffic without dismounting. Loop detectors are another means of controlling traffic lights.

The MUTCD approved equestrian crossing caution sign

As a trail comes to a roadway, it should be oriented perpendicular to it to give the greatest visual advantage in each direction. The crossing itself should generally be on a straight segment of the roadway.

Appropriate surfaces at roadway crossings are critical to rider safety. Most asphalt and concrete surfaces do not provide enough traction for horses. Where trails do need to cross sections of asphalt it is recommended that the surface be roughened. Some uncoated surfaces provide more traction than coated asphalt. Rubberized asphalt has been used with some success. In desert environments, asphalt is softened by the heat and may stick to hoofs, and potentially burn tissues. Asphalt with chip is considered to have a fair rating with respect to traction. This option is suitable for limited uses at crossings. Rough textured concrete has a good traction rating however is still not a comfortable surface for horses.

Similar to other trail crossings, traffic control devices should be used at at-grade roadway crossings. These include: equestrian crossing caution signs, decreased speed limits, road markings, narrowed travel lanes, and signals.

Accessible Trail Design

The design guidelines listed above for multi-use trails, adequately address the needs of people with disabilities. General guidelines include: slopes less than 5% grade. Ramps at 8% may be used, however landings or resting areas must be provided every thirty feet at a minimum. Travel ways shall be a minimum of three feet wide.

Trail surfaces need not be paved in order to meet ADA guidelines

The surface shall be firm and stable. The Forest Service Accessibility Guidelines define a firm surface as a trail surface that is not noticeably distorted or compressed by the passage of a device that simulates a person who uses a wheelchair.

At roadway crossings and curbs, curb ramps shall be provided. It is also a best management practice to provide tactile warning strips at roadway crossing of high visual contrast to the surrounding surface. Auditory crossing signals help those with site impairments safely negotiate roadway crossings.

Operating Standards

Riverside County Flood Control District (RCFCD) owns the area within which the Tahquitz Creek Trail system will occur. Accordingly, operational and maintenance standards must be respected with the development of any related trail facilities. Above all else, the main priority for RCFCD is to maintain the flood capacity of Tahquitz Creek. Any changes or alterations to the creek channel itself must assure that the design is maintained at the 100 year plus one foot safety margin of flood level. Both trail advocates and RCFCD prioritize benefits to water quality. Alterations that result in improvements to water quality should be considered.

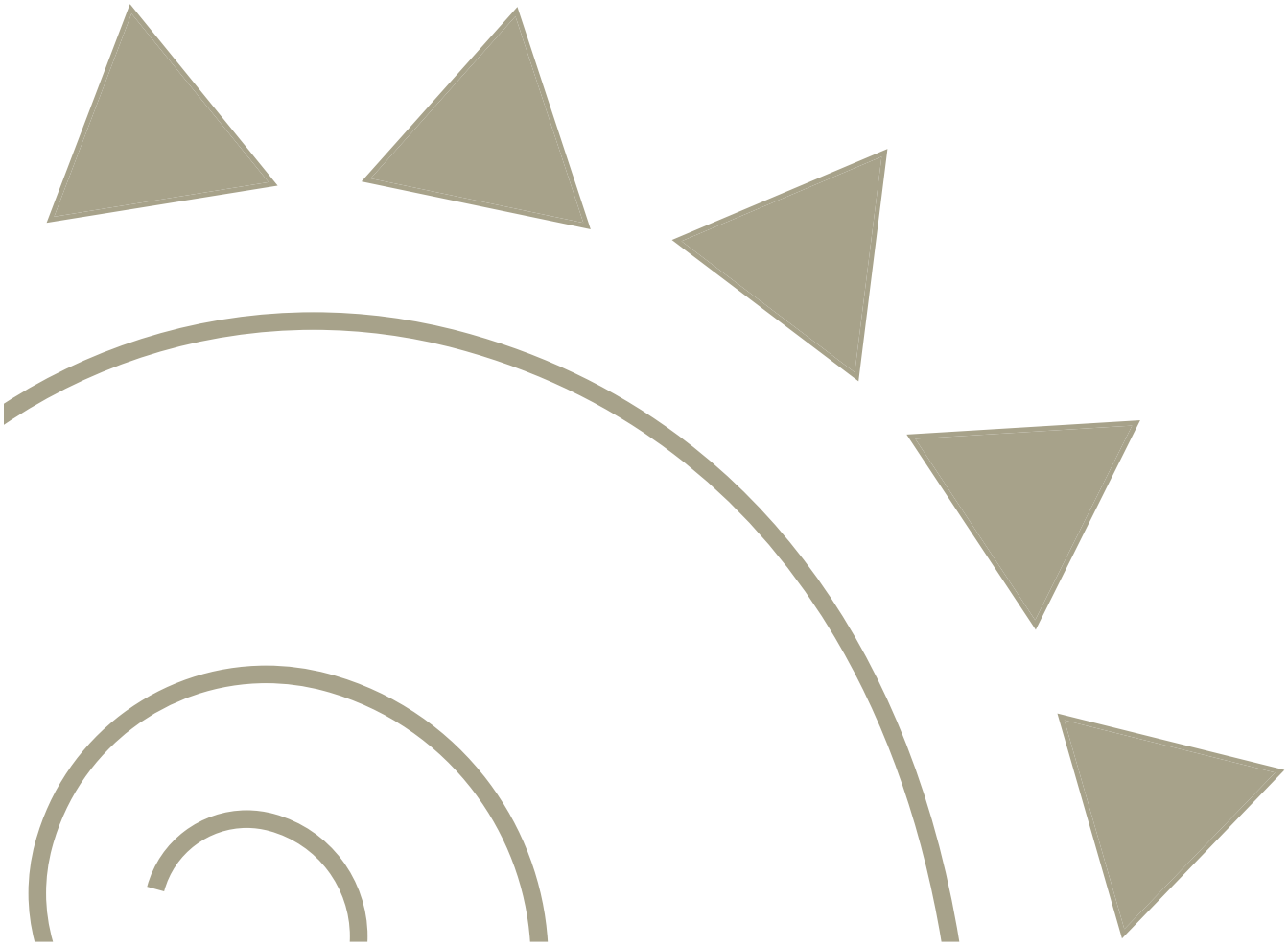
A large flood control spillway structure west of the project site is a significant feature in the landscape

A maintenance road currently is found on the embankment between the channel and both North and South Riverside Drives. RCFCD requires 15’ of width for accommodation of maintenance vehicles. Curbs present challenges to maintenance vehicles and should be kept to a minimum. Straight roadways are preferred with minimum 50’ turning radii. Regular maintenance procedures include:

- Spraying herbicides to control vegetation
- Sediment removal on an as-needed basis
- Debris removal on an as-needed basis

TAHQUITZ CREEK TRAIL MASTER PLAN

Existing Conditions, Opportunities and Constraints



Existing Conditions

Study Area

The study area for the Tahquitz Creek Trail Master Plan includes approximately 1.5 miles of the Tahquitz Creek Channel spanning between the Agua Caliente Tahquitz Canyon Visitors' Center and one-quarter of a mile east of Sunrise Way at the Mesquite Country Club. The project extends to both sides of the concrete and riprap sided creek between North and South Riverside Drives. The area has been used historically as well as presently for recreation and has significant historic interest.

Environmental Conditions

Vegetation

The project site is located within the Coachella Valley of the Colorado sub-desert. The City of Palm Springs receives less than six inches of rainfall per year on average. Daytime temperatures average in the 70s during the winter months and go well above 100 degrees in the summer.

The City of Palm Springs stays true to its namesake with numerous palms lining its streets. The California fan palm (Washingtonia filifera) is the native species. The palm is naturally found near springs and waterways such as Tahquitz Canyon. Unfortunately, the palm has been nearly eradicated from the canyon due to its value as a fuel source and building material. The fruits and seeds of the native palm were further valued by the native Cahuilla as a food source.

Invasive species of primary concern for the canyon include: fountain grass (Pennisetum setaceum), umbrella flat sedge (Cyperus alternifolius) and tamarisk (Tamarix spp.).

A mature mesquite tree provides shade on the north side

Numerous plantings occur within the project area along the Tahquitz Channel. Many plants have been established by the residents of adjacent parcels and some function as screening for these residents. Appropriate, low water-use species that are currently found along the study corridor include: mesquite, desert willow, palo verde, California fan palm, creosote, and catclaw acacia. Existing species also include many older oleander plants (Nerium oleander). Oleander is a non-native, species naturally found in association with water ways and should not be included in future plans for the trail system.

A non-native oleander hedge on S. Riverside Drive

Topography

Traveling from the west to east, along the project area, there is a gentle slope downwards towards the Mesquite Country Club. The sides of the channel currently are covered with rock and concrete protection and slopes range from 25% to 50%. The top of bank or slope protection is primarily ten feet above the bottom of the channel. A berm is also located on the south side of the channel along the right-of-way line between Sunrise Way and the pedestrian bridge at Camino Real.

The dramatic San Jacinto Mountains and Tahquitz Canyon rise above the project site to the west. San Jacinto Peak summits at an elevation of 10,804 feet. The Santa Rosa Mountains are to the south. Palm Canyon defines the space between the two ranges. From the highest points on the proposed Tahquitz Creek Trail, the Indio Hills may be seen to the northwest.

Pedestrian bridge at east end of Sunny Dunes Road

Drainage

Tahquitz Creek is part of the Whitewater Watershed. Stormwater collected by the Tahquitz Channel flows east into the Whitewater Wash. Riverside County Flood Control District (RCFCD) right-of-way for the Tahquitz Channel ranges from 160' in width to 395' within the study area. The bottom of the floodway ranges from between 50' and 104'. The channel has been designed to contain the capacity of a 100 year flood event plus a one foot freeboard (safety margin).

Wildlife

Local wildlife are dependent on the creek system. Numerous birds, coyotes, desert hares and lizards make their home near the riparian corridor. Native vegetation will enhance habitat and foraging opportunity for these species.

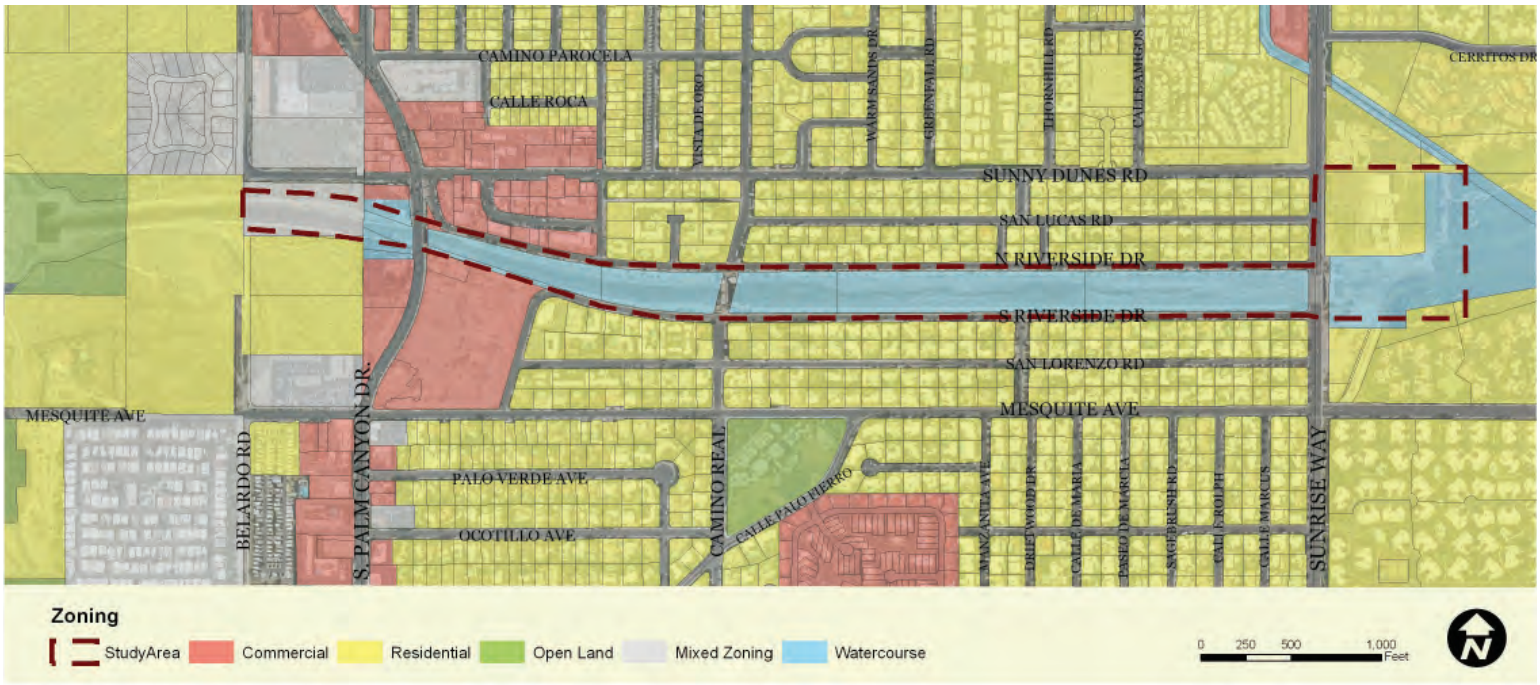
Land Uses

Zoning

The majority of the project site occurs within property zoned as a watercourse. One parcel designated as TAG (meaning split zoning) also occurs as well as one residential and open space parcels at the western end. If a recreational trail is not considered a primary use in each of these zones, a conditional use permit will be required.

Parcels adjacent to the study area are primarily residential. The majority of the study site sits within the Tahquitz River Estates neighborhood. The Historic Tennis Club Neighborhood occurs directly adjacent the northwest portion of the project area. Also, the Neighborhood of Warm Springs is just north of Sunny Dunes Road and Deepwell Estates occurs to the south of Mesquite Avenue.

Commercially zoned properties are concentrated along South Palm Canyon Drive.



Zoning Map

Ownership

The majority of the parcels within the study site are owned by the Riverside County Flood Control District (RCFCD). The eastern edge of the study area terminates at the Mesquite Country Club on leased Indian land. A significant number of parcels owned by the Agua Caliente Band of Cahuilla Indians and individual tribe members are also found west of S. Palm Canyon Drive. The western edge of the study area is bound by open space owned by the tribe. RCFCD has an easement for the channel through each of these properties.

North of the channel and east of Sunrise Way, several properties are owned by the International Church of Foursquare Gospel. While the church appears to own the road right-of-way in this area, a trail is shown as being planned on a segment of Sunny Dunes Road. This connects to a small pedestrian bridge that leads to a Class I pathway.

Private residential properties (both single and multi-family dwellings) are located to the north and south of the study area along North and South Riverside Drives. The Tahquitz Creek Trail will provide a significant open space opportunity for the community as well as an amenity for visitors and regional trail users. See Appendix B, Ownership.

Destinations

Both the commercial and residential areas will be generators of future trail users as well as destinations.

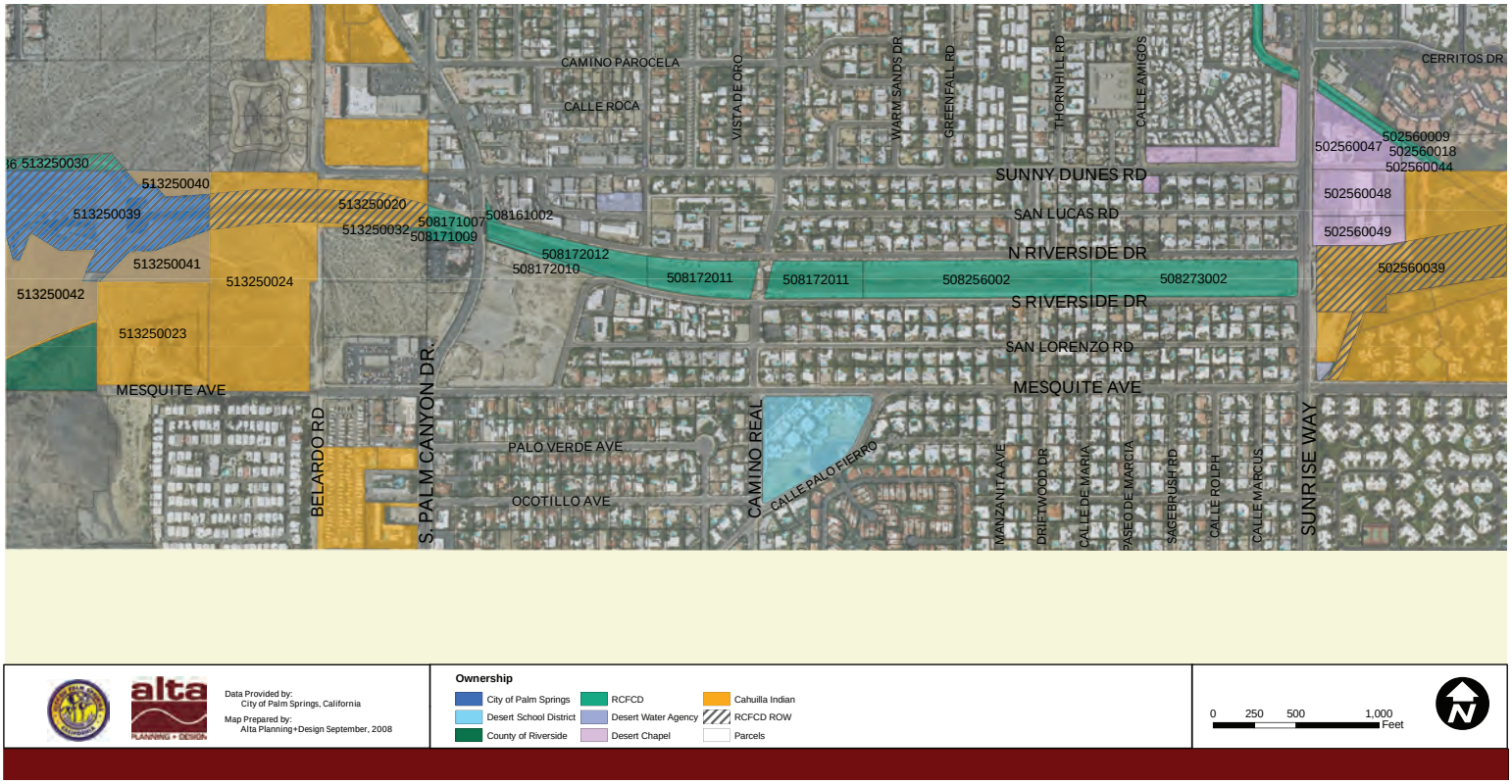
Schools

Staff and students of Cahuilla Elementary School, located on Calle Palo Fierro, and Desert Chapel School on Sunrise, are potential benefactors of the trail system.

Cultural Destinations

Significant recreation and cultural destinations include: the Agua Caliente Tahquitz Canyon Visitors' Center, Tahquitz Canyon itself and associated hiking and equestrian trails that extend into the San Jacinto Mountains at the west end of the project area. A new Agua Caliente Cultural Museum is also in the process of being built on E. Tahquitz Canyon Way.

A church is located at the southern terminus of the Camino Real pedestrian bridge



Ownership Map
Lines are from City GIS and are for planning purposes only.
Source: City of Palm Springs City Line GIS

Art

Numerous public works of art are found throughout the City of Palm Springs. While no pieces of the City's public art collection are currently found within the vicinity of the Tahquitz Creek Channel, the trail presents an excellent opportunity for the incorporation of art.

Views/Experience

The view of the San Jacinto Mountains is spectacular from Tahquitz Creek. Also, from the western edge of the study site, a unique perspective of the valley encompassing the City of Palm Springs may be gained.

The experience of walking the banks of the channel is very different from the feeling one attains by stepping down into the bottom of the floodway. Channels naturally function as drainage ways for water as well as cool air. The experience within the floodway is one of respite from the nearby urban environment.

Parking

Currently, the majority of trail users appear to originate from the local neighborhood. On-street parking near the study site does not appear to currently be an issue. Those wishing to access the South Lykken Trail in the foothills of the San Jacinto Mountains informally park at the west end of Mesquite Road.

While a formal parking lot is available at the west end of the site at the Tahquitz Canyon Visitor Center, it is designed to serve the visitor's center and is not owned by the city.

Tahquitz Canyon

View of the valley from the parking lot of the Tahquitz Canyon Visitor Center

Formalization of a trail system will bring more trail users to the area and more demand for vehicle parking. Historically, trail parking and access in the area has been done informally in under-developed areas. As the City expands and empty lots are filled in with private development, rights of access will become an issue. No bicycle parking was observed within the study area. Equestrian tie up areas are present at the Rock Garden Cafe.

A bike locked to an access gate

Connectivity & Circulation

Existing Trails

Several existing and proposed trails are found at and near the project site creating opportunities for future connections. At the project site, Flood Control access routes doubles as a bicycle and pedestrian pathway. A ten foot wide colored concrete maintenance access path/Class I bike path exists on the north side of the channel. It extends between Calle Palo Fierro and Sunrise Way. A fifteen foot wide access road also occurs on the south side of the floodway between Palm Canyon Drive and Sunrise Way. On the south side, the access road is not paved, but is also used by walkers and mountain bikers. RCFCD has stated that they need a minimum of fifteen feet of width to operate and maintain the creek channel. Several access gates are in place to limit vehicle use to RCFCD personnel, however RCFCD has expressed a willingness to keep these open.

View of the San Jacinto Mountains from Tahquitz Creek

At the eastern edge of the study area, trail users connect into an existing Class I pathway that follows the northern boundary of the golf course leading to the Citywide Loop at S. Farrell Drive. The Citywide Loop also has a Class III connection to the study site on S. Palm Canyon Way.

The Deepwell Loop to the south is primarily a Class III route which provides a connection to the Tahquitz Creek Loop. The Citywide Loop intersects the proposed Tahquitz Canyon Trail at Camino Real. A Civic Center Loop crosses the Tahquitz Creek channel at Sunrise Way as a sidewalk path. Sidewalk paths are utilized by golf carts.

Horse gate and trail leading to the Lykken Trail

Currently, equestrians most often utilize the bottom of the creek channel. RCFCD plans show an equestrian trail at the bottom of the floodway near the toe of slope of the bank protection on the north side. An eight foot wide colored concrete access path is also shown on RCFCD plans.

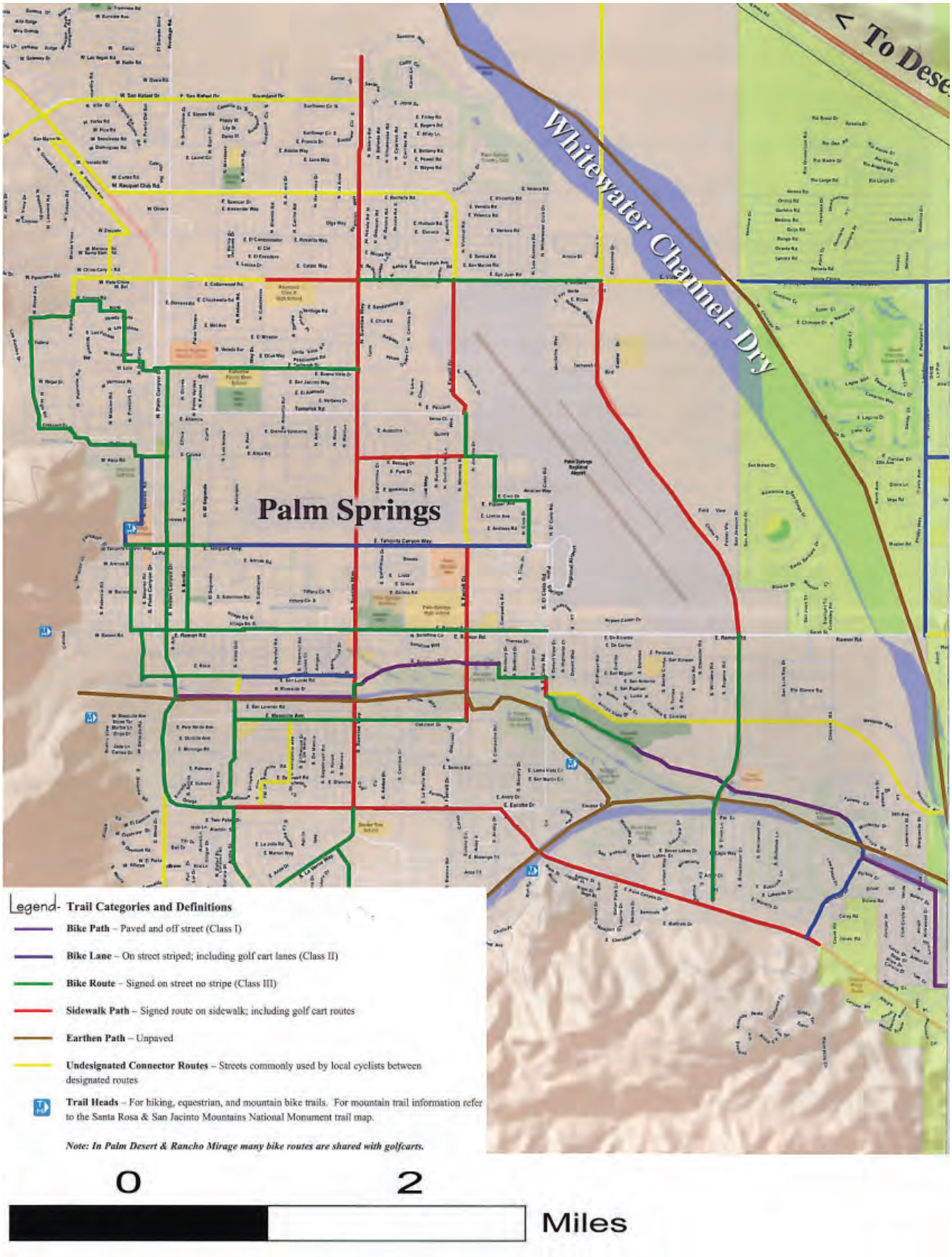
Informal equestrian trails extend from the Rock Garden Café as well as Ramon Road and filter into the foothills of the San Jacinto Mountains. An equestrian access gate and trail are located west of South Palm Canyon Drive so that riders may connect to the South Lykken equestrian and hiking trail.

Pedestrians can be found using each of the above mentioned trails for walking, recreation and exercising their pets at all times of the day and year.

A view of the existing colored concrete access road and bicycle path

Planned Trails

The planned Heritage Trail Class II bike lane, will be accessible via the Citywide Loop and will extend directly to the new Agua Caliente Cultural Museum. The in-progress Belardo Bridge crossing is shown on City trails plans as including a planned trail crossing. As of July 2008, construction drawings show the bridge as having five foot wide sidewalks on each side.



Coachella Valley Urban Trails & Bikeways Map

The Tahquitz Creek Trail will provide a connection to the regional Coachella Valley Bikeway which one day will extend from Palm Springs all the way to the Salton Sea. The Coachella Valley Community Trails Alliance is working to make this goal a reality.

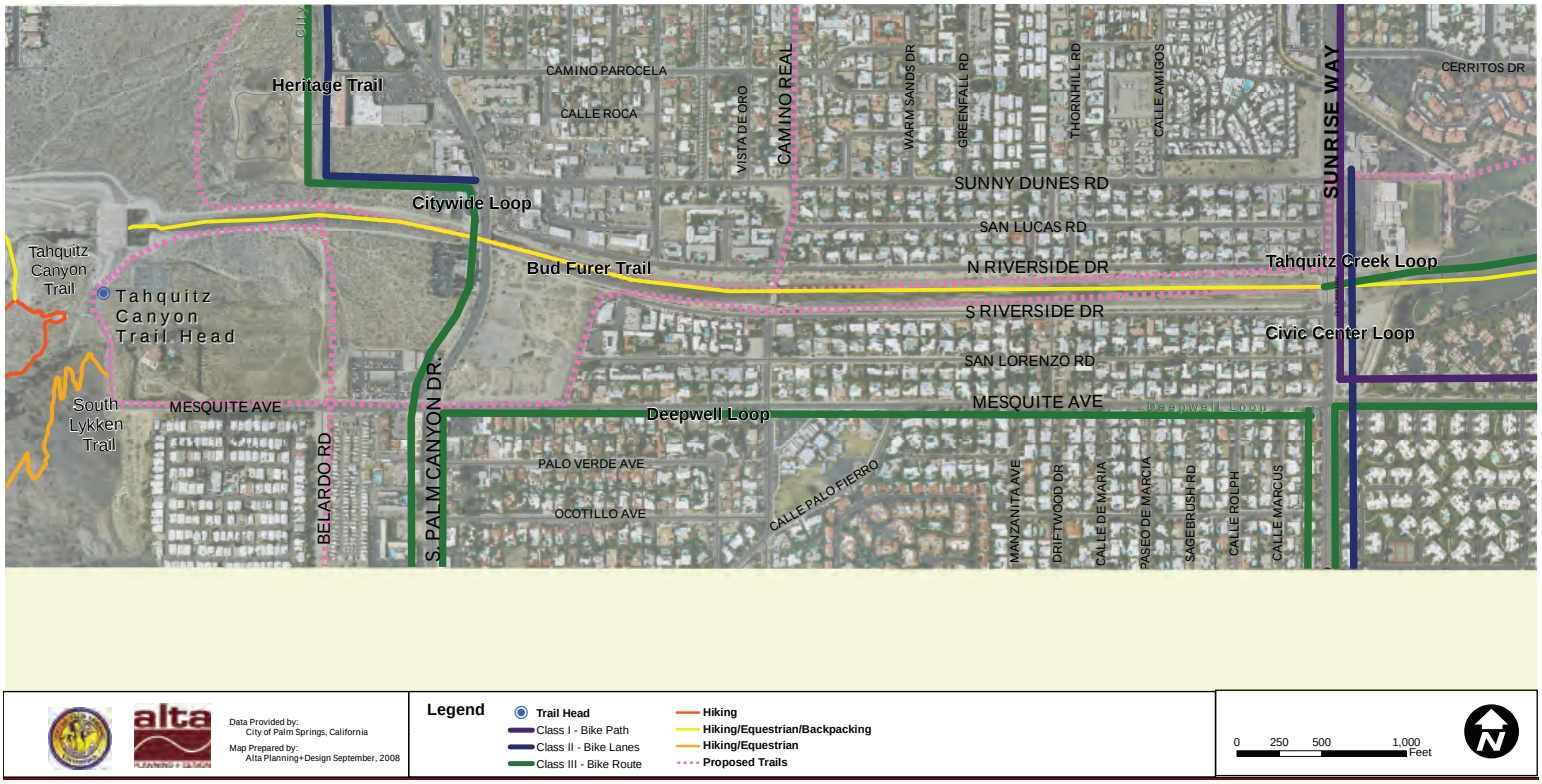
Vehicular Circulation

The majority of the project site is bound by North and South Riverside Drives. Each roadway has a fifty foot right-of-way. North Riverside Drive is 36'10" from curb to edge of pavement (+ 4'4" to existing wall) and South Riverside Drive is 29' from curb to curb.

The existing Type 1 crossing on Sunrise Way at North Riverside Drive is inadequate given vehicle speeds and volume

Several roadways cross through the study area. From west to east these are: Belardo Road, South Palm Canyon Drive, Camino Real and Sunrise Way. Belardo Road is proposed to be a bridge crossing and is nearing completion of construction documents. South Palm Canyon is a five lane, 40 mph road with an eighty foot right-of-way (2 travel lanes in each direction, plus one turn lane). Currently, trail users should head north to Sunny Dunes Road and cross at an existing signal. Camino Real is a residential scale street which ends at each side of the project site. An eight foot wide pedestrian bridge at Camino Real connects the north and south sides of the channel. Sunrise Way is a four lane, 40 mph road with a 120 foot right-of-way (2 travel lanes in each direction). An at-grade crossing exists at Sunrise Way with pedestrian crossing advance warning signs and standard crosswalk striping.

NEV's, or Neighborhood Electric Vehicles, are a common site in the City of Palm Springs. NEV's are found in bike lanes as well as on sidewalk paths. The issue of electric vehicles on shared-use paths has not been formally addressed by a City ordinance. NEV's are permitted to cross the pedestrian bridge at Camino Real.



Site Circulation Map
Lines are from City GIS and are for planning purposes only.
Source: City of Palm Springs City Line GIS

Roadway	Current Crossing Treatment*	Number of Lanes	Road ROW Width	Posted Speed (mph)	Traffic Volume (ADT-2007)
S. Palm Canyon Way	Median, signalized crossing at Sunny Dunes	4+1	80’	40	12,945
Sunrise Way	Pedestrian crossing warning signs, standard crosswalk striping	4	120’	40	18,452

Table 1. Trail-Roadway Crossings Matrix for Tahquitz Creek

**Within 300’ of Tahquitz Creek/Roadway intersection*
Source of 2007 traffic data: City of Palm Springs

Utilities

Overhead power lines cross the project site at 3 locations at 711 E. South Riverside Drive, Pedestrian Bridge, and 1277 E. South Riverside Drive.

Stormwater conveyance will have a significant impact on the Tahquitz Creek Trail Master Plan as the majority of land is owned by the Riverside County Flood Control District and maintenance and operating procedures will need to be respected.

Bike crossing warning sign

Site Amenities

The site currently has few existing amenities. Two shaded concrete benches are found on the north side of the creek west of Sunrise Way. Landscaping in the same area includes several large boulders which serve as informal seating opportunities as well.

RCFCD gate with no trespassing or dumping signs

Signs

Identity/Way-finding

No identity information currently exists at the site. Standard MUTCD bike route signs were observed.

Regulatory

No trail use regulations are currently posted along the Tahquitz Creek Channel. At the pedestrian bridge, a sign warns NEV users that they must yield to bicycles and pedestrians. Also, RCFCD has signs (in addition to gates) blocking access.
Standard bike route and crossing warning signs were found in relation to existing bike facilities.

Interpretive

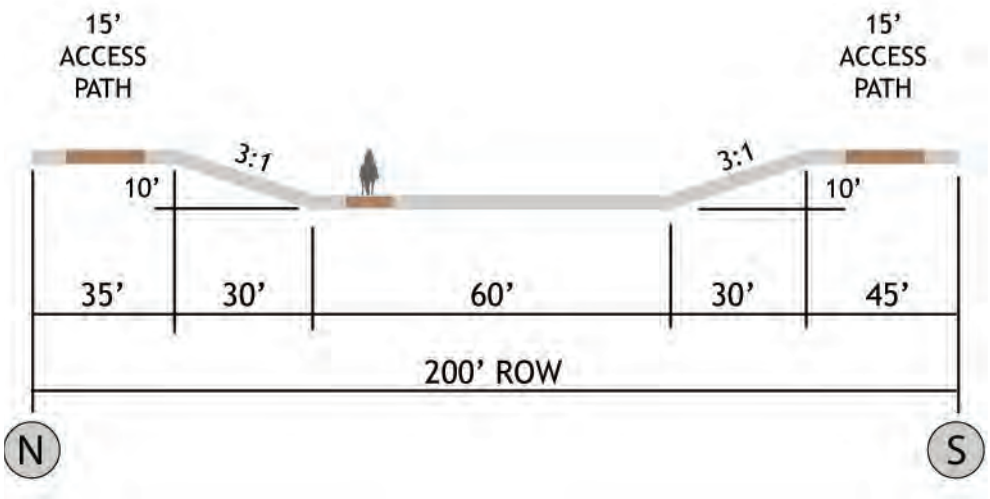
No interpretive signs currently exist at the site. The nearest interpretive location is the Visitor Center at Tahquitz Canyon which has information on the history and culture of the Agua Caliente Band of Cahuilla Indians, including the legend of Tahquitz, the first shaman whose spirit is said to live in the canyon.

Trail etiquette sign

Existing Cross Sections

Sections showing existing site conditions from west to east are below.

Spillway to S. Palm Canyon Drive

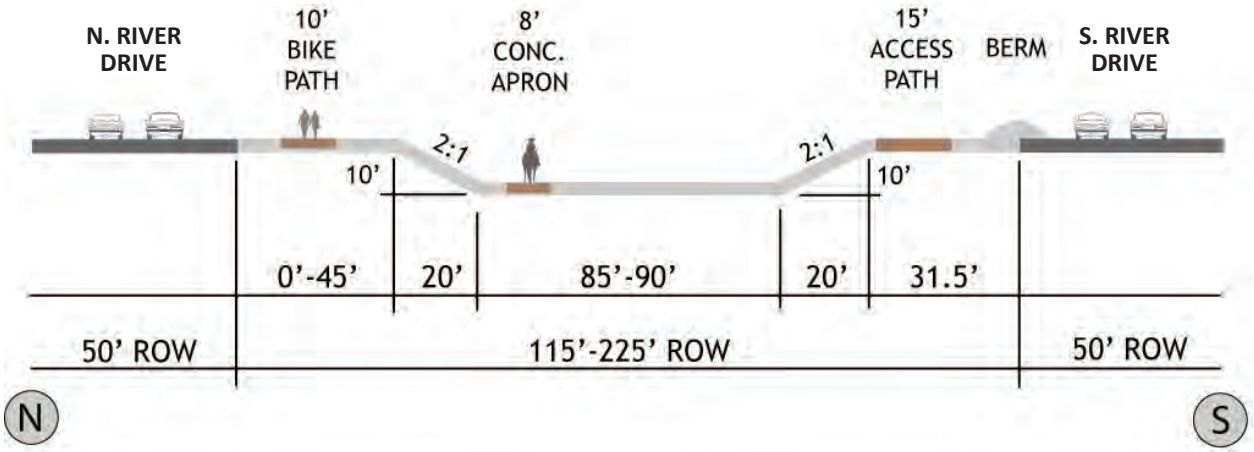


- RCFCD ROW at spillway structure extends to 760' width max.
- 8' concrete apron extends 540' west of S. Palm Canyon Road.
- 9.22% grade on access ramp (180 LF)
- 15' wide access path on north side between top of ramp and spillway

On the south side looking west towards the spillway

On the north side looking east towards the S. Palm Canyon Road bridge

S. Palm Canyon Drive to Pedestrian Bridge at Camino Real

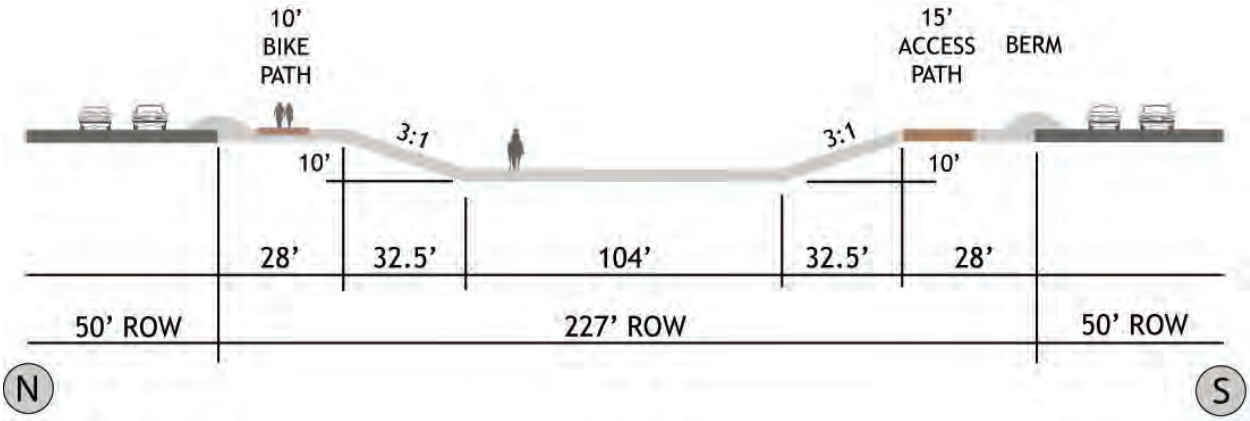


- RCFCD ROW is 225' west of Camino Real and tapers to 115' at S. Palm Canyon Drive
- 10' wide bike path/ access path on north side between pedestrian bridge and Calle Palo Fierro (680 LF)
- Road ROW borders top of channel on north side at S. Palm Canyon Road
- No bike path from Calle Palo Fierro to S. Palm Canyon

Looking west towards the bridge at S. Palm Canyon Road

On the north side looking east at the concrete apron in the channel bottom

Pedestrian Bridge at Camino Real to Drop Structure at Hermosa

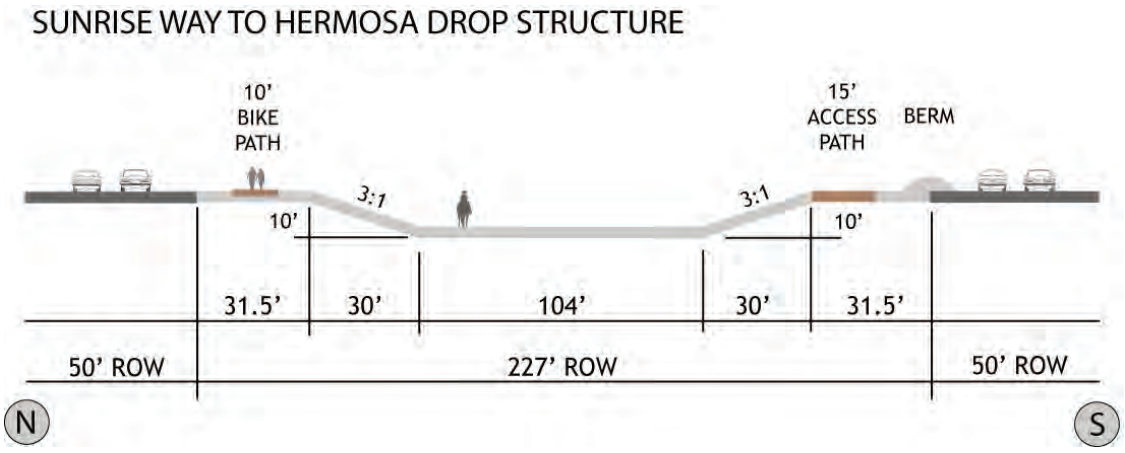


- 10' min. vertical clearance under pedestrian bridge
- 10' wide access and bike path on north side
- 15' wide access path and berm on south side

Looking east at the existing concrete access road and bicycle path on the north side

Looking west on the access road with the vegetated berm on the south side

Drop Structure at Hermosa to Sunrise Way

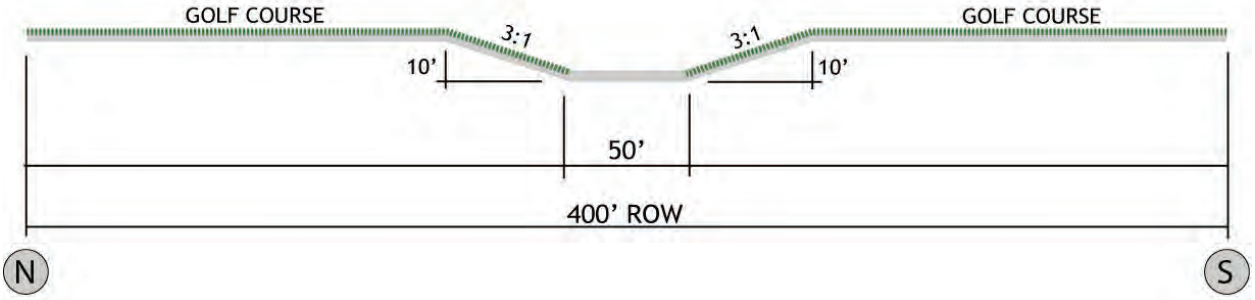


- 10' wide access and bike path on north side
- 15' wide access path and berm on south side

Looking west from the bridge at Sunrise Way

Looking east at the concrete access and bicycle path on the north side

Sunrise Way to Mesquite Golf Course



- An empty space north of the channel is included in RCFCD's ROW
- Sunny Dunes road connects to the existing pedestrian pathway at the golf course, however the roadway appears to have been vacated on ownership maps
- 9'3" minimum vertical clearance from bottom of Sunrise bridge to concrete channel surface.

On the north side looking east at the golf course

Looking west towards Sunrise Way at Sunny Dunes Road

Opportunities & Constraints

While challenges exist, numerous opportunities are found throughout the Tahquitz Creek study area for creating a unique and memorable trail experience.

Environmental Conditions

Topography

The bottom of the floodway creates a unique opportunity for escape from the urban environment. Also, the physical separation between the bottom of the flood channel and the top of its banks creates the opportunity for separated trails. The physical separation lends itself to a system where different trail users with varying needs may enjoy the Tahquitz Creek.

The western part of the project has lush desert vegetation

Drainage

The creek channel has an important role to play with respect to the conveyance of stormwater. Modifications which subdue the straight channel slopes would soften the structure so that it better reflect its former natural state. Any modifications to the floodway must be approved by RCFCD and not impact the channel's ability to convey stormwater during a 100 year flood event.

Vegetation

Numerous opportunities exist to utilize native vegetation along the corridor. In the words of one community representative:

> *The concept for the creek pathway should be based on the idea of standing on the Sunrise Bridge and pulling the natural character of the mountain down into the valley.*

One possibility is to plant the corridor with indigenous xeri-riparian species as found in the Tahquitz Canyon Creek, to bring a segment into the valley. Local plant species that would convey this concept include:

The desert willow is a native to desert riparian areas of the Coachella Valley

- California fan palm *(Washingtonia filifera)*
- Fremont's cottonwood *(Populus fremontii)*
- Western sycamore *(Platanus racemosa)*
- Mesquite *(Prosopis spp.)*
- Desert willow *(Chilopsis linearis)*
- Cresote *(Larrea tridentata)*
- Jojoba *(Simonsia chinensis)*
- Brittlebush *(Encelia farinosa)*
- Chuparosa *(Justicia californica)*
- Desert marigold *(Baileya multiradiata)*
- Golden dyssodia *(Dyssodia pentachaeta)*

Efforts should be made to remove invasive species found in the project site including: fountain grass, tamarisk and oleander.

Wildlife

Native vegetation will enhance habitat and foraging opportunities for resident wildlife species and could increase the potential for wildlife/human encounters. Efforts should be made to educate the users of the benefits and dangers of the presence of wildlife.

Destinations

Opportunities to provide connections to and from numerous destinations should be pursued. The implementation of a formalized trail will allow neighborhood children to walk or ride their bike to school and area residents to use the trail instead of their vehicle for quick trips to local destinations.

Additional destinations include the Tahquitz Canyon Visitor Center and Mesquite Country Club. The Rock Garden Cafe is a popular destination among equestrians including members of the Desert Riders group.

The Tahquitz Creek Trail will also become a significant destination itself with potential for art works and interpretive information.

Connectivity & Circulation

Trails

The City of Palm Springs is a world class recreation destination. As such, numerous trails provide world class opportunities for hiking, biking and equestrian use. The Tahquitz Creek Trail is another link in the comprehensive system for Coachella Valley.

Crossings

Roadway crossings at Belardo, S. Palm Canyon Drive and Sunrise Way will need to be address to ensure a safe trail experience. Each shall be evaluated on an individual basis. Both at-grade and grade-separated options are potential approaches to improving the existing trail experience. Crossing enhancements not only improve the safety of a trail, they also often serve as gateways and present opportunities for incorporation of distinct art elements.

From the Palm Springs General Plan:

Sunrise Way

Sunrise Way serves is an important north–south corridor through the central city for the City's residents. The street currently has partially built landscaped medians, which should be completed and continued along the entire length of the corridor to create an attractive and visually unified corridor identity. Additional streetscape elements appropriate to the residential character of the corridor, such as pedestrian–scaled lighting fixtures or bollards, benches, and marked pedestrian crossings, should be added along the length of Sunrise Way to encourage pedestrian use and reduced vehicular speeds.

South Palm Canyon Drive and East Palm Canyon Drive

These two roadway segments serve as important connectors to adjacent cities and the South Canyon neighborhoods and should be developed with an attractive and unified corridor identity that delineates these areas as unique from other areas of the City.

Site Amenities

A number of amenities make a trail inviting, engaging and comfortable for the user. Below are some common items that make trail systems memorable.

Maps and Signs

A comprehensive sign system makes a trail system memorable. Informational kiosks with maps at trailheads and other pedestrian generators can provide enough information for someone to use the trail system with little introduction.

Interpretive Installations

Interpretive installations and signs can enhance the trail experience by providing information about the history and culture of the area. Installations may discuss local ecology, environmental concerns, and other educational information.

Water Fountains, Bicycle Parking, and Equestrian Hitching

Water fountains provide water for people (and pets, in some cases), while bicycle racks allow trail users to safely park their bikes if they wish to stop along the way at destinations. Likewise, equestrian hitching areas allow riders to dismount in order to relax or visit local services.

Gathering Nodes and Seating

Providing benches at key rest areas and viewpoints encourages people of all ages to use the trail by ensuring that they have a place to rest along the way. Benches may be simple (e.g., rock, concrete) or more ornate (e.g., stone, wrought iron). Nodes where small groups may gather help foster a sense of community.

Shade

Providing nodes of shade is essential to providing a safe and comfortable user experience within the desert environment. Shade may be provided naturally via vegetation or by built structures.

Art Installations

Local artists may be commissioned to provide art for the trail system, making it uniquely distinct. Many trail art installations are functional as well as aesthetic, as they may provide places to sit and play. Artistic themes may draw upon the history or environmental surroundings, or could simply be whimsical. This type of art has the ability to make the trail experience memorable, especially for children.

Native Plant Materials

Native plant materials are a low cost way to provide shade thereby enhancing trail user comfort. Indigenous plant materials, adapted to the regional environment, also require less maintenance and water than other species. The use of native plant materials is an effective way to showcase an area's unique environment as well as educate trail users about native plants and their benefits.

Irrigation

Using native plants reduces the need for extensive watering. Still, new plantings require irrigation for establishment. Drip or bubbler irrigation systems are effective means of efficiently delivering water directly to plant materials. Sensible watering hours, seasonal adjustments to irrigation timers, and passive water harvesting are additional ways to efficiently deliver water in arid environments.

Signs

Identity

Gateways or monument signs at major access points with trail identity information, should be considered. Trail branding or identity may also be conveyed through the use of a logo throughout the site.

Way-finding

Way-finding information directing users of the trail, should be incorporated into the master plan. This may take the form of an overall area map, specific independent directional signs or both. Notable destinations include: downtown Palm Springs, the commercial area on S. Palm Canyon Drive, Cahuilla and Desert Chapel Schools, the Tahquitz Canyon Visitor Center, Mesquite Country Club and City trails.

Regulatory

Regulatory signs should state the rules and regulations associated with trail usage, as well as the managing agency, organization or group. Typical trailhead regulations and messages include: hours of operation, trail etiquette procedures, emergency and maintenance call numbers. Pet waste has been identified as a concern at the site. Additional information on regulatory signs may be found in the trail design standards section.

Interpretation

Cultural History

The City of Palm Springs has a rich cultural history that includes: the early days of the Agua Caliente Band of Cahuilla Indians, westward expansion, cowboy culture, establishment as a playground for Hollywood celebrities, and most recently a first class recreation and resort town.

Natural History

Few people understand the significant role that watersheds and creek channels provide. Within the desert environment, washes provide habitat, refuge and food supply for a significant portion of the local flora and fauna. Opportunities to educate trail users about these sensitive areas exist throughout the project site.

A view of the City of Palm Springs from Tahquitz Canyon.

Trail Theme

A design theme is significant for any trail system. A theme can create a unique, unifying and enriching experience for the trail user, while strengthening the trail's identity and coherence.

The Tahquitz Creek Trail should be designed around a theme that reflects the existing cultural, historic and natural resources of the area. Materials should be used in simple and elegant ways, but should shy away from being too rustic in character. Key elements of a unique, Palm Springs Specific design theme could include:

- Incorporation of a unique trail logo.
- Interpretation and enhancement of the area's rich cultural, historic and environmental identity.

• A low-water use, native plant palette, reflective of the natural desert riparian environment that provides a connection to the San Jacinto Mountains and Tahquitz Canyon.

• Materials that compliment the desert environment in terms of colors, forms and structural qualities.

Equally important, the creation of a trail presents an opportunity for environmental enhancement and stewardship. As the trail is developed, opportunities should be captured to enhance wildlife habitat, improve water quality and groundwater infiltration, and improve the native plant community.

Community Partnerships

The Tahquitz Creek Trail is fortunate to have an established friends group that is actively working towards establishing the site as a special place for residents and visitors of Palm Springs. Continued partnerships with community groups, the Agua Caliente Cahuilla Band of Indians, adjacent neighborhood associations and individual area residents will be key to ensuring a successful trail system.

Public Participation

Several opportunities were made to inform and involve the public in the master plan process. In addition to receiving comments and input from a neighborhood steering committee, three opportunities for engagement were offered to the public to both learn about the trail system, ask questions and provide input.

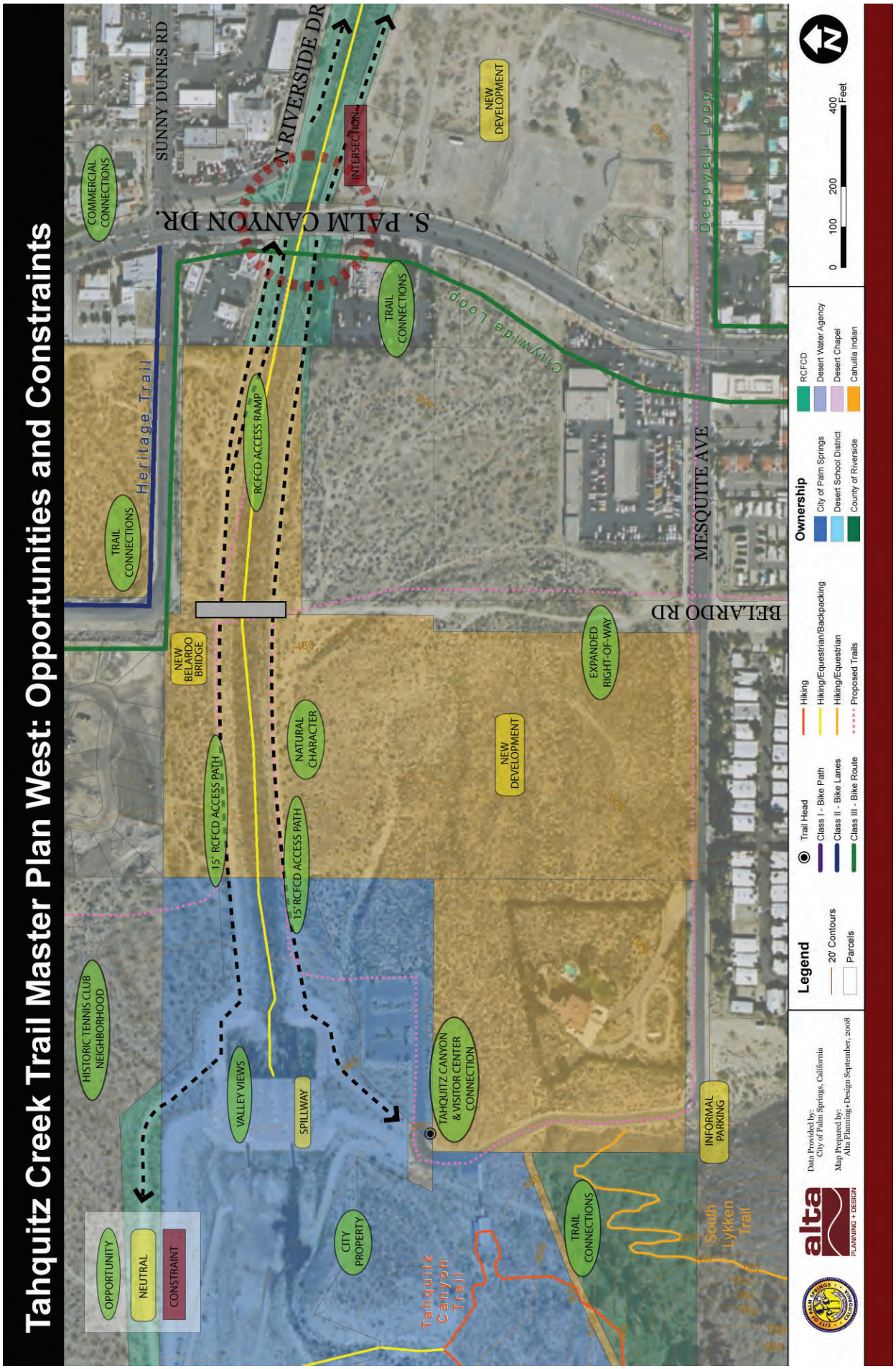
The first public meeting was held on October 10th, 2008 at Unity Church of Palm Springs. Public meeting #1 included: a project introduction and background, a presentation outlining trail design standards as well as the design process for the Tahquitz Creek Trail master plan, site analysis for the project area, and a discussion of existing conditions. The evening concluded with a facilitated conversation between designers and the public to re-affirm the vision and goals for the trail as well as to further gain insight from participants on the opportunities and constraints of the project.

Public meeting #2 occurred on October 11th and consisted of a site walk with the project design team, city staff, and members of the community. The site walk allowed the public to voice their concerns and ideas at specific locations along the trail.

Public meeting #3 was held on February 23rd at the City of Palm Springs Council Chambers. A presentation was given to provide project background as well as inform the public of the latest ideas for the trail alignment and accompanying amenities. After the presentation, members of the public were welcome to visit poster stations showing the concept plan for the trail and associated elements. The public were then asked for their specific input on the design ideas.

Meeting summaries are located in Appendix A.

Members of the public walk portions of the existing trail with trail designers and city staff


Tahquitz Creek Trail Master Plan West: Opportunities and Constraints
OPPORTUNITY
NEUTRAL
CONSTRAINT
HISTORIC TENNIS CLUB NEIGHBORHOOD
VALLEY VIEWS
SPILLWAY
CITY PROPERTY
Tahquitz Canyon Trail
TAHQUITZ CANYON & VISITOR CENTER CONNECTION
TRAIL CONNECTIONS
INFORMAL PARKING
South Lykken Trail
15' RCFCD ACCESS PATH
15' RCFCD ACCESS PATH
NATURAL CHARACTER
NEW BELARDO BRIDGE
RCFCD ACCESS RAMP
TRAIL CONNECTIONS
Heritage Trail
COMMERCIAL CONNECTIONS
SUNNY DUNES RD
N RIVERSIDE DR
INTERSECTION
S. PALM CANYON DR.
NEW DEVELOPMENT
TRAIL CONNECTIONS
Citywide Loop
Deepwell Loop
NEW DEVELOPMENT
EXPANDED RIGHT-OF-WAY
NEW DEVELOPMENT
BELARDO RD
MESQUITE AVE
Legend
20' Contours
Parcels
Trail Head
Class I - Bike Path
Class II - Bike Lanes
Class III - Bike Route
Hiking
Hiking/Equestrian/Backpacking
Hiking/Equestrian
Proposed Trails
Ownership
City of Palm Springs
Desert School District
County of Riverside
RCFCD
Desert Water Agency
Desert Chapel
Cahuilla Indian
0
100
200
400
Feet
Data Provided by:
City of Palm Springs, California
Map Prepared by:
Alta Planning+Design September, 2008
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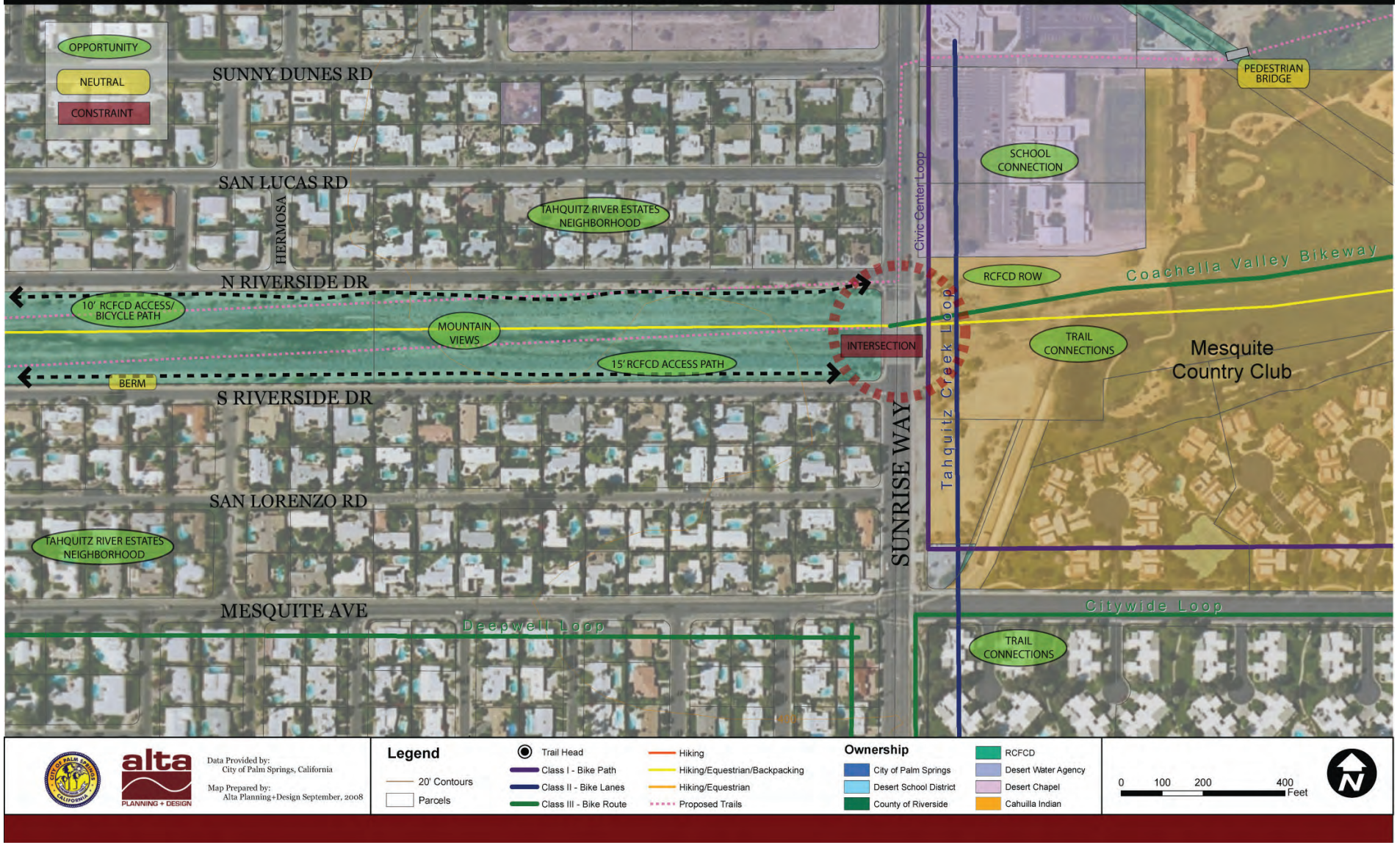
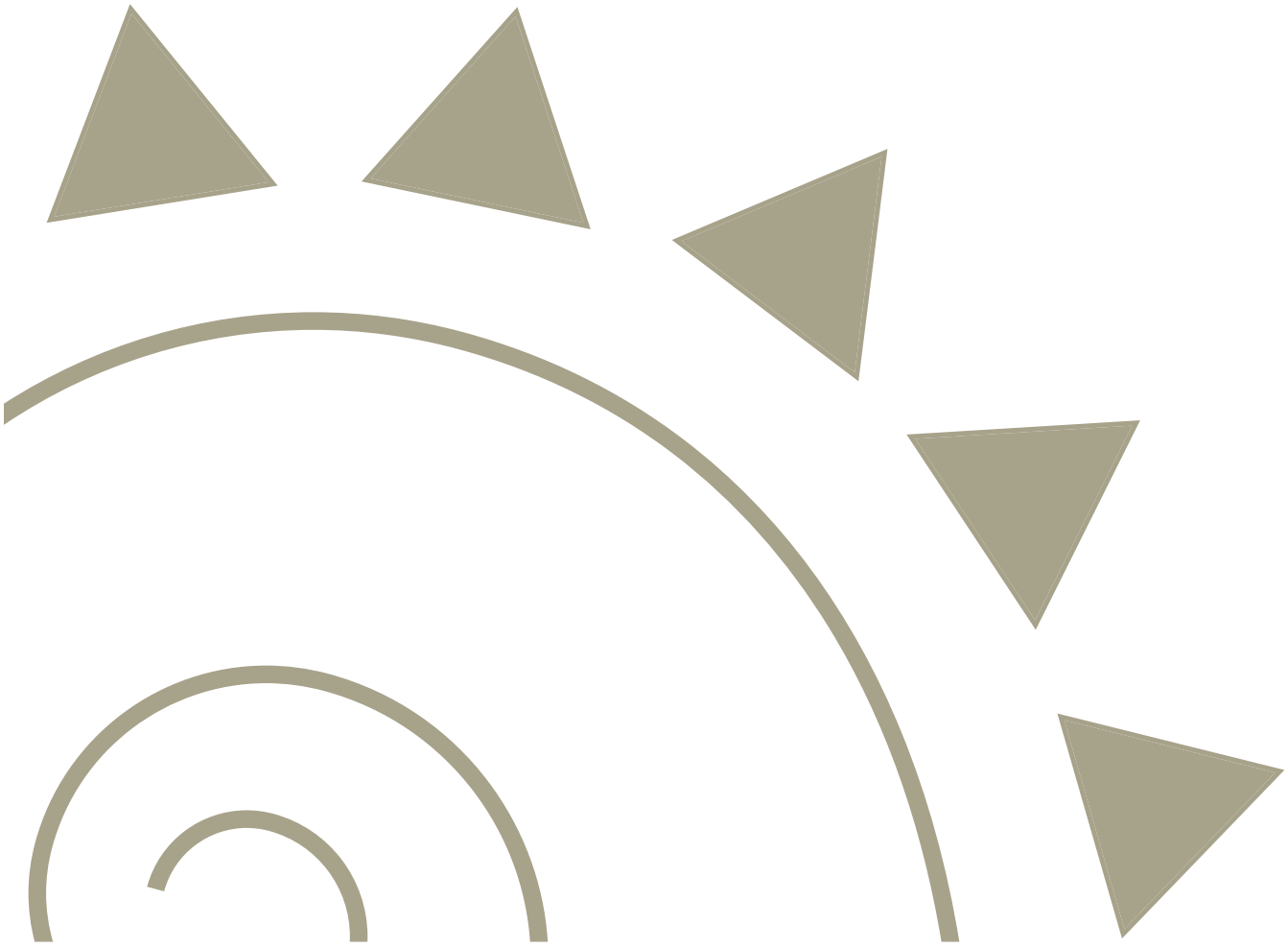
Tahquitz Creek Trail Master Plan Central: Opportunities and Constraints

Tahquitz Creek Trail Master Plan East: Opportunities and Constraints



TAHQUITZ CREEK TRAIL MASTER PLAN

Alignment Alternatives



Alignment Alternatives

Primary Options

Three primary routes are considered for the Tahquitz Creek Trail Master Plan. Alignment options may be viewed on the following maps titled, "Tahquitz Creek Trail Master Plan: Alignment Alternatives West/East." The options are as follows:

Option A – North of Creek
A multi- or shared-use path (Class I) may be located north of the creek between the top of bank and N. Riverside Drive. A portion of this segment is already in place as a ten foot wide colored concrete path and Riverside County Flood Control District (RCFCD) access path. While much of the alignment is not currently paved, an earthen route serves as access for the flood control while still being used as a trail.

Connections to Belardo Road, S. Palm Canyon, Callo Palo Fiero, Camino Real, S. Hermosa, Sunrise Way and the Mesquite Country Club, are shown as maintained. Crossing improvements at S. Palm Canyon and Sunrise Way, need to occur. Alignment Option A shows these as underpasses while providing on-street connections that contribute to area connectivity while providing alternative routes during times of high creek flows.

Option B – Creek Bottom
An equestrian trail is considered for within the bottom of the creek channel. This is an existing use and a 20' wide easement is in place for the equestrian trail.

Connections to mountain trails, the access road on the north side of the creek west of S. Palm Canyon and the Mesquite Country Club are shown as being maintained. No roadway crossings are proposed with Option B. Drop structures within the creek channel would need to accommodate equestrian travel.

Option C – South of Creek
Option C shows a multi- or shared-use path (Class I) located south of the creek between the top of bank and S. Riverside Drive. This segment is used by RCFCD as a fifteen foot wide earthen access route. It is also actively used by cyclists and pedestrians for recreation.

Connections to Belardo Road, S. Palm Canyon, Camino Real, S. Hermosa, Sunrise Way and Mesquite Country Club, are shown as maintained. Crossing improvements at S. Palm Canyon and Sunrise Way, need to occur. Alignment Option C shows these as underpasses while providing on-street connections that contribute to area connectivity while providing alternative routes during times of high creek flows.

Secondary Options

Secondary alignment options exist at the east end of the project area. A connection to the existing path north of the Mesquite Country Club is desired.

Option A1
Option A1 follows an existing sidewalk on the west side of Sunrise Way to the signalized intersection at Sunny Dunes Road. It then follows Sunny Dunes (a private street) through the Desert Chapel School property to make the path connection at the existing foot bridge. The sidewalk is of substandard width for a multi-use path and would require roadway or private property impacts to expand to the necessary width for a multi-use path. On Sunny Dunes Road, an easement would be needed from the school as well as costly roadway improvements.

Tahquitz Creek Trail Master Plan: Alignment Alternatives West

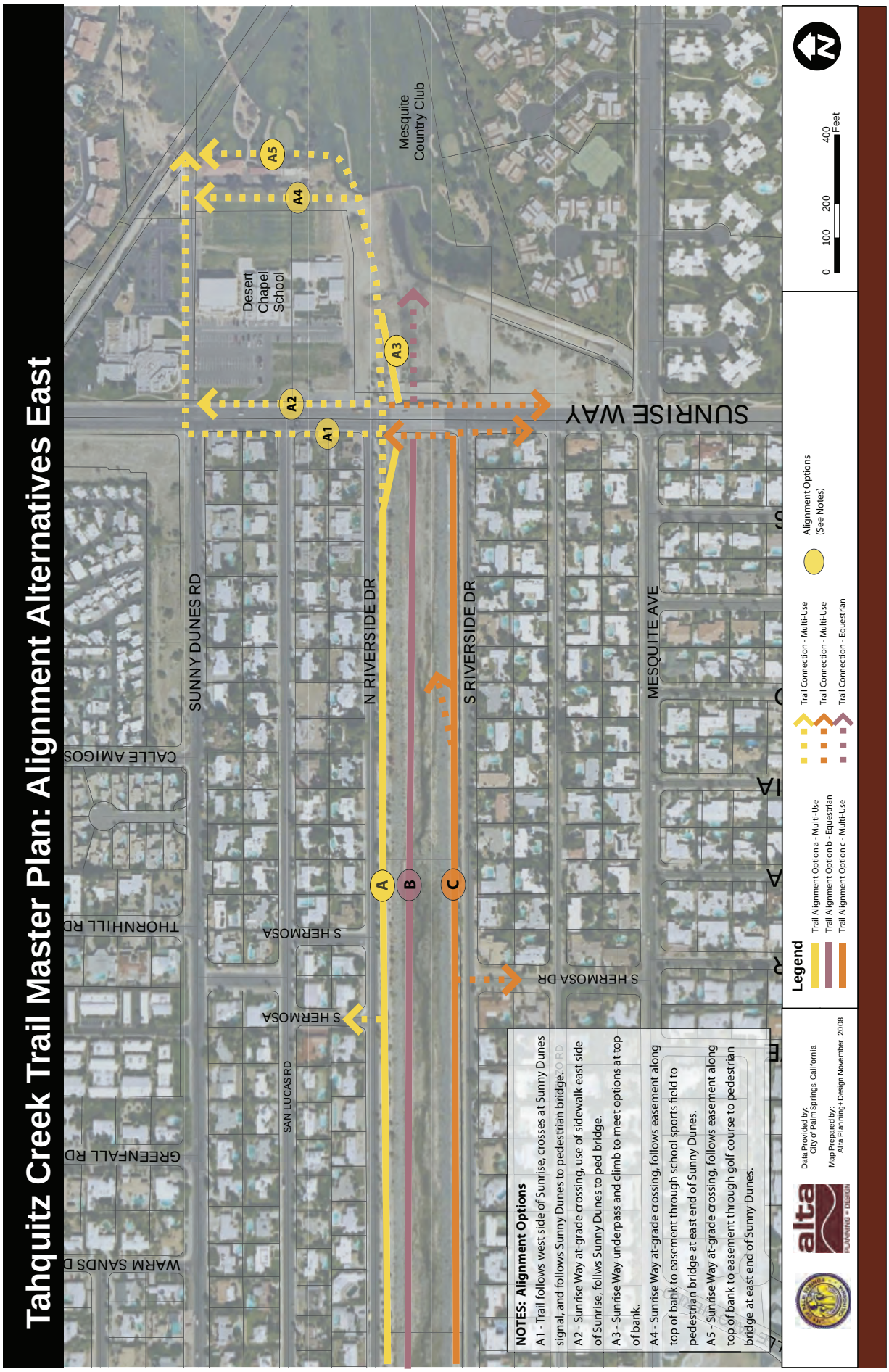
Data Provided by:
City of Palm Springs, California

Map Prepared by:
Alta Planning+Design November, 2008

Legend

- Trail Alignment Option A - Multi-Use
- Trail Alignment Option B - Equestrian
- Trail Alignment Option C - Multi-Use
- Trail Connection - Multi-Use
- Trail Connection - Equestrian
- Trail Connection - Multi-Use

0 100 200 400 Feet


Tahquitz Creek Trail Master Plan: Alignment Alternatives East
SUNRISE WAY
SUNNY DUNES RD
N RIVERSIDE DR
S RIVERSIDE DR
MESQUITE AVE
S HERMOSA DR
S HERMOSA
SAN LUCAS RD
THORNHILL RD
GREENFALL RD
WARM SANDS D
CALLE AMIGOS
Desert Chapel School
Mesquite Country Club
A
B
C
A1
A2
A3
A4
A5
NOTES: Alignment Options
A1 - Trail follows west side of Sunrise, crosses at Sunny Dunes signal, and follows Sunny Dunes to pedestrian bridge.
A2 - Sunrise Way at-grade crossing, use of sidewalk east side of Sunrise, follws Sunny Dunes to ped bridge.
A3 - Sunrise Way underpass and climb to meet options at top of bank.
A4 - Sunrise Way at-grade crossing, follows easement along top of bank to easement through school sports field to pedestrian bridge at east end of Sunny Dunes.
A5 - Sunrise Way at-grade crossing, follows easement along top of bank to easement through golf course to pedestrian bridge at east end of Sunny Dunes.
Legend
Trail Alignment Option a - Multi-Use
Trail Alignment Option b - Equestrian
Trail Alignment Option c - Multi-Use
Trail Connection - Multi-Use
Trail Connection - Multi-Use
Trail Connection - Equestrian
Alignment Options (See Notes)
0 100 200 400 Feet
Data Provided by: City of Palm Springs, California
Map Prepared by: Alta Planning+Design November, 2008
alta PLANNING + DESIGN

Option A2
Option A2 follows the east side of Sunrise Way before connecting to Sunny Dunes Road. While the sidewalk is wider in this option, it also includes an unprotected crossing of Sunrise and is thus considered less safe than A1 which crosses at an existing signal. Similar costs would be required for property acquisition or easement and roadway improvements on Sunny Dunes.

Option A3
Option A3 crosses under Sunrise Way and climbs the embankment out of the creek channel. It then turns northward through Desert School Chapel or Mesquite Country Club property. While an undercrossing would be safer for trail users than the existing situation, it would have a greater impact to RCFCD operations than the at-grade option. This option would require an easement from RCFCD.

Option A4
Option A4 extends from an at-grade or below-grade crossing of Sunrise Way before passing through Desert Chapel School's existing sports field. This option would require an easement from the school as well as RCFCD. While schools are often amenable to trail access, they seldom welcome the general public directly onto school grounds due to safety concerns.

Option A5
Option A5 also extends from an at-grade or below-grade crossing of Sunrise Way, then turns northward through the Mesquite Country Club property to make the connection to the existing foot bridge. This option would require an easement from RCFCD as well as the golf course.

Alignment Evaluation

Each of the alignment alternatives were assessed using an evaluation matrix. The evaluation criteria are found on the following table titled, "Alignment Evaluation Matrix." Scores ranged between 0 and 2 with 0 being a negative result, 1 being equivalent to the existing situation. A score of 2 was given when positive or beneficial outcomes are expected.

Tahquitz Creek Trail - Alignment Evaluation Matrix

Alta Planning + Design - November 2008

ALIGNMENT OPTION:	Connects to Local Destinations	Consistant with Local Plans	Maintains Trail Consistency	Safety	Impacts RCFCD Operations	Private Property or Roadway Impacts	Requires Land Use Agreement	Environmental Considerations	Public Support	Implementation Costs		TOTAL SCORE	Implementation Recommended (Y/N)
Option A - Multi-use trail, north side													
A1	2	1	0	1	2	0	0	2	0	0		8	**N**
A2	2	2	0	0	2	1	0	2	1	1		11	**N**
A3	2	2	2	2	0	1	1	0	2	0		12	**Y**
A4	2	1	1	1	1	1	0	2	1	2		12	**N**
A5	2	2	2	2	1	1	1	2	1	2		16	**Y**
Option B - Equestrian trail, channel bottom													
B	2	2	2	2	1	2	1	2	2	2		18	**Y**
Option C - Multi-use trail, south side													
C	2	2	2	1	1	1	1	2	2	2		16	**Y**

Scoring: scale of 0 to 2
0: score equivalent to existing condition
1: option has neutral or moderate positive impact to criteria
2: best conceivable solution to satisfy criteria

Criteria:
Connects to Local Destinations - School, golf course, existing pathways.
Consistant with Local Plans - Follows and connects to existing and planned pathways.
Maintains Trail Consistency - Keeps trail character (closeness to creek) while providing directness of travel.
Safety - layout supports visibility, eyes on the trail, and safe roadway crossings.
Impacts RCFCD Operations - Option will impact Flood Control practices.
Private Property or Roadway Impacts - Physical impacts on private property or roadway.
Requires Land Use Agreement - Determines difficulty of reaching an agreement or number of agreements (fewer = higher score)
Environmental Considerations - Environmental impacts including significant grading required.
Public Support - Rates option based on support from members of the community.
Implementation Costs - does the concept require major investment in terms of land acquisition or needed improvements.

Preferred Alignments

Based on the evaluation matrix, Options A, B and C are all recommended preferred alignments. As each option is already in use by the public, few negative impacts are anticipated. Environmentally, both A and C scored low on environmental impact and implementation costs due to significant grading required for the creation of underpasses. These negative scores are offset however by the anticipated safety benefits for trail users. Option B, the equestrian trail scored high overall as it has few negative impacts and will be relatively inexpensive to implement.

Of the secondary options, A3 (the Sunrise underpass) and A5 (the golf course connection) are recommended. These options are expected to be less costly to implement than the others, as well as safe, consistent and achievable in terms of easement negotiations.

Surface Options

A variety of options also exist for trail surface materials. Due to the needs of horses, the equestrian trail is assumed to be a soft surface of either natural earth or crushed fine material. The multi-use paths however, may be paved or unpaved. Additionally, the option exists to have different surfaces for the multi-use trails (one paved and one a soft surface).

Each of these options were considered in an evaluation matrix. Scores were weighted based on project goals and the long term needs of the City of Palm Springs. See Table titled, "Trail Options Matrix."

Trail surface was discussed with RCFCD. While their preference is to have a paved surface, they are amenable to an unpaved option as this is equivalent to the condition of the majority of their existing access roads throughout the county. Given an option, RCFCD would prefer to have the access road/trail at the edge of the top of creek bank without site furnishings or vegetation impeding access. At the same time, precedents exist for having both vegetation and furnishings within this zone. See attachment title, "Tahquitz Creek Trail: Conceptual Sections."

Preferred Surface Materials

Based on the evaluation matrix, it was determined that either a paved or unpaved surface would serve the needs of trail users on the multi-use trails. Due to the desire to separate users and offer a variety of experiences, as well as maintenance considerations and implementation costs, a system having one paved trail and one soft surface trail is recommended. While this will not preclude the use of the trail as a loop for many, it also meets the differing needs of the widest variety of user groups.

Tahquitz Creek Trail - Trail Options Matrix

Alta Planning + Design - November 2008

TRAIL OPTIONS:	Accommodates Walkers	Accommodates Runners	Accommodates Road Cyclists	Accommodates Mountain Bikes	Accommodates Equestrians	Separation of Conflicts	Meets RCFCD's Needs	Low Maintenance Requirements	Compliments Site Character	Public Support	Environmental Considerations	Implementation Cost	TOTAL UNWEIGHTED SCORE	TOTAL WEIGHTED SCORE	Implementation Recommended (Y/N)
Paved multi-use trails, top of bank both sides	5	3	5	5	1	3	3	5	5	4	1	5	45	55.5	**N**
Soft multi-use trail, top of bank both sides	5	5	1	5	3	4	3	3	5	4	5	3	46	55.5	**N**
One paved and one soft multi-use trail, top of each bank	5	4	3	5	2	5	3	4	5	4	3	4	47	58.5	**Y**
Weight of Criteria	*0.5*	*0.5*	*0.5*	*0.5*	*0.5*	*2*	*2*	*1*	*2*	*2*	*1*	*2*			

Scoring: Scale of 1 to 5
1: score equivalent to existing condition, 5: best conceivable solution to satisfy criteria

Weighting: Based on project goals.

Property Requirements

A 40' wide easement is recommended for both trail alignments A and C. A 20' wide easement should be secured to accommodate Alignment B. While the majority of parcels within the study area are owned by the Riverside County Flood Control District (RCFCD), several parcels are owned by the tribe and/or individual tribal members that have existing RCFCD easements. The Mesquite Golf Course (MGC) also has a lease agreement in place with the Indian landowners. Desert Chapel School (DCS) is another potential land owner with whom negotiations may need to occur. Parcels are identified by their APN number on the ownership map within the existing conditions section of this document.

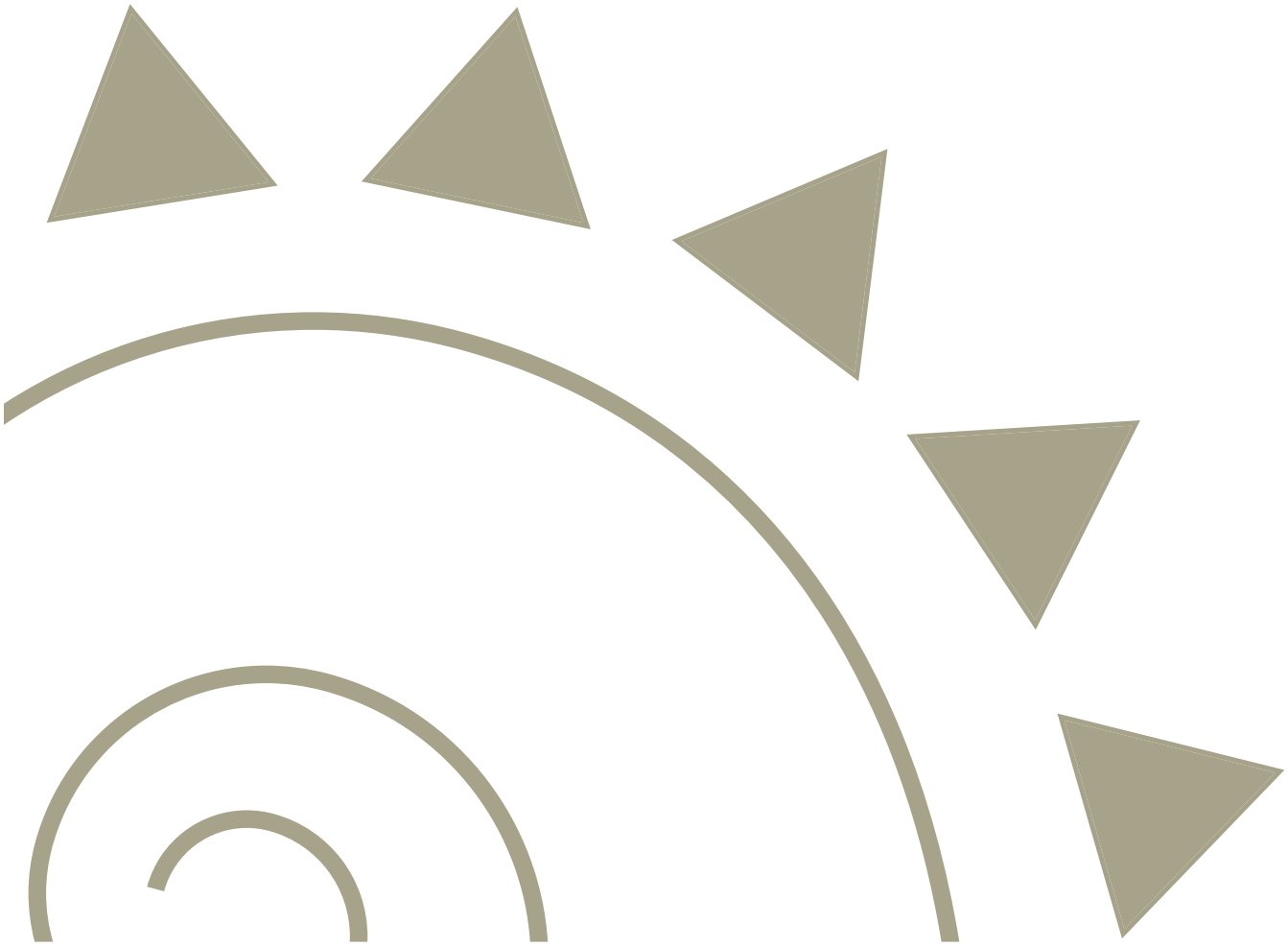
APN	Owner	Existing Easements	Notes
513250020	Tribal	RCFCD	Individual allottee
513250032	RCFCD		Individual allottee
508171007	RCFCD		
508171009	RCFCD		
508161002	RCFCD		
508172012	RCFCD	20’ riding & hiking	Channel bottom
508172010	RCFCD		
508172011	RCFCD	20’ riding & hiking	Channel bottom
508256002	RCFCD	20’ riding & hiking	Channel bottom
502560039	Tribal	RCFCD/MGC/50’ equestrian trail (bottom)	Individual allottee
502560009	RCFCD	20’ wide bike trail	
502560018	RCFCD	20’ wide bike trail	
502560044	DCS	20’ wide bike trail	

Existing Easements

Alignments A, B and C will require encroachment permits from Riverside County Flood Control District and the Bureau of Indian Affairs (BIA). Additionally, preferred secondary alignment A5 through the golf course will require a use agreement from the Mesquite Golf Course and the BIA. In determining the preferred alignments at the east end of the project, the Indian landowner and golf course operators were assumed to be more amenable to public use than the school.

TAHQUITZ CREEK TRAIL MASTER PLAN

Conceptual Design



Conceptual Design

Trails in the hills, canyons, and mountains of Palm Springs serve as cultural, historical, and recreational assets as well as practical alternative means of circulation and movement about the City and adjacent communities. Natural trails also serve as tangible links to the past. Wildlife in the Palm Springs area originally carved trails in the hillsides and canyons. The Agua Caliente Indians, who settled in the mountains and canyons, used trails to travel to nearby villages. During the mid-1800s, early miners and ranchers established wagon roads and cattle driveways along trails long used by the Cahuilla people.

City of Palm Springs 2007 General Plan

Trail Theme

A unique Palm Springs theme unifies the trail experience. Materials and design elements should reflect the area's natural and cultural history. A strong presence of native plant and rock materials should be used throughout the trail. Design details should consider natural desert patterns as well as the geometric forms crafted by the historic residents of the area.

The local tribe is the Agua Caliente Band of Cahuilla Indians. The Cahuilla are known for their basket weaving. Patterns and forms from this art should also be incorporated into trail design elements.

Image: Agua Caliente Cultural Museum

Trail Identity

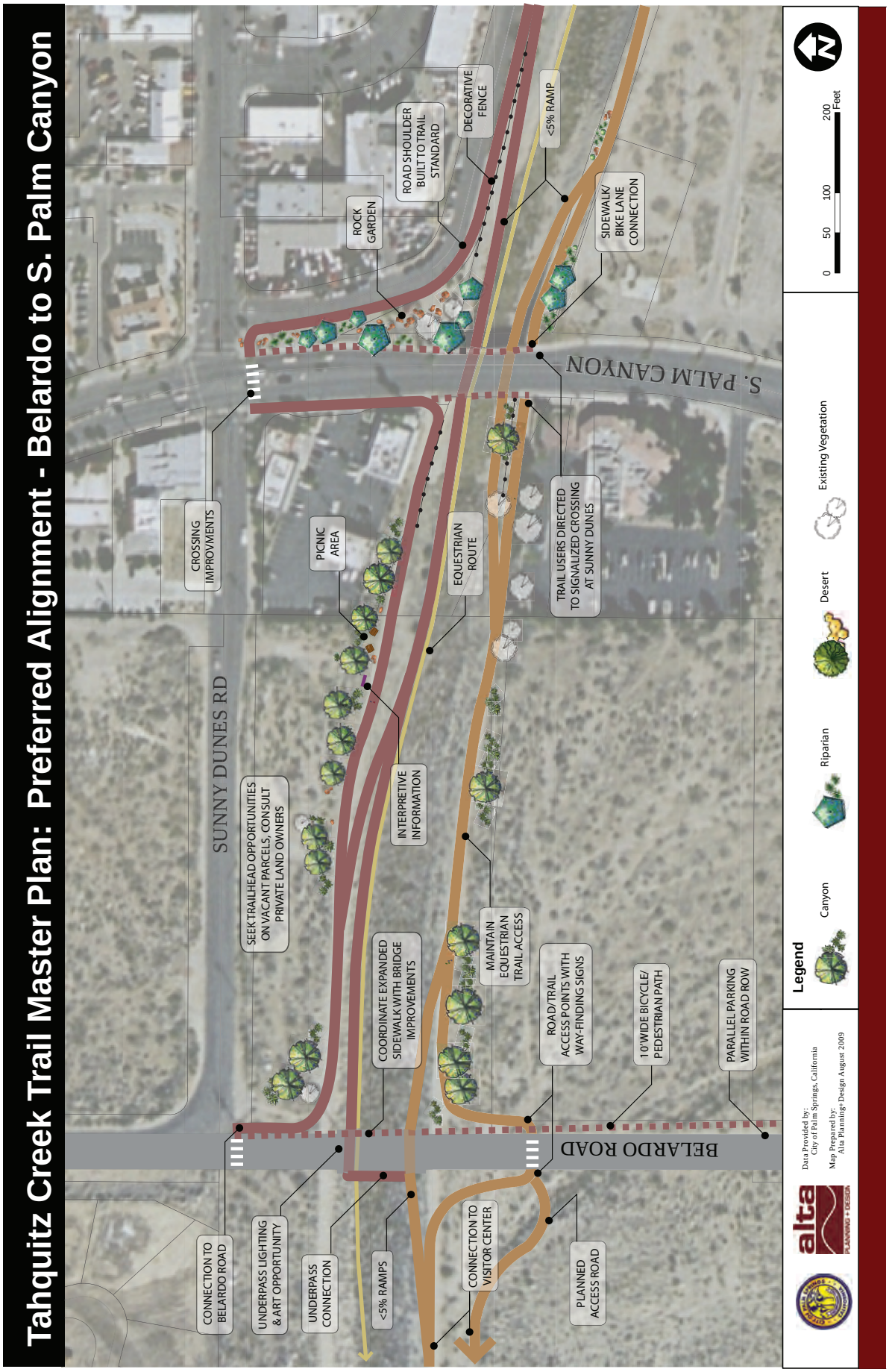
A trail name would help establish the segment as a cohesive and memorable destination. A number of trail name options were presented to the community for consideration. Among the options were the following:

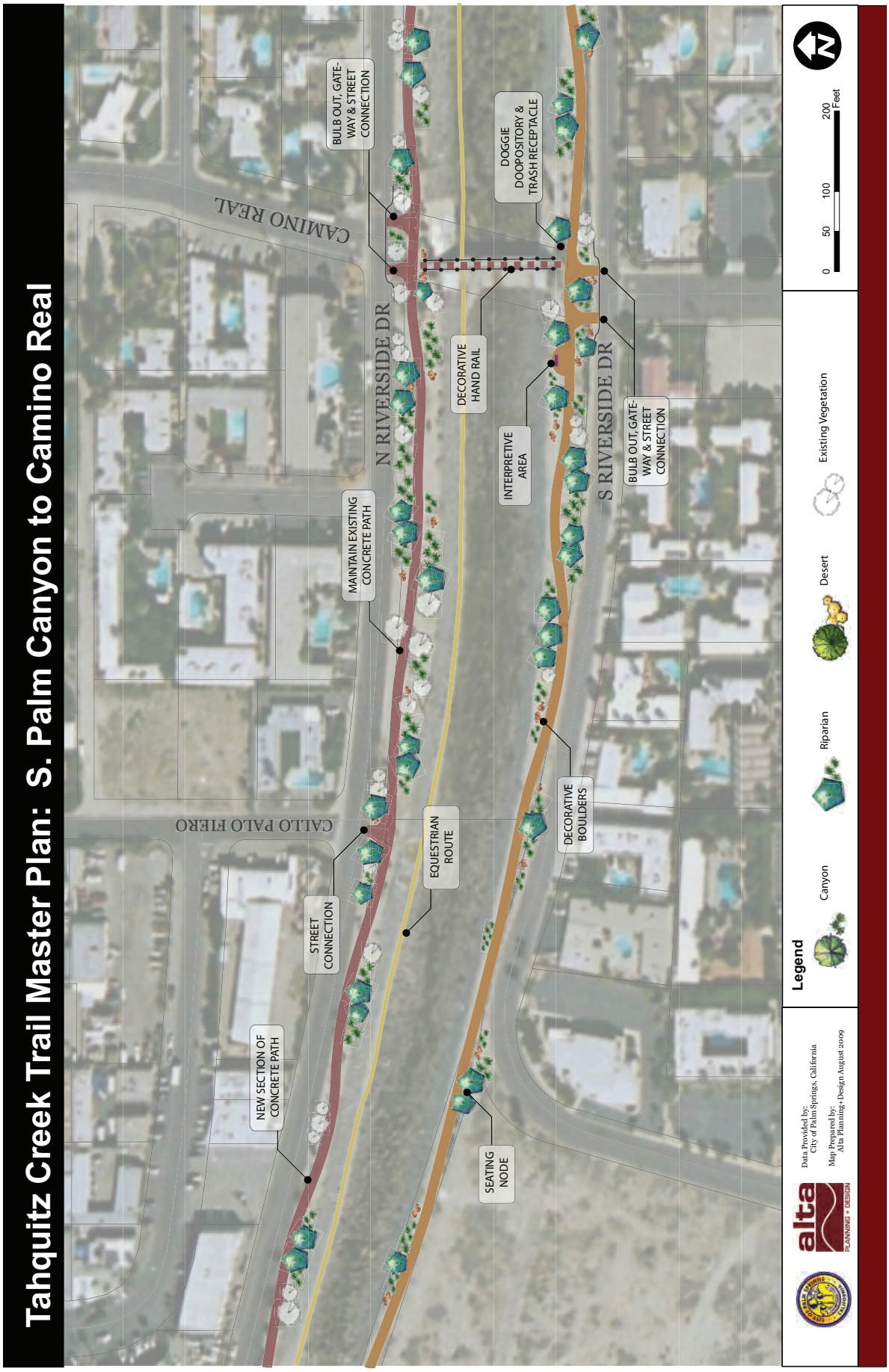
- Tahquitz Creek Nature Trail
- Tahquitz Creek Scenic Recreation Area
- Tahquitz Creek Trail
- Tahquitz Falls Trail
- Tahquitz Canyon Trail
- Tahquitz Trail
- Tahquitz Nature Trail (TNT)
- Mighty Tahquitz River
- Tahquitz Creek Parkway

Over half of respondents expressed a preference for the name "*Tahquitz Creek Trail.*" The name should be incorporated into monument signs, way-finding elements and a trail logo.

Master Plan

The Tahquitz Creek Trail Master Plan includes an unpaved multi-use path on the south side of the creek at the top of the bank, and a paved multi-use trail on the north side. A soft surface equestrian trail is located in the bottom of the creek channel. Each trail has a meandering alignment which largely follows existing RCFCD access routes. The maps on the following pages show the Preferred Alignment, connections and site amenities from west to east.


Tahquitz Creek Trail Master Plan: Preferred Alignment - Belardo to S. Palm Canyon
SUNNY DUNES RD
BELARDO ROAD
S. PALM CANYON
CONNECTION TO BELARDO ROAD
UNDERPASS LIGHTING & ART OPPORTUNITY
UNDERPASS CONNECTION
<5% RAMPS
CONNECTION TO VISITOR CENTER
PLANNED ACCESS ROAD
SEEK TRAILHEAD OPPORTUNITIES ON VACANT PARCELS, CONSULT PRIVATE LAND OWNERS
COORDINATE EXPANDED SIDEWALK WITH BRIDGE IMPROVEMENTS
INTERPRETIVE INFORMATION
MAINTAIN EQUESTRIAN TRAIL ACCESS
ROAD/TRAIL ACCESS POINTS WITH WAY-FINDING SIGNS
10'WIDE BICYCLE/ PEDESTRIAN PATH
PARALLEL PARKING WITHIN ROAD ROW
CROSSING IMPROVMENTS
PICNIC AREA
EQUESTRIAN ROUTE
TRAIL USERS DIRECTED TO SIGNALIZED CROSSING AT SUNNY DUNES
ROCK GARDEN
ROAD SHOULDER BUILT TO TRAIL STANDARD
DECORATIVE FENCE
<5% RAMP
SIDEWALK/ BIKE LANE CONNECTION
Legend
Canyon
Riparian
Desert
Existing Vegetation
0 50 100 200 Feet
Data Provided by: City of Palm Springs, California
Map Prepared by: Alta Planning+Design August 2009


Tahquitz Creek Trail Master Plan: S. Palm Canyon to Camino Real
CAMINO REAL
CALLO PALO FIERRO
N RIVERSIDE DR
S RIVERSIDE DR
NEW SECTION OF CONCRETE PATH
STREET CONNECTION
MAINTAIN EXISTING CONCRETE PATH
BULB OUT, GATE-WAY & STREET CONNECTION
EQUESTRIAN ROUTE
SEATING NODE
DECORATIVE HAND RAIL
INTERPRETIVE AREA
DOGGIE DOOPOSITORY & TRASH RECEPTACLE
DECORATIVE BOULDERS
BULB OUT, GATE-WAY & STREET CONNECTION
Legend
Canyon
Riparian
Desert
Existing Vegetation
0
50
100
200
Feet
Data Provided by:
City of Palm Springs, California
Map Prepared by:
Alta Planning + Design August 2009
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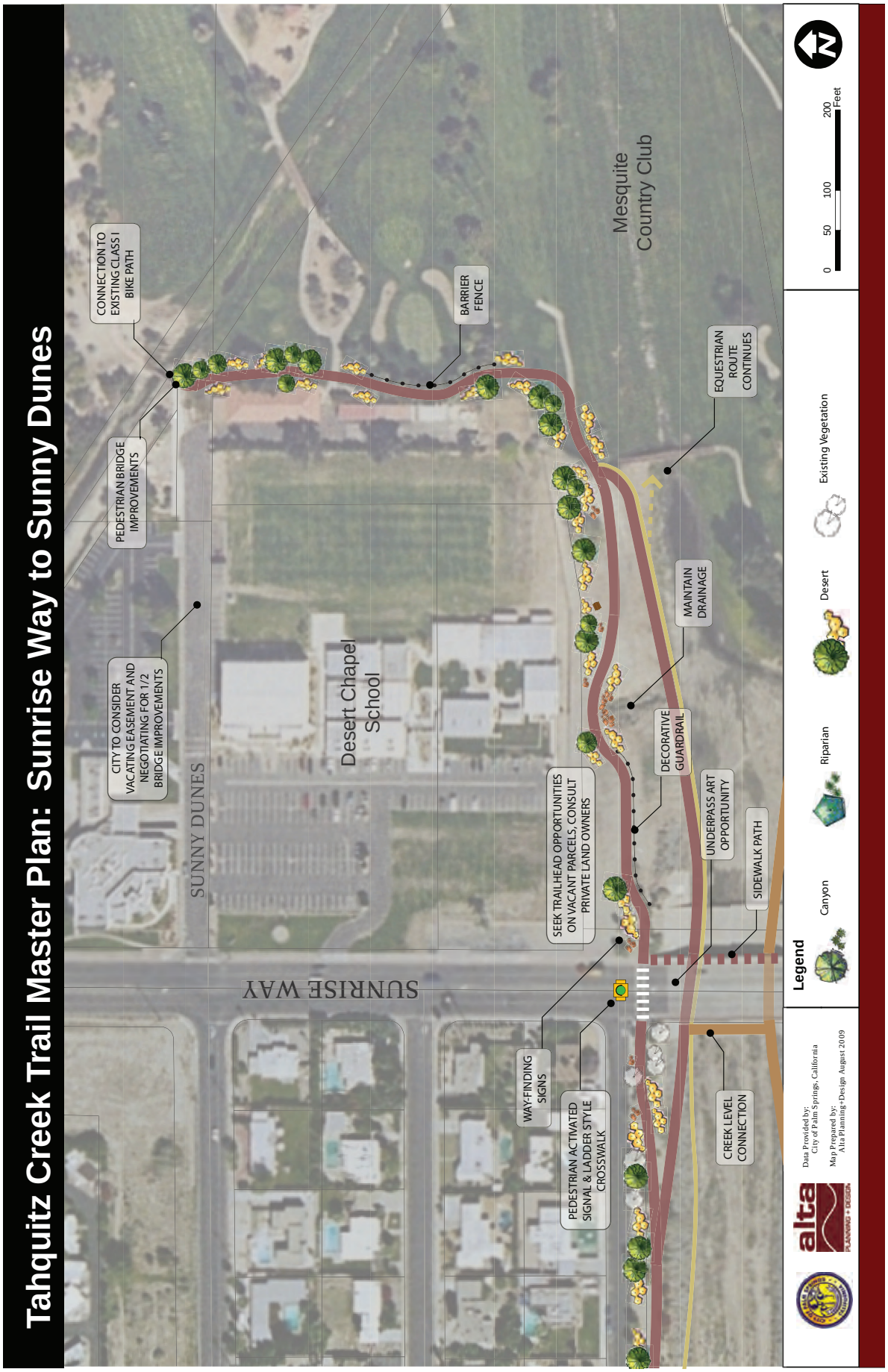
Tahquitz Creek Trail Master Plan: Camino Real to Hermosa Dr
SAN LUCAS RD
S HERMOSA DR
S HERMOSA DR
N RIVERSIDE DR
STREET CONNECTION
RETAIN EXISTING SEGMENT OF CONCRETE PATH
RETAIN MATURE LOW WATER USE PLANTINGS
EQUESTRIAN ROUTE
SEATING NODE
REMOVE CONCRETE BERM, ADD NATIVE BOULDER MATERIAL
INTERPRETIVE & WAY-FINDING INFORMATION
SOFT SURFACE MULTI-USE TRAIL
REPLACE OLEANDER HEDGE WITH LOW WATER USE PLANTS
S RIVERSIDE DR
STREET CONNECTION
S HERMOSA DR
SAN LORENZO RD
Legend
Canyon
Riparian
Desert
Existing Vegetation
0
50
100
200
Feet
Data Provided by:
City of Palm Springs, California
Map Prepared by:
Alta Planning+Design May 2009
alta
PLANNING + DESIGN


Tahquitz Creek Trail Master Plan: S. Hermosa Dr. to Sunrise Way
S HERMOSA DR
N RIVERSIDE DR
S RIVERSIDE DR
SUNRISE WAY
RETAIN EXISTING SEGMENT OF CONCRETE PATH
EQUESTRIAN PATH
REMOVE CONCRETE BERM, ADD NATIVE BOULDER MATERIAL
RETAIN MATURE LOW WATER USE PLANTINGS
SOFT SURFACE MULTI-USE PATH
REPLACE OLEANDER HEDGE WITH LOW WATER USE PLANTS
PEDESTRIAN ACTIVATED SIGNAL & LADDER STYLE CROSSWALK
BRIDGE UNDERPASS
UNDERPASS CONNECTION
<5% RAMP TO UNDERPASS
<5% RAMP
SIDEWALK CONNECTION
Legend
Canyon
Riparian
Desert
Existing Vegetation
0
50
100
200
Feet
N
Data Provided by:
City of Palm Springs, California
Map Prepared by:
Alta Planning +Design August 2009
alta
PLANNING + DESIGN

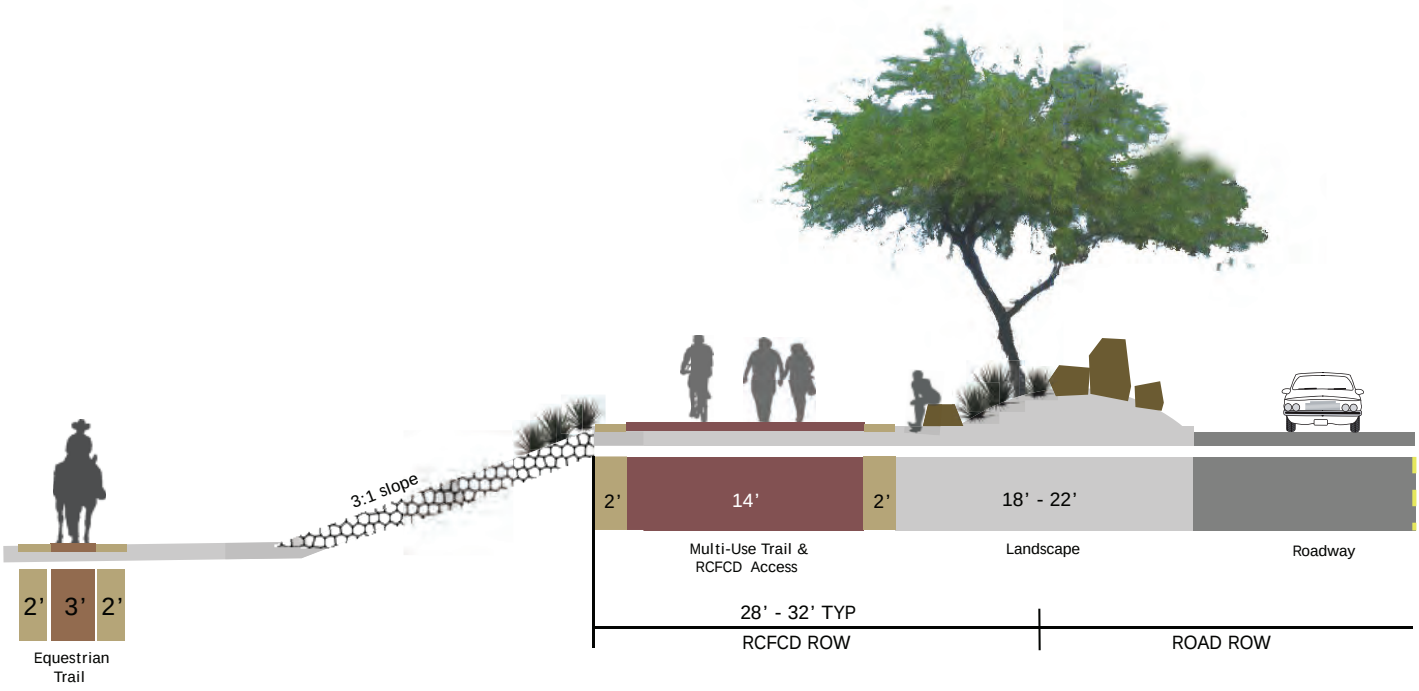

Tahquitz Creek Trail Master Plan: Sunrise Way to Sunny Dunes
CONNECTION TO EXISTING CLASS I BIKE PATH
PEDESTRIAN BRIDGE IMPROVEMENTS
CITY TO CONSIDER VACATING EASEMENT AND NEGOTIATING FOR 1/2 BRIDGE IMPROVEMENTS
BARRIER FENCE
EQUESTRIAN ROUTE CONTINUES
MAINTAIN DRAINAGE
DECORATIVE GUARDRAIL
UNDERPASS ART OPPORTUNITY
SIDEWALK PATH
SEEK TRAILHEAD OPPORTUNITIES ON VACANT PARCELS, CONSULT PRIVATE LAND OWNERS
WAY-FINDING SIGNS
PEDESTRIAN ACTIVATED SIGNAL & LADDER STYLE CROSSWALK
CREEK LEVEL CONNECTION
SUNNY DUNES
SUNRISE WAY
Desert Chapel School
Mesquite Country Club
Legend
Canyon
Riparian
Desert
Existing Vegetation
0
50
100
200
Feet
Data Provided by:
City of Palm Springs, California
Map Prepared by:
Alta Planning+Design August 2009
alta
PLANNING + DESIGN

Trail Cross Section

The recommended trail cross section varies per each alignment. According to the evaluation matrix, a paved multi-use trail is recommended on the north side of the creek, whereas a soft surface or crushed fine trail is recommended on the south side. The paved trail shall be 12' in width with 2' crushed fine shoulders on each side for those who prefer a soft surface. The trail on the south side shall be 12' wide and composed of crushed fines with 2' wide decomposed granite shoulders. In each case, a minimum of 8' vertical clearance shall be maintained with 10' being preferred.

Additionally, members of the community are in favor of maintaining a buffer between the trails and the homes on North and South Riverside Drives. The existing concrete berm on the south side (which has no flood control function) shall be removed. Buffering should occur in the form of a natural appearing berm, undulating between ground level and approximately four feet in height. Visual openings should be maintained in order to retain the opportunity for visual surveillance. Native plants and large native rock and boulder material should also provide screening.

The equestrian trail, located at the bottom of the creek channel shall be a 3' wide path of native earth. A 2' clear shoulder area shall be provided on each side and a vertical clearance of 10' (12' preferred) shall be maintained. One of the greatest deterrents to equestrians to riding within the Tahquitz Creek is the debris that is encountered along the route. Periodic clearing of obstructive materials is needed to maintain equestrian access. The local Desert Riders equestrian group has expressed an interest in assisting the City with a regular maintenance plan to improve conditions for riders. A second concern for equestrians is water within the channel. While a low flow channel already exists, options for improving its effectiveness should be explored.



Connectivity

Connections in the form of access paths to existing roadways with bicycle, pedestrian and equestrian facilities are found throughout the plan. A connection to the Belardo and Sunrise Bridges would complete a loop system as well as allow access to the street system. Access to South Palm Canyon, Calle Palo Fiero and Camino Real are also recommended.

Connections to the Lykken Trail as well as a trail north of the Tahquitz Canyon and visitor center should be preserved for hikers and equestrians. Connections to the east which lead to the regional Coachella Valley Bikeway, should also be maintained.

Crossings

At-grade Crossings

If an undercrossing is not possible at S. Palm Canyon Way in the near term, trail users should be routed approximately 200 feet north to the existing signalized crossing at Sunny Dunes Road. Advanced warning signs should be added to warn vehicle drivers of the trail crossing. Also, high visibility ladder style crosswalks should be incorporated into the intersection.

The at-grade crossing at Sunrise Way should be augmented with additional pedestrian and bicycle crossing warning signs, high visibility ladder style crosswalk markings and a pedestrian activated signal. Vehicle speeds and volumes meet the recommended warrants for installation of a signalized crossing. These crossing improvements would encourage pedestrian activity while reducing vehicular speeds.

A pedestrian activated signal is recommended at Sunrise Way

A loop system is desired for the Tahquitz Creek Trail. Opportunities for multi-use path users to cross between the north and south sides of the creek should be available. This option should be preserved at the Camino Real pedestrian bridge as well as on the east side of both the existing Sunrise Bridge and the planned Belardo Bridge. A 10' wide sidewalk would sufficiently accommodate this use (8' width minimum). The needs of trail users should be considered in tandem with the development of the Belardo Bridge plans.

As equestrians prefer to travel within the bottom of the creek, equestrian specific accommodations at roadway crossings are not deemed necessary.

Underpasses

Ramps bringing the multi-use trails under South Palm Canyon and Sunrise Way are proposed. The Engineering Report found in Appendix B details the design exploration of underpasses for the Tahquitz Creek Trail. Underpasses allow for trail consistency and greater trail user safety through the avoidance of at-grade crossings. Underpasses need to be approved by RCFCD. Hydraulic modeling will be required to confirm that additional fill material needed to build the ramps will not adversely impact flood channel conveyance capacity. Existing ramps should be textured to improve usage for equestrians.

In order to limit the need to cross busy roadways at surface level, north/south connections at Belardo and Sunrise should also occur below the bridges. As building hard surface (paved) trails within the creek channel would be subject to issues of erosion or damage, trail connections should occur along the existing spans of concrete under each bridge. Existing structures should be signed or painted with way-finding symbols and information. This could include signs with the trail logo and directional arrows as well as fog line striping, arrows and medallions of thermoplastic. Underpasses should be lit for safety. Artistic embellishments would contribute to the legibility of the trail route as well as perception of safety at the underpasses.

Way-finding medallions or stencils augment route legibility.

Concrete bridge aprons are built to withstand flood events and could easily be striped with way-finding markings to direct trail users and create a system loop.

Channel Alteration

Numerous alterations to the creek channel were considered and discussed with the Riverside County Flood Control District (RCFCD) in order to restore the channel to a more natural appearance. RCFCD's main concern with alterations is that the flood capacity of the channel not be reduced. The leading idea accepted by Flood Control is to add a layer of soil over the existing rip rap material, then vegetate the soil with local plant material. The drawback of this solution is that a significant flood event, may wash away soil and plant material thereby requiring periodic reinstallation. It is recommended that the top most portion of the channel be altered in this way, in order to minimize maintenance and cost burden on the City.

An example of a flood control channel stabilized with Armor-Flex material and revegetated.

Removing the existing rip rap and re-armoring the banks with a material called Armor-Flex is also an acceptable option by Flood Control standards. This technique involves pieces of concrete block woven together with cables, while retaining gaps for vegetation growth. While this approach

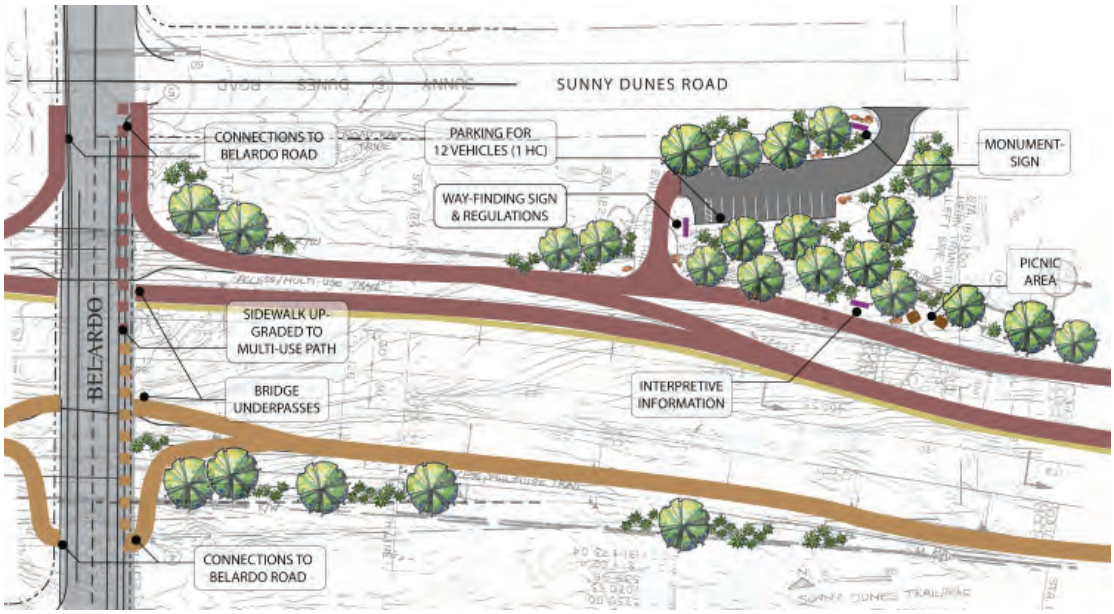
would have a greater life span than the first option, initially it would be significantly more expensive. This approach was not preferred by the community.

An Engineering Report detailing the ideas suggested above, along with cost implications and feedback from RCFCD, are included within Appendix B.

Trail Access

Existing parcels of vacant land should be considered for trail access opportunities. Between the Creek and Mesquite Avenue, the right-of-way of Belardo Road is wider than necessary (75 - 80') for the planned vehicle travel. This additional width is sufficient to allow for one lane of parallel vehicle parking, trail signs and a multi-use path, in addition to the planned two vehicle travel lanes. While 5' wide sidewalks are currently proposed on each side of Belardo Road, a 10' wide pathway (on the east side) should be provided for bicycle and pedestrian access to the trail system.

Vacant lands north of the Creek between Belardo and S. Palm Canyon Roads, may also be considered as a location for a trail access point. Individual landowners should be approached to determine if there are opportunities for trailhead development. A trailhead with vehicle parking spaces would relieve parking pressure on neighborhood roads. A formal trailhead should include a monument sign identifying the trail access point. A kiosk with trail rules and regulations as well as way-finding information should also be included at any developed trailhead. Trailhead signs typically include the following information: hours of operation, allowed and permitted uses, proper trail etiquette, and emergency contact information.

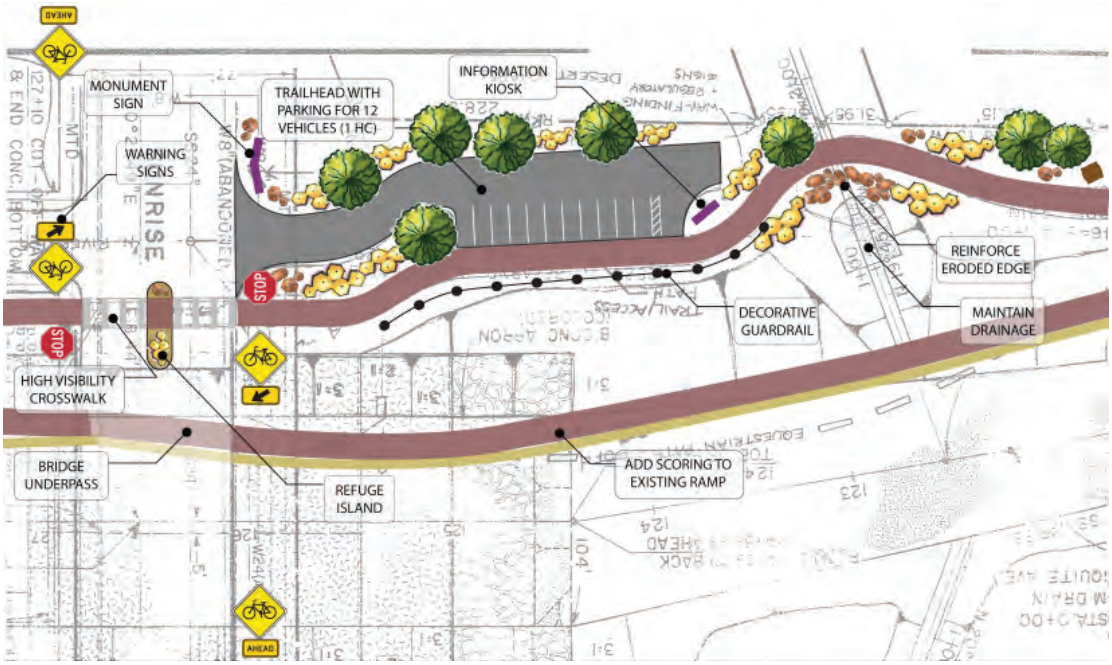


Potential Conceptual Sunny Dunes Trailhead
(Currently not a part and under private ownership)

A second trailhead should be considered in the eastern portion of the study area. Currently, a parcel of vacant land is found east of Sunrise Way, north of the creek. This parcel is allotted to an individual tribal member, leased to a private golf course, and has easement rights held by RCFCD. RCFCD currently utilizes the area for staging maintenance vehicles. Both

the individual land allottee and RCFCD should be included in future discussions as design development continues. The landowner must be approached to determine if they have interest in this potential land use.

A potential conceptual trailhead layout is shown below. Again, any trailhead or access point should include a clear identity sign marking the access point. An information kiosk with trail rules, regulations and way-finding map should also be included. Incorporating twelve spaces for vehicular parking is appropriate, including one accessible space.



Potential Conceptual Sunrise Way Trailhead
(Currently not a part and under private ownership)

Trail Amenities

Monument Signs

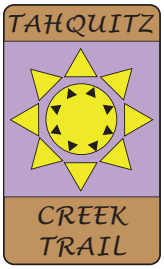
Monument or identity signs should be placed at each major and secondary entry way to the trail system. A monument sign is the first step in the trail visitor's way-finding experience. Trail themes, colors and forms should be consistent with other elements found along the trail. Images and text on a monument sign should be clear and legible from a roadway when oriented towards those arriving via motorized vehicle. Smaller signs, in scale with the pedestrian perspective, are recommended for the neighborhood gateway points at Hermosa.

A monument sign for the trail should incorporate colors, themes and materials found throughout the trail while harmonizing with the surrounding environment.

Trail Logo

Several conceptual ideas for a Tahquitz Creek Trail logo are shown below. Appropriate themes include soft desert colors, images of the sun, the creek, desert plants and Native American geometric patterns. A clear font should be used with text legible from a distance. A trail name is yet to be officially designated and several different options are included in the logos seen below. An official trail logo should be incorporated into a way-finding sign system found throughout the trail system. At the public meeting held February 23, 2009, logo option C shown below, was preferred by the majority of community participants.

A.



B.

C.

D.

E.

F.

G.

H.

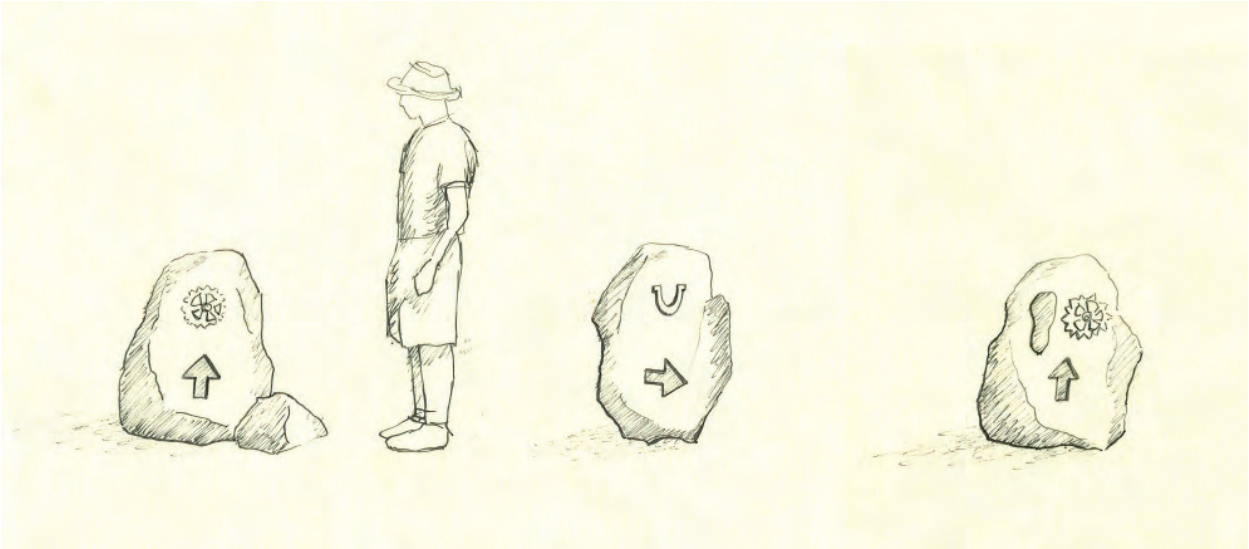
Way-Finding

Monument signs should be included at major trail access points. They should be visually clear and distinctive while maintaining consistency with other sign features found on the trail.

Clear, pedestrian-scaled, signs and markers will aid in way-finding and separation of user groups. Signs should be consolidated to avoid clutter and sign fatigue. In addition to a trail logo being posted on bollards, gates and at the trailheads, way-finding markers and signs should be placed at key decision points.

Way-finding materials typically include a trail map which indicates current location, nearby destinations and prominent natural and built features. Way-finding maps are recommended at trailhead facilities for orientation.

Directional guidance should also be auspiciously placed at key decision points. Distances may also be marked on boulders so that trail users who wish to pace themselves have a means of doing so. Distance markers placed every ¼ mile are recommended. Distance and directional information may come in the form of local boulders, with impressions of different symbols aimed at the various anticipated user groups.



Conspicuously placed boulders with directional signs.

Bollards

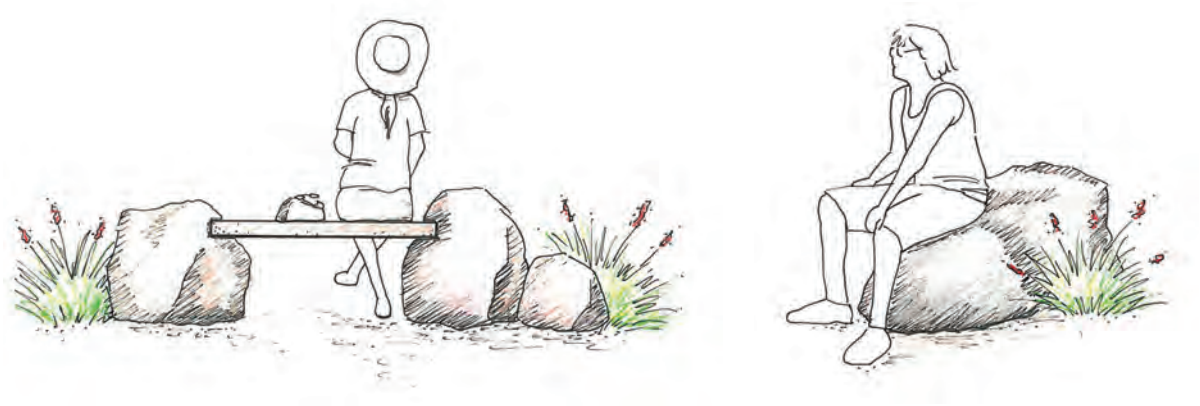
Bollards are often used in association with trail systems as a means of deterring vehicular access. Although another utilitarian object, bollards themselves may be creatively designed. Design elements should reflect themes found throughout the trail so that the experience is perceived as a unified whole. Bollards should be of concrete or metal material.

For the Tahquitz Trail a central bollard is recommended at each end of the pedestrian bridge. Bollards may also be used in lieu of traffic control gates. In order to control vehicular traffic while allowing the through movement of bicycles and pedestrians, bollards should be spaced no more than 5' apart. A removable bollard allows a gap for maintenance and emergency vehicles. If night time trail usage is anticipated, reflective paint or tape should be included in the bollard design.

Seating Nodes

Opportunities for intimate seating areas are found throughout the corridor. Due to concerns expressed for neighbor privacy, seating nodes should be strategically placed near currently undeveloped parcels, public or quasi-public lands.

Seating areas should be small in size, accommodating no more than four people at a time. Seating nodes should offer shade and a place to rest. Site furnishings should be composed of natural materials including stone benches and boulders.



Intimate seating areas utilizing local materials.

Interpretive Opportunities

Members of the public have suggested that the pedestrian bridge at Camino Real is an appropriate location for interpretive information. Many school children use this route each day making an educational component appropriate.

Interpretive elements may also be placed near each of the trailheads. Themes to be addressed include the history of Palm Springs and its inhabitants; the local flora and fauna including habitat zones; flood control and the history of the creek channel.

Interpretive signs should use similar materials, forms and colors as other sign elements found throughout the trail in order to provide a unified trail experience.

The Cahuilla

More than 2000 years ago, the original inhabitants of the Palm Springs area were the Cahuilla Indians. Cahuilla villages were concentrated along the shores of ancient Lake Cahuilla, a freshwater lake formed by alterations in the course of the Colorado River. Prior to historic contact, the Cahuilla were primarily hunters and gatherers of wild plant foods and lived in permanent villages, linked by social and economic ties. The drying of Lake Cahuilla led to the gradual dispersal of villages to the canyons and alluvial fans in the mountains near permanent water sources. Complex communities were developed in Palm, Murray, Andreas, Tahquitz, and Chino Canyons where the Agua Caliente managed hundreds of plant resources. The Agua Caliente also fashioned a network of trailways connecting them with other cultures in southern California.

City of Palm Springs 2007 General Plan

Plant Materials

A planting scheme for the Tahquitz Creek Trail should celebrate the unique natural beauty of the local environment. Rivers and creeks extend through the desert bringing higher elevation species into the low lands. The planting plan should emphasize this natural pattern as well as the creek's connection to Tahquitz Canyon by incorporating indigenous canyon and riparian plant materials.

A gradient showcasing the different ecological habitats of the area should extend from the western portion of the trail to the east. The western zone should consist of canyon species. Plants indigenous to the local desert canyons are accustomed to having a reliable water source and thus would require a regular watering program. The second zone should be composed of plants naturally found in close proximity to xeri-riparian or local desert streams. Species in this zone would include deciduous trees that provide shade during the summer months, while allowing the sun to penetrate throughout the

Tahquitz Creek Trail - Suggested Plant Palette

Common Name	Scientific Name	Water	Notes
CANYON			
Trees			
California sycamore	*Platanus racemosa*	moderate	Important wildlife plant
California fan palm	*Washingtonia filifera*	2x/mo.	naturally occurs in clusters at oases
Fremont cottonwood	*Populus fremontii*	constant	Not an arid plant, requires irrigation
Shrubs			
Parry's beargrass	*Nolina parryi*	1-2x/mo.	stabilizes slopes
Deer grass	*Muhlenbergia rigens*	1x/mo.	used to make baskets
Indigo	*Psorothamnus schottii*	1x/mo.	blue blossoms
DESERT RIPARIAN			
Trees			
Desert willow	*Chilopsis linearis*	drought tolerant	long-lasting bloom time
Narrow-leaved willow	*Salix exigua*	drought resistant	winter dediduous
Shrubs			
Arrowweed	*Pluchea sericea*	natural rainfall	traditional medicinal
Jojoba	*Simmondsia chinensis*	natural rainfall	provides good visual screen
White sage	*Salvia apiana*	natural rainfall	white blossoms
DESERT			
Trees			
Mesquite	*Prosopis spp.*	drought tolerant	provides filtered shade
Cat claw acacia	*Acacia greggii*	natural rainfall	small tree, multi-stemmed
Palo verde	*Cercidium floridum*	drought tolerant	provides filtered shade
Shrubs			
California barrel	*Ferocactus cylindraceus*	drought tolerant	accent plant
Brittlebush	*Encelia farinosa*	drought resistant	rapid growth, yellow flower
Creosote	*Larrea tridentata*	natural rainfall	minimal maintenance
WASH			
Shrubs			
Chuparosa	*Justicia californica*	drought tolerant	found naturally in sandy washes
Smoke bush	*Psorothamnus spinosus*	drought resistant	naturally occurring in desert washes

Note: Although a plant may be listed as drought tolerant or resistant, all plant materials require water during establishment (typically the first two years) as well as during periods of prolonged drought in order to maintain good health and visual appearance.

winter. Low land desert scrub species should be the third local habitat showcased. Trees that provide filtered light and shrubs that require very little maintenance or water would be featured. This planting zone would not require supplemental irrigation after initial plant establishment (typically two years). The last zone is the wash within the bottom of the creek channel itself. These plants naturally occur in washes. Large trees are not recommended to be planted within the creek as they would disrupt flood control operations as well as impact flood carrying capacity.

Any planting plans should include an effort at restoring indigenous vegetation to the flood channel. Community service projects should include eradication of the invasion fountain grass (Pennisetum setaceum) currently dominating portions of the channel. Species endemic to the frequent scouring of the wash include: Chuparosa (*Justicia californica*) and smoke bush (*Psorothamnus spinosus*).

Indigenous plants such as the Psorothamnus spinosus celebrate the natural desert environment while being drought resistant.

The following verbiage related to plant materials is taken from the City of Palm Springs General Plan:

CD7.1 Encourage the use of native desert plants and trees that require minimal water and maintenance.

CD7.2 Select plant species that will: (a) enhance the pedestrian character and convey a distinctive and high quality visual image for the City's streets, (b) be drought tolerant and fire and pest resistant, (c) require low maintenance and no pesticides, and (d) complement existing landscape.

CD7.5 Ensure that all public landscaping is adequately maintained. Over pruning and pruning into unnatural shapes is discouraged. Rather, landscaping should have a natural look and feel. When appropriate, a licensed arborist should be consulted prior to installation and maintenance of public landscaping.

Irrigation

A low water and low maintenance planting plan will conserve the managing agency's time and resources. Low water use, indigenous plantings, will also be more consistently healthy than plants not adapted to the desert environment. The plantings listed above are all species naturally found in the region. Canyon plantings are accustomed to a reliable water source and thus will require occasional water, particularly during the first two years of establishment, as well as during the summer months. The desert riparian, desert and wash species are more resistant to drought and should only require watering during initial establishment and during periods of extended drought in order to maintain optimal appearance.

Drip irrigation which applies water locally at the root zone should be used. Irrigation should not occur during the afternoon peak hours of sun and heat in order to minimize loss through evaporation. A seasonal irrigation program should be utilized that adjusts water quantity applied according to need. Standard operating procedures should include reviewing the irrigation schedule each season as well as spot checking for leaks or missing emitters.

Passive water harvesting in the form of tree wells and berms should direct water to remain at the root zone of plantings. Water harvesting may also be used to capitalize on precipitation available from rain events.

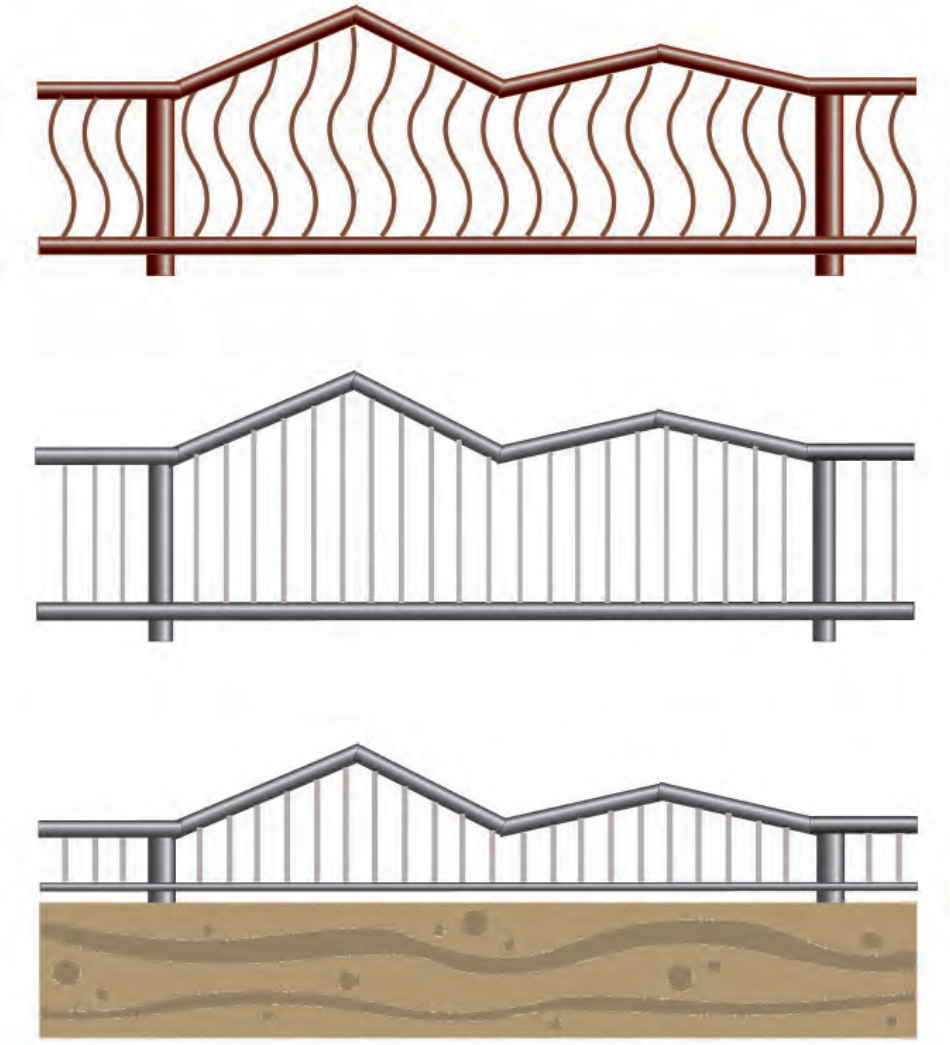
Stormwater

The Tahquitz Creek both historically and presently, is a means of conducting stormwater. In the past, stormwater has been approached as something to be quickly eliminated. When done artificially, however, this creates significant burden on the City's stormwater system. Current thinking relies more so on natural processes that slow water down instead of engineered solutions that quickly carry it away. Passive means of slowing water's movement, such as water harvesting, allow for treatment of water on a localized scale. Collecting water in shallow basins, allows for ground infiltration. It also creates the opportunity for use by vegetation, reducing the need for supplemental irrigation.

East of South Palm Canyon and north of the creek, a triangular parcel of land currently funnels stormwater into the Tahquitz Creek. Currently, a rill of angular concrete quickly conducts the water to the larger system. The master plan proposes removing this concrete and replacing it with a rock garden and basin system that would offer preliminary treatment to the water. The rock garden would mimic a natural rock wash with varying sizes of local rock material. In areas controlled by the flood control district, plant materials are viewed as a nuisance to maintenance and water conveyance, and may not be used.

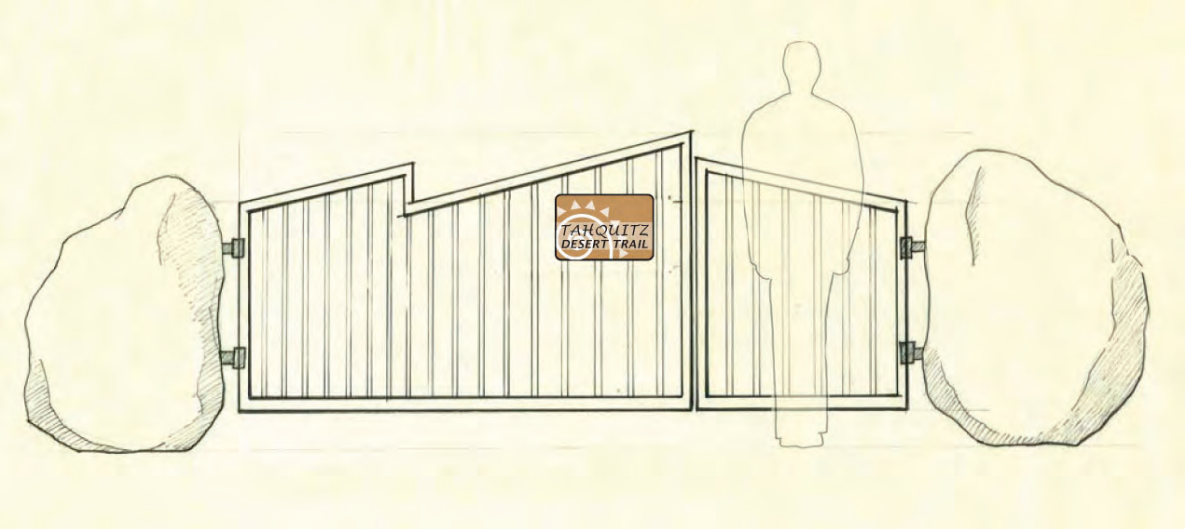
Fences and Guard Rails

Several areas of the study corridor currently have fences or guard rails. This is typically due to the trail or access way being in close proximity to a steep drop or change in elevation. While existing guardrails appear adequate, they also create opportunities for creative elements. Three different guardrail options are shown below. Corten steel, painted metal or metal and concrete is recommended due to their durability in the desert environment. The third option is suggested as an embellishment to be added to the existing pedestrian bridge structure in the event of replacement or upgrade.



Access Gates

Flood Control gates are currently found at the access points to the trail from South Palm Canyon, Camino Real and Sunrise Way. While RCFCD has expressed a willingness to open the gates, it is likely that they will want to maintain the ability to close the trail at times when maintenance is being performed and heavy equipment is being used. The gates themselves may be trail features. The conceptual idea below brings the profile of the mountains and local boulder material to the valley. An open design that maintains visual access is suggested as well as durable materials such as rock and metal.



Existing flood control access gates should be replaced with decorative elements

Non-Motorized Parking

The Tahquitz Creek Trail will become a destination for cyclists and equestrians. Bike parking facilities should be located at trailheads and major access points. Equestrians also frequently tie up at the Rock Garden Cafe. Improved hitching facilities should be considered.

Bicycle racks create an opportunity to incorporate artistic elements into utilitarian features.

Art Elements

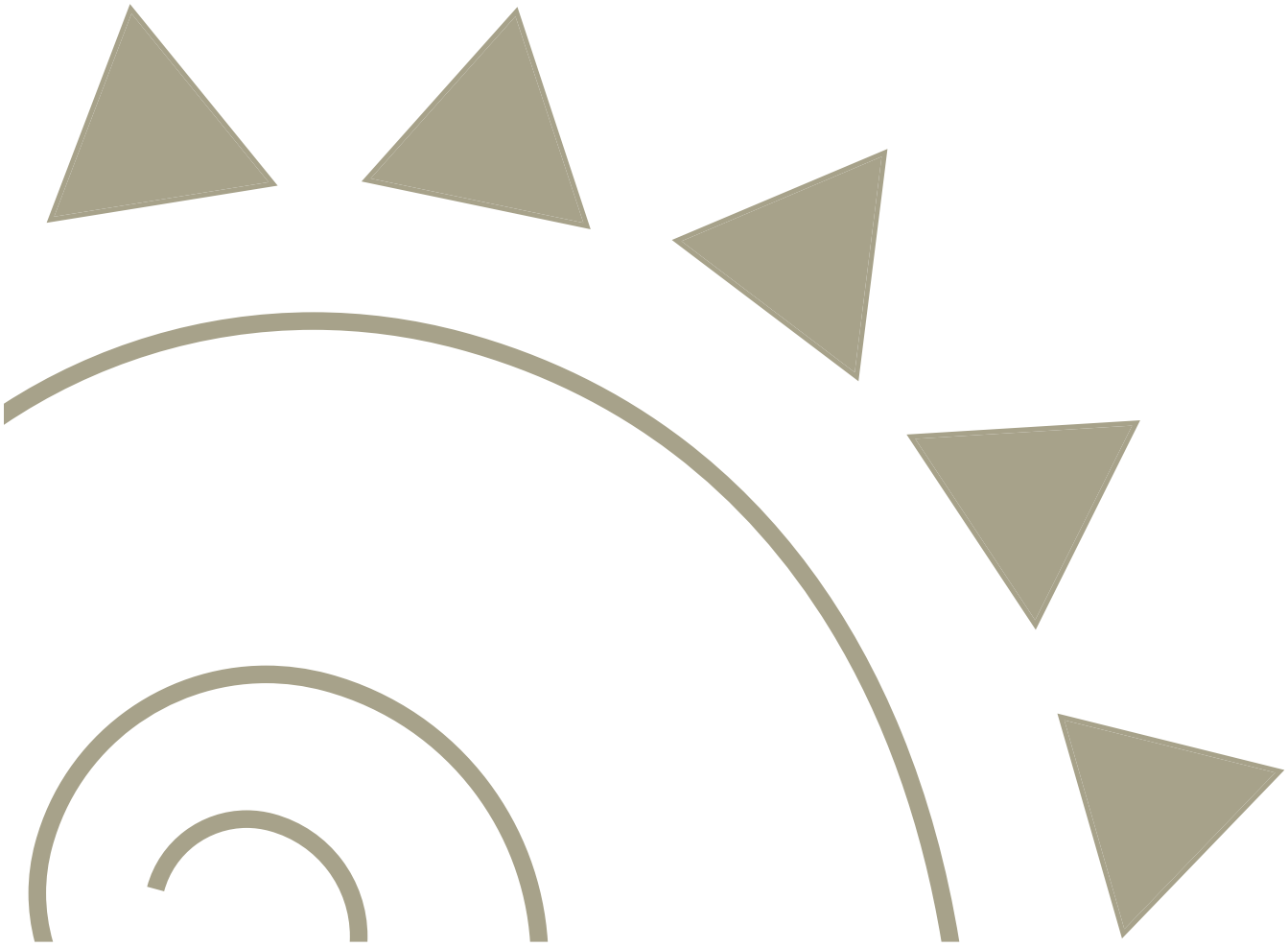
Art elements present opportunities to make a trail experience more memorable. Themes should draw from the local natural and cultural environment. Each improvement, whether it be a bench, trash receptacle, bike rack, paving material or pattern is an opportunity to be creative. Art pieces may be overt such as large scale sculpture or subtle as in details integrated into design elements.

One idea for the Tahquitz Creek Channel is to etch stones with local flora, fauna or Native American patterns. These stones would create opportunities for discovery and interpretation along the trail. Designs etched into rock would also create pockets that would capture water in rainfall or flood events, creating pools that may be utilized by local wildlife species. Impressions should be shallow and not retain water more than twenty-four hours in order to not create breeding opportunities for insects.

Art integrated into the undersides of bridge structures is an effective way to enliven a space which may otherwise be perceived as unapproachable. Durable materials such as tile work create numerous opportunities for embellishing the trail experience.

TAHQUITZ CREEK TRAIL MASTER PLAN

Goals and Objectives, Design and Operating Standards



Local Regulatory Permit Review

Plan Adoption and Approval

The Tahquitz Creek Trail occurs within the City of Palm Springs, in Riverside County, California. To maximize the execution of this plan, local land use jurisdictions and other agencies, where appropriate, should recognize this Master Plan and participate in the implementation of the Plan.

City of Palm Springs

The City of Palm Springs is responsible for this plan and as such is the lead agency for trail implementation. The City will serve to coordinate and collaborate with all other participating agencies and jurisdictions in order to see the project through to completion.

The following questions should be addressed when developing a detailed planning, design, and implementation framework for the City:

- What land use designations/zoning districts are involved in the Preferred Alignment and Phasing Plan?
- What is the Plan's timeline for implementation?
- Are there scheduled plan review dates or are there amendment procedures?
- Is the Plan consistent with or complementary to any other Town plans for the project area?
- Who will be responsible for implementation and long-term management/maintenance of the trail?

Required Permits

During the master planning process for the Tahquitz Creek Trail project it is necessary to determine those agencies that may have jurisdictional or permitting authority related to construction along Tahquitz Creek. Those requirements are listed below:

City Requirements

The study area includes several zoning classifications, within which, the trail could be aligned. Most classifications will require a Conditional Use Permit (CUP) for trail construction. The requirements under each zoning classification are listed below:

R-1-C, single family residential	92.01.01, section D, subsection 9	CUP for recreational facilities
R-3, multiple family residential and hotel zone	92.04.01, section D, subsection 6	CUP under country clubs, golf courses and driving ranges
C-1 & C-2, retail business zone & general commercial zone (respectively)	Not a permitted use	Formal determination from the Planning Commission
"W", watercourse (no zone classification suffix)	92.20.01, section B, subsection 2, line c.	CUP under country clubs, golf courses and driving ranges
W-R-3, multiple family residential in a watercourse	92.20.01, section B, subsection 1, line c.	CUP under country clubs, golf courses and driving ranges

W-C-2, general commercial zone in a watercourse	92.20.01, section B, subsection 1, line c.	CUP under country clubs, golf courses and driving ranges
O-20, open land	92.21.01, section A, subsection 7	Permitted use under public parks and recreational areas
Bureau of Indian Affairs		Grant easements on Indian land

Note: Trail projects in the City of Palm Springs are typically established as easements, not actual projects.

Permitting Matrix

Agency	Permit Requirements
Riverside County Flood Control and Water Conservation District	• Right-of-Way encroachments permits in established flood-plains • CEQA document preparation to assess potential environmental impacts of a project
California State Clearinghouse & Planning (SCH) Department	• CEQA Document Submissions. SCH will coordinate the distribution to appropriate State agencies for their review
California Department of Water Resources	• New and rehabilitated projects must meet the Water Conservation in Landscaping Act requirements
California Regional Water Quality Control Board, Palm Desert Office	• Section 401, Water Quality Certification
California Department of Fish and Game, Region 6, Inland Desert	• CEQA Review • Lake and streambed alteration notification
United States Army Corp of Engineers	• Section 404 permits

Relevant Permitting Agencies and Jurisdiction

In addition several private, public and quasi-public utility companies will require encroachment permits and design review for proposed improvements crossing their respective rights-of-way or easements. These organizations include:

- The Gas Company
- Southern California Edison
- Verizon, California Inc.
- Desert Water Agency

Riverside County Flood Control Encroachment Permits

An encroachment permit application from the Flood Control District typically requires two to three months to process. Requirements include:

- Application form
- Permit fee deposit
- Signed and approved plans for the proposed work
- District as-built drawings
- Approved and filed CEQA documents
- Proof of NPDES (National Pollutant Discharge Elimination System) compliance
- Hydrology and hydraulic calculations

Costs

The implementation of the Tahquitz Creek Trail would create a significant resource for the residents and visitors of Palm Springs. An annual inflation factor will need to be applied based on the year in which construction occurs. The totals below do not include property acquisition or easement costs. Costs for implementation, in 2009 dollars, are estimated to be as follows:

Planning Level Cost Estimate

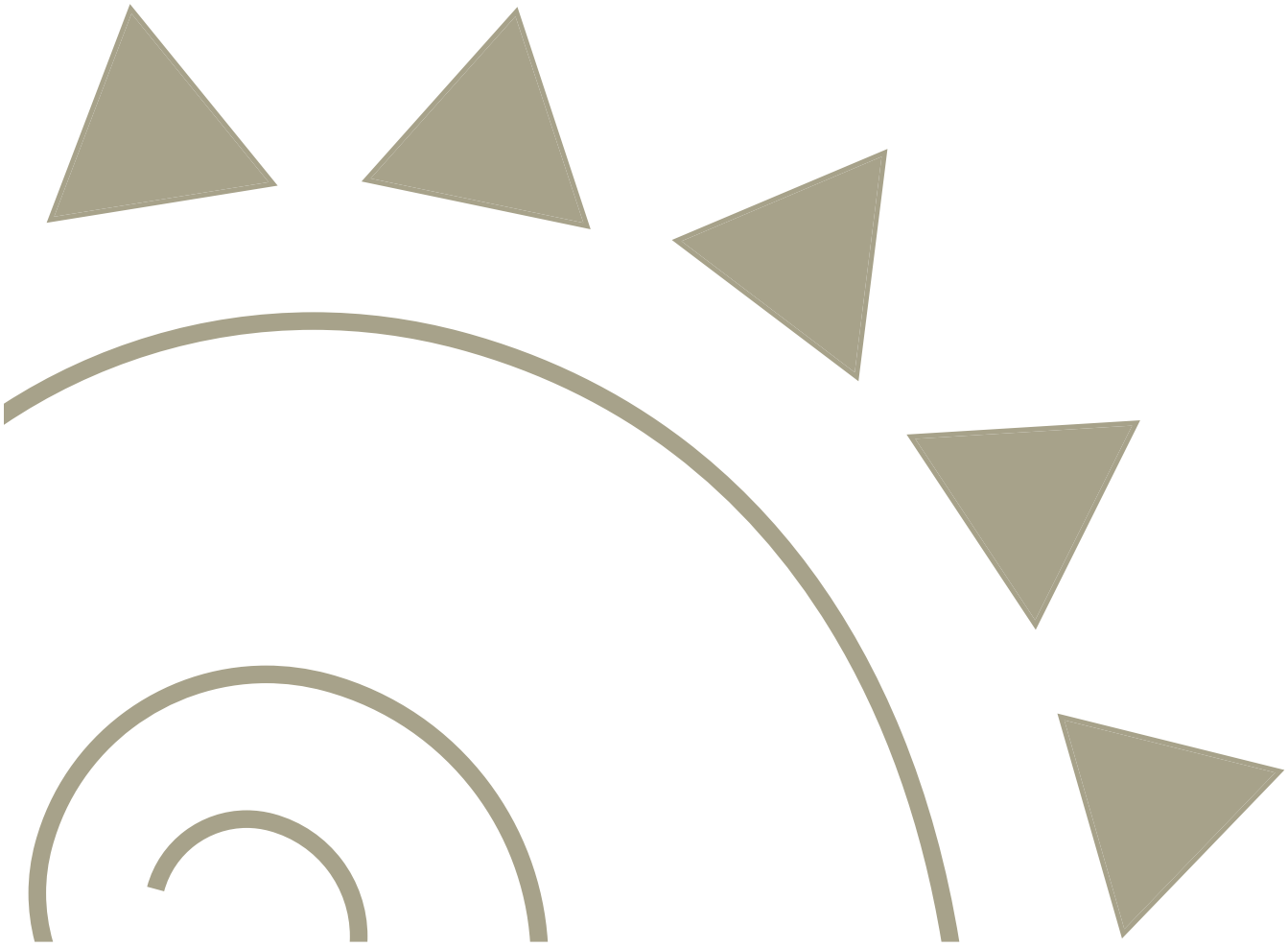
Tahquitz Creek Trail

June 28 2010

Item	Description	Total
Demolition	Berm and rip rap removal, demolition and disposal	$168,600
Paved Multi-Use Trail (North Side)	12' wide concrete trail with 4' wide crusher fine shoulders	$488,500
Soft Surface Multi-Use Trail (South Side)	12' wide crusher fine path with 4' wide decomposed granite shoulders	$362,500
3' Soft Surface Equestrian Trail (Creek Bottom)	3' wide clear native earth path	$32,500
Underpass ramps	Excavation, fill, soil cement, stabilization and ramp scoring	$1,500,000
Roadway Crossings	Pedestrian activated signal, bollards, crosswalk markings, way-finding and traffic control signs	$194,550
Landscape (North Side)	Native boulders and plantings, decomposed granite mulch, grading for berm	$138,350
Landscape (South Side)	Native boulders and plantings, decomposed granite mulch, grading for berm	$153,750
Trailhead West @Sunny Dunes	Monument sign, information kiosk, native boulders and plantings, decomposed granite mulch, grading	$63,980
Trailhead East @ Sunrise Way	Monument sign, information kiosk, native boulders and plantings, decomposed granite mulch, grading, stormwater outlet protection	$85,250
Stormwater Improvements	Concrete removal and native rock garden, granite mulch	$49,500
Sign system	Primary and secondary monument signs, interpretive, way-finding and regulatory signs and mounts	$60,880
Erosion Control/Construction	Construction access, EC fencing, hydroseed, tree protection, irrigation	$132,980
Subtotal		**$3,431,340**
Art works 2%		$68,630
Preliminary engineering 15%		$514,700
Permitting (grading, road, env.) 2%		$68,630
Mobilization 10%		$343,130
Traffic control 10%		$343,130
Construction Management 20%		$686,270
Contingency 30%		$1,029,400
Grand Total		**$6,485,230**

TAHQUITZ CREEK TRAIL MASTER PLAN

Appendix A - Public Meeting Summaries



Tahquitz Creek Trail Master Plan

Public Meeting Summary

Date: February 23, 2008

This summary is provided to facilitate a mutual understanding of the design progress for the Tahquitz Creek Trail Master Plan. It shall serve as the base for the concept plan document once approved by City staff.

Meeting date: Monday, February 23rd, 2009, 6 p.m.

Location: City of Palm Springs, Council Chambers City Hall

In Attendance:

- Sharon Heider, City of Palm Springs, Department of Parks and Recreation
- George Hudson, Alta Planning + Design
- Karen Vitkay, Alta Planning + Design
- 45 community members signed in

Agenda:

1) Introduction – *City of Palm Springs (Sharon Heider)*

2) Project Background – *Steering Committee (April Hildner and Max Davila)*

3) Master Plan – Alta (Karen Vitkay)

4) Facilitated Poster Discussions – Hosted by steering committee members and Alta

5) Public Preference Boards – Facilitated by steering committee and Alta

Public Preferences:

1) Please indicate you first TRAIL priority:

   a. Colored concrete 12' wide pathway on the north side. – *7 votes*

   b. Soft surface (crushed fines) 12' wide pathway on the south side. – *22 votes*

   c. Natural surface 3' wide equestrian path in the creek bottom. – *5 votes*

   d. Other: please specify. - Native environment – *1 vote*
   Solar low level lighting for night – *1 vote*

2) Please indicate you first TRAILHEAD priority:

   a. Trailhead on Sunny Dunes, East of Belardo Road. – 5 votes

   b. Trailhead on Sunrise Way south of Desert Chapel. – *15 votes*

   c. Community entry points at Hermosa. – *10 votes*
   (public comment: Disposal cans at each entry point. One can for trash and dog poop.)

   d. Other: please specify. – 3 votes for a trailhead at Palm Canyon (triangle parcel north of creek).
   Public comment: Great ideas!
   Public comment: What about parking rules for the 2 Riverside Drives? (Depends of course on whether we have trailheads with parking).

3) Please indicate your top three TRAIL AMENITY priorities:

   a. Monument sign – *9 votes*

   b. Seating – *23 votes*
   (Written comment: No seating by bridge, too impacted spread it out).

   c. Vegetation/Shade – *18 votes*

   d. Fences and guardrails – *1 vote*
   (Written comments:
   Only minimal number.
   Prefer present simple functional gates.
   No! Keep simple design.

   e. Bollards – *8 votes*

   f. Way-finding stones – *4 votes*
   (Comment: interpretive signage)

   g. Pedestrian bridge improvements – *10 votes*
   Comments:
   Prefer straight simple look – no design sand blasting
   No! Keep simple (No mountain shapes)
   Don't do this, only at Desert Chapel.

   h. Art elements – *7 votes*
   Pockets of water create mosquito issue.

   i. Other: please specify.
   Comments:
   Logo = Agua Caliente approved design.
   Safe crossing @ Sunrise.
   Pergola.
   Hate bridge handrails – impractical.

4) *Please provide us with your idea for a TRAIL NAME:*
Public suggestions:
Tahquitz Creek Nature Trail – 5 votes
Tahquitz Creek Scenic Recreation Area – 1 vote
Tahquitz Creek Trail – 18 votes
Tahquitz Falls Trail – 1 vote
Tahquitz Canyon Trail – 1 vote
Tahquitz Trail – 1 vote
Tahquitz Nature Trail (TNT) – 1 vote
Mighty Tahquitz River – 1 vote
Tahquitz Creek Parkway – 1 vote
Comments:
"Arroyo" vs. "Creek"
I like "trail" in the name – more rustic.

5) Please indicate your preference for a LOGO STYLE:

   a. 0 votes

   b. 4 votes

   c. 16 votes for design with brown background and yellow sun spiral

(Comment: like contrast and simplicity, highly visible)

d. 0 votes

e. 0 votes

f. 2 votes

g. 2 votes

h. 6 votes

Summary Discussion:

- Are bollards necessary?
    - This is a management issue dependent on need to control traffic.
- Might the trail serve as an opportunity for memorials (i.e. commemorative benches or signs)
    - Yes, it is possible.
- We are concerned about costs.
    - We may recommend a Plan A and Plan B representing short and long term opportunities.
- The bridge area is already highly impacted. Consider dispersing elements. It is an appropriate place for an interpretive stop.
- The berm isolates the trail in a protective way. This quality should be preserved. The area is valued by dog owners.
- Create accessibility to the parkway via curb cuts.
- Name should be the Tahquitz Creek Trail.
- Who will maintain the trail?
    - The City would maintain the trail elements and Flood Control would continue to maintain the channel.
    - A balance needs to be achieved.
- The debris basin and large concrete areas will be attractive to skateboarders. Consider adding rocks to deter.
- Will there be lighting?
    - Early discussions with the public found a desire to not have lights.
    - Bridge underpasses and parking areas should be lit for safety.
- Concern about seating at the Camino Real pedestrian bridge. Site elements should be more spread out. Seating would be more appropriate away from residential areas.
- Consider an open gathering area that the church may use.
- Concern that gathering areas become gathering places for the homeless and also attract parking in the roadway.
- Opportunity to close drainage ways to homeless with grates?
    - Flood Control is resistant to grates due to debris build up.
- Preference stated for quiet seating areas away from traffic.

- Consider benches as optional.
- Homeless have not been observed near the existing benches on the north side.
- I want to enjoy my neighborhood. It is *our responsibility* to contact the police in order to control nuisances. It is our responsibility to keep our neighborhood safe. The police are responsive
- A developed trail will result in more police awareness and patrols.
- Those on citizen patrol could like direct access as well as visual access to the flood control access roads.
- The trail should be sensitive to the natural environment.
- The north side is more open and has fewer problems. Lighting is a deterrent.
- Riverside needs traffic calming.
    - Out of scope for this project.
    - Community can put in a request for improvements.
    - The City has acquired a Safe Routes to School grant for sidewalk improvements at the Camino Real pedestrian bridge.

Tahquitz Creek Trail Master Plan

Public Meeting #1 & 2 Summary

Date: October 14th, 2008

This summary is provided to facilitate a mutual understanding of the design progress for the Tahquitz Creek Trail Master Plan. It shall serve as the base for the concept plan document once approved by City staff.

Meeting date: Friday October 10th, 2008, 6 p.m.

Location: Unity Church of Palm Springs, 815 S. Camino Real.

In Attendance:

- Sharon Heider, City of Palm Springs, Department of Parks and Recreation
- George Hudson, Alta Planning + Design
- Karen Vitkay, Alta Planning + Design
- 25 community members signed in

Day 1:

1) Introduction and project background – *City of Palm Springs*

2) Master Plan process: vision, goals, design standards, site analysis, existing conditions – *Alta Planning + Design*

3) Working groups – *Participants were divided into two working groups in order to address the following questions. A member of the public reported back the following findings:*

   a. *What character do you envision for the creek?*
   (Natural, urban, subtle, desert, oasis, rustic, formal, linear, meandering, etc.)

   Group A
   - Keep the creek as natural as possible.
   - Maintain a soft look.
   - Maintain/Augment habitat for wildlife.
   - Enhance the natural character. Any art elements should not overwhelm.
   - The two sides can have different characters. Maintain the north side as it is whereas the south side can be softer with more natural materials.
   - It should be a place where one does not need to interact with the urban environment. It should be more of a natural experience.

   Group B
   - We would like to see a natural meandering trail.
   - The north side should be oriented towards bikes with a hard linear surface, whereas the south should be softer (with decomposed granite or colored asphalt) and more meandering.
   - Emphasize the feeling of bringing the elements of the canyon down into the valley. It should feel canyon or riparian-like.
   - Design elements should be subtle.
   - It should maintain a desert feel with native plant materials.

b. *How do you want to use the Tahquitz Creek?*
(Exercise, recreation, transportation, walking, biking, horse riding, dog walking, etc.)

Group A
- Consider accommodations for equestrians.
- The parkway should be an amenity for residents and visitors.
- It should be a place for children to learn.
- It should include habitat for wildlife.
- We would like to see small places to gather including groves of trees that would provide shaded nodes. The seating areas should not be too comfortable.
- We envision equestrians in the bottom of the channel and cyclists and pedestrians on the top.

Group B
- We would like to see bikes and non-motorized scooters on the north side with a more linear path while the south side should be more meandering and accommodating to those who prefer a softer surface.
- Small, intimate seating opportunities should be provided.
- It should be a place for tourists, students and local residents and should include opportunities for learning about topics like the native american culture, local geology, low water-use native plants (it should be a low water-use demonstration area).
- It should be accessible to people with disabilities.
- Facilities should be provided for equestrians specifically in the bottom of the floodway. Equestrian access is primarily from trails in the west, access to the top of the flood channel by equestrians is not viewed as essential.
- Opportunities for education and connections to the school should be incorporated.
- We want to use the parkway for exercise, walking and biking as well as for transportation.

c. *What do you see as the primary opportunities?*

Group A
- Soften the existing berm but keep a buffer from the street. The berm should be melded into the project.
- Some parking should be included.
- The pedestrian bridge should be softened.
- Groves of trees as seating areas.
- Shade structures present opportunities for artistic elements.
- Create connections to area trails.
- We should strive to enhance the natural character of the site. Any art elements should not overwhelm the natural beauty of the space.
- There is potential to have the two sides of the creek be different in character with one side more developed and the other softer and more natural.
- There is a distinct sound of water within the flood channel as created by the flood control drop structures. The sound of water is important in the desert and should be celebrated.
- Capture mountain views.

Group B
- Explore opportunities to create small, intimate seating areas.
- The existing berm should be replaced with a series of boulders that offer a buffer to adjacent residents while emphasizing the riparian character of the creek. There is an opportunity to bring the natural quality of the mountain canyon down into the wash.
- Smoke trees once occupied the creek and would be resistant to flooding. Perhaps they could be planted in the floodway.
- There is an opportunity to replace existing negative uses such as abuse and homeless population with positive uses and activities.
- The parkway could include demonstration areas of low water-use native plantings in the landscape.
- Gateway features such as public art, information and way-finding signs could be included at a parking area north of the creek and east of Sunrise Way or west of S. Palm Canyon Drive.

- Consider opportunities for education about the local history, culture, ethno-botanical information and the natural environment. Children and the schools should be involved.
- There is an opportunity to create an access point with a seating area on the south side of the creek at Hermosa.
- Art elements could enhance the existing pedestrian bridge as well as the main roadway bridges. One community member likes the pedestrian bridge as it is an thought that adding art elements is a terrible idea. She further suggested painting the bridge a light sand color to better blend in with the natural environment.
- Dark night skies should be maintained.
- We would like to see more trees and shade.
- Seating areas should be included.
- Law enforcement personnel should be invited to meetings.
- Ways to access the channel bottom should consider the elderly population.
- We should seek opportunities to use sustainable and recycled materials.
- We should connect to the existing pathway at the golf course.
- Rest areas should be included at the pedestrian bridge and at Hermosa on the south side.
- An equestrian stable facility is located on El Cielo. Include this as a destination or turn around point for equestrians doing a loop trail.

d. What do you see as the main constraints or challenges?

Group A
- We have a concern about the ability of the City to maintain the parkway.
- Safety is a concern and lighting should be provided at key locations including under the roadways.
- There will be a need to minimize traffic impacts adjacent to the park.
- Any improvements in the bottom of the channel should be resistant to flooding.
- The need to manage storm water and work within the requirements of Flood Control is a challenge as well as building elements that will not be lost to flood damage.
- There is a concern about how future developments, such as hotel and condo projects will impact and respond to the presence of the trail.
- There is a need to involve the native american community to ensure that we are meeting their needs and gain their approval.
- Major roadway crossings are a concern. All roadway crossings should be grade separated.
- Securing project funding is a concern..

Group B
- The equestrian perspective should be included in the design process. The Desert Riders equestrian group should be contacted and involved. (Note: two equestrian riders were present in Group A).
- Funding will be a constraint.
- Flood events will impact design elements that may be included.
- The presence of the homeless community in the creek and creating a safe environment.
- Physically getting under the bridges will be a challenge

Day 2:

On the second day, the community was invited to walk the project site with the design team to further discuss ideas for improvements. The group met at the south end of the pedestrian bridge.

Discussion:

- While the idea of having a small gathering node at the southwest end of the pedestrian bridge has been mentioned, adjacent residents expressed a concern that the area would invite groups of people who would engage in disruptive activities including listening to loud music. An alternative idea of having a stopping point with interpretive information was found to be acceptable. An interpretive opportunity at this location could provide an educational

opportunity while enhancing the connection to the school. Others were still open to the idea of a small seating area for up to four people. A suggestion was made to red curb the roadway near seating areas to deter parking and listening to music.

- Community members further discussed the existing concrete berm and opportunities to soften its appearance. Participants responded favorably to the idea of using large boulders to create a buffer to adjacent residents.

- The question of Riverside County Flood Control District (RCFCD) requirements with respect to maintenance was discussed.

- At Hermosa, the group discussed the opportunity to have a gateway to the park from the neighborhood. An access point that opened the berm and providing a direct connection to the park could include seating. Participants noted that adjacent neighbors might be resistant to creating gathering nodes near their homes.

- A gathering node could be a space where people/neighbors could bring chairs instead of having seating provided.

- Fire and police officers should be invited to the next public meeting about the trail.

- Residents feel that changes should occur on North and South Riverside Drives to slow traffic down, such as: curb extensions, chokers, parallel parking, bike lanes . Drivers use S. Riverside Dr. to avoid traffic on Mesquite. The roadway widths are considered wider than necessary by residents.

- The Sonoran blue palo verde is an appropriate native species that should be used throughout the design. The desert willow and mesquite are also an appropriate species.

- The Yacht Club still organizes bimonthly clean up events.

- Mosquitoes are a problem where water is allowed to collect.

- If the trail is aligned through the golf course, fencing should be erected in response to any areas, near the proposed trail, where golf balls may be directed.

- While Sunny Dunes Road right-of-way is currently owned by the Desert Chapel Church, it is open to the public.

- The school is in the process of replacing the pedestrian bridge at the east end of Sunny Dunes.

- A set of rocks creates a waterfall effect in the floodway near Hermosa.

- Rocks such as those found on the north side, could serve as informal seating opportunities.

- On the north side of the creek, east of S. Palm Canyon Way, the triangular parcel of land is owned by flood control. This area was highlighted as a potential location for a monument sign.

- Parking spaces could potentially be incorporated into the design of the Belardo Bridge.

- The group observed the equestrian gate west of the Rock Garden Café. A new development is slated for the currently vacant parcel. Once actual implementation begins the Belardo Bridge work will begin.

- Community members stressed a desire to have roadway crossings completely separated from vehicular traffic. They expressed a preference for under crossings.

- It was suggested by an area resident that there is an opportunity for a small gathering node on the south side of the creek at the bend in S. Riverside Drive, east of S. Palm Canyon Drive. The space would be appropriate for a gathering area as to the north is the industrial area and to the south is a church. The church was designed by well known mid-century modern architect Albert Frey.

- As the corridor could serve as an opportunity to showcase low water-use native plantings, it was proposed that a native plant nursery would be an ideal tenant for a vacant parcel located within the industrial area on North Riverside Drive.

- The general consensus of the group was that they loved the built trail portion on the north side of the creek. Resident's indicated that much of the plant material had been removed and should be replaced, but in general everyone liked the character of this built portion of trail.

Next steps

Discuss strategy for next steps and project schedule (Alta and City of Palm Springs).

Discuss an appropriate name for the project as well as craft a vision statement (Yacht Club).

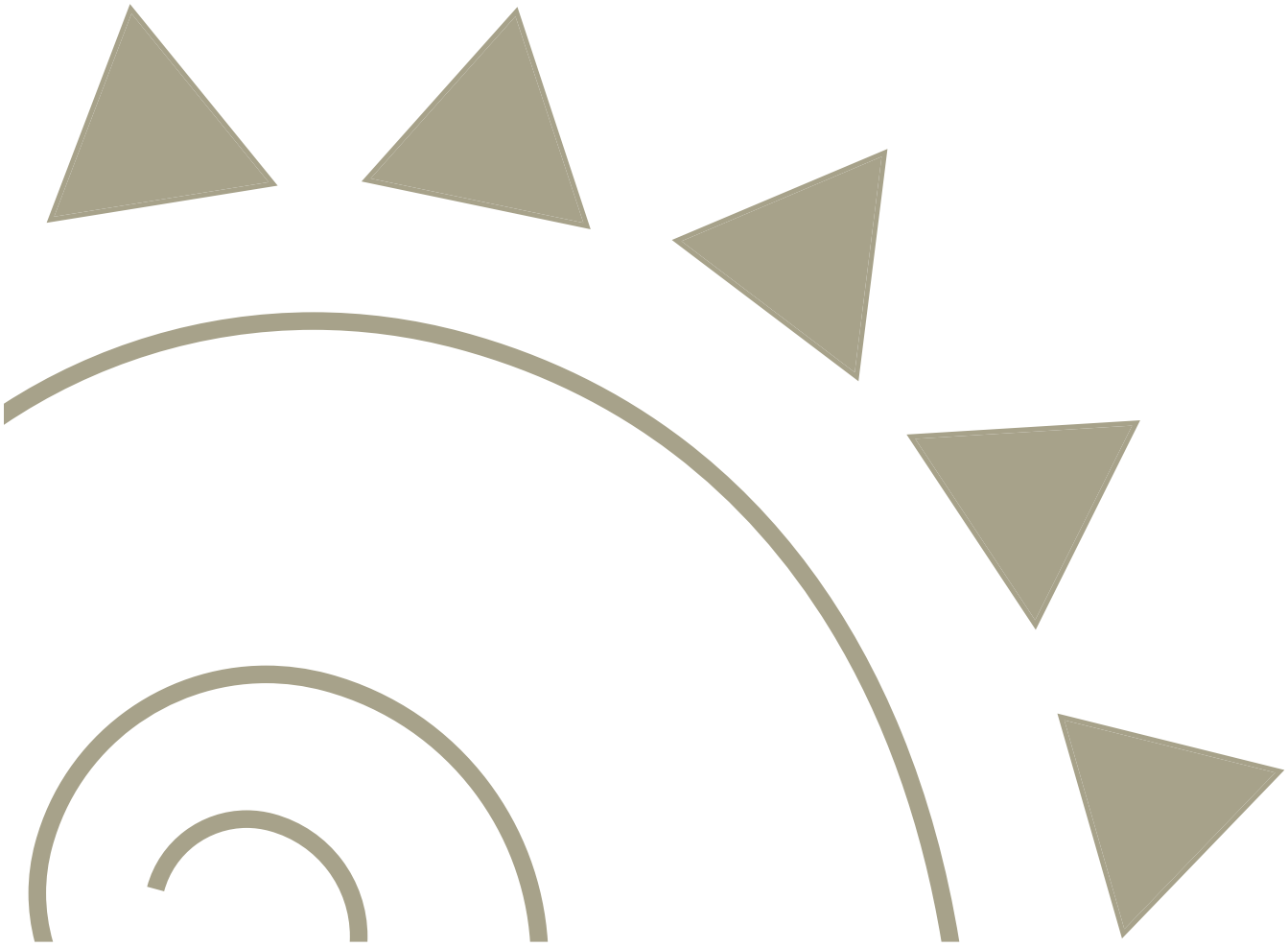
Refine opportunities and constraints memo and maps to reflect public input (Alta).

Work on alignment and graphic representation of design ideas (Alta).

END OF SUMMARY

TAHQUITZ CREEK TRAIL MASTER PLAN

Appendix B - Engineering Report



January 22, 2009 JN 20-101032

Ms. Karen Vitkay, Senior Designer
ALTA Planning + Design, Inc.
711 SE Grand Avenue
Portland, OR 97214

Subject: Report Draft for RBF Civil Engineering Services
Conceptual Design Development
Tahquitz Creek Trail Master Plan Study
Palm Springs, CA

Dear Karen,

At your request and authorization, we are presenting this draft report of findings and recommendations to supplement the ALTA Planning + Design (ALTA) study for the above mentioned project. Pursuant to our agreement, RBF provided civil engineering services which generally consisted of site visits, review of the ALTA Tahquitz Creek Trail Master Plan working Paper #2 dated September 26, 2008 as well as existing available channel plans, meetings, and discussions with Riverside County Flood Control District (RCFCD), preparation of conceptual improvement channel sections coordinated with ALTA and this report of findings and recommendations and an associated preliminary cost estimate.

Project Description:
As described by the ALTA report including the aerial photo exhibit, the study area generally includes approximately 1.5 miles of the Tahquitz Creek Channel spanning between the Agua Caliente Tahquitz Canyon Visitor's Center and one quarter mile east of Sunrise Way at the Mesquite Country Club. The project addresses both sides of the concrete and rip rap creek (channel) between North and South Riverside Drives. The area has been used for recreation trail use and has significant historic interest.

Project Goals:
The goals of the project include modifying the trail in and around the creek area, enhancing the access, physical condition, and appearance of the creek while maintaining the flood capacity of the drainage facility. Proposed modifications and improvements might include softening the surfaces hard rip rap channel lining with vegetation where possible, improving the condition of the existing cracked and uneven concrete trail within the creek bottom, and providing ramped trail access into the creek from the upper maintenance access roads under the existing bridges.

Drainage Facility Issues:
Tahquitz Creek is a part of the Whitewater Watershed. Stormwater collected by the Tahquitz creek flows east into the Whitewater River. The existing flood control channel improvements were constructed with reference plans prepared in 1981 (stage I) and 1989 (Stage II). These plans were made available for RBF review prior to our site visit.

The improvements generally consisted of rip rap and concrete along with various concrete drop structures near the bridge crossings. In addition there were provisions for concrete equestrian trails within the creek. The bottom of the creek varied between soft bottom and portions with grouted and ungrouted rip rap.

Opportunities for trail improvements:

RBF visited the site and discussed the goals for trail improvements with both ALTA and RCFCD representatives. Sketches of various alternatives for improved typical cross sections (attached in this report) were presented for review and are described below.

Section A:

This section shows a new layer of planted soil over the existing rip rap. The intent is to provide planted side slopes yet retaining the protection against 100 year storm events. This section was acceptable to RCFCD (District) with the provision that additional analysis would be required to verify the channel cross section would maintain the capacity to convey the flows expected in the 100-year storm event. Furthermore, RCFCD indicated the City would be required to maintain the side slope of the channel. Planting along the slope would also have to be approved by the District.

This option seems to be economical in that existing rip rap would not be removed and a softer planted surface would accomplish one of the goals outlined above.

Section B:

This section applies to and area along South Riverside Drive where a concrete slope lining was required to retain a berm along the adjacent roadway. According to the District, these improvements were constructed prior to the channel improvements as requested by the residents on South Riverside Drive. It appeared the sloped concrete was designed to retain the berm however this may be accomplished with a compacted fill embankment or soil cement lining due to the marginal expected flows at this elevation. Again an analysis would be required to modify the channel section at this location.

Section C:

This section addresses the improvement to the trail with in the creek bottom at some locations where desired. It was agreed to the District that soil cement may be used to replace the concrete trail provided the section could withstand loads from maintenance vehicles.

The colored soil cement section would likely be less susceptible to severe cracking and deterioration as noted with some areas of the existing concrete that had failed.

Section D:

This section delineates the areas where trail ramps are required near bridge crossings to allow for a ramp into the creek from the roadway, upper trails, and maintenance road beneath the bridges to avoid at grade crossings.

The soil cement surface noted in this section would extend to the channel bottom and allow for a suitable trail surface yet durable to withstand expected creek flows.

Soil Cement has been used effectively in flood control facilities in lieu of concrete and rip rap. The mix of cement and sandy soil provides an alternative to concrete for the ramps. The texture and color characteristics of soil cement may be more desirable than cast-in-place concrete. Scored patterns along ramp surfaces should be considered for additional traction.

The introduction of a new ramp access may affect the flows and high water surface elevation as the channel width is slightly narrower. A hydraulic analysis would be required to prove the capacity of the channel meets or exceeds the 100 year flood levels. Such access ramp layouts have been used on similar flood control facilities such as Santa Ana River Trail in San Bernardino and Orange Counties.

The preferred clearance for an equestrian trail beneath a bridge soffit is 10 ft. Attention should be given to Trail locations near the bridges to allow for the suggested vertical clearance.

Section E:

This section indicated replacement of existing rip rap at the upper 5 ft. portion with a reinforced soil slope (with geogrid) and planted to provide a softer side slope compared to the existing rip rap. A new hydraulic analysis must show that the upper portion of the channel is not required to armored.

This proposed section is not allowed by the District.

Section F:

This section indicates replacement of the existing rip rap side slopes at the upper 6 ft. with a gabion system (rocks contained in a wire basket) and planted along the tiers. This system provides some armoring of the upper section where flows are expected to be less that the original design provided.

This proposed section is not allowed by the District.

Section G:
This section attempts to utilize the armoring capacity of gabions and relocate the existing rip rap to the lower portion of the channel. A new hydraulic analysis must show that the upper portion of the channel is not required to armored and the ultimate cross section of the channel can accommodate the 100 year storm flows.

This proposed section is not allowed by the District.

Section H:

This section indicates the replacement of rip rap along the creek bottom and side slopes with Armorflex, a mat of spaced concrete blocks connected with a grid of wires. Although this alternative may allow some plant growth in the spaces between the blocks, complete removal of the existing rip rap is an added cost consideration.

The District indicated preliminary approval of this option however there are significant cost considerations with this alternative due to the required removal of existing rip rap where the Armorflex would be placed. An example of an RBF project using this system is provided in the report photos to gain a better understanding of its final appearance.

Removal of concrete structures within the creek:

The concrete drop structures, cutoff walls, concrete slope lining noted particularly at the bridges are required for increased velocities from storm flow at the restrictions where the channel narrows. Removal of the concrete structures are not allowed as they provide protection to piles, abutments and side slopes. Replacement of concrete with a soft bottom in these areas would require impractical replacement or retrofit of piling for bridge foundations. Retrofit measures for bridge are less effective than the existing protection and is impractical.

Cost Estimate:

RBF has included an engineer's estimate of construction cost on a "square foot of surface" (attached to this report) for the proposed channel and trail improvements that are allowed by the District. The estimates are based on our experience with similar projects.

Please call me if there are any questions regarding this report or if we can be of further assistance.

Sincerely,

Bradley R. Mielke, PS, SE
Senior Vice President

Cc:
Howard Barndt, PE (RBF)
Mike Sutton, PE (RBF)

Attachments:
Cross Sections
Referenced Plans indicating cross sections
Construction Cost Estimate
Site Photos

Path: 20101032/Admin/Reports/ALTA Trails/Draft Report

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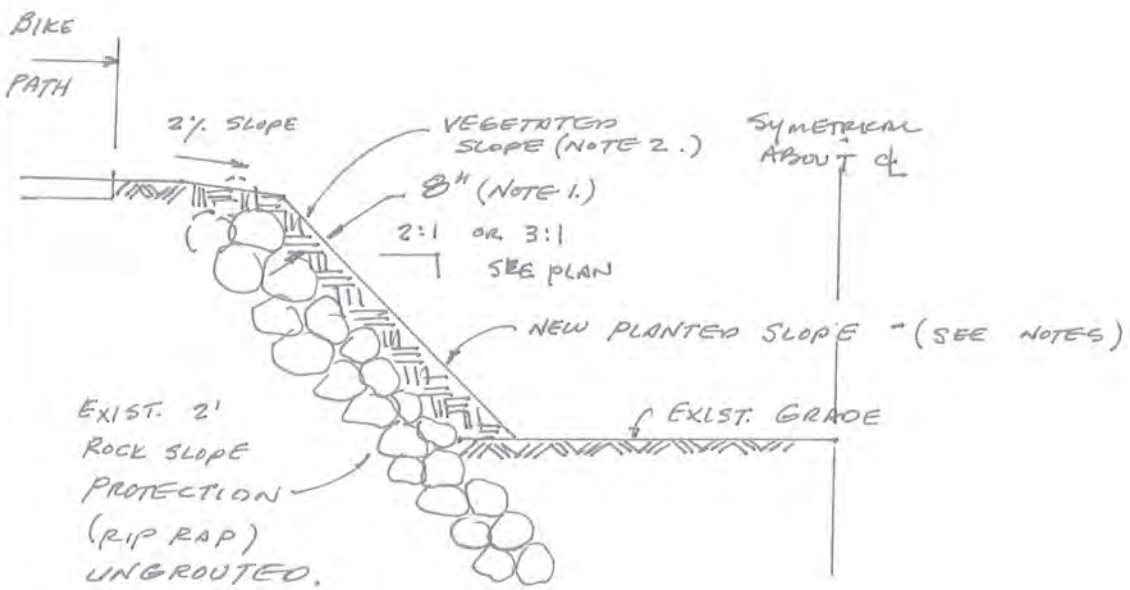
JOB TAHQUITZ CREEK 20-101032
SHEET NO. 1 OF 4
CALCULATED BY BRM/HB DATE 11.10.08
CHECKED BY HB DATE
SCALE NONE



A - TYPICAL SECTION / VEGETATED SLOPE OVER RIPRAP

NOTES:
1. FILL VOIDS OF ROCK SLOPE PROTECTION AND PLACE A COMPACTED LAYER OF SOIL (APPROX. 8" THK.)
2. PLANTING SHALL BE APPROVED BY THE RCFCD GENERALLY CONSISTING OF HYDROSEED MIX OR PLANTS. TEMPORARY IRRIGATION SHALL BE USED FOR PLANT ESTABLISHMENT.

REFERENCES: a) EXIST. PLANS - SHT 6 OF 112 (STA 132+00)
b) DRAFT REPORT (CALTA) - P. 11 & 12

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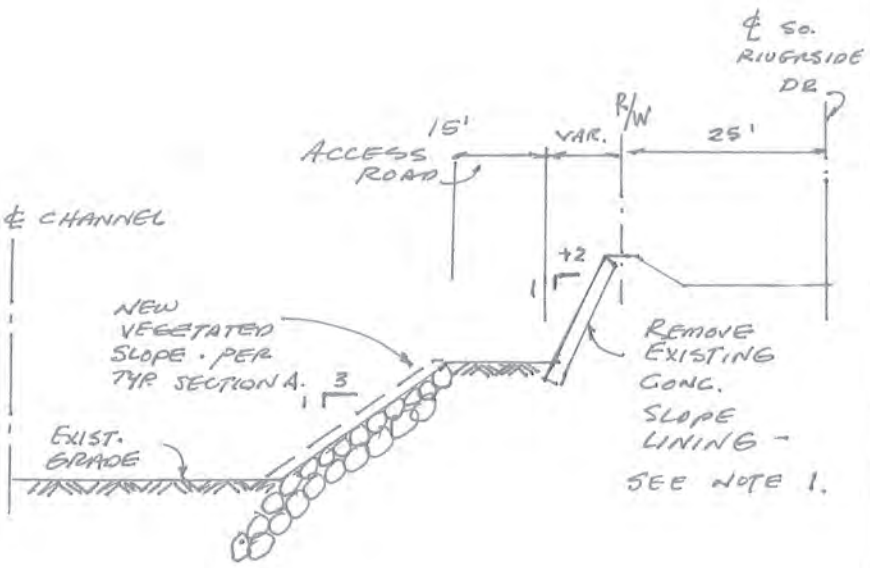
JOB TAHQUITZ CREEK 20-101032
SHEET NO. 2 OF 4
CALCULATED BY BRM/HB DATE 11.10.08
CHECKED BY DATE
SCALE



B - TYPICAL SECTION ACCESS ROAD (STA. +133 -)

NOTES:
1. EXISTING CONC. SLOPE LINING MAY BE REMOVED AND REPLACED WITH VEGETATED SLOPE WITH SUITABLE MATERIAL.
2. SOIL SHALL BE COMPACTED AND STABLE @ 2:1 SLOPE. REMOVAL OF EXISTING SOIL AND RECOMPACTION MAY BE REQUIRED.

REF. a - EXIST. PLANS - SHEETS 5-7 OF 112
b. REPORT BY ALTA (DRAFT.) P. 13.

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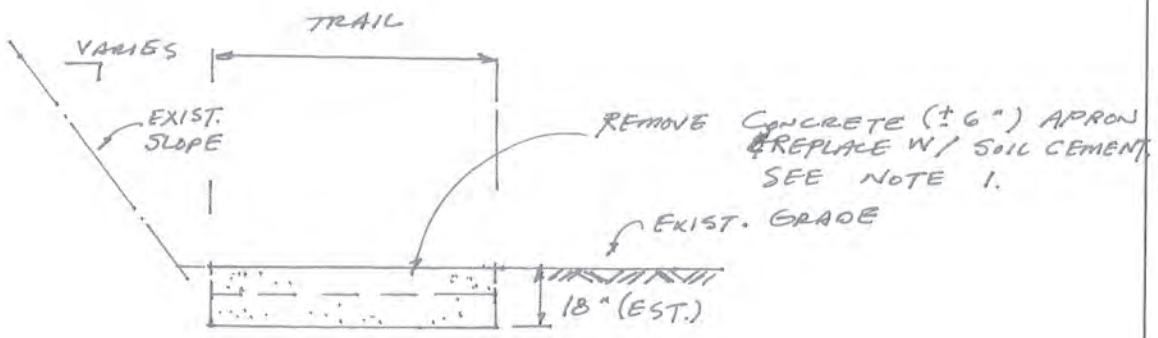
JOB TAHQUITZ CREEK 20-101032
SHEET NO. 3 OF 4
CALCULATED BY ____ DATE ____
CHECKED BY ____ DATE ____
SCALE ____



C - TYPICAL SECTION - EQUESTRIAN TRAIL

NOTES: 1. SOIL CEMENT SECTION SHALL BE DESIGNED BY ENGINEER PER SPECIFICATIONS FOR DURABILITY - MAY BE COLORED

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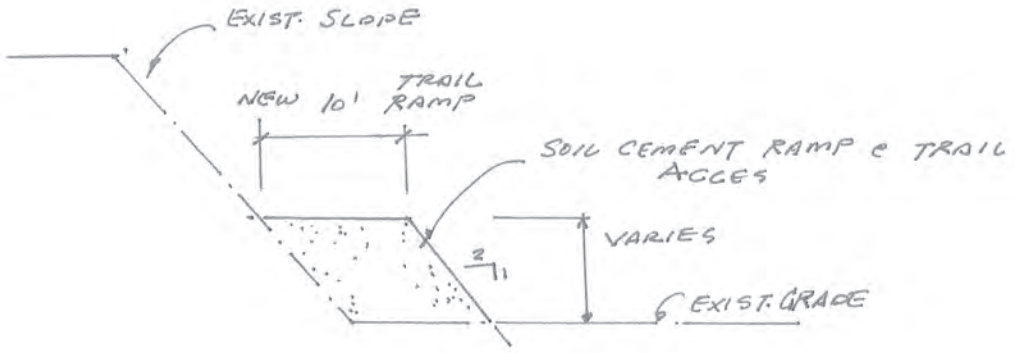
JOB TAHQUITZ CREEK 20-101032
SHEET NO. 4 OF 4
CALCULATED BY BRM DATE 11.10.08
CHECKED BY _____ DATE _____
SCALE _____



D - ACCESS (TRAIL RAMP) NEAR BRIDGES @ PALM CANYON AND SUNRISE WAY.

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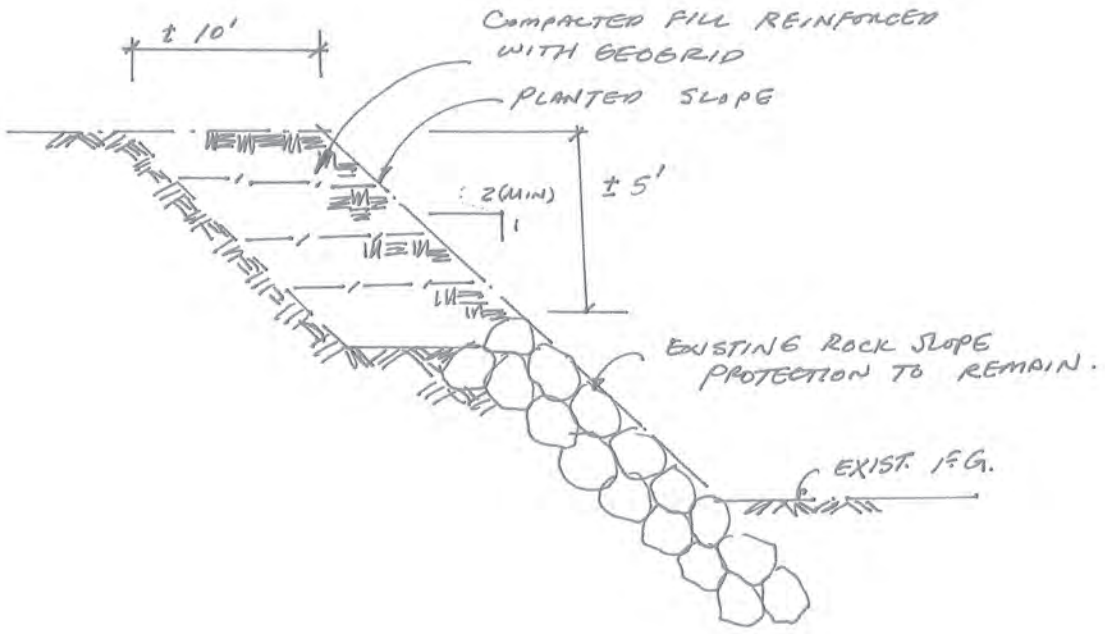
JOB TAHQUITZ CREEK 20.101032
SHEET NO. 1 OF 3
CALCULATED BY BRM DATE 11-18-08
CHECKED BY DATE
SCALE NONE



E. TYPICAL SECTION - UPPER 5'

REINFORCED EARTH

SEE SECTION A. FOR ADDITIONAL NOTES.

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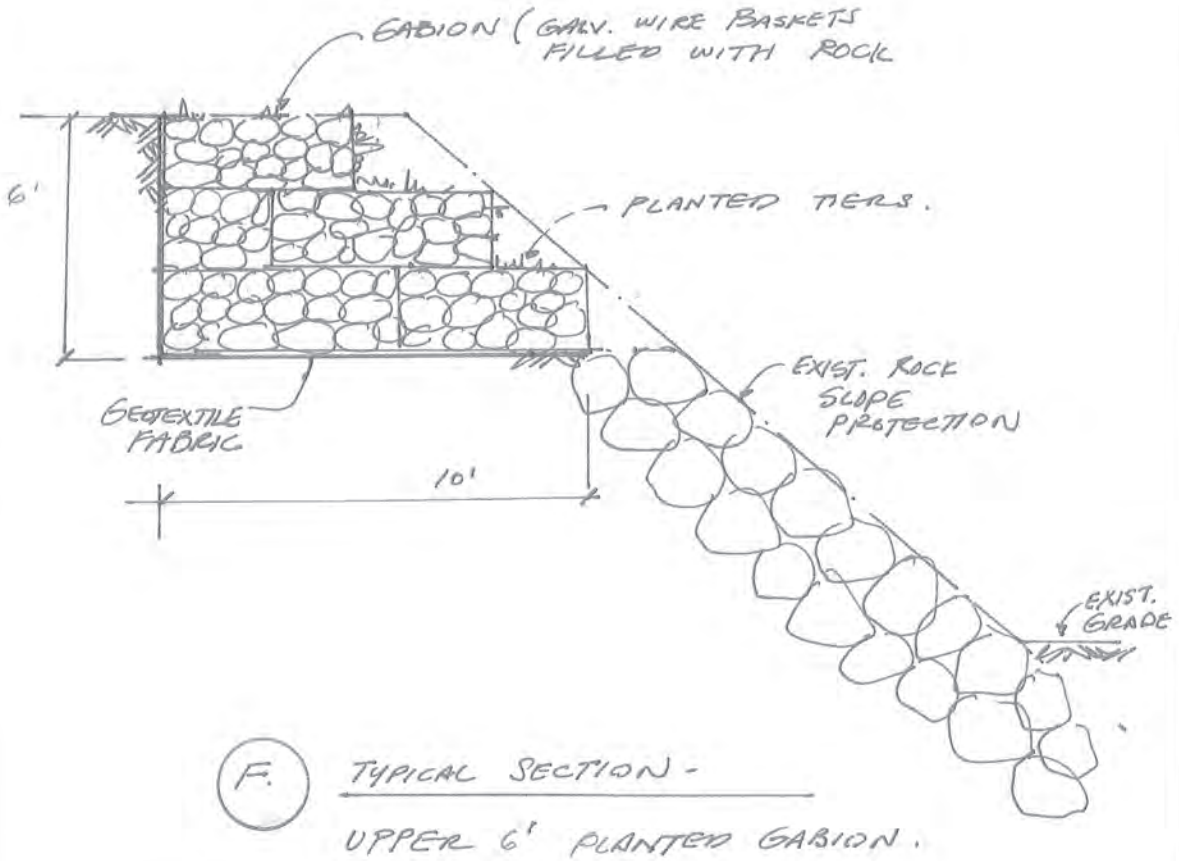
JOB TAHQUITZ CREEK · 20-101032
SHEET NO. 2 OF 3
CALCULATED BY BRM DATE 11-18-08
CHECKED BY DATE
SCALE



F. TYPICAL SECTION -
UPPER 6' PLANTED GABION.

SEE SECTION A FOR ADDITIONAL NOTES.

RBF CONSULTING

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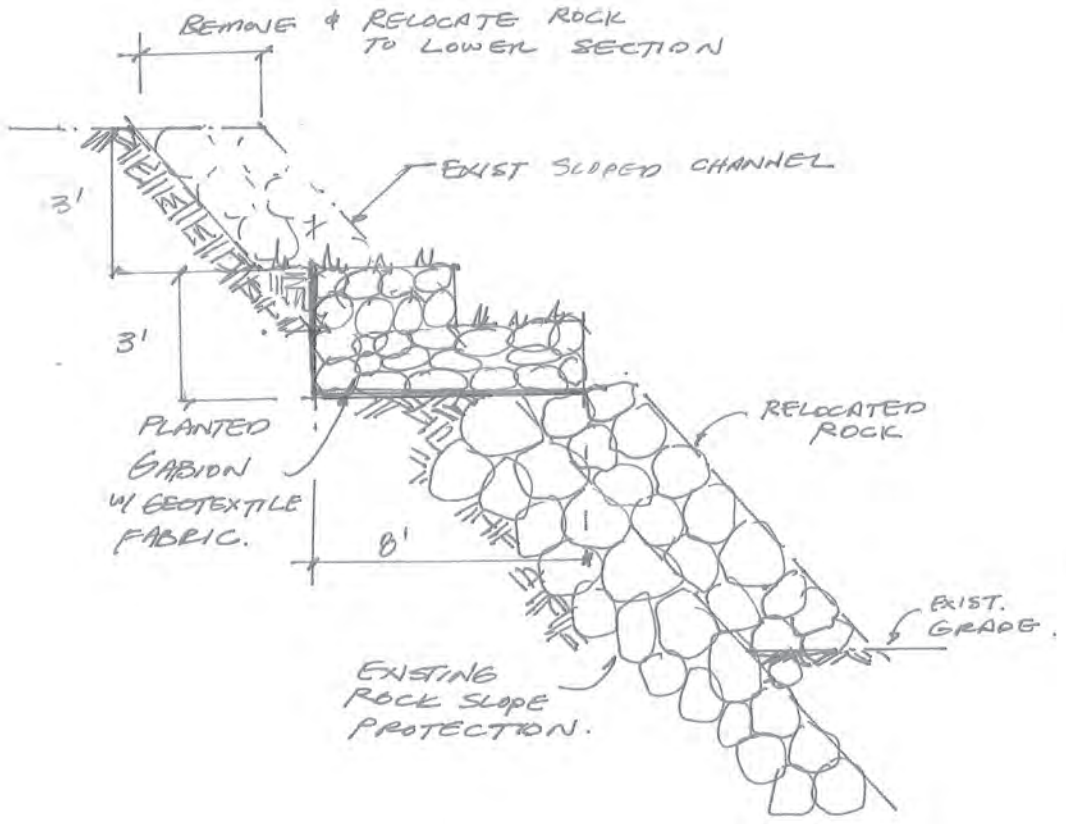
JOB TAHQUITZ CREEK
SHEET NO. 3 OF 3
CALCULATED BY BRM DATE 11.18.05
CHECKED BY DATE
SCALE NONE



G TYPICAL SECTION -

BENCHED TERRACE

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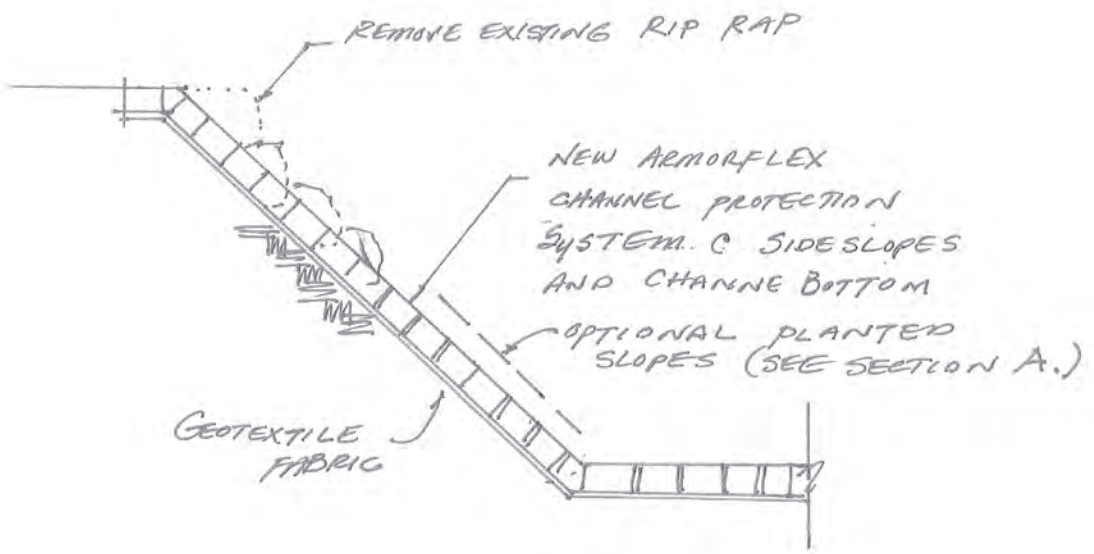
JOB TAHQUITZ CREEK 20-101032
SHEET NO: 1 OF 1
CALCULATED BY BRM DATE 1/5/09
CHECKED BY DATE
SCALE



H ARMORFLEX TYPICAL SECTION

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JOB TAHQUITZ CREEK 20-101032
SHEET NO. 1 OF 1
CALCULATED BY BRM DATE 1-18-09
CHECKED BY _____ DATE _____
SCALE _____

Construction Cost Estimates: Based on SF exposed area.

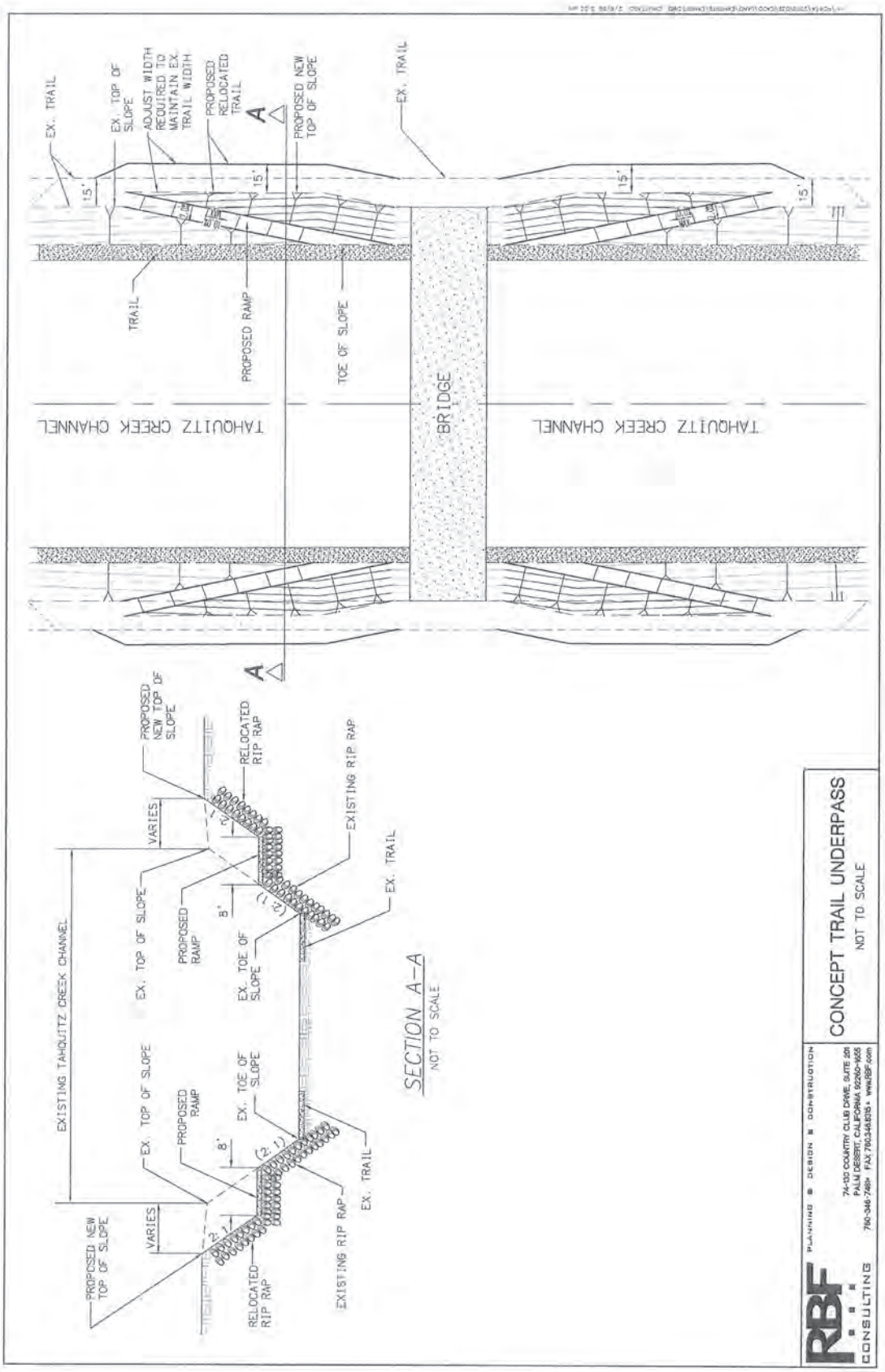
Remove ungrouted rip rap
- Slopes = $2.80 / SF
- Channel Bottom = $1.70 / SF

Remove Concrete Trail (6" thk) = $3.00/SF.

New Soil Cement Trail (18" thk) = $ 5.50 / SF

Armoflex w/ Geotextile (installed) = $ 18./ SF.

Compacted fill (8" thk) = $4.60 / SF
Hyroseed mix (installed) = $ 0.10 / SF
Irrigation for establishment = $2.10 / SF.


EX. TRAIL
EX. TOP OF SLOPE
ADJUST WIDTH REQUIRED TO MAINTAIN EX. TRAIL WIDTH
PROPOSED RELOCATED TRAIL
PROPOSED NEW TOP OF SLOPE
EX. TRAIL
15'
TRAIL
PROPOSED RAMP
TOE OF SLOPE
TAHQUITZ CREEK CHANNEL
BRIDGE
TAHQUITZ CREEK CHANNEL
A
A
PROPOSED NEW TOP OF SLOPE
RELOCATED RIP RAP
EXISTING RIP RAP
EX. TRAIL
VARIES
EX. TOP OF SLOPE
PROPOSED RAMP
8'
(1:2)
EX. TOE OF SLOPE
EXISTING TAHQUITZ CREEK CHANNEL
EX. TOP OF SLOPE
PROPOSED RAMP
8'
(2:1)
EX. TOE OF SLOPE
EX. TRAIL
PROPOSED NEW TOP OF SLOPE
VARIES
2'
1'
RELOCATED RIP RAP
EXISTING RIP RAP
SECTION A-A
NOT TO SCALE
RBF CONSULTING
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PALM DESERT, CALIFORNIA 92260-1655
760-346-7489 • FAX 760-346-8235 • www.RBF.com
CONCEPT TRAIL UNDERPASS
NOT TO SCALE

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JOB _____
SHEET NO. _____ OF _____
CALCULATED BY _____ DATE _____
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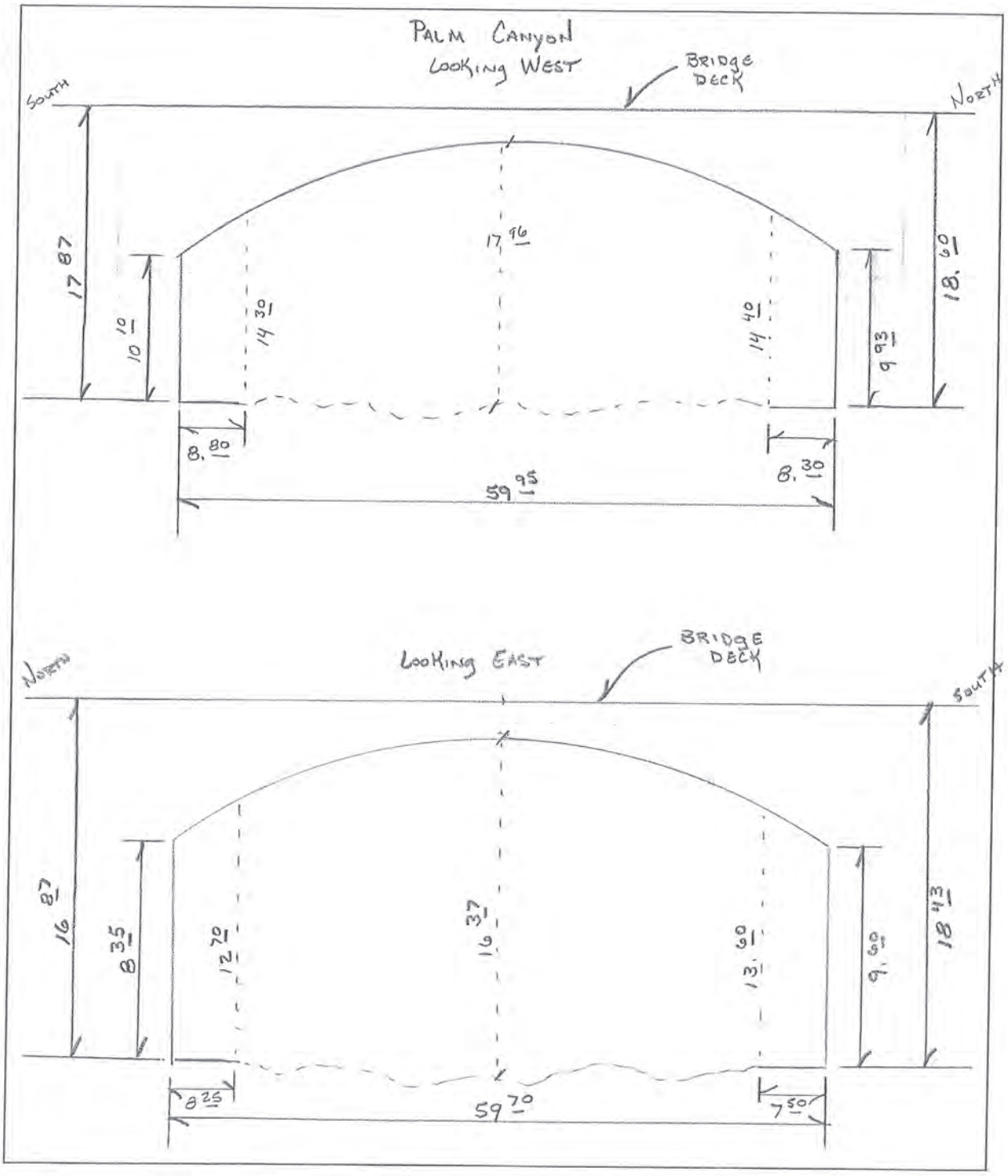
SCALE _____



2 OF 2

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JOB
SHEET NO. OF
CALCULATED BY DATE
CHECKED BY DATE
SCALE NTS

CAMINO REAL PED BRIDGE
LOOKING EAST