Wildcat Creek Trail
Feasibility/Conceptual Engineering
and Biological Assessment Study
Final Report

For:
East Bay Regional Park District

By:
DKS Associates
ALTA Planning + Design
Donaldson Associates
And
Environmental Collaborative

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Executive Summary

A feasibility/conceptual engineering and biological assessment study was performed for the East Bay Regional Park District (EBRPD) in order to evaluate trail-crossing alternatives of the Wildcat Creek Regional Trail at the Richmond Parkway, in unincorporated Contra Costa County in an area known as North Richmond. The purpose of the study is to provide project stakeholders, including EBRPD, Contra Costa County, and the City of Richmond, sufficient conceptual information to develop a preferred trail-crossing alternative of the Richmond Parkway.

In the early 1990’s, a trail undercrossing was built to provide pedestrian travel under the Richmond Parkway. The facility included a floodwall separating the trail from Wildcat Creek and a pump station and drainage system to discharge stream flows that overtopped the wall. After several years of operation, the pumps failed largely due to the discharge line being inundated with silt. Over time, the sediment from the creek flows breaching the wall collected leaving significant deposits on the trail. Storm water was trapped behind the wall which rendered the trail impassable, resulting in its closure. In order to provide trail users improved accessibility across Richmond Parkway, EBRPD determined that a feasibility study was needed to evaluate alternative concepts for a trail crossing of the Richmond Parkway.

The study evaluates three distinct solutions, 1). Redesign of the existing trail undercrossing that runs parallel to Wildcat Creek, 2). Construction of a new trail bridge overcrossing of the Richmond Parkway and, 3). Implementation of a 0.6-mile multi-use trail that would extend along both sides of Richmond Parkway between Wildcat Creek and the signalized intersection of Pittsburg Avenue.

Rehabilitation of the existing undercrossing is recommended as the most feasible alternative. This recommendation requires modification to the existing facilities, with the implementation of an improved maintenance plan for the trail undercrossing as well as the creek bed. In recognition of the findings that creek sediment deposition has caused a build-up in the elevation of the creek bed causing continued inundation of the trail, the Contra Costa County Flood Control and Water Conservation District (FCD) is agreeable to evaluating desilting operations along the trail wall on the creek side on a more regular basis. In turn, this will assist EBRPD in minimizing the length of time of trail closures. Temporary or seasonal trail closures at the undercrossing location from some storm events may still need to be implemented.

The basis for the selection of this alternative is that it is feasible in the short term, makes best use of the existing facilities, has no impact on the accessibility for creek maintenance, and improves the water quality of the discharge from the pump station.
Section 1: Project Alternatives

Introduction

Alternatives for the Wildcat Creek Trail Crossing of the Richmond Parkway

The study area is located in unincorporated Contra Costa County (County) and is part of the North Richmond Redevelopment Area (RDA) established in 1987, and managed by the County Redevelopment Agency (Figure 1.0). The 900-acre RDA includes lands beyond Wildcat Creek to the south to the City of Richmond boundary, just beyond San Pablo Creek and Parr Blvd. to the City of Richmond boundary to the north, west of the Richmond Parkway, and east to the Union Pacific Railroad alignment. Some of the General Plan land use designations of light and heavy industrial in the project area are currently undergoing conversion to residential land uses. Currently, the East Bay Regional Park District (EBRPD) operates and maintains 1.2 miles of paved, multi-use Wildcat Creek Regional Trail on the north bank of Wildcat Creek, between Giaramita Street and the observation deck overlooking Wildcat Marsh and San Pablo Bay, just west of the Wildcat Creek staging area.

Regional trails provide pedestrian and bicyclists recreational and non-motorized transportation corridors that link residential areas, schools, businesses, transportation facilities, parklands, and local connector trails. One-quarter mile east of the Richmond Parkway, the Wildcat Creek Trail connects directly to the Verde Elementary School and residential cross streets in North Richmond. In the project area, a connection to the Wildcat Creek Trail will be provided from a future residential subdivision (Nove by Signature Properties) just east of the Parkway and north of the trail. The provision of a safe trail crossing of the Richmond Parkway would improve access for all trail users, including students and local residents, to the Wildcat Creek Trail and to both existing and future segments of the San Francisco (SF) Bay Trail.

Existing SF Bay Trail in the project area is located along the west side of Richmond Parkway. In order to provide an improved trail alignment, which will bring trail users closer to the bay’s shoreline features and away from a busy roadway, a new parallel segment of the SF Bay Trail on the West County Wastewater District (WCWD) property is currently undergoing environmental review and engineering design by EBRPD. This alignment will be approximately 1.1 miles in length and will extend north from the viewpoint at the end of the Wildcat Creek Regional Trail, along the Wildcat Marsh side of the WCWD property to the West County Landfill entrance. From this location, the trail will extend as a spur trail around the Landfill to the west. To the east it will follow the south bank of San Pablo Creek to the existing SF Bay Trail along the Richmond Parkway, approximately 500 feet south of Parr Blvd.
Local trail connections, which utilize the existing signalized intersections of Gertrude and Pittsburg Avenues to cross the Richmond Parkway, could link to both the Wildcat Creek Regional Trail and the SF Bay Trail.

The North Richmond Municipal Advisory Committee (MAC) facilitates community input for this area. The Wildcat–San Pablo Creeks Watershed Council is recognized by the County Board of Supervisors as the forum for consensus planning among various agencies, citizen’s groups, and individuals who seek solutions to technical, management, monitoring, and funding issues for the Wildcat Creek and San Pablo Creek watersheds.

**The Richmond Parkway**

At one time, the County owned the original right of way of the Richmond Bypass, which was the predecessor to the Richmond Parkway. The City of Richmond subsequently purchased the right of way and currently it is owned by the City in fee. Today, the County has responsibility for maintenance, drainage, and liability of the Parkway within unincorporated North Richmond. The Richmond Parkway has a 110-foot wide right of way in the vicinity of the study area. The City of Richmond still retains maintenance responsibility for the strips of land beyond the curbs (and all the landscaping), which may be turned over to County jurisdiction in the future. The City of Richmond is also studying the feasibility of dedicating the Richmond Parkway to Caltrans in the future. Resolution of this ownership issue will likely need to be resolved prior to implementing a trail bridge overcrossing alternative, if selected.

The Richmond Parkway crosses Wildcat Creek with a dual divided bridge structure. The bridge structure spans the creek and trail that runs parallel to the creek. On both sides of the Richmond Parkway, just north of the Wildcat Creek Bridge crossing, there are driveway accesses. Along the easterly side of the Richmond Parkway there is an existing gate and chain link security fence that restricts access for maintenance only to the FCD property. The west side driveway provides access for maintenance, as well as for the public, to the staging (parking) area for the Wildcat Creek Trail. Any future work on the creek or its banks would require an encroachment permit from FCD.

**Wildcat Creek Trail**

Wildcat Creek is a naturalized creek, which also functions as a flood control channel under management by the County Flood Control and Water Conservation District (FCD). EBRPD and FCD entered into an agreement in 1990 for a recreational trail easement for the Wildcat Creek Trail/Flood Control Project that granted a perpetual, non-exclusive easement to EBRPD for use in the construction, maintenance, and operation of a recreational trail. The 12-foot wide trail also functions as the FCD service road for maintenance activities on Wildcat Creek. Creek maintenance is the responsibility of FCD.
Originally built in 1985, the Wildcat Creek flood control channel was designed with sloughs on each side. Subsequently a trail undercrossing of the Richmond Parkway was built next to the channel. The facility included a wall to isolate some of the creek floodwaters from inundating the trail and a pump station to remove excess water that overtopped the wall protecting the trail. The improvements were permitted by the Army Corps of Engineers and constructed in the early 1990’s. Unfortunately the pump station failed after two years, which resulted in the collection of significant silt on the trail that settled out from the floodwaters. The cause of the pump station failure cannot be documented; however, one plausible reason is that the discharge line could have become clogged with silt, or the end of the discharge line became submerged in silt, resulting in pump failure. Once the pumps failed, any water that overtopped the wall would settle out the silt onto the trail. The water trapped behind the wall would seep through the deteriorated expansion joints in the wall until it reached the level of the silt on the creek side of the wall. Since the pump station is below the trail, silt would engulf the pump station. Over time, the level of silt within the creek increased the elevation of the creek bed reducing the water carrying capacity of the creek. This resulted in more frequent overtopping of the trail wall with storm water and an increase in the quantity of the waterborne silt being deposited on the trail. In effect, lesser intense storms overtopped the channel/trail wall resulting in more frequent deposits on the trail. The entrapment of stormwater on the trail also rendered the trail impassable, resulting in its closure.

The first year that FCD removed silt from the creek’s bed was 2006. Prior to this silt removal, the silt build up of the creek bed had reached the top of the trail wall to elevation 8.25. According to FCD, the criterion for triggering creek bed sediment removal in the creek channel is met when 50% of the freeboard capacity is lost. The original design of the channel provides for 3-foot of freeboard between the design 100-year storm level elevation (EL) 11 and the top of bank (EL 14). When the top of the 100-year water surface to the top of the banks goes from 3 feet to less than 1.5 feet, a silt removal project is planned. According to FCD, silt deposits in the creek under the Parkway Bridge are less than in other areas. FCD is agreeable to considering increased desilting operations of the creek bed along the trail wall on a more regular basis. FCD would need to further evaluate the elevation of the creek bed and how it relates to the inundation frequency of silt laden floodwaters into the trail area, and develop a plan with EBRPD to determine additional maintenance intervals for desilting in order to minimize trail closures.

Current regulations of the San Francisco Regional Water Quality Control Board (RWQCB), which regulates creek discharges from point sources, require clarifying stormwater by installation of silt control devices. The devices remove the silt so that there is no discharge of silt back into the creek from the silt that is deposited on the trail. The RWQCB is also encouraging more sustainable design for the Wildcat Creek study area, without perpetual cycles of desilting causing disturbance over large areas, which may result in potential impacts on the environment, habitat for sensitive species, and water quality.

Complicating the needs for any ongoing silt removal in the creek channel by FCD, or on the trail by EBRPD, are the financial constraints on these maintenance activities for both agencies. In order for FCD to consider more frequent desilting, FCD would require additional funding.
sources for both the construction and environmental permitting costs. In addition, EBRPD would also need to identify a funding mechanism for maintenance of the trail undercrossing.

This study was initiated to determine the feasibility, conceptual design, and biological considerations of rehabilitating the existing trail undercrossing, or developing alternative Wildcat Creek Trail crossings of the Richmond Parkway, in order to minimize trail closures for the public and to provide information to the stakeholders in order to determine a preferred alternative for further evaluation, design, construction, operation, and maintenance.

The following sections of this Study provide conceptual descriptions of three trail crossing alternatives including modifications of the existing trail undercrossing, a grade separated bridge overcrossing structure, and an at-grade street option. Sections also evaluate safety and security, maintenance needs and costs, preliminary environmental screening of potential environmental impacts from the alternatives, design standards and best practices, cost estimates, and possible sources of funding for capital construction and long term maintenance, and final recommendations.
Crossing Alternatives

Alternative 1 - Trail Undercrossing of the Richmond Parkway

Existing Conditions

The existing trail undercrossing of the Richmond Parkway is separated from Wildcat Creek by a wall that is intended to prevent most creek flows from entering the trail area. The FCD last removed deposits of silt from upstream sources in 2006. The FCD schedule for creek maintenance has been dependent primarily on silt build up, permitting, and available funding. The interval of occurrence of silt deposit on the trail is variable and dependent upon several conditions, namely the intensity of the flows in the creek caused by a storm event; the existing elevation of the creek bed, level of silt at the Richmond Parkway stream crossing, and the available cross sectional area for the stream to flow beneath the bridge.

The FCD criterion for the silt removal is triggered when the level of silt deposited in the stream decreases the depth of freeboard between the 100-year flood level of the stream from 3-feet to 1-1/2-feet. The original design for the creek channel is to allow the floodwater to reach 11-feet for the 100-year interval storm. This depth is 2-3/4 – feet above the height of the wall separating the creek from the trail. Therefore, the original design of the wall was not intended to control all flows, particularly heavy winter storm flows, from inundating the trail with storm water and the resultant silt that inevitably is carried by these high flows.

The Creek continues to receive a significant amount of silt from upstream areas. The wall is set at a fixed elevation of 8.25 feet and consists of several segments, which are separated by expansion joints; however, the joint material has deteriorated allowing stream flows to enter and seep into the trail area under the bridge. Under design conditions, the 100-year flood level of the stream is approximately elevation 11. Therefore, the height of the wall is ample to keep stream flow from inundating the trail during most average storm events. Overtopping is likely to occur during larger storm events. Overtopping is a function of the intensity of the storm and the amount of existing silt in the stream corridor. The amount and frequency of silt deposited on the trail varies greatly with the intensity of the storm flows and the level of silt in the creek in relation to the top of the wall separating the creek from the trail. Since the creek is not a flowing stream and the downstream area is currently inundated with silt, it is not easily definable as to what the annual interval of silt build up is nor the frequency for inundation of silt upon the trail caused by storm season events.

Under current conditions, when the stream level rises above the lowest trail level (EL 5); the flow, which includes silt, inundates the portion of the trail beneath the bridge. The trail also collects rainwater from the higher portions of the trail. The longitudinal profile of the existing undercrossing is illustrated in Figure 1.1.
To drain the impounded water, a duplex pumping station was constructed and located on the western side of Richmond Parkway beneath the trail. The discharge for the pump is located in a storm drainage outfall located on the westerly side in the Wildcat Creek staging area. The pump system was constructed in 1993 and was functional for approximately two years. Currently, the pump station and the trail are inundated by silt.

Several design concepts were conceived to improve the existing undercrossing and reduce the current drainage and siltation problems and improve the reliability of public access. Design concept (1A) is to increase the wall height and improve the water retention capability of the wall; design concept (1B) is to reconstruct the pump station and modify the discharge line to flow to a new stilling device to trap the silt, and design concept (1C) requires minimal capital improvements, allows the waters to continue to inundate the trail during storm events, modifies the pump station and provides a wet well with drains to discharge flood water without mechanical means, but is more maintenance intensive.

Under existing conditions, all the undercrossing design concepts could result in temporary or seasonal trail closures under the Parkway due to annual storm season flooding and silt build up on the trail. In order to reduce and minimize trail closures, the undercrossing option, if selected, EBRPD would need a corresponding maintenance and funding plan with FCD that includes changing the FCD trigger mechanism for stream maintenance adjacent to the trail from the current threshold relating to the 100 year storm to one that relates to the inundation frequency of silt laden floodwaters into the trail area. A stream hydraulic study would have to be performed that would model the stream for a variety of storm events and historical stream flow data would be utilized to assess the optimal stream carrying capacity (intensity of storm). This analysis would enable the agency stakeholders to establish better maintenance intervals aimed at
providing year around trail access. If the creek maintenance will not be done frequently, or at all, spillover onto the trail will continue, increasing the need for maintenance of the trail, which is not currently financially feasible for EBRPD.

As examples of silt build up in the channel, photographs taken prior to 2003 have indicated that the silt build up was as high as elevation 8.25-feet on the streamside of the wall. The following pictures depict the condition that existed in 2002 when the silt on the streamside of the wall extended to nearly the top of the wall. Pictures were taken on the west side of the Parkway Bridge.

**Design 1A - Increase Height of Retaining Wall**

Raising the height of the wall presents some problems with the stormwater carrying capacity of the bridge opening. The bridge crossing the creek has three spans of approximately 24-feet in width each. The height of the bridge soffit is approximately elevation 11.75-feet at the upstream entrance to the structure. The bridge supports include a series of structural columns and there is a retaining wall on the northerly third segment at the trail that extends up to elevation 8.25-feet.
Silt deposits exist in the creek with the base elevation of the creek being at roughly elevation 5 with the stream channel being about elevation 2.

A schematic cross section of the stream and trail is illustrated in Figure 1.2. The size of the opening of the existing bridge cross-section area is approximately 500 square feet. By increasing the wall height above the flood level of the creek, the cross section area of the bridge is reduced, which in turn reduces the flood handling capacity by more than 10%. Increasing the floodwall is not feasible because it diminishes the storm carrying capacity of the creek at the crossing. Increasing the floodwall height could jeopardize the bridge structure and potentially result in a catastrophic failure of the bridge. Increasing the wall height would also require analysis of the wall section since the increased water pressure caused by the increase wall height may seriously overtax the integrity of the wall that was designed to support loads to the current height. The wall may have to be removed and reconstructed. Therefore, this option is not recommended for further consideration.

![FIGURE 1.2 CROSS-SECTION OF THE STREAM AND TRAIL](image-url)
Design 1B - Leave Wall at Present Elevation, add Desilting Structure and Reconstruct Pump Station Equipment, Increase Creek and Trail Maintenance and Maintenance Funding

Another option would be to modify the facility to trap stones and debris from fouling the pumps while allowing the silt laden water to be pumped to a new siltation basin which would be placed at the end of the pump station discharge line. The basin would have sufficient capacity to address one year of heavy rain season flows. The basin would be set above the 100 year flood zone instead of discharging it to the existing outfall ditch.

The current design provides for two drainage troughs located at the low points along the trail beneath the bridge. These drainage troughs would be fitted with improved grating so that the stormwater flows to the pump station would trap stones and other deleterious material before it reached the pumps. The pump stations would be fully reconditioned. A new silt basin would be constructed at the end of the discharge line. The purpose of the silt basin would be to provide a location for the deposit of silt picked up by maintenance of the trail and drainage basins. During a storm event, the basin would also act as a treatment device in accordance with current regional water quality policy. The wall would be rehabilitated so that the joints would be resealed so that seepage would not occur.

By placing the outfall and silt basin beyond the 100-year flood level, the likelihood of the outfall being submerged by silt is virtually eliminated, as long as the silt collection basin is maintained. Periodic maintenance of the silt collection devices and the pump station in general, would be essential to the longevity of the system to keep the trail clear of silt. Temporary or seasonal trail closures still may occur with this option. It is also recommended that swing gates be provided on either side of the bridge to regulate access to the undercrossing when the portion of the trail beneath the bridge is closed for public use. Soffit lighting in the undercrossing would also be included with this option.

Design 1B would require that maintenance funding sources be identified to develop and implement a new maintenance plan to address more frequent creek bed desilting maintenance adjacent to the trail by FCD and trail maintenance by EBRPD. Figure 1.3 depicts a schematic plan and profile that identifies the siltation basin system in relation to the trail in plan and elevation.
FIGURE 1.3 ALTERNATIVE 1-B

NEW SILT TRAP AT OUTFALL

DEBRIS GRATE

REBUILD EXISTING PUMP STA

3' FREEBOARD

TOP OF BANK OF CREEK

NEW SILT TRAP AT OUTFALL

FIGURE 1.3 ALTERNATIVE 1-B
Design 1C - Minimal Capital Improvements, Increase Creek and Trail Maintenance, and Maintenance Funding

A low capital cost, but higher maintenance concept would be to allow the creek waters to continue to inundate the trail during major storm events. In this scenario, normal stormwater flows are handled without mechanical means. If there were a major storm event, which causes silt and stormwater to enter the trail area, the seepage at the expansion joints would discharge most, if not all of the water. However, as silt continues to build up against the wall separating the creek and trail, the incidence of silt-laden storm water deposits onto the portion of the trail would be more frequent and eventually there would be no outlet for the storm water. The silt would have to be cleaned up by mechanical means of a sweeper and centrifugal mud pumps would have be brought to the site to pump out the station when needed and disposed of according to the requirements of the San Francisco Bay Regional Water Quality Control Board. Temporary or seasonal trail closures would be significantly higher with this concept than with Design 1B.

As with Design1B, maintenance funding sources must be identified to develop and implement a new maintenance plan to address more frequent creek desilting maintenance adjacent to the trail by FCD and trail maintenance by EBRPD. Figure 1.4 depicts elimination of the pumps from the pump station.

![FIGURE 1.4 MODIFIED WET WELL DETAIL](image-url)

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Recommend Design 1B - Leave Wall at Present Elevation, add Desilting Structure and Reconstruct Pump Station Equipment, Increase Stream and Trail Maintenance and Maintenance Funding

The recommended design for the trail undercrossing alternative, if selected, is 1B, whereby the existing drainage pump station is reconstructed and a water desilting device is introduced in a separate facility, allowing the heavy particulate matter to settle out. Floodwall joints would be repaired and soffit lights would be added. This is a low cost alternative that can be effective for the majority of the time. However, it would require maintenance after a significant storm event, much like the existing system does. An important element of this solution is having a maintenance plan in effect for the pump station. Lack of maintenance of the silt collection devices will cause mud to enter the wet well. Heavy mud could seize the discharge pipe and ultimately cause failure of the pumps. In this event, pump out of the station would be with a portable pump system that is not subject to inundation by mud of the stream and would be more effective than the existing design. Maintenance costs would be tied to frequency of major storm events. Complicating the silt maintenance requirements and costs are that the FCD is responsible for removing excess silt from the stream corridor while EBRPD would be responsible for removing silt from the trail and maintenance of the pump station. These maintenance activities will require the two agencies to develop a maintenance plan and identify maintenance funding.

Alternate 2 – Trail Bridge Overcrossing Concepts

This study evaluated a conceptual design of a trail bridge overcrossing (2A), with variations on bridge landings based on available right of way and adjacent land uses on both sides of the Richmond Parkway. The design evaluated included open bridge abutments and 10 and 12-foot bridge widths.

Existing conditions on the east side of the Parkway include gated access to the trail that is used primarily by maintenance vehicles. On the west side, there is a public staging area served by a driveway into two parking lots via a lockable gate. The FCD requires ample room to perform stream maintenance operations on both sides of the Parkway. The existing top of bank on the stream side is the limit of regrading for any area closer to the stream. Therefore, the alignment of the roadway for the bridge approach must be set to provide ample clearance for stream maintenance and for accommodating service and security vehicles.
Access to the trail on the westerly side of Richmond Parkway is from the staging area. The roadway elevation at the creek crossing is at elevation 14. The trail elevation in the vicinity of the roadway varies and is approximately elevation 13.

The City of Richmond is studying the feasibility of dedicating the Richmond Parkway to Caltrans. Therefore, bridge clearance over the roadway must meet Caltrans requirements in order to give sufficient flexibility in the future for Caltrans to take responsibility of the roadway. Current design criteria include 17.5 feet of vertical clearance. Therefore, the soffit of the bridge deck should not be any lower than elevation 30.5-feet.

The design criteria for a bridge structure includes light-duty maintenance and public safety vehicle access for the FCD and EBRPD. Additional criteria for the bridge and its landings are that it must be designed to meet the Americans with Disabilities Act (ADA) requirements. ADA requirements stipulate that a ramp can extend a slope of 5% without landings and without handrails. To achieve sufficient clearance for the bridge structure over Richmond Parkway, a ramp of approximately 370-feet is needed. See Figure 1.5 for profile.

![Figure 1.5 Proposed Profile of Richmond Parkway Overcrossing](image)

EBRPD has had excellent experience with Cor-Ten steel bridge structures, which would be recommended for a bridge overcrossing of the Richmond Parkway. The following is a sample photo of a steel bridge located in Kane County, Illinois.
Ideally, the best type of crossing for the span over the Richmond Parkway is one that keeps the column bents as far from the motoring traffic as possible and one that maintains an open atmosphere which is user friendly and safe for trail users.

The horizontal alignment for pre-manufactured bridges should be straight if possible for economic reasons. The alignment of the existing trail is favorable to having an alignment that has straight segments with short curves (Figure 1.5). The span over the Richmond Parkway would extend a distance of approximately 160-feet maximum. The horizontal clearance from the roadway to the bent structure would be a minimum of 35-feet. This complies with Caltrans horizontal clearance requirements. It is assumed that there would be several intermediate bents with spans of 190-feet for each of the bridge approaches, for a total of 900 feet of bridge.

FCD maintenance access and recreational trail use are the primary functions of the trail. Therefore, any aerial structure that would be constructed has to provide ample room adjacent to the bridge structure for periodic stream maintenance equipment. FCD advises that on the east side of the Parkway, from the hinge point of the levee embankment, no retaining wall or embankment over two feet high can be placed within 20-feet. Bridge columns or bents can be located somewhat closer than 18-feet to the hinge point but will be evaluated on a case by case basis. The toe of slope of a fill embankment cannot be placed within 18-feet of the hinge point of the levee. Any portion of the bridge structure above the column bent cannot be any lower than 14-feet, or if it is lower than 14-feet, closer than 20-feet to the hinge point of the levee. In order to provide access for both recreational trail and FCD maintenance vehicles, a 21’ X 21’ square paved area will be needed. See Figure 1.6 for plan and section of typical bridge landing details.
In order to meet the criteria stated in the preceding paragraph, the alignment of a bridge would have to extend north beyond the limit of the existing land under the control of the FCD and
EBRPD, which is infeasible. Adjacent land uses include a future residential subdivision on the north side of the Wildcat Creek Trail in the RDA approved by the Contra Costa County Development Department in 2007. This project, known as Nove by Signature Properties, will be adjacent to the Richmond Parkway and the Wildcat Creek Regional Trail. The County Redevelopment Agency has indicated that no part of the grade separated trail improvement can encroach onto the Nove project site. Therefore, the bridge layout needs to be designed to be solely located within the EBRPD easement and to the maximum extent, outside of the 100-year flood level of the Wildcat Creek.

The 2A bridge design would provide for open abutment architecture. The abutments would be located at the point of transition to the trail on either side of the Richmond Parkway with intermediate bents that reduce each span, which is less expensive. A bridge crossing would require a protective, yet transparent screen wall to provide for the public’s safety and visibility.

The bridge section should maintain a minimum width of ten feet clearance between bridge rails, and the rails should be sufficiently high for safety purposes.

Alternative bridge design widths were also evaluated - ten feet and twelve feet. Due to the long run of the bridge, it is recommended that the width be held at twelve feet wide to provide some refuge area in the event that a security vehicle were to enter the bridge. Costs comparisons of the two widths are available in Section 7. The need for security vehicle access also increases the constraints on bridge type.

A berm lines both sides of the creek to contain flood waters. The trail occupies one of the berms. The top of bank of this berm is located approximately 21-feet from the right of way line for the FCD. Therefore placement of a bridge structure will occupy approximately half of the width of the berm.
The access roadway for service vehicles would extend parallel to the elevated trail. For FCD to remove silt in the narrower portion of berm, smaller equipment, than they used in their last desiltation project in 2006, could be employed. Silt removal from the creek would likely take more time and therefore the cost of removal would be higher than existing conditions.

An alternative bridge landing design of a switchback, scissors, or spiral design on the east side of the Parkway was considered infeasible due to the program requirement of providing bridge access for security vehicles.

Also considered, was an east bridge landing design on additional right of way created by the construction of a retaining wall in the floodway to maintain the needed 21-feet of clearance. Construction of the wall would displace some of the stream floodway cross section. Further analysis would be needed to determine whether the modification would adversely impact the flood levels in the stream. Construction of the retaining wall would also require additional environmental assessment to determine whether the construction would cause adverse impacts.
Recommended Design-2A

Summary

The recommended design for a trail bridge overcrossing alternative, if selected, is Design 2A within available right of way which would require FCD to use smaller desilting maintenance equipment than they have used in the past. The open architecture is less intrusive, it affords maximum access and views across the bridge structure, it is not subject to flooding and related safety concerns, and it accommodates maintenance vehicle access.

Alternative 3 - At-Grade Option

The third alternative evaluated is an at-grade option that would divert trail trips from the Creek alignment 3400 feet (.64 miles) total onto, and along, the east side of the Richmond Parkway to the signalized crossing at Pittsburg Avenue. Trail users would then need to return to the staging area of the Wildcat Creek Trail via a segment of existing SF Bay Trail along the west side of the Richmond Parkway.

The challenge for this alternative is to improve the walkway along the easterly side of the Richmond Parkway in a way that encourages the trail user to use the safer facility rather than jump over the obstacles and perform an unsafe mid-block crossing at an uncontrolled area with four lanes of 50+ miles per hour traffic. Contra Costa County, the City of Richmond, and EBRPD, have concurred that formalizing a mid-block crossing of the Richmond Parkway at the Wildcat Creek is infeasible due to safety issues.

The width of the trail is an important element of the design. The Richmond Parkway is a limited access Parkway with access points at signalized intersections and occasional driveways. There are no driveways north of the study area that provide access to private property on either side of the street. However, there are two driveways at Wildcat Creek, one serving the FCD on the east side of the Richmond Parkway, and one serving the EBRPD Wildcat Creek staging area.
Along the easterly side of the Richmond Parkway between Pittsburg Avenue and Wildcat Creek, there is a surface swale that collects the runoff from the existing properties to the east. This drainage channel flows towards the Pittsburg Avenue intersection where an underground drainage system collects the runoff. Currently, the vacant property between Pittsburg Avenue and Wildcat Creek that fronts on the east side of the Richmond Parkway is the site of the future Nove subdivision by Signature Properties. That project will consist of 355 residential dwelling units separated by a sound wall that would extend along the right of way line. The distance between the right of way line and the curb line is 20-feet. The Richmond Parkway has a typical cross section which provides for two travel lanes and an 8-foot shoulder with a 12-feet median. The total right of way width is 132-feet. This study assumes that the project would be appropriately designed with detention facilities that would lie outside of the right of way of the Richmond Parkway and that storm water would not affect the capacity of the existing swale system.

There is an existing asphalt paved walkway nine-feet in width along the west side that extends from the Wildcat Creek staging area to Pittsburg Avenue, which is considered SF Bay Trail, constructed and maintained by the City of Richmond. At the intersection of Pittsburg Avenue and Richmond Parkway, there is an existing traffic signal with pedestrian actuated buttons and pedestrian signal heads. The Contra Costa County Traffic Engineering Department has considered this option and is concerned that although a signalized crossing exists, the public may try to cross the median at an unsafe mid-block location rather than be forced to divert a ½ mile out of their travelway.

Non-compliant ADA curb ramps exist at the corners (see photograph next page). The street segment in the study area is illuminated with cobra head type lamps. Most of the lighting is located in the median, except at the intersections where it is located on the side of the street.
The recommended design attributes for the at-grade alternative, if selected, include:

1. Provide a minimum 8-foot to maximum 10-foot wide multi-use trail along both sides of Richmond Parkway from Wildcat Creek to Pittsburg Avenue.
2. Improve the curb ramps to current ADA requirements.
3. Install a median fence extending from the existing crash cushions at the Wildcat Creek/Richmond Parkway road bridge to a distance of approximately 200-feet north of the staging area for Wildcat Creek.
4. Extend a longitudinal fence or barrier at least 18-inches behind the face of curb for the extent of the multi-use trail along both sides of Richmond Parkway.
5. Provide two feet of lateral clearance from the edge of the multi-use trail to vertical obstructions.
6. The new multi-use trail would displace an existing swale that extends along the easterly side of Richmond Parkway which ties into an existing storm drainage system at the intersection of Richmond Parkway and Pittsburg Avenue. Provide new drainage improvement or relocate the existing drainage swale of sufficient size to accommodate the existing and future stormwater flows for the existing tributary area. Maintain a shoulder of two feet from the edge of the trail to the hinge point for the swale.

The following cross section and plan view depicts the improvements for Alternative 3
FIGURE 1.8 AT-GRADE ALTERNATIVE CROSS SECTIONS

Feasibility/Conceptual Engineering and Biological Assessment Study

March 30, 2008

Final Report
Section 2: Security and Safety Evaluation

Security

Security is an issue for any new trail crossing project. A study of 372 trails nationwide\(^1\) showed that trails consistently have the same security issues as their surrounding community. In other words, trails in communities with low crime will also have low crime rates. According to Sergeant David Hall of the East Bay Regional Park District Police Department (Park Police), “Public safety crime issues tend to mirror the problems that the municipal and county law enforcement agencies address within their jurisdictions. Under existing population density levels and use patterns, and via a review of current data, the issues that Park Police officers have addressed on the Wildcat Creek Trail range from drug arrests, and numerous contacts with parolees, to basic public order issues.”

As with many urban areas, security and safety concerns about crime will be an issue for some users on the Wildcat Creek Trail. Within a framework of education, design, and enforcement, the Park Police identify issues and problems that interfere with the safe enjoyment of the park system, and proactively take action. This approach has helped the Park Police maintain a relatively crime free system of District parks and trails. Through education, the Park Police are able to educate park users about the issues and problems that occur within the parks, and ways in which they can decrease their chances of becoming crime victims. In addition to education, the Park Police continually work with District planners, Park Rangers, and the community to identify and design the parks and trails in ways that limit opportunities for crime to occur. For example, ensuring proper lighting, educational signage identifying District ordinances, and creating spaces that are conducive to a positive experience, make it difficult for criminal activity to take hold. Park Police combat crime through enforcement, issuing citations, and making arrests as appropriate. By collaboratively working with the community to identify effective methods to combat criminal activity, the Park Police are able to work in partnership with community stakeholders to effectively combat public order issues and criminal activity in the park and trail system.

Security for new crossings can also be evaluated by visibility factors. Facilities that are visible and accessible from well-used public roadways have the lowest security issues. Facilities that are not visible from well-used public roads, that require users to enter the facility without being able to see all the way through the facility, that have features that people can hide behind, that are not well-lit by natural or artificial lighting, or not easily accessible to emergency vehicles, pose security issues. If design standards don’t provide

\(^2\) Rails-to-Trails Conservancy: Rail Trails & safe Communities: Experience on 372 Trails, 1998
maximum safety and security for trail users, more police efforts may be needed via education and enforcement.

EBRPD Park Police currently patrol the Wildcat Creek Trail and most likely would patrol a rehabilitated trail undercrossing or a new trail overcrossing of the Richmond Parkway. The roadways in the study area in North Richmond are served by the Contra Costa County Sheriff’s Department (510-262-4203) operating out of the Bay Station substation. Park Police have mutual aid agreements with both the Contra Costa County Sheriff’s Department and the City of Richmond Police Department for emergency response in the Study area. Fire protection and primary emergency medical response is provided by the Contra Costa County Fire District (925-930-5500). Supplemental fire protection would also be provided by EBRPD and the City of Richmond.

The three alternatives pose different security issues for trail users, Park Police, and public agency operations and maintenance personnel.

**Alternative 1: Undercrossing**

To assure a safer experience, it is the opinion of Sergeant Hall that the undercrossing would require regular patrol checks to address any criminal activity. Parts of the undercrossing would not be visible from Richmond Parkway, but would be accessible from the Wildcat Creek Trail Staging Area and the trail on either side of the undercrossing. Artificial lighting would need to be provided during hours of darkness to enhance visibility for trail users and Park Police. EBRPD regional trails are open to the public from 5:00 a.m. to 10:00 p.m. The Wildcat Creek Trail would be appropriately signed with EBRPD rules, regulations, and curfews under Ordinance 38 (www.ebparks.org/activities/ord38) to better ensure that illegal activity does not occur in the undercrossing. Raising the existing trail wall elevation would create a tunnel feeling for the user and would further deteriorate surveillance visibility.

**Alternative 2: Bridge Overcrossing**

The bridge overcrossing alternative with transparent barrier fencing (assuming the Park Police are delegated jurisdiction over a bridge), would provide greater visibility for trail users and Police from the street, especially where it crosses the Richmond Parkway. Sufficient lighting would need to be provided during hours of darkness to view activity on the bridge. The bridge should have fences that are of sufficient height to limit the possibility of people climbing over or jumping from the bridge, or tossing items over and should be of sufficient width to safely accommodate a full-size police vehicle and trail users. The Wildcat Creek Trail would be appropriately signed with EBRPD rules, regulations, and curfews under Ordinance 38 to better ensure that illegal activity does not occur on a bridge overcrossing. According to Sgt. Hall, “A bridge crossing would most likely create the least amount of impact on Park Police resources.”
The ramps would not be highly visible, but they would offer essentially the same visibility as currently exists on most of the Trail. The bridge would not be visible for its entire length prior to entering, however it can be designed so there are few, if any, hiding places, and be visible at each approach at least to the mid-span of the structure. Police would also be able to easily view the entire structure from the Richmond Parkway.

**Alternative 3: At-Grade Crossing**

The at-grade crossing alternative, which would utilize the existing SF Bay Trail on both the east and west side of the Richmond Parkway, would most likely remain within the jurisdiction of the local agency, in this case, the County Sheriff's Department, and would not offer any specific security issues that do not already exist on the Wildcat Creek Trail. If the at-grade crossing remains the jurisdiction of the County Sheriff, Sergeant Hall states, “An at-grade crossing would have little to no impact on the resources of Park Police except for the slight impact on the EBRPD Park Police Dispatch Center in case emergency calls for service were transferred or directed to EBRPD.”

**Safety**

Trail user safety for trail crossing projects is defined by conflicts between trail users and automobiles, in this case, the Richmond Parkway, and between the users themselves. Projects that provide separation between trail users and vehicles, and maximize the space available for trail users, offer the greatest safety.

**Alternative 1: Undercrossing**

This alternative would provide a grade separation for trail users, and as such eliminates conflicts with vehicles. However, the reliance on artificial lighting, narrow confines of the undercrossing (nine foot width) and downslopes may result in some potential safety issues between users. In addition, while flooding issues are expected to be addressed in the modification, potential flooding events pose an additional safety issue for users. When the undercrossing is flooded, the trail would be closed by EBRPD until made safe and accessible. Some trail users may likely try to cross the Richmond Parkway at mid-block which is undesirable and dangerous.

**Alternative 2: Bridge Overcrossing**

This alternative would also provide a grade separation for users. However, the vertical change required of trail users is almost twice that of an undercrossing (about 20 feet), which may result in some trail users attempting to try and cross the Richmond Parkway.
at-grade and mid-block and avoid the climb which is considered unsafe. Adequate fencing and signing would need to be provided at the crossing location to discourage this movement. In addition, the gradient (5% and under) of the bridge could result in higher speeds for bicyclists. The bridge should be designed with adequate sight distance where the bridge trail merges with the existing trail to minimize safety issues. Finally, trail users on the Richmond Parkway should be clearly directed to the bridge entry point at the Wildcat Creek staging area to minimize attempts of trail users to cross the Richmond Parkway at-grade and mid-block to continue on their trip.

**Alternative 3: At-Grade Crossing**

The proposed at-grade crossing option would require trail users to divert approximately 3,400 feet (.64 mile) from the regional trail’s alignment to cross at the existing signalized intersection at Pittsburg Avenue. Research on trail crossings include extensive counts, surveys, and safety studies, which have shown that there is considerable resistance by trail users to divert further than 200 feet (400 feet total) out of their line of travel, even if the trips are recreational in nature. Given that the Pittsburg Avenue crossing is eight (8) times further in distance than this limit, it is likely that many trail users would attempt to cross the Richmond Parkway mid-block. Fencing would need to be designed to be vandalism resistant and of sufficient height and length to deter users from crossing the Parkway mid-block. Even with these measures, the fencing could ultimately be vandalized as people seek a more direct crossing. Maintaining trail user safety would then continue to be an issue.
Section 3: Maintenance Needs

The operations and maintenance (O&M) requirements of any and all of the alternatives are important considerations for stakeholders in order to determine a preferred crossing alternative of the Richmond Parkway. Agency standards and current costs of O&M must be evaluated in order to determine impacts on the public agencies that would operate and maintain the new facility.

Operations

Operation activities for the undercrossing and bridge overcrossing alternative concepts under consideration would likely be the responsibility of the EBRPD operations staff who currently manages the Wildcat Creek Trail and staging area. The on-street at-grade trail and crossing would be under the jurisdiction of the City of Richmond as existing SF Bay Trail on the west side of the Parkway, and of new trail on the east side of the Parkway. EBRPD operations in the study area would consist primarily of resource protection, trail patrol interaction with the public, inspection, litter pick-up, and response to calls from the public. The monitoring of trail accidents and incidents is an activity of the Operations staff and includes identifying the primary causes and rectifying any physical deficiencies. Some of these activities occur during actual on-site inspection or as part of routine operation procedures.

Maintenance

Maintenance activities for the undercrossing alternative under consideration would be the responsibility of EBRPD staff, however, the on-street at-grade trail and crossing would be under the jurisdiction of the City of Richmond to include SF Bay Trail on the west side of the Parkway, and new trail on the east side of the Parkway. The maintenance of a bridge overcrossing of the Richmond Parkway has not been determined.

Maintenance for regional trails includes maintenance of trail pavement, signs, garbage cans, fencing, entry structures, weed abatement, graffiti removal, and vegetation management. Regional trail operations and maintenance for these items District-wide is currently estimated at approximately $25,000 per mile per year – as discussed below, these costs for the new portions of the trail may need to be increased. Currently, EBRPD O&M in the study area consists of daily opening and closing of the Wildcat Creek staging area at approximately 8:00 am to 4:00 pm, routine cleaning of the restroom, seasonal pruning, painting, graffiti removal, etc. on as-required basis. The entire trail is driven and necessary maintenance undertaken one day per week. EBRPD staff which is responsible for the Wildcat Creek Trail and staging area has additional O&M duties outside of the study area - at Pt. Pinole Regional Park, Pinole Shores, Lone Tree Point, Selby and Bayfront Park, and on a segment of SF Bay Trail in Hercules.
Unique maintenance requirements for each of the alternatives are discussed below.

**Alternative 1: Undercrossing**

The undercrossing currently has high, on-going maintenance needs and costs due to the annual flooding of Wildcat Creek and the intrusion of floodwaters, silt, and water seepage onto the trail. These high maintenance costs have resulted in the need for the trail to be closed until made safe and accessible. According to FCD, silt deposits in the creek under the Parkway Bridge are less than in other areas. FCD is agreeable to considering increased desilting operations along the trail wall on the creek side on a more regular basis. However, complicating the needs for any ongoing silt removal in the creek channel by FCD, or on the trail by EBRPD, are the financial constraints on these maintenance activities for both agencies. In order for FCD to consider more frequent desilting, FCD would require additional funding sources for both the construction and environmental permitting costs. In addition, EBRPD would also need to identify a funding mechanism for maintenance of the trail undercrossing. If a funding mechanism is found for additional creek maintenance, this may provide added longevity of the pump system and potentially reduce the long-term maintenance costs and minimize the length of trail closures.

**Alternative 2: Bridge Overcrossing**

Jurisdiction for maintenance for a new bridge overcrossing has not been determined. Typically, this type of Cor-Ten steel bridge structure would require maintenance efforts including graffiti removal, sweeping, and light bulb replacement. If the decking is asphalt, a slurry seal is recommended just after construction and then once again every five years. An asphalt overlay would be advised after 15 years of use. If concrete decking is used, maintenance would not typically require any additional surface treatments.

**Alternative 3: At-Grade Crossing**

Currently, the City of Richmond is responsible for the maintenance of the SF Bay Trail segment on the west side of the Parkway – with the at-grade alternative, their responsibility would include both sides of Richmond Parkway (sidewalks, fencing, signing) would need maintenance. Large amounts of dirt, dust and other deleterious material currently ends up on the Parkway year around, which would result in the need for additional labor to maintain cleanliness and safe footing.
Private Property Protection

The undercrossing and the at-grade crossing alternatives would affect adjacent properties in the same manner they do today – there would be no change. However, the overcrossing alternative would be located directly adjacent, and visible to, some of the future subdivision homes on the north side of the creek, and some of the existing new homes on the south side of the creek.

The Wildcat Creek Trail will be accessible from the future development, Nove by Signature Properties, through a planned physical connection onto the trail, and would be considered an amenity for these new neighbors. On the south side of the creek, the existing Bella Flora Homes are not directly accessible from the creek or existing trail, but some homeowners may have a view of a new overcrossing.

Multi-use Trail Repairs & Closure

All trail users on any of the alternatives would need to be managed during construction and periodic maintenance of trail segments that are closed or unavailable to them. EBRPD has standard operating procedures for temporary trail closures. Trail users would be notified of impending closures and given adequate information as to how to proceed.
Section 4: Potential Funding Sources

This feasibility/conceptual engineering and biological assessment study is the first step towards implementation of the preferred crossing alternative. The next steps include environmental review/approvals, permitting, final design, funding, and construction. An important element of this feasibility study is the development of cost estimates, which can then be used to seek funding.

Funding for planning, design, construction, or rehabilitation of the preferred trail crossing can come from a variety of local, state, regional, and federal funding sources. Most of these programs are competitive and involve the completion of extensive applications with clear documentation of the project need, costs, and benefits. Local matches from the operating or owning agency can be used to leverage many of these grants. Ongoing trail maintenance funding however, is not typically provided through competitive grant programs.

While funding program grant amounts, priorities and orientation can change, the following sources are most frequently used to construct new bicycle and pedestrian trail crossings in general order of likelihood:

(a) Proposition 50-California River Parkways Grant Program
(b) Federal Earmark -SAFETEA-LU
(c) Recreational Trails Program (RTP)
(d) Office of Traffic Safety (OTS)
(e) Proposition 84
(f) Regional Bicycle & Pedestrian Program (RBPP)
(g) Contra Costa County Measure J
(h) Potential EBRPD Measure AA Extension for EBRPD projects
(i) Transportation Development Act (TDA)Article 3
(j) Parkland Dedication fees
(k) Bicycle Transportation Account (BTA)
(l) Safe Routes to Schools (SR2S)

The following sources are most frequently used to rehabilitate and restore trail crossings in general order of likelihood. Additional sources listed above may provide some competitive funding as well.

(a) Contra Costa County Measure J
(b) Recreational Trails Program (RTP)
(c) Potential EBRPD Measure AA Extension for EBRPD projects
(d) Proposition 50-California River Parkways Grant Program

A review of different funding sources is below.
Federal Funding Sources

The primary federal source of surface transportation funding – including bicycle and pedestrian facilities – is SAFETEA-LU, the Safe, Accountable, Flexible, and Efficient Transportation Equity Act: A Legacy for Users. SAFETEA-LU is the fourth in a series of Federal transportation funding bills. The $286.5 billion SAFETEA-LU bill, passed in 2005, authorizes federal surface transportation programs for the five-year period between 2005 and 2009.

SAFETEA-LU funding is administered through the State (Caltrans and Resources Agency) and regional planning agencies. Most, but not all, of these funding programs are oriented toward transportation versus recreation, with an emphasis on reducing auto trips and providing inter-modal connections. Specific funding programs under SAFETEA-LU include:

Recreational Trails Program — In California, RTP funds are administered by the California State Parks Department. Recreational Trails Program funds may be used for the following:

- Maintenance and restoration of existing trails
- Purchase and lease of trail construction and maintenance equipment
- Construction of new trails
- Acquisition of easements or property for trails
- Operation of educational programs to promote safety and environmental protection related to trails (limited to five percent of a State's funds).

$3.3 million statewide was available in fiscal year 2006.

Federal Highway Administration, RTP Program
www.fhwa.dot.gov/environment/rec trails/index.htm

California State Parks, RTP Guide
Safe Routes to School (SR2S) – In September 2004, with the passage of SB 1087 (Soto), the State extended Safe Routes to School legislation for three additional years. The bill is scheduled to sunset on January 1, 2013. This program is intended to improve the safety of walking and bicycling to school as well as encourage students to walk and bicycle to school by identifying existing and new routes to school and implementing pedestrian and bicycle safety and traffic calming projects. Caltrans is currently evaluating California’s SR2S funding, in light of new federal SR2S Program. SAFETEA-LU legislation includes SR2S funding and requires each state’s Department of Transportation to designate a SR2S Coordinator. As of this printing, whether or not these programs will be combined in California or will remain autonomous has not been determined. Therefore, the amount of funds available is unknown at this point.

Caltrans, SR2S Program

www.dot.ca.gov/hq/LocalPrograms/saferoutes.htm

The State of California uses both federal sources (such as the Recreational Trails Program) and its own budget to fund pedestrian projects and programs. In some cases, such as Safe Routes to School, Office of Traffic Safety, and Environmental Justice grants, project sponsors apply directly to the State for funding.

State Funding

Bicycle Transportation Account — The State Bicycle Transportation Account (BTA) is an annual statewide discretionary program that is available through the Caltrans Bicycle Facilities Unit for funding bicycle projects. Available as grants to local jurisdictions, the emphasis is on projects that benefit bicycling for commuting purposes. Due to the passage of AB1772 in the year 2000, the BTA had $7.2 million per year available between 2000 and 2005. Following the year 2005, the fund dropped to $5 million per year. In funding cycle 2007/2008, there are $5 million in statewide BTA funds available. The local match must be a minimum of 10% of the total project cost.

http://www.dot.ca.gov/hq/LocalPrograms/bta/btawebPage.htm

Proposition 50 California River Parkways Grant Program - Established in 2002 after California voters passed Proposition 50, this act authorizes funds for the acquisition, restoration, protection, and development of river parkways. The Wildcat Creek Trail would appear to fit this program description very closely. Over $38 million was released to 37 projects in 2006. Eligible projects must provide public access or be a component of a larger parkway plan that provides public access. Again, this project fits this description very closely. Also, all projects must meet two of the following conditions:

- Provide compatible recreational opportunities including trails
- Protect, improve, or restore riparian habitat
• maintain or restore open-space character of land along rivers to be compatible with periodic flooding
• Convert existing developed riverfront land into uses consistent with river parkways
• Provide facilities to support or interpret river restoration or other conservation activities

http://www.resources.ca.gov/bonds_prop50riverparkway.html

Office of Traffic Safety (OTS) Grants - The California Office of Traffic Safety distributes federal funding apportioned to California under the National Highway Safety Act and SAFETEA-LU. Grants are used to establish new traffic safety programs, expand ongoing programs to address deficiencies in current programs. Bicycle and pedestrian safety are included in the list of traffic safety priority areas. Eligible grantees include governmental agencies, state colleges and state universities, local city and county government agencies, school districts, fire departments, and public emergency services providers. Grant funding cannot replace existing program expenditures, nor can traffic safety funds be used for program maintenance, research, rehabilitation, or construction. Grants are awarded on a competitive basis, and priority is given to agencies with the greatest need. Evaluation criteria to assess need include: potential traffic safety impact, collision statistics and rankings, seriousness of problems, and performance on previous OTS grants. OTS expects to have $25 million in funding available statewide for FY 2009.

www.ots.ca.gov/grants/default.asp

Proposition 84 - On November 7, 2006, the voters approved the initiative titled The Safe Drinking Water, Water Quality and Supply, Flood Control, River and Coastal Protection Bond Act of 2006. Proposition 84 authorizes the state to sell about $5.4 billion in general obligation bonds for safe drinking water, water quality, and water supply; flood control; natural resource protection; park improvements; and sustainable community planning. It would fund a range of water projects as well as provide funding for state and local park improvements, public access to natural resources, and conservation efforts.

www.resources.ca.gov/bonds_prop84

Regional Funding Sources

Regional Bicycle and Pedestrian Program (RBPP) – The RBPP was created in 2003 as part of the long range Transportation 2030 Plan developed by the Bay Area Metropolitan Transportation Commission. The program—currently funded with Congestion Mitigation and Air Quality funds—funds regionally significant bicycle and pedestrian projects, and bicycle and pedestrian projects serving schools or transit. $200 million dollars are committed to this program over the 25-year period. Seventy five percent of the total funds are allocated to the county congestion management agencies based on population. The remaining 25 percent of funds are regionally competitive, with
the county CMAs recommending the projects to be submitted to MTC for funding consideration.

www.mtc.ca.gov/planning/bicyclespedestrians/regional.htm#bikepedprog

Local Funding Sources

**TDA Article 3** – Transportation Development Act (TDA) Article 3 funds are available for transit, bicycle and pedestrian projects in California. According to the Act, pedestrian and bicycle projects are allocated two percent of the revenue from a ¼ cent of the general state sales tax, which is dedicated to local transportation. These funds are collected by the State, returned to each county based on sales tax revenues, and typically apportioned to areas within the county based on population. Eligible pedestrian and bicycle projects include construction and engineering for capital projects; maintenance of bikeways; bicycle safety education programs; and development of comprehensive bicycle or pedestrian facilities plans. A city or county is allowed to apply for funding for bicycle or pedestrian plans not more than once every five years. These funds may be used to meet local match requirements for federal funding sources.

www.mtc.ca.gov/funding/STA-TDA/index.htm

**Measure J, Contra Costa County** – Approved by voters in 2004, this extension of the half-cent county-wide sales tax will provide revenue for transportation projects for 25 years starting in 2009 and ending in 2034. Bicycle, pedestrian, and trail projects will receive $30 million with fully 33 percent of this money earmarked for EBRPD to develop and maintain paved regional trails.

In addition, there is $0.8 million set aside for bicycle and pedestrian projects in West County.

http://www.ccta.net/EXTENSION/TEP/TEP.pdf

**Subregional Transportation Mitigation Fee Program (STMP)** – The West Contra Costa County Transportation Advisory Committee (WCCTAC) collects and disburses traffic mitigation fees in West Contra Costa County.

http://www.wcctac.org

**EBRPD Measure AA Extension** – In 1988, with increased urbanization in the East Bay and skyrocketing land prices, EBRPD struggled to keep pace with the growing population. With their commitment to open space and regional parks, over two-thirds of the voters in Alameda and Contra Costa counties voted for Measure AA – a $225 million bond measure. Passage of Measure AA provided the critical tool that allowed the acquisition and preservation of 34,000 acres of some of the most beautiful and pristine East Bay land. The result is the present network of parks, open space, and trails, recognized as one of the best examples of integrated parklands in any urban region in the United States.
Since Measure AA’s passage, EBRPD has leveraged money to secure over $49 million of “matching” funds from other public agencies and private donors at no additional cost to taxpayers. In addition, EBRPD officials have strategically refinanced existing Measure AA bonds at lower interest rates, saving taxpayers more than $14 million over the life of the bonds.

With about 25 percent of Measure AA funds allocated toward local park projects, EBRPD has also funded close to $60 million worth of recreational needs for every city in its jurisdiction, including restoring swimming pools, sports fields, playgrounds, and community and senior centers. [http://www.ebparks.org/news/measureAA - top#top]

After 20 years, EBRPD has successfully used or allocated all funds provided by Measure AA. The EBRPD Board of Directors is considering the placement of a new bond measure on the ballot in 2008 that would extend Measure AA by providing new funding for Regional Park land acquisition, new park and trail development, habitat restoration and rehabilitation of aging park facilities, as well as funding for city parks and recreation departments and special park districts to meet local needs. The passage of the bond measure by voters would enable EBRPD to preserve vanishing open space and shoreline, keep pace with recreation needs of the growing population in Alameda and Contra Costa counties, and continue helping cash-strapped communities with their local park and recreation facilities.

http://www.ebparks.org/news/measureAA - top#top

Parkland Dedication fees - Park dedication fees in Contra Costa County are assessed on new development and are used for park and trail acquisition and development, but cannot be used for ongoing maintenance.

Contra Costa County Redevelopment, North Richmond Community Facilities District (CFD) - The services to be funded, in whole or part, by the CFD include all direct and incidental costs related to providing the following services.

I. Parks and Parkway Operations and Maintenance Services (O&M) in No. Richmond Area.
II. Open Space Services, O&M of open space and natural wild lands in No. Richmond owned or otherwise controlled by Contra Costa County.
III. Flood and Storm Drainage Services. O&M of flood and storm drainage improvements to the No. Richmond Area owned or otherwise controlled by Contra Costa County or FCD.

The Contra Costa County Redevelopment Agency’s North Richmond Community Facilities District (CFD) may provide some funding to help maintain the undercrossing, if selected.
Section 5: Environmental Screening

The Wildcat Creek Trail is an EBRPD trail facility and FCD maintenance road which extends 1.2 miles. The paved trail generally parallels Wildcat Creek on top of an earthen embankment designed to contain the high water flows associated with wintertime rain storms. At the crossing of the Richmond Parkway, the trail drops down into the high water channel and passes beneath the Richmond Parkway protected by a concrete flood wall that has not functioned effectively and is impassible most of the time due to silt and water ponding caused by winter flooding.

Three alternatives to the existing trail undercrossing are being studied, as summarized below:

Trail Undercrossing- Two of the design concepts of an undercrossing would consist of a variation of upgrading the existing trail undercrossing to improve the current drainage and silting problems. These improvements would then result in more public access opportunities.

Trail Bridge Overcrossing – These designs of a bridge overcrossing alternative consists of a trail bridge over the Richmond Parkway with appropriate-length ramps touching down onto the existing trail. Several variations are under consideration involving options for the width and design of the approach embankments and bridge structures. The bridge and its approaches would generally be located along the northerly edge of the trail right of way.

At-Grade Alternative – This alternative would utilize the existing right-of-way on both sides of the Richmond Parkway as multi-use trail to access the signalized intersection of Pittsburg Avenue, cross the street, and then return to the Trail. It requires a rather circuitous route of approximately 3,400 total feet.

Approach

Conceptual plans for the alternatives were reviewed and field visits were completed on the site, concentrating on areas that would be affected by construction of each of the design alternatives. Applicable environmental documentation pertinent to the project was reviewed, including the CEQA Initial Study on the Nove subdivision by Signature Properties, a residential development project to be constructed immediately adjacent to the Wildcat Creek Trail and the Richmond Parkway.

The purpose of this report section is to screen each of the alternatives for potentially significant environmental concerns. The Initial Study Checklist found in the CEQA
Guidelines has been utilized to guide the environmental screening of the alternatives.\(^2\) However, this is a preliminary, planning level, study that is focused on potential issues of concern; it is not a formal Initial Study of one or all of the project alternatives, nor is it intended to determine the feasibility or infeasibility of any of the alternatives.\(^3\) The environmental analysis in the following section is organized alphabetically, by topic, consistent with the format of a CEQA Initial Study Checklist. The topics raised by the questions in each of the categories in a CEQA Checklist have been considered in the following analysis.

**Preliminary Environmental Analysis**

**Aesthetics**

None of the project alternatives have the potential to cause significant adverse effects on scenic vistas, or resources within a scenic highway. Nor would they substantially degrade the visual character of the site and surroundings or create substantial new sources of light and glare.

The undercrossing alternative would result in virtually no visual changes, while the at-grade alternative would result in new sidewalks, visible from the Richmond Parkway, but consistent with the urban quality of the surroundings.

Among the alternatives, the overcrossing alternative would be the most visible, but it is not expected that its visual impacts would not be so great as to result in significant adverse aesthetic impacts. With sensitive design, the overcrossing could be visually compatible with the urban creek/transportation corridor setting in which the site is located, and with proper mitigation the project’s lighting, color, texture and landscaping could be designed to ensure that the project would not substantially degrade the site’s visual characteristics or cause significant adverse effects on daytime or nighttime views. The bridge would provide an elevated platform from which trail users would be able to experience an overview of the Wildcat Creek corridor, providing a new public viewpoint that might be quite attractive.

\(^2\) California Code of Regulations, Title 14, Section 15000 et. seq., Appendix G.

\(^3\) Note that once the project options have been sufficiently refined to commence formal CEQA review, the Lead Agency should investigate the possibility that the project may qualify for a Class 1 or Class 2 Categorical Exemption (CEQA Guidelines, Sections 15301, 15302) in which case a formal Initial Study will not have to be prepared.
Agricultural Resources

The project would have no effects on agricultural resources.

Air Quality

None of the project options being considered have the potential to conflict with the region’s air quality plan, cause violations of any air quality standards, or result in cumulatively considerable increases in criteria air pollutants. Nor would any of them possibly result in objectionable odors.

Among the alternatives, the at-grade alternative would route trail users alongside the Richmond Parkway for about 3400 feet. Since the Richmond Parkway carries moderately heavy volumes of cars and diesel powered trucks this option would result in longer exposures by trail users to vehicular pollutants than would the other alternatives. Although diesel exhaust has been classified as carcinogenic, the traffic volumes and pedestrian exposure times would not be high enough to result in potentially significant impacts. The environmental review for the future adjacent Nove by Signature Properties subdivision project predicts a cancer risk of 11 cases per one million people for a 30-year residency and a risk of 20 cases per million people for a 70-year residency. While this exceeds the Bay Area Air Quality Management District CEQA Guideline threshold of 10 cases per million, the exposure times for trail users would be far lower, and it is not likely that the at-grade alternative would approach this threshold.

Biological Resources

Although the footprint of proposed improvements have been extensively disturbed by past flood control, roadway, and park improvements, the larger Wildcat Creek corridor is a highly sensitive biological and wetland resource, and there is a potential for direct and indirect impacts to this feature. The creek corridor contains jurisdictional waters subject to State and federal regulations. Any modifications below the top of bank are regulated by the California Department of Fish and Game as part of their Streambed Alteration Agreement project, under Section 1600 of the State Fish and Game Code. Any modifications to the channel below the Ordinary High Water Mark are regulated by the U.S. Army Corps of Engineers under Section 404 of the Clean Water Act, and the Regional Water Quality Control Board under Section 401 of the Clean Water Act. The riparian and relatively newly formed woodland and scrub along the creek is considered a sensitive natural community type by the California Natural Diversity Data Base, and a number of special-status animal species are known from the lower reaches of Wildcat Creek.

Most of the special-status species in the project vicinity are associated with the extensive coastal salt marsh habitat at the mouth of Wildcat Creek and San Pablo Creek. Wildcat
Wildcat Creek is known to support runs of the federally threatened steelhead (*Oncorhynchus mykiss*) and possibly other anadromous fish species, and individual fish species could migrate up or down the drainage. Wildcat Creek also contains suitable habitat for western pond turtle (*Emys marmorata*), which is not a listed species but is considered a California Special Concern species by the California Department of Fish and Game. Other special-status species associated with coastal salt marsh habitat not found on the site include: the state and federally-endangered salt marsh harvest mouse (*Reithrodontomys raviventris*), the state and federally-endangered California clapper rail (*Rallus longirostris obsoletus*), the state-threatened California black rail (*Laterallus jamaicensis coturniculus*), and many other species considered to be federal Special Concern species and California Special Concern species.

Several special-status plant species are known from the uplands and coastal salt marsh habitats along the shoreline of San Francisco and San Pablo Bay, but none have been reported from the vicinity of the site. A single occurrence of fragrant fritillary (*Fritillaria liliaceae*) was reported from the Point Richmond area in 1900, but this occurrence is believed to have been extirpated by development, and suitable habitat is absent on the site. Other special-status plant species known from marshland habitat along the shoreline of the bay include: the state-rare soft-haired bird’s beak (*Cordyphanthus mollis* ssp. *mollis*), mason’s lilaeopsis (*Lilaeopsis masonii*), and San Francisco gumplant (*Grindelia hirsutula* var. *maritima*). All three of these species are maintained on List 1B of the CNPS Inventory, and are considered rare under Section 13580 of the CEQA Guidelines. None have been reported from the site, and suitable habitat is absent on portions of the site proposed for improvements. Past grading for flood control and roadway improvements has eliminated the potential for occurrence of any special-status plant species on the site.

Among the alternatives, the at-grade and overcrossing alternatives would have little potential for adverse impacts on sensitive biological resources. The footprints of these alternatives would avoid jurisdictional waters and the riparian habitat along Wildcat Creek. Affected vegetation would be limited to planted native and non-native landscape trees, shrubs, and groundcovers, and ruderal (weedy) non-native grassland. A row of planted young native trees (coast live oak, box elder, Fremont cottonwood, and California buckeye) occur along the fence line separating the creek from the future Nove by Signature Homes property, but these all have trunk diameters under 8 inches and can be easily replaced if removal is required. No authorization from regulatory agencies would be required under these alternatives, as currently proposed. Sensitive construction practices would still be required to ensure that no indirect impacts on nearby wetlands and riparian habitat occur as a result of these alternatives. These include prohibition on operation of construction equipment at the bottom of the creek channel slope, where

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4 California Special Concern species have no formal legal protection but nest sites and communal roosts are generally recognized as significant biotic features by the California Department of Fish and Game.
jurisdictional wetlands are located, implementation of a comprehensive Storm Water Pollution Prevention Plan (SWPPP) to prevent sediment from moving into the creek, and revegetation of graded slopes and replacement of any landscaping affected by the project. These measures should serve to avoid habitat for special-status animal species associated with Wildcat Creek and more common found in the vicinity.

The undercrossing alternative concepts could involve modifications to the existing undercrossing, which is located within the jurisdictional waters of Wildcat Creek. No new incursion into the jurisdictional waters of the creek channel would occur under this alternative as the trail would follow the existing undercrossing alignment and no modifications are proposed to the retaining wall. However, although the undercrossing is existing, proposed modifications to the pumping system, if selected, may still require review and authorization from the regulatory agencies. The undercrossing would have to be dewatered during construction, and silt removed, which could impact the water quality of Wildcat Creek unless hauled off-site. Construction activities associated with installation of the new pumping system would most likely have to be restricted to the dry period from June 15 to October 15 to reduce the likelihood that anadromous fish could be present in the reach of Wildcat Creek near the site. FCD would need to have review and authorization from the regulatory agencies prior to any desilting operations in the trail area.

A long-term solution would have to be developed to address dewatering and silt removal from the trail to prevent it from being dumped into the channel following winter flooding. This would have to be defined as part of routine maintenance, with silt-laden water cleaned and any accumulated silt hauled to an acceptable location. FCD has a no-cost silt deposit site nearby, which could be used for disposal of accumulated silts, although desilting the trail could be problematic over the long-term, and would increase operation and maintenance costs for this alternative. There is a remote possibility that steelhead, western pond turtle, or California red-legged frog individuals could become trapped within the undercrossing during a major flood event that overtops the retaining wall. However, this risk is true for the existing undercrossing condition as well, and the new pump system would not increase this potential for inadvertent loss of individuals of these species. As part of routine maintenance of the undercrossing, a qualified biologist should inspect the area after a major storm event to ensure no aquatic-dependent special-status species have become trapped, and relocate any individuals back into a secure location within the active creek channel before the undercrossing is pumped dry. The qualified biologist must have appropriate authorization from State and Federal regulatory agencies to handle a listed species.

**Cultural Resources**

Generally the project area is considered sensitive for archaeological resources, and ground-disturbing activity could potentially damage or destroy prehistoric cultural resource sites. Among the alternatives, the undercrossing and at-grade alternatives would
have little potential for archaeological impacts, as they would involve, either, a) the repair of existing facilities or, b) the addition of sidewalks on previously graded Richmond Parkway right-of-way.

While the overcrossing option would involve subsurface excavation for foundations and supports, it is proposed to be constructed on top of previously constructed levee embankments and trail facilities. Archaeological monitoring during excavation may be appropriate, and routine mitigation measures would be sufficient to avoid significant impacts on archaeological resources.

None of the alternatives would be projected to have impacts on historical resources.

**Geology and Soils**

The project is sited within an area potentially subject to very strong ground shaking and liquefaction in the event of a major earthquake. Among the alternatives, the at-grade alternative would be the least likely to result in risks to people from seismic forces. The undercrossing alternative would repair an existing facility and would not increase seismic hazards. Because of their relatively recent construction, it is assumed that the Parkway bridges have been designed to perform adequately in an earthquake.

Design of the overcrossing alternative would require engineering to withstand reasonably foreseeable seismic forces. This would affect the cost and complexity of both the design and construction, but the risk from seismic hazards could be reduced to an acceptable level.

Construction work for any of the alternatives could potentially result in soil erosion and the addition of silt and sediment to Wildcat Creek. Effective mitigation to address this potential impact would be provided in the form of project specific SWPPP, and it is recommended that a SWPPP be prepared and implemented for whichever alternative is selected.

No significant impacts from landslides or expansive soils are predicted.

**Hazards and Hazardous Materials**

No significant hazards to the public would be expected from any of the alternatives due to the transport, use, or disposal of hazardous materials, or the release of hazardous materials into the environment. It is not believed that the site is on a list of hazardous
Hazardous materials including motor fuels, lubricants, and other materials would be used during construction; however, standard contracting requirements and safety protocols would be implemented to manage these risks and reduce the potential for significant harm to the environment, the public or to workers.

Urban pollutants gathered by storm waters in the upstream areas of Wildcat Creek could be concentrated in the silt deposited in the undercrossing. The extent to which this occurs is unknown, although preliminary testing could be useful in determining whether special protocols would be necessary for handling and disposing of the material over time, as would be required if this alternative is implemented.

No impacts related to the proximity to schools, or to airport safety hazards or emergency evacuation would be present.

**Hydrology**

Implementation of the undercrossing alternative would not change existing surface drainage patterns, or the configuration of the floodway relative to existing conditions; it essentially calls for modifications to the existing design that would improve its operational effectiveness along with an improved maintenance plan aimed at minimizing the length of trail closures. The maintenance plan would call for removal of silt that has, and may in the future; accumulate on the trail and for its disposal at a nearby (off-channel) disposal site operated by the County FCD. Accordingly, the maintenance work would not adversely affect the hydrologic conditions of the creek. FCD would need to further evaluate creek hydrology in order to establish creek bed maintenance intervals and frequency adjacent to the trail.

The at-grade and overcrossing alternatives would have minor effects on existing surface drainage patterns, and the potential for increasing erosion, primarily during construction. As noted above, these issues could be mitigated with the preparation and implementation of a SWPPP.

While the proposed project lies within or adjacent to the floodplain and floodway of Wildcat Creek, none of the alternatives would be expected to result in significant flooding impacts. None of them involve the placement of housing in a flood plain nor would they involve the construction of structures that would redirect flood flows and increase flood hazards.

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5 This is based on information reported in the Nove by Signature Homes Initial Study (Contra Costa County), which addresses a large adjoining parcel, but does not specifically address the trail corridor.
The projects would not have any effects on groundwater, nor would they adversely affect existing storm water drainage systems or provide substantial additional sources of polluted runoff.

The risk of damage from inundation by seiche, tsunami or mudflow is considered low, and would not result in potentially significant impacts.

**Land Use and Planning**

The proposed project would close an important gap in the existing Wildcat Creek Trail. The trail is recognized as an existing feature in the land use and recreation plans adopted by Contra Costa County, the City of Richmond, EBRPD, and the Association of Bay Area Governments, which administers the SF Bay Trail Project.⁶ Improving the trail crossing of the Richmond Parkway would be consistent with the applicable land use plans.

Among the alternatives, the undercrossing or overcrossing options would be preferable to the at-grade alternative, from a land use planning perspective, because they are more direct routes. The at-grade alternative would add about 1700 feet of new trail which would route trail users along a busy highway, and away from the creek corridor, diminishing the recreational experience that most users seek, and potentially encouraging dangerous mid-block pedestrian crossings in areas lacking signals or other traffic control measures.

The project would not physically divide an established community; indeed, it would enhance connections between residential areas and bay front recreational opportunities. Nor would the project conflict with any habitat conservation plans or natural community conservation plans.

**Mineral Resources**

The project would not affect any mineral resources.

**Noise**

The Richmond Parkway is a significant source of environmental noise generated by passing vehicles. Recent studies predict that noise levels at outdoor spaces adjacent to the Richmond Parkway in the project vicinity are anticipated to range from 74 to 77 dBA

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⁶ The Wildcat Creek Regional Trail is not part of the San Francisco Bay Trail, which currently runs along the west side of the Richmond Parkway and would, coincidentally, be upgraded under the on-street alternative.
These noise levels are sufficiently high to mandate the erection of noise barriers between the Parkway and any adjacent residential developments. (The Noise Element of the Richmond General Plan, considers noise levels of up to 65 DNL “normally acceptable” for multi-family developments and noise levels no greater than 60 DNL to be “normally acceptable” for single-family residential developments.) The Wildcat Creek Trail facility would cross the Richmond Parkway, and trail users would be located in the noise-influenced zone of the Parkway for limited periods of time. Furthermore, higher ambient noise levels can be tolerated by recreational facilities, because the sleep disturbing potential of elevated noise levels, which are very important in residential areas, are not a consideration in recreational areas.

However, elevated noise levels are disturbing to recreational users, especially those seeking more natural areas, such as a creek corridor, where the sounds of birds and wind in the trees are desired and the sounds of traffic noise are intrusive. Accordingly, design options that minimize noise exposure are preferable. The at-grade alternative would have far greater noise exposure than either the overcrossing or undercrossing alternatives. While the noise exposure to trail users following the at-grade alternative is not expected to be so high as to violate accepted noise impact criteria (and become a significant adverse environmental impact), it would degrade the recreational experience, discourage some people from using the trail, and possibly even encourage short-cutting. From an environmental noise perspective, the overcrossing and undercrossing alternatives would be strongly preferred over the at-grade alternative.

The project is not near a public or private airport, and aircraft related noise would not be an issue of concern.

Construction of the project would result in short-term noise from construction equipment. Standard practices such as limiting the construction to daytime hours would reduce the potential disturbance from these activities. Currently, there are no sensitive receptors near the construction zone, although residential developments are under construction adjacent to the trail corridor on the east side of the Richmond Parkway. These subdivisions would be protected from traffic by noise barriers, which would also minimize the potential impacts of construction noise associated with this project. Among the alternatives, the overcrossing alternative would have the highest short-term use of heavy equipment and the most construction noise.

**Population and Housing**

The project would not generate population growth, either directly or indirectly, nor would it displace housing or people.

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Public Services

The project would not have any substantial adverse physical impacts that could, in turn, result in environmental impacts related to the need for new governmental facilities necessary to maintain acceptable service ratios, response times, or other performance objectives for public services, including fire protection, police services, schools, or parks.

Recreation

While one of the goals of the project is to facilitate increased usage of the Wildcat Creek Trail by closing a gap in the trail, it would not be expected to increase usage to the extent that there would be environmental impacts from deterioration of the facility, or the need to expand the facilities or construction new facilities that would, themselves, have potentially significant environmental impacts.

Transportation and Traffic

The project would generate little, if any, additional vehicular trips and would not cause a substantial increase in traffic congestion, nor exceed any adopted traffic level of service standards, nor increase hazards due to design features or incompatible uses. Nor would it adversely affect emergency access or result in inadequate parking capacity. Nor would the project affect air traffic.

The Wildcat Creek Trail can serve as an alternative non-motorized transportation facility for some bicyclists and pedestrians. By repairing a gap in the trail, the project would support alternative non-motorized transportation policies which encourage the reduction of vehicle emissions.

Utilities and Service Systems

The project does not generate water demand or wastewater and would not affect existing water or wastewater utility systems. Nor would it require the construction of new storm drain facilities, or the expansion of existing storm drain facilities.

The overcrossing and at-grade alternatives would generate small amounts of solid waste during construction, but the impacts on landfill capacity would be insignificant. The undercrossing alternative could routinely generate small volumes of silt deposited in the course of high winter flows and removed in the spring and summer to maintain the trail. While the disposal protocols for this material are not known, if routed to landfills the volumes would not be so great as to overtax their available capacity.
Mandatory Findings of Significance

CEQA requires that any project that triggers any one of three general tests for significant adverse environmental impact must automatically be reviewed in an Environmental Impact Report. These Mandatory Findings of Significance have been reviewed in the context of this project, and none of the criteria for findings of significance have been found applicable to this project.
Section 6: Design and Best Practices

This section provides specific design and implementation guidelines and standards to ensure that the preferred alternative is constructed to a consistent set of the highest and best standards currently available in the United States. EBRPD has design standards which may be slight modifications to these guidelines and standards, which are included in Attachment 2.

The design of pedestrian and bicycle overcrossings of State Highways in California are governed by the Caltrans Highway Design Manual (HDM) in Sections 105.2 (Pedestrian Grade Crossings), 105.3 (Accessibility Requirements), 208.6 (Pedestrian Overcrossings and Undercrossings), 208.10 (Bridge Railings), 309.2 (Vertical Clearances), the Americans with Disabilities Act (ADA) Design Guidelines, and Chapter 1000 (Bikeway Planning and Design). Signing is governed by the Manual of Uniform Traffic Control Devices, California Supplement (MUTCD) (Part IX. Traffic Controls for Bicycle Facilities) (California Supplement). The design of the preferred alternative would be designed to Caltrans standards along with FCD, City of Richmond, and EBRPD standards and guidelines.

These standards are intended to be a guide to engineers in their exercise of sound judgment in the design of projects. Design standards should meet or exceed the Caltrans standards to the maximum extent feasible. Lower standards may be used “when such use best satisfies the concerns of a given situation.” Mandatory design standards “are those considered most essential to achievement of overall design objectives.”

Project Needs

The HDM states that the need for a pedestrian overcrossing should be studied in conjunction with pedestrian generating sources in the area, type of highway to be crossed, location of adjacent crossing facilities, land use, and the predominate type and age of persons expected to use the facility. The HDM states that historical pedestrian patterns should be maintained, and where vehicular crossings are inadequate, grade-separated crossings for pedestrians should be provided. “In general, if a circuitous route is involved, a pedestrian separation may be justified even though the number of pedestrians is small.”

The Wildcat Creek Trail crossing location meets the requirements for grade separation as identified in the HDM. The volumes of users on the facility is expected to increase given the new redevelopment and housing planned adjacent to the northeast side of the Parkway which will generate hundreds of new trail users of all ages. In addition, potential Parkway conversion to an Expressway (if Richmond is successful in its handover to Caltrans) would result in higher vehicle volumes and increased safety concerns for residents and trail users alike.
Accessibility Requirements

New pedestrian overcrossings must meet the requirements of the Americans with Disabilities Act (ADA) and specifically the ADA Accessibility Guidelines. Caltrans requires adherence to the accessibility guidelines in Title 24 of the California Code of Regulations and the ADA Accessibility Guidelines. Curb cuts at the ramp entrances, placement of bollards with a minimum 36-inch clearance, and adherence to ADA-compliant maximum gradients, would result in a project in full compliance with the ADA. Improvements to the existing pedestrian curb ramps at the intersection of Richmond Parkway and Pittsburg Avenue are necessary to meet current ADA standards.

Multi-use Trail and Facility Widths

The recommended minimum width for paved multi-use trails, according to the California HDM, is eight feet, with two feet of lateral clearance on each side. The EBRPD trail standard is modified from the HDM to a ten-foot paved asphalt surface with two foot decomposed granite (DG) shoulders on both sides, where feasible. If the multi-use trail is projected to have higher volumes of bicyclists and others, or if maintenance vehicles will be using the multi-use trail on a regular basis, a minimum width of 12 feet is recommended by the HDM with the same lateral and vertical clearances. For the Wildcat Creek Trail crossings, the recommended interior, clear inside width on the structure is recommended to be a minimum of eight (8) feet, with 10 feet preferable. A discussion of the widths for the three alternatives being considered is presented next.

Alternative 1: Undercrossing

The existing undercrossing trail width is nine feet wide and no changes are proposed for this width. Signs alerting the approaching trail users to this narrowed condition, narrower than the current nine feet paved width along the Creek (and much narrower when one considers that the existing trail has significant room on both sides of its paved width), should be installed to encourage bicyclists to slow down and pedestrians to be alert. Also, with this alternative, seasonal flooding may require EBRPD Operations to shut down the entire multi-use trail to all trail users and would need corresponding sign notification. Special signing should be developed that warns users at all times that the multi-use trailway may be flooded, with additional full closure signing designed so that when flooding does occur, staff is ready to install them at the closure and detour locations, if any.

Alternative 2: Bridge Overcrossing

Caltrans does specify, in the HDM Section 1003.1(2) that the “…clear width on structures between railings shall be not less than 8 feet.” The proposed 10 feet overall
width for the structure, therefore, is more than sufficient. In this feasibility study, both 10 and 12-foot widths of the overcrossing alternative will be evaluated for costs.

**Alternative 3: At-Grade Crossing**

With this alternative, trail users would be routed up one side of the Richmond Parkway and down the other side between the existing Wildcat Creek structure and the signalized intersection at Pittsburg Avenue. This is a one-way distance of approximately 1700 feet meaning a total detour of 3400 feet. The HDM, Section 1003.1(5) requires that “bike trails closer that 5 feet from the edge of the shoulder shall include a physical barrier to prevent bicyclists from encroaching onto the highway.” This alternative would meet this condition triggering the installation of a barrier, satisfied by a 54 inch high cyclone fence (or similar style) set back one foot from the face of curb.

On the west side, the trail (considered part of the SF Bay Trail, built and maintained by the City of Richmond) cross-section consists of three distinct segments – southern, central, and northern. Figure B is a picture showing the central and northern segments. The southerly and northerly segments are the same cross-sections – consisting of a 14.5 feet width as measured from the face of curb to the existing cyclone fence. The southerly segment is from the Wildcat Creek structure to a point about 1300 feet to the north and the northerly segment is for the 100 feet segment closest to Pittsburg Avenue. Upon installation of the fence barrier, the resultant trail width of 13.5 feet would more than satisfy trail width requirements (minimum 12 feet) discussed in a previous section.

The remaining central segment, approximately 300 feet long, contains a metal guardrail that reduces the existing sidewalk width from 14.5 feet to 12.75 feet. The installation of the fence barrier one foot from the face of curb results in a clear width of 11.75 feet. This width is only 0.25 feet shy of the desirable width of 12 feet and, for this relatively short distance, is acceptable. Caltrans does specify, in the HDM Section 1003.1(2) that the “…clear width on structures between railings shall be not less than 8 feet.” In addition, two-feet wide ‘clear zones’ are required along the multi-use trailway, bringing the total required minimum trail width to 12 feet. Given this, the proposed 11.75 feet-wide section will require a Design Exception from an engineer.

In addition to these constraints, there are existing street light and sign standards that reduce the clear width between the guard rail and the standard to 9.5 feet. Though the clear multi-use trail width is still adequate to accommodate this infrequent narrowing, yellow lane striping, directing the approaching bicyclist to move slightly to their left, should be installed. (See MUTCD Figure 9C-8, page 9C-17.). EBRPD does not normally stripe their regional trails. Conversely, the lighting and sign standards could be relocated so as not to impact the available width for a trail.
EXISTING CONDITIONS ON RICHMOND PARKWAY  
(SF BAY TRAIL—MAINTAINED BY CITY OF RICHMOND)

On the east side, no trail or sidewalks exist. Beyond the face of curb, the gravel shoulder is level for approximately three to four feet of width before sloping down rather sharply to an existing drainage ditch. A new sidewalk/trail on this side of Richmond Parkway is required, and would require significant construction such as a retaining wall, fencing, and drainage improvements. There is sufficient right-of-way width to permit construction of a trail that could have an unobstructed interior width of 12 feet.

**Intersections and Crossings**

Only the at-grade alternative would require the use of an intersection by trail users at Pittsburg Avenue to cross the Richmond Parkway. This location has pedestrian push buttons, standard signal timing to safely cross the street, pedestrian ramps (which would need to be upgraded to current ADA standards), pedestrian signal indicators, and good all-around visibility.

Road crossings at separated multi-use trails and overcrossings require two critical considerations: (1) multi-use trail users will be enjoying an auto-free experience and may enter into an intersection unexpectedly, and (2) motorists will not expect to see bicycles or pedestrians from an unmarked location into the roadway. In the case of the Wildcat Creek Trail crossing alternatives, only the at-grade alternative will need to design for these two issues. Bikeway approaches at the signalized intersection of Richmond Parkway and Pittsburg Avenue would need to alert approaching bicyclists to pay attention to the signal indications. These improvements and their maintenance would be under the responsibility of the City of Richmond.
Design Speed

According to the California HDM, the minimum design speed for multi-use trails is 20 miles per hour (mph), except on sections where there are long downgrades (steeper than four percent, and longer than 500-feet). EBRPD has modified this speed limit to 15 mph on its paved regional trails. Speed bumps or other surface irregularities should never be used to slow bicycles. It would be desirable to slow bicyclists at the ends of the ramps for the overcrossing alternative. A level section at least 20 feet long is recommended prior to merging with another trail or sidewalk in order to help slow bicyclists.

Horizontal Alignment

Recommended curve radii and super elevations should conform to Caltrans HDM Chapter 1000 specifications, along with recommended stopping distances.

Grades

All three alternatives under consideration would require acceptable grades (maximum of 5%) and slopes to meet ADA requirements. A consistent 5% gradient is recommended rather than a steeper gradient combined with landings. If five percent or less, as is currently proposed, it is not considered a “ramp” meaning no hand rails are required and no intermediate level landings are required. The undercrossing alternative would retain existing grades on the structure of two percent thereby meeting ADA requirements.

Fencing and Screening

For the overcrossing alternative, chain link fencing or screening is required to provide a protective but transparent barrier for both pedestrians and bicyclists. Refer to Figure 1.9. It will also deter users from dropping or throwing objects on the roadway below. Caltrans’ HDM Section 208.10(5) discusses details of appropriate fencing. A minimum 6 feet height is required where there are pedestrians – which easily accommodates the minimum 54 inches height required if a bicycle-only facility were to have been constructed. The fencing would be installed on 6-inch concrete high curbs located on both sides of the structure. Sight distance at the bridge ends and view over the side of the bridge would be considered in the overall design.
The at-grade alternative would require the installation of a 54-inch fence on both sides of Richmond Parkway. This fence should have periodic openings, approximate every 200 feet to accommodate persons seeking the safety of the sidewalk should their car break down. The openings should be a minimum 36-inch clear width to accommodate persons in wheelchairs.
Barrier Posts

Barrier posts, also known as bollards, at trail intersections and entrances may be necessary to keep unauthorized motor vehicles from entering a trail. EBRPD has standard bollard details for use in certain locations; however, EBRPD Operations staff recommends installation of a short single or double steel or chain linked gate trail entry structure with a clearance of 48 inches for trail user entry to span the trail’s entries instead of bollard posts. According to the Wildcat Creek Trail Supervisor John Hitchen, “A gate is faster and easier to unlock and can last a long time.” A gate would be his first choice for combining security with ease of use (see Attachment 2). The gate’s opening should be designed to be visible to bicyclists and others, especially at night, with reflective materials, appropriate striping and lighting if appropriate. If bollards are used, clear distances between bollards should be five feet to easily enable bicycles with trailers, wheelchairs, and others to pass without enabling undesired motor vehicles to enter. Diamond shaped pavement markings, in yellow, should be placed around the bollards to alert approaching bicyclists of the upcoming obstacle (see MUTCD Figure 9C-2, page 9C-8). If it is determined by the EBRPD Park Police that it is unlikely any vehicles will ever try and use an overcrossing, it is recommended that no bollards be provided since they represent a safety hazard to trail users.

Signing and Markings

Multi-use trail signing and markings must follow the standards presented in the California MUTCD. EBRPD standards for signing and markings will also be reviewed and incorporated. This includes advisory, warning, directional, and informational signs for bicyclists, pedestrians, and motorists. The final striping, marking, and signing plan for the chosen alternative should be reviewed and approved by a licensed traffic engineer or civil engineer.

In general, the HDM requires all signs along trails shall be located three to six feet from the edge of the trail, have a minimum vertical clearance of four to five feet and, when located directly above the trail’s multi-use trail surface, be a minimum of eight feet clear. All signs should be oriented so as not to confuse motorists. The designs (though not the size) of signs and markings should be the same as used for motor vehicles. Sizes are determined by the MUTCD, Table 9b-1 – generally, bicycle signs are smaller than those intended for motorists unless a motorist is expected to share the multi-use trail (e.g., maintenance vehicles) or need to be guided by the same sign.

The at-grade alternative would also have the trail along the Richmond Parkway. Signs placed along the multi-use trail, intended for the trail users, would have to meet MUTCD standards meaning that they would have to be a minimum eight feet vertical clearance because portions of the sign would be over the trail. Signs placed to regulate, direct, or warn the motorists on the Richmond Parkway would not be able to be placed where they normally would be – with the sign blade a minimum two feet behind the face of curb. In this restricted instance, a one-foot clearance would be acceptable. (Per Caltrans STANDARD PLANS, 2006, Sheet RS1 and MUTCD, page 2A-11) However, the vertical clearance of such signs would have to be a
minimum eight feet, due to the proximity of the multi-use trail, rather than the standard seven feet.

Directional signing may be useful for multi-use trail users and motorists alike. For motorists, a sign reading “Wildcat Creek Trail Xing” along with a multi-use trail emblem or logo helps both alert and promote use of the trail itself. EBRPD has a well-developed Sign Plan and series of signs used for trail identification, regulations, direction, and other uses. Care should be taken that these signs are not similar to MUTCD “warning” signs – rather they should be more similar to street name identification signs, white letters on green backgrounds. For multi-use trail users, directional signs and street names at crossings help direct people to their destinations. Care should be taken to keep vegetation and other obstacles out of the view line for motorists and multi-use trail users.

**Lighting**

While lighting is not required on trail or bikeway facilities, it is often recommended for under and overcrossings to enhance visibility and safety. In Chapter 1000 of the HDM, Caltrans recommends that bikeways expected to serve a transportation function provide lighting. The AASHTO Guide for the Development of Bicycle Facilities (1998) states that “lighting should be considered through underpasses or tunnels, and when nighttime security could be an issue. Depending on the location, average maintained horizontal illumination levels of 5 lux to 22 lux should be considered.” Luminaires should be designed to be vandal-resistant, use low-energy long life bulbs, and minimize off-site impacts. The undercrossing alternative, being more secluded and hidden from view from the Parkway and any natural or street lighting, should provide lighting per EBRPD operation polices. Fixed-source lighting reduces conflicts along trails and at multi-use trail junctions. In addition, lighting allows the bicyclist to see the trail’s direction, surface conditions, and obstacles. Research or studies show lighting for multi-use trails is important and should be considered where bicycle riding at night is expected, and improved visibility between bicyclists and pedestrians, is desired. New or improved lighting is recommended for both the undercrossing and overcrossing alternatives.

**Landscaping**

Landscaping components of the project, if any, should consider the use of native, drought tolerant plants to minimize watering and to complement the existing setting. However, plants near trail junctions or at locations where visibility of approaching trail users (for matters of safety and security) is important, should be of a low mature height to minimize barriers to visibility and to minimize maintenance requirements.
Security Features

Aside from lighting for the undercrossing and overcrossing alternatives, other specific security features to be considered in the design of the facility includes:

- If fencing is provided along the Richmond Parkway (at-grade, overcrossing alternatives), a gate should be provided along with a curb cut on Richmond Parkway to facilitate maintenance and emergency access.
- Landscaping and other potential obstructions over three (3) feet in height should be kept to minimum.
Section 7: Cost Analysis

Another basis for comparison of the projects is looking at the capital costs and the long-term maintenance and operation costs of the recommended designs of each of the alternatives. Agencies are able to obtain capital improvement funds, however operating and maintenance funds are much more difficult for the agencies to appropriate and are not available through grants in most cases. Costs are based upon 2007 unit prices and design contingency of 20% plus a construction contingency of 10%.

Trail Undercrossing Alternative 1B recommendation includes the repair of the existing trail undercrossing by the addition of desilting and drainage structures, replacing the pump station, equipment, restoration of the floodwall joints, and the addition of lights. Additional costs for FCD increased maintenance and permitting for more frequent desilting operations adjacent to the trail would need to be developed and funded.

Trail Bridge Overcrossing Alternative 2A costs were evaluated for two bridge widths, one with a 10-foot wide bridge structure and the other with a 12-foot wide structure.

The third alternative is the at-grade alternative, including improvements to the west side existing SF Bay Trail and new trail on the east side of the Parkway to Pittsburg Avenue.

In addition to the capital improvement costs, operations and maintenance costs for each alternative have been evaluated.

For Trail Undercrossing Alternative 1B, the operations and maintenance cost estimates include an annual pump station maintenance contract, desilting of the outfall siltation basin, periodic removal of stone and debris that collects at the trench drains that feed into the pump station, and sweeping the trail of silt resulting from major storm events that top the wall with silt laden water. It is assumed that storm events that could inundate the trail with significant silt deposits would deposit approximately 5 cubic yards of silt per event and would be deposited in the outfall silt basin. The costs for the silt removal include off-hauling to a no-cost site. EBRPD staff costs for standard trail operation and maintenance ($25,000 per mile per year) have not been assumed. The pump station equipment maintenance includes replacement of the pump equipment every five years and annual jet cleaning of the lines that feed the station and accept the outfall from the pump station to the silt basin. Additional costs for more frequent desilting operations adjacent to the trail by FCD will need to be developed and funded in a maintenance plan.

For Trail Bridge Overcrossing Alternative 2A, the operations and maintenance costs are based upon a similar bridge structure (Iron Horse Regional Trail) in the City of Walnut Creek over Ygnacio Valley Road. Since the trail is observed in its current configuration, no added costs are anticipated for security.
For the third alternative at-grade, maintenance of the on-street trail segments would be the responsibility of the City of Richmond. The study has prorated the costs for the actual extent of the at-grade option.

The following table is a planning level cost estimate summary for the three alternatives. Details of the capital costs can be found in Attachment 1.

<table>
<thead>
<tr>
<th>Description</th>
<th>Construction Costs</th>
<th>Operation &amp; Maintenance Cost (20 yrs)*</th>
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<td>$ 532,400.00</td>
<td>$ 814,400.00</td>
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<td>$7,596,800.00</td>
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<tr>
<td>Alternate 2A - 10' Wide Bridge Overcrossing with Open Abutments</td>
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<td>$ 160,800.00</td>
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<td>$3,218,500.00</td>
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* Assume 5% O & M increase per year
Section 8: Recommendations

From a capital cost perspective, the least costly alternative is 1B, the trail undercrossing with reconstruction of the pump station with wall improvements to minimize the infiltration of creek water to the trail surface. Additional costs for FCD construction and permitting for more frequent desilting operations adjacent to the trail would need to be developed and funded. The second most costly option is the at-grade on-street alternative. The most costly option is 2A, the grade separation trail bridge overcrossing alternative with a 12-foot width.

From a perspective of long term maintenance costs, the 10-foot bridge overcrossing structure would be the most cost effective; the at-grade alternative would be next most cost-effective, followed by the reconstruction of the existing trail undercrossing facility which would be the most costly in terms of maintenance, and would require the identification of additional funding mechanisms for maintenance by EBRPD and FCD. This consideration is important due to the lack of available mechanisms for maintenance funding beyond current budgets. Maintenance costs cannot be funded out of capital improvement grants.

When one combines the capital costs with the maintenance costs, alternative 1B, the trail undercrossing alternative is the most cost effective, followed by the at grade on-street alternative, and then the grade separated alternative.

From an environmental perspective, the construction improvements of the bridge overcrossing would likely cause the most disruption for a short period of time and not have many significant impacts thereafter. The at-grade alternative would have some displacement of an open ditch and perhaps enclosure of a portion. Much more asphalt pavement is proposed for this alternative than the other two options. The users would be required to divert their trips from the Creek along Richmond Parkway for a distance of .64 miles, and thereby be exposed to more highway tailpipe emissions than the other two alternatives.

Upgrade of the existing undercrossing alternative would have minimal initial impacts, but could have more significant long-term impacts either directly or indirectly due to the requirement for periodic removal of silt from the trail area by EBRPD and from the creek bed adjacent to the trail by FCD to a suitable off-site fill deposit site. FCD has indicated to EBRPD that they have such a site that can be made available at no cost to EBRPD. If additional sources of maintenance funding can be identified, EBRPD and FCD could implement an improved maintenance plan for the trail undercrossing as well as the creek bed, aimed at minimizing the length of time of trail closures of the undercrossing.

From a safety perspective, the grade separated trail bridge overcrossing alternative is the best alternative. It provides safe access over the Richmond Parkway from potential vehicular conflicts and provides a safe highly visible crossing on the bridge deck that can be easily monitored by law enforcement. The program for a bridge overcrossing alternative would include provision to allow occasional EBRPD Park Police and light duty maintenance vehicles to cross the bridge while performing their duties. The trail undercrossing alternative is ranked second in terms of safety. Park Police would need to perform routine patrols of the undercrossing from either side of the trail and not from the Parkway, and with the potential for periodic closure of the trail due to silt inundation, some trail users may attempt to cross the Richmond Parkway midblock near the location where the stream crosses the roadway surface which is unsafe. The at-grade alternative is the least desirable alternative from a safety point of view. The .64 miles of added path for a user to travel is a significant detour and users may incorrectly assume they can safely cross the Richmond Parkway at the stream corridor.
All three options would have identical plan approval processes. However, the trail bridge overcrossing structure would likely require more engineering review and likely would take a correspondingly longer time line to go from design to construction. The at-grade alternative would require longer design review due to the multiple agencies involved.

In summary, the overall ranking of the three alternatives is as follows: The grade separated trail undercrossing alternative is ranked highest. The existing undercrossing would likely take the least amount of time to restore because the majority of the infrastructure is currently in place. This project would not be dependent on resolution of Parkway ownership issues. It is the least expensive to develop, but has a requirement for provision of significant financial resources for periodic long-term maintenance for both EBRPD and FCD, who are willing to consider increasing creek desilting intervals adjacent to the trail. If rehabilitation and ongoing maintenance funding can be acquired, development of this alternative becomes feasible. Modifications to the existing undercrossing design and development of an improved maintenance plan with EBRPD and FCD, could be made to improve its operational effectiveness aimed at minimizing the length of trail closures. Temporary or seasonal trail closures may still be required with implementation of this alternative.

A bridge overcrossing ranks second. Although a bridge offers the best combination of security and safety benefits (open and visible to trail users and police patrols), is not subject to flooding and related trail closures, has minimal operational and maintenance issues, and provides a direct grade-separation of the Parkway, the potential of a future ownership change of the Richmond Parkway to Caltrans, and high costs, make it currently infeasible. If the Parkway ownership change moves forward, design changes to the Parkway in the study area may be required; this could impact any trail bridge overcrossing. Both a 10-foot and 12-foot wide trail bridge crossing would also be extremely expensive, more than $6.0 million and $7.5 million respectively.

However, in the future, the undercrossing could be replaced by bridge overcrossing of the Richmond Parkway under coordination of the West Contra Costa County Transportation Advisory Committee (WCCTAC). The San Pablo Creek-Wildcat Creek Watershed Council, at their meeting of August 2, 2007, requested through a resolution that WCCTAC be the lead coordinating body to resolve issues regarding project sponsorship, project funding, rights of way, and maintenance responsibility, for the Wildcat Creek Trail at Richmond Parkway project, once the issues regarding the potential turnover of the Richmond Parkway to Caltrans are resolved. The WCCTAC Board passed the resolution on consent at their September 28, 2007 Board of Directors meeting.

The at-grade alternative is ranked as the lowest due to the long trail diversion from the Wildcat Creek Trail alignment and resulting inherent danger and personal risk to users who may attempt to cross mid-block on the Richmond Parkway to directly access the trail and avoid the detour.
## Summary Table of Findings

<table>
<thead>
<tr>
<th>Alternative 1B</th>
<th>Capital Cost</th>
<th>Maintenance Requirements</th>
<th>Effectiveness</th>
<th>Impact to Wildcat Creek flow capacity</th>
<th>Environmental Effect</th>
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</thead>
<tbody>
<tr>
<td>remove silt from system, provide siltation structures and rebuild pump station</td>
<td>Visibility for police from the trail not the Parkway; somewhat more remote location</td>
<td>$282,000</td>
<td>Lower maintenance than rebuild or changing to wet well system. $532,400 - assumes 5% O&amp;M increase per year</td>
<td>Very effective in keeping the silt laden water from inundating the trail. Some inundation will occur where the drainage system will introduce some sediment if the stream flow exceeds the height of the grates for the drainage system. Will require maintenance funding. Additional desilting operations by FCD would assist in keeping the trail from flooding</td>
<td>Should pose no significant impact to the storm flow capacity of the crossing. FCD will need to further evaluate potential impacts to flow capacity</td>
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<td>Will have no effect on the low flow characteristics of the creek. FCD will need to further evaluate potential impacts from additional desilting operations</td>
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<th>Alternative 2A</th>
<th>Capital Cost</th>
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<th>Effectiveness</th>
<th>Impact to Wildcat Creek flow capacity</th>
<th>Environmental Effect</th>
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<tr>
<td>Overcrossing bridge with open abutments</td>
<td>Better visibility for users and police patrols</td>
<td>$6 million</td>
<td>Pre-manufactured bridge would provide grade separated access to the trail over Richmond Parkway. $161,000 - assumes 5% O&amp;M increase per year</td>
<td>Has no impact to the existing bridge structure. Provides clear span over Richmond Parkway. Available right of way for east landing allows for maintenance access to the creek if smaller desilting equipment is used by FCD</td>
<td>No impact</td>
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<td>Moderate visual impact. Construction impacts</td>
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<th>Alternate 3 at-grade solution</th>
<th>Capital Cost</th>
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<th>Effectiveness</th>
<th>Impact to Wildcat Creek flow capacity</th>
<th>Environmental Effect</th>
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<td>Unsafe mid-block crossings across Richmond Parkway may occur due to length of detour</td>
<td>Over $3.2 million</td>
<td>More local maintenance of trail (.64 mile). $494,000 - assumes 5% O&amp;M increase per year</td>
<td>Alternate not trail user friendly. Trail detour is approximately .64 miles. Barriers may be a problem for a driver of a disabled vehicle on Parkway</td>
<td>No impact to the existing stream corridor</td>
<td>Trail users could be subject to vehicle fumes</td>
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Attachment 1

Concept Cost Estimates
### Alternate 1B - Rebuild Existing Facility

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<th>Construction Costs</th>
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**TOTAL** $ 814,400.00

* Assume 5% O & M increase per year

**NOTE:** STATEMENT OF PROBABLE CONSTRUCTION COST IS MADE ON CONSULTANTS PAST EXPERIENCE WITH SIMILAR PROJECTS AND ASSUMPTIONS WHERE NO PAST EXPERIENCE IS AVAILABLE. THIS STATEMENT IS PROVIDED FOR BUDGETARY, BONDING AND RELATED PURPOSES ONLY. NO GUARANTEE IS OFFERED OR IMPLIED TO PERFORM THE CONSTRUCTION WORK, OR THAT AN ACTUAL CONTRACTOR'S BID WILL CONFORM TO THIS ESTIMATE.
**Alternate 2A - 12' Wide Flyover with Open Abutments**

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**TOTAL**  $7,596,800.00

**NOTE:** STATEMENT OF PROBABLE CONSTRUCTION COST IS MADE ON CONSULTANTS PAST EXPERIENCE WITH SIMILAR PROJECTS, AND ASSUMPTIONS WHERE NO PAST EXPERIENCE IS AVAILABLE. THIS STATEMENT IS PROVIDED FOR BUDGETARY, BONDING AND RELATED PURPOSES ONLY. NO GUARANTEE IS OFFERED OR IMPLIED TO PERFORM THE CONSTRUCTION WORK, OR THAT AN ACTUAL CONTRACTOR'S BID WILL CONFORM TO THIS ESTIMATE.

* Assume 5% O & M increase per year
### Alternate 2A - 10' Wide Flyover with Open Abutments

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**TOTAL** $6,141,750.76

**NOTE:**

Statement of probable construction cost is made on consultants past experience with similar projects, and assumptions where no past experience is available. This statement is provided for budgetary, bonding and related purposes only. No guarantee is offered or implied to perform the construction work, or that an actual contractor's bid will conform to this estimate.

* Assume 5% O & M increase per year
<table>
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<tr>
<th>Year No. *</th>
<th>Construction Costs</th>
<th>Operation &amp; Maintenance Cost</th>
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<td>$25,200.00</td>
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<tr>
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<td>$27,900.00</td>
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<td>$32,400.00</td>
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<td>$34,100.00</td>
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<td>16</td>
<td>$35,900.00</td>
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<td>$35,900.00</td>
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<tr>
<td>17</td>
<td>$37,700.00</td>
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<tr>
<td>18</td>
<td>$39,600.00</td>
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<tr>
<td>19</td>
<td>$41,600.00</td>
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<tr>
<td>20</td>
<td>$43,700.00</td>
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<td>$43,700.00</td>
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</table>

**TOTAL** $3,218,500.00

* Assume 5% O & M increase per year

**NOTE:**

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### Alternate 1B - Rebuild Existing Facility

<table>
<thead>
<tr>
<th>Item No.</th>
<th>Description</th>
<th>Unit</th>
<th>Quantity</th>
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<th>Cost</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Mobilization (10%)</td>
<td>LS</td>
<td>1</td>
<td>$11,950.00</td>
<td>$11,950.00</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Clearing &amp; Grubbing</td>
<td>LS</td>
<td>1</td>
<td>$2,500.00</td>
<td>$2,500.00</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Water Pollution Control</td>
<td>LS</td>
<td>1</td>
<td>$10,000.00</td>
<td>$10,000.00</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>De-Silting Structure</td>
<td>EA</td>
<td>1</td>
<td>$100,000.00</td>
<td>$100,000.00</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Reconstruct Pump</td>
<td>LS</td>
<td>1</td>
<td>$40,000.00</td>
<td>$40,000.00</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Restoration of Floodwall Joints</td>
<td>LS</td>
<td>1</td>
<td>$20,000.00</td>
<td>$20,000.00</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Pipework</td>
<td>LS</td>
<td>1</td>
<td>$10,000.00</td>
<td>$10,000.00</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Repair Bridge Soffit Lights</td>
<td>LS</td>
<td>1</td>
<td>$7,000.00</td>
<td>$7,000.00</td>
<td></td>
</tr>
</tbody>
</table>

**Base Bid Subtotal**  $201,450.00

<table>
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<th>Unit cost</th>
<th>Cost</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contingency (30%)</td>
<td>LS</td>
<td>1</td>
<td>$39,435.00</td>
<td>$60,000.00</td>
<td></td>
</tr>
<tr>
<td>Construction Management (10%)</td>
<td>LS</td>
<td>1</td>
<td>$13,145.00</td>
<td>$20,145.00</td>
<td></td>
</tr>
</tbody>
</table>

**Other Costs Subtotal**  $80,145.00

**Total**  $282,000.00

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## Alternate 2A - 12' Wide Flyover with Open Abutments

<table>
<thead>
<tr>
<th>Item No.</th>
<th>Description</th>
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<th>Quantity</th>
<th>Unit cost</th>
<th>Cost</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Mobilization (10%)</td>
<td>LS</td>
<td>1</td>
<td>$482,792.46</td>
<td>$482,792.46</td>
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</tr>
<tr>
<td>2</td>
<td>Clearing &amp; Grubbing</td>
<td>LS</td>
<td>1</td>
<td>$10,000.00</td>
<td>$10,000.00</td>
<td>Includes fence demo</td>
</tr>
<tr>
<td>3</td>
<td>Water Pollution Control</td>
<td>LS</td>
<td>1</td>
<td>$10,000.00</td>
<td>$10,000.00</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Traffic Control</td>
<td>LS</td>
<td>1</td>
<td>$20,000.00</td>
<td>$20,000.00</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Drainage System</td>
<td>LS</td>
<td>1</td>
<td>$36,000.00</td>
<td>$36,000.00</td>
<td>6 inlets and 600 ft of pipe</td>
</tr>
<tr>
<td>6</td>
<td>Asphalt Concrete</td>
<td>TON</td>
<td>107</td>
<td>$160.00</td>
<td>$17,052.00</td>
<td>3&quot; thick by 12' wide for access roads</td>
</tr>
<tr>
<td>7</td>
<td>Aggregate Base</td>
<td>CY</td>
<td>181</td>
<td>$85.00</td>
<td>$15,425.91</td>
<td>10&quot; thick under AC</td>
</tr>
<tr>
<td>8</td>
<td>Abutments</td>
<td>CY</td>
<td>24</td>
<td>$750.00</td>
<td>$18,000.00</td>
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</tr>
<tr>
<td>9</td>
<td>CIDF</td>
<td>CY</td>
<td>140</td>
<td>$1,200.00</td>
<td>$167,466.67</td>
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</tr>
<tr>
<td>10</td>
<td>Bridge Structure</td>
<td>SF</td>
<td>11,280</td>
<td>$400.00</td>
<td>$4,512,000.00</td>
<td>12' wide structure</td>
</tr>
<tr>
<td>11</td>
<td>Reinforced Concrete Columns</td>
<td>CY</td>
<td>18</td>
<td>$1,200.00</td>
<td>$21,979.98</td>
<td></td>
</tr>
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</table>

### Base Bid Subtotal

$5,310,717.01

### Contingency (30%)

<table>
<thead>
<tr>
<th>Description</th>
<th>Unit</th>
<th>Quantity</th>
<th>Unit Cost</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>LS</td>
<td>1</td>
<td>$1,593,216.00</td>
<td>$1,593,216.00</td>
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</tr>
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</table>

### Construction Management (10%)

<table>
<thead>
<tr>
<th>Description</th>
<th>Unit</th>
<th>Quantity</th>
<th>Unit Cost</th>
<th>Cost</th>
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<tr>
<td>LS</td>
<td>1</td>
<td>$531,072.00</td>
<td>$531,072.00</td>
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</tbody>
</table>

### Other Costs Subtotal

$2,124,288.00

### Total

$7,436,000.00

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### Alternate 2A - 10' Wide Flyover with Open Abutments

<table>
<thead>
<tr>
<th>Item No.</th>
<th>Description</th>
<th>Unit</th>
<th>Quantity</th>
<th>Unit cost</th>
<th>Cost</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Mobilization (10%)</td>
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<td>$388,504.49</td>
<td>$388,504.49</td>
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</tr>
<tr>
<td>2</td>
<td>Clearing &amp; Grubbing</td>
<td>LS</td>
<td>1</td>
<td>$10,000.00</td>
<td>$10,000.00</td>
<td>Includes fence demo</td>
</tr>
<tr>
<td>3</td>
<td>Water Pollution Control</td>
<td>LS</td>
<td>1</td>
<td>$10,000.00</td>
<td>$10,000.00</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Traffic Control</td>
<td>LS</td>
<td>1</td>
<td>$20,000.00</td>
<td>$20,000.00</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Drainage System</td>
<td>LS</td>
<td>1</td>
<td>$36,000.00</td>
<td>$36,000.00</td>
<td>6 inlets and 600 ft of pipe</td>
</tr>
<tr>
<td>6</td>
<td>Asphalt Concrete</td>
<td>TON</td>
<td>89</td>
<td>$160.00</td>
<td>$14,210.00</td>
<td>3&quot; thick by 10' wide for access roads</td>
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<tr>
<td>7</td>
<td>Aggregate Base</td>
<td>CY</td>
<td>151</td>
<td>$85.00</td>
<td>$12,854.93</td>
<td>10&quot; thick under AC</td>
</tr>
<tr>
<td></td>
<td>Abutments</td>
<td>CY</td>
<td>0</td>
<td>$750.00</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td></td>
<td>CIDF</td>
<td>CY</td>
<td>0</td>
<td>$1,200.00</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Bridge Structure</td>
<td>SF</td>
<td>9,400</td>
<td>$400.00</td>
<td>$3,760,000.00</td>
<td>10' wide structure</td>
</tr>
<tr>
<td>9</td>
<td>Reinforced Concrete Columns</td>
<td>CY</td>
<td>18</td>
<td>$1,200.00</td>
<td>$21,979.98</td>
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</tr>
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**Base Bid Subtotal** $4,273,549.39

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<th>Cost</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Contingency (30%)</td>
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<td>1</td>
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<td>$1,282,065.00</td>
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</tr>
<tr>
<td></td>
<td>Construction Management (10%)</td>
<td>LS</td>
<td>1</td>
<td>$427,355.00</td>
<td>$427,355.00</td>
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</tr>
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</table>

**Other Costs Subtotal** $1,709,420.00

**Total** $5,983,000.00

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## Alternate 3 - At-Grade Crossing

<table>
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<th>Item No.</th>
<th>Description</th>
<th>Unit</th>
<th>Quantity</th>
<th>Unit cost</th>
<th>Cost</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Mobilization (10%)</td>
<td>LS</td>
<td>1</td>
<td>$172,164.98</td>
<td>$172,164.98</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Clearing &amp; Grubbing</td>
<td>LS</td>
<td>1</td>
<td>$10,000.00</td>
<td>$10,000.00</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Water Pollution Control</td>
<td>LS</td>
<td>1</td>
<td>$10,000.00</td>
<td>$10,000.00</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Traffic Control</td>
<td>LS</td>
<td>1</td>
<td>$20,000.00</td>
<td>$20,000.00</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Drainage System</td>
<td>LS</td>
<td>1</td>
<td>$57,600.00</td>
<td>$57,600.00</td>
<td>16 inlets and 300 ft of pipe</td>
</tr>
<tr>
<td>6</td>
<td>Curb Ramps</td>
<td>EA</td>
<td>2</td>
<td>$3,000.00</td>
<td>$6,000.00</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Asphalt Concrete</td>
<td>TO</td>
<td>218</td>
<td>$160.00</td>
<td>$34,800.00</td>
<td>9’ wide x 2.5” thick path along Richmond Prky</td>
</tr>
<tr>
<td>8</td>
<td>Aggregate Base CL 3</td>
<td>CY</td>
<td>1,400</td>
<td>$85.00</td>
<td>$118,999.88</td>
<td>Approx. dimensions per concept plan.</td>
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<tr>
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<td>Subbase CL 4</td>
<td>CY</td>
<td>600</td>
<td>$85.00</td>
<td>$50,999.95</td>
<td>Approx. dimensions per concept plan.</td>
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<td>ATPB</td>
<td>CY</td>
<td>250</td>
<td>$85.00</td>
<td>$21,249.98</td>
<td>Approx. dimensions per concept plan.</td>
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<td>Barrier</td>
<td>LF</td>
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<td>$100.00</td>
<td>$320,000.00</td>
<td>1,600’, both sides along Richmond Prky</td>
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<tr>
<td>12</td>
<td>Chainlink Fence</td>
<td>LF</td>
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<td>$45.00</td>
<td>$72,000.00</td>
<td>1,600’ along Richmond Prky</td>
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<tr>
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<td>Imported Borrow</td>
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<td>14,400</td>
<td>$65.00</td>
<td>$936,000.00</td>
<td>Assumes 3’ tall embankment fill along Richmond Prky</td>
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<td>Concrete Lined Ditch</td>
<td>LF</td>
<td>1,600</td>
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<td>$64,000.00</td>
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**Base Bid Subtotal** $1,893,814.79

<table>
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<tr>
<td>Contingency (30%)</td>
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<td>$189,382.00</td>
</tr>
<tr>
<td>Construction Management (10%)</td>
<td>LS</td>
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</table>

**Other Costs Subtotal** $757,527.00

**Total** $2,652,000.00

---

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Attachment 2

East Bay Regional Park District Standards
SAMPLE
FOR REFERENCE ONLY