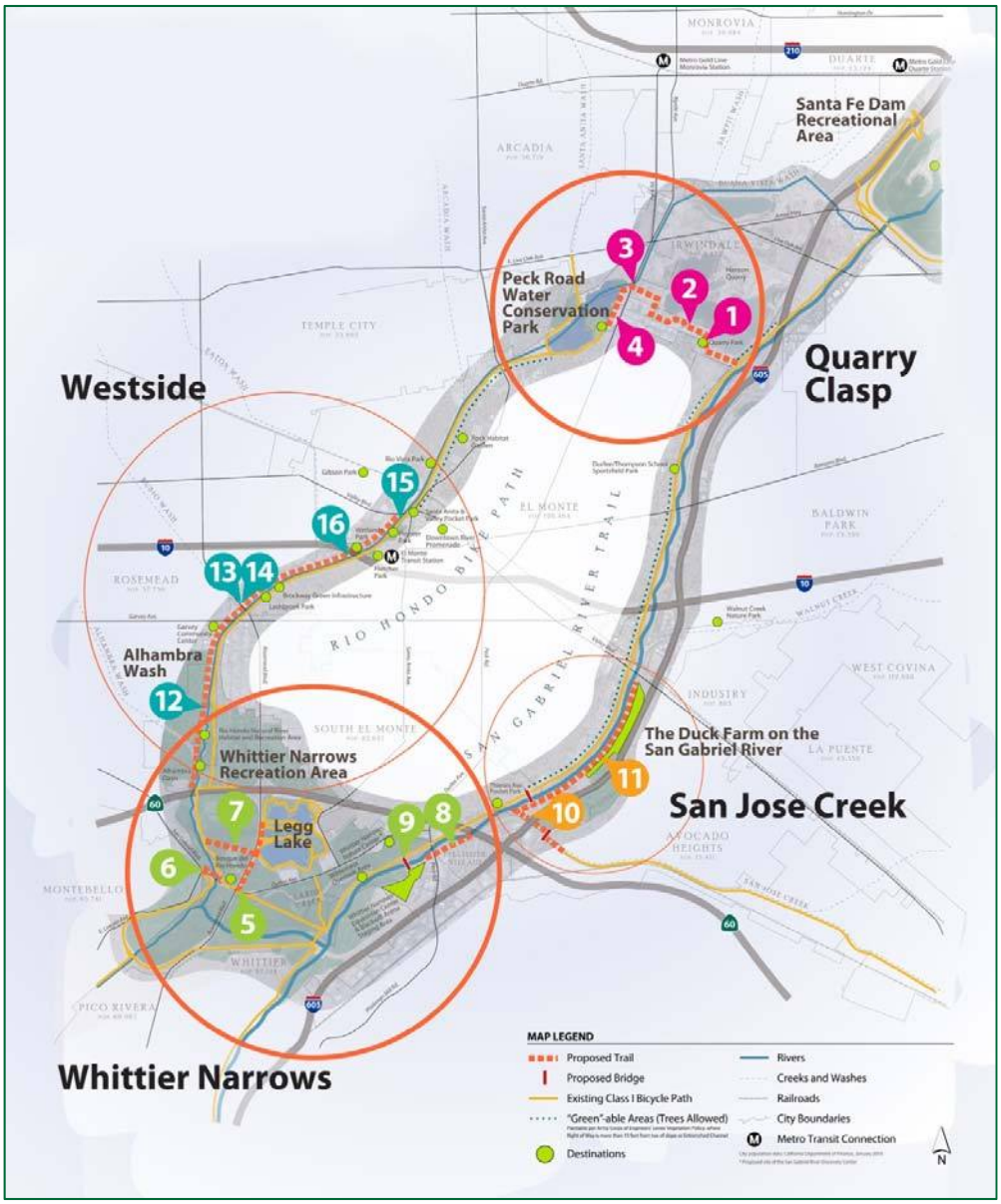
EMERALD NECKLACE

IMPLEMENTATION PLAN - PHASE I
Implementation Project Reports 1-16
January 2017



EMERALD NECKLACE STEERING COMMITTEE:

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County of Los Angeles California

Supervisor Hilda Solis, First District

County of Los Angeles Department of Parks & Recreation

County of Los Angeles Public Works

Los Angeles County Flood Control District

Amigos de los Rios

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EXECUTIVE SUMMARY

INTRODUCTION

The Watershed Conservation Authority (WCA) is proposing the Emerald Necklace Implementation Plan – Phase I. The proposed plan includes fifteen (15) projects that will close gaps in the Emerald Necklace's regional trails network and increase access to the trails for hundreds of thousands of people. The WCA has prepared a Program Environmental Impact Report (PEIR) that identifies and evaluates the potential environmental impacts associated with the implementation and operation of the proposed project.

The Emerald Necklace is located in the San Gabriel Valley in the southeastern portion of Los Angeles County. The San Gabriel Valley is an urbanized area that is largely built out with single- and multi-family residential, commercial, and industrial land uses. The Emerald Necklace is a 17-mile interconnected network of bikeways, multi-use trails, parks, and greenways along the Rio Hondo and the San Gabriel River. Along the Rio Hondo the Emerald Necklace stretches from Peck Road Water Conservation Park in the north to the Whittier Narrows Recreation Area in the south. Along the San Gabriel River it stretches from Hanson Quarry in the north to Whittier Narrows Recreation Area in the south.

PROJECT BACKGROUND

In 2005, Amigos de los Rios, a California non-profit organization, in conjunction with various cities and stakeholders, developed the Vision Plan for the Emerald Necklace. The Vision Plan presented opportunities for the development of linear greenway projects along the Rio Hondo and the San Gabriel River. In 2006, the County of Los Angeles Board of Supervisors adopted a resolution encouraging the development of the "Emerald Necklace" with the County of Los Angeles Department of Public Works (DPW) and County of Los Angeles Department of Parks and Recreation (DPR) working in coordination with Amigos De Los Rios. In 2010, a Memorandum of Understanding (MOU) between the Los Angeles County Flood Control District (LACFCD) and Amigos De Los Rios was executed. The MOU defined goals and plans of each participant pertaining to the Emerald Necklace.

In 2012, the Watershed Conservation Authority, a joint powers authority composed of the San Gabriel and Lower Los Angeles Rivers and Mountains Conservancy (RMC) and the LACFCD, was tasked to conduct an extensive feasibility study to evaluate the existing elements of the Emerald Necklace and identify feasible projects that support the Emerald Necklace Vision. The feasibility study was presented to the Emerald Necklace Steering Committee (Committee) composed of the Los Angeles County First Supervisorial District, RMC, DPR, DPW, LACFCD, Amigos de los Rios, and Southern California Edison (SCE).

Thirty-seven (37) projects were analyzed in the feasibility study and presented to the Committee. After initial recommendations for changes and additions, formal project reports were drafted and circulated among Committee members for further review and comment. Comments were received from the LACFCD, DPR, and DPW. After review, an additional seven projects were added along the west side of the Rio Hondo creating a final total of forty-four (44) potential projects.

To aid in the prioritization of these projects the Committee developed a set of consensus goals that were used in assessing projects. The goals included:

1. Completion of a trail loop through a "Clasp" at the northern portion of the loop
2. Connecting the recreational areas of Whittier Narrows to the trail loop
3. Providing access to the Emerald Necklace for surrounding communities
4. Providing access points, missing multi-use/equestrian trail elements, and other park elements

In prioritizing projects, an attempt was made to achieve significant improvements in all of the above categories in the order of importance. Within each category projects were ranked according to the overall goal of that category. Highest rated projects were generally projects that filled a missing link in connectivity, or were relatively simple projects that produced great benefits with little effort or cost. Sixteen (16) projects that best met the goals listed above were developed further in this document, the "Phase-I Implementation Plan for the Emerald Necklace". The long-term goal is to develop future phases to be composed of the 44 original projects.

An Initial Study, which considered the 16 priority projects was completed in March 2013 to help focus the scope of a Program Environmental Impact Report (PEIR). Since the Initial Study was completed, Project 4 in the Quarry Clasp area was removed for expedited implementation under a separate implementation plan and separate CEQA documentation. As a result, the remaining fifteen (15) projects are being carried forward herein. This implementation report constitutes the more detailed project descriptions contained in the PEIR. Cost estimates and benefit-cost ratios were calculated for all projects and are attached to each project chapter in this report. The complete Benefit Cost Analysis is attached as Appendix A. In addition, the mitigation monitoring and reporting requirements for each project under the PEIR are attached as Appendix B.

DESCRIPTION OF PROPOSED PROJECTS

The projects are organized in four distinct regional areas: Quarry Clasp, Whittier Narrows, San Jose Creek, and the Westside. The project area map below shows all areas and projects with project numbers as presented in this report and the PEIR. The Quarry Clasp project area is located along the northern end of the Proposed Project within the cities of Arcadia and El Monte and in an unincorporated area of the County of Los Angeles. The Whittier Narrows project area is located along the southern end of the Proposed Project within unincorporated areas of Los Angeles County and partially within the City of Industry. The San Jose Creek project area is located along the southeastern side of the Proposed Project within unincorporated areas of Los Angeles County (Avocado Heights) and the City of Industry. The Westside project area is

EMERALD NECKLACE

FEASIBILITY STUDY & IMPLEMENTATION PLAN - PHASE I

The Emerald Necklace is an extraordinary 17-mile loop of bicycle and multi-use trails which links parks and open spaces along two waterways, the San Gabriel River and the Rio Hondo. Phase I's 16 projects will close gaps in this regional recreational trails network and increase access to hundreds of thousands of constituents. Ongoing efforts will also add gateways, signage and greening. Further phases identified in the feasibility study will continue to expand the system in following years, contingent on funding and public support.

Westside Multi-Use Trail:

A Trail for All User Groups

The primary benefit of this trail would be to create a continuous loop around the Emerald Necklace for equestrians, and improve recreational potential for all user groups. The secondary benefit is improving access to the Emerald Necklace system for west side communities.

12 **Multi-Use Trail: Alhambra Wash from State Route 60 to the Garvey Community Center with Gates, Signage, etc.**

13 **Street Access Ramps at Rosemead Blvd. with Gates & Signage**

14 **Underpass at Rosemead Blvd.**

15 **Multi-Use Trail: Rosemead Blvd. to Valley Blvd.**

16 **10 Freeway Underpass Improvements**

Whittier Narrows Connectivity:

Linking Existing Park Resources

Trail connections at the southern end of the necklace involve strategic placement of Class I bike path segments and new Multi-Use Trails within the area. Internal circulation within the Whittier Narrows area will be improved so pedestrians and bicyclists can access all park areas currently inaccessible without a car.

5 **Class I Bicycle Path: Adjacent to Rosemead Blvd. to Legg Lake**

6 **Class IV Bicycle Path: From El Bosque del Rio Hondo to Lincoln Ave. on San Gabriel Blvd. with Enhanced Signalized Crossing, Signage & Wayfinding**

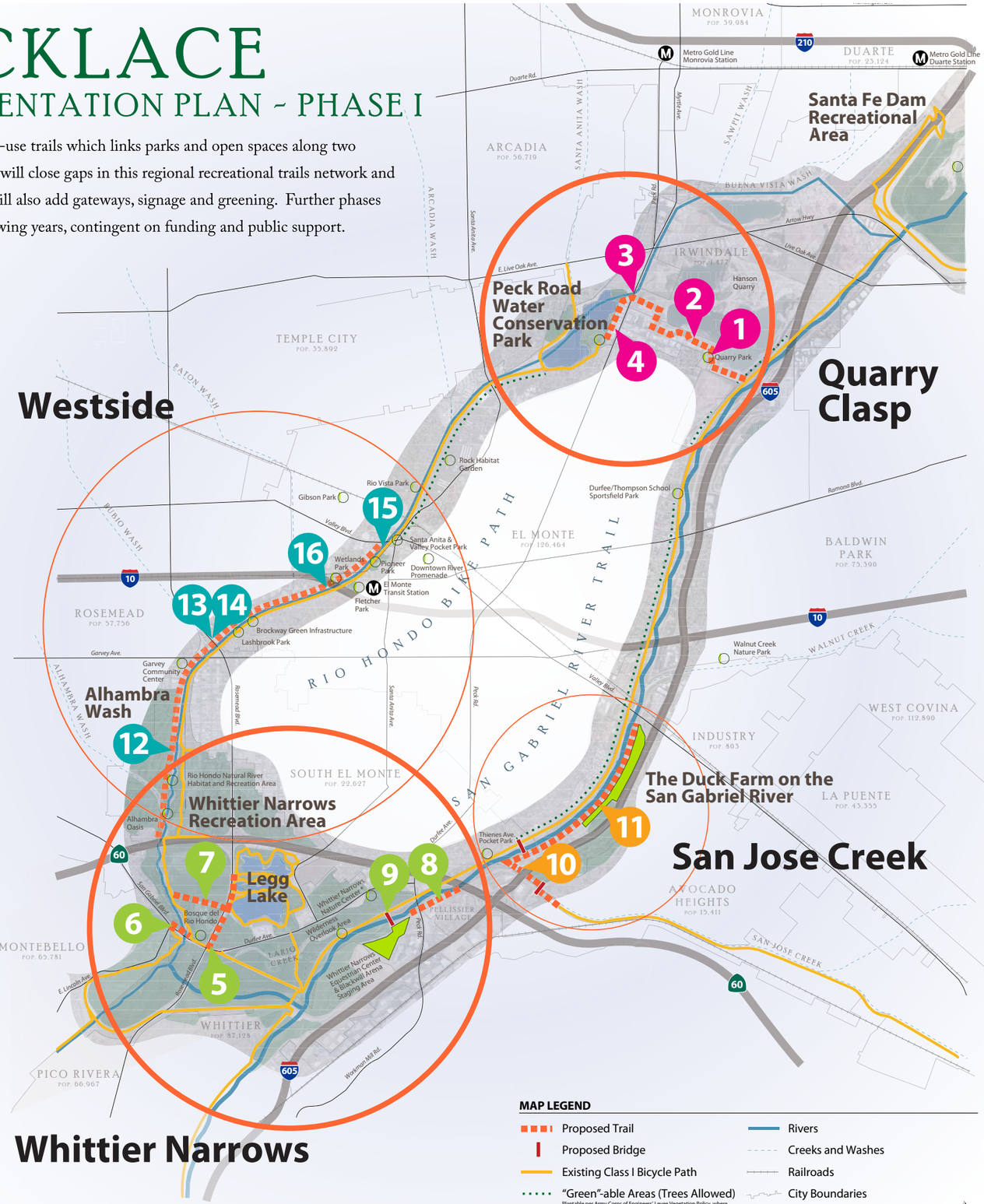
7 **Class I Bicycle Path: From the Rio Hondo to Legg Lake through the Southern California Edison Easement**

8 **Multi-Use Trail: Pellissier Village from State Route 60 to Peck Road Bridge**

9 **Multi-Use Bridge: Pellissier Bridge at Blackwill Arena Staging Area**

PROJECT COMPONENTS

Greening (per notes on map legend) · Equestrian Trail · Multi-Use Trail · Ped/Bike/Horse Bridge (to cross over waterway) · Street Crossing (Crosswalk, signal may be needed) · Bridge Underpass · Tunnel (Throughpass & Improvements)



MAP LEGEND

- Proposed Trail
- Proposed Bridge
- Existing Class I Bicycle Path
- "Green"-able Areas (Trees Allowed) — Plantable per Army Corps of Engineers' Levee Vegetation Policy, where Right of Way is more than 15 feet from toe of slope or Entrenched Channel
- Destinations
- Rivers
- Creeks and Washes
- Railroads
- City Boundaries
- Metro Transit Connection

City population data: California Department of Finance, January 2010
* Proposed site of the San Gabriel River Discovery Center

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Quarry Clasp:

Completing the Loop

Multi-Use Trail extension projects from Peck Road Water Conservation Park east to the San Gabriel River will connect the trail gap between the Class I bike paths on the Rio Hondo and the San Gabriel Rivers.

1 **Park Development with Trail, Gates, Signage and Amenities**

2 **Multi-Use Trail and Bike Paths**

3 **Signalized Crossing at Peck Road with Signage and Wayfinding**

4 **Rio Hondo Multi-Use Trail and Class I Bicycle Path: Connection in Peck Road Water Conservation Park**

San Jose Creek Regional Access:

Connecting Communities East of the San Gabriel River

Trail completions and creek/bridge crossings will improve access to the Emerald Necklace for a significant population east of the San Gabriel River.

10 **Multi-Use Trails and 2 Multi-Use Bridges: From San Jose Creek Trail to San Gabriel River Trail**

11 **Multi-Use Trail: From San Jose Creek to the Duck Farm on the San Gabriel River**

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OCT 2016

located along the western side of the Proposed Project within unincorporated areas of Los Angeles County and the cities of El Monte, Rosemead, and South El Monte.

1. Quarry Clasp Park Development

The project consists of the acquisition of land for the development of a public park at the intersection of Durfee Avenue and Clark Street in the City of Arcadia. This project entails a park that features equestrian amenities such as trailer parking, picnic areas, restroom facilities, a potable water source, trail maps, native plantings, and interpretive signage. Other park elements include a new concrete curb cut and drive entrance, parking space for approximately five horse trailers and five cars, bicycle racks, drinking fountain, a viewing and seating plaza, interpretive signs, and approximately three acres of turf area. The remaining landscape will be planted with native trees and shrubs. The park will be constructed per DPR Guidelines, the County of Los Angeles Trails Manual, and the County of Los Angeles Equestrian Design Guidelines. This park will be owned and operated by the County of Los Angeles.

2. Quarry Clasp Multi-Use Trail and Bicycle Path

This project connects both a multi-use trail and a combination of Class I bicycle path and Class IV bikeway from the Foothill Transit parking lot on Peck Road to the existing Class I bicycle path on the San Gabriel River. This connection is referred to as the "Clasp" of the Emerald Necklace. The trails will be located along the southern edge of the Hanson Quarry, turning south behind the Transit Center and then east to parallel Clark Street. Approximately mid-way towards the San Gabriel River, the trails will be located on Clark Street right-of-way due to industrial building development at the quarry edge. The trail alignments will continue on Clark Street through the intersection of Clark Street and Durfee Avenue. From the Clark Street and Durfee Avenue intersection and cul-de-sac, both trails will continue east through the Clark Street easement and the proposed Quarry Clasp Park (Project 1) to a narrow passageway between the active Hanson Quarry and an inactive quarry site slated for industrial building development. This area is referred to as the "Spine".

3. Peck Road Signalized Crossing and Trail Connectivity

The Peck Road Signalized Crossing Project (Project 3) in conjunction with Project 2, the Quarry Clasp Multi-Use Trail and Bicycle Path, will connect Peck Road Water Conservation Park, a regional recreation area on the Rio Hondo, to the San Gabriel River Trail. This connection is referred to as the Quarry Clasp of the Emerald Necklace. The project will modify an existing intersection on Peck Road to accommodate a safe crossing for all trail users. In addition, the Foothill Transit parking lot entrance will be modified to accommodate both a Class I bicycle path and a multi-use trail.

4. Rio Hondo Multi-Use Trail and Class I Bicycle Path Connection in Peck Road Water Conservation Park

This project was included in the Feasibility Study, but is now carried forward for design and implementation under a separate planning program.

5. Class I Bicycle Path on Rosemead Boulevard to Legg Lake

This project will improve recreational connectivity on Rosemead Boulevard from San Gabriel Boulevard to the Whittier Narrows Recreation Area. This project includes development of a Class I bicycle path and a multi-use trail on the eastern shoulder of Rosemead Boulevard and partially on the adjacent strawberry field, leased from the U.S. Army Corps of Engineers (USACE). Right-of-way will be obtained from the USACE. The proposed bicycle path and multi-use trail will link the El Bosque del Rio Hondo Park and a western spur of the San Gabriel River Trail on Siphon Road to Legg Lake and will be designed to Caltrans Highway Design Manual standards and AASHTO guidelines.

6. Class IV Bikeway from El Bosque del Rio Hondo to Lincoln Avenue on San Gabriel Boulevard

The intent of this project is to fill in the missing gap between the northern and southern portions of the Rio Hondo Class I bicycle path with a Class IV bikeway. Specifically, this project will extend the existing Class I bicycle path on the north side of San Gabriel Boulevard from the end of the northern section of the Rio Hondo Bicycle Path to Lincoln Avenue. To gain the width necessary for the new Class IV bikeway, all traffic lanes would be reduced and the center raised median relocated to allow an expansion of the north sidewalk. The Class IV bikeway will be designed to Caltrans Highway Design Manual standards, AASHTO guidelines, the MUTCD guidelines, and other applicable requirements.

7. Class I Bicycle Path from the Rio Hondo to Legg Lake through the Southern California Edison Easement

Project 7 has three components that will connect the northern section of the Rio Hondo Class I bicycle path directly to the Legg Lake recreation area. The first project component will develop an approximately half-mile long Class I bicycle path located on the north side of the Southern California Edison (SCE) transmission line corridor to connect the Rio Hondo Bike Path to Rosemead Boulevard. The 12-foot wide asphalt bicycle path would be designed to Caltrans Highway Design Manual standards and AASHTO guidelines. The second trail connection component associated with this project is a mid-block signalized pedestrian crossing on Rosemead Boulevard with center median modifications for planting and irrigation. From the signalized crossing a continuation of the Rosemead Boulevard Bicycle Trail will extend north approximately 1,400 linear feet along the street to the parking lot at the main entry to the Legg Lake. This segment of the trail will be a Class I bicycle path separated from traffic by a landscaped buffer. The project may also include a multi-use trail within the SCE transmission line corridor, running parallel and adjacent to the proposed bicycle path. This component will be considered during the design development phase.

8. Pellissier Village Multi-Use Trail from State Route 60 to Peck Road Bridge

This project will develop a pedestrian path a multi-use trail and a stormwater management component (bio-swale) to reduce pollution from equestrian use along the San Gabriel River.

The hardened pedestrian trail will connect to an ADA accessible ramp on the northeast side of the new Peck Road Bridge. The project will accommodate DPR's plans for a small arena located at the end of Pellissier Road. The arena will be constructed to drain to the proposed bio-swale. The bio-swale will tie into the existing stormwater drainage system at the street end and at the edge of an office building parking lot adjacent to Peck Road. Implementation of the widened Peck Road Bridge will include improvements to the existing multi-use trail underneath the bridge. Underpass height clearance will be maintained for equestrian use.

9. Pellissier Bridge at Blackwill Arena Staging Area

The proposed shared-use Pellissier Bridge will span the San Gabriel River at a critical location to link existing recreational facilities on both the west and east sides of the river. The Blackwill Arena Staging Area (formerly known as Horseman's Park) is located on the east side of the river. The Whittier Narrows Nature Center is located directly across the river to the west. The shared-use bridge will be flush with the proposed adjoining paths and will be approximately 540 feet long and 15 feet wide. The bridge will emulate a proposed shared-use bridge developed by DPW for Emerald Necklace Project 10, the San Jose Creek Regional Access Project. Emerald Necklace way-finding and regulatory signage will be installed at each end of the bridge.

10. Multi-Use Trail and Bridge Connections from the San Jose Creek Trail to San Gabriel River Trail

The intent of this project is to close the half-mile gap between the San Gabriel River Trail on the west side of the river and the existing Class I river trails along San Jose Creek. The project includes two multi-use bridges, one over San Jose Creek, and the other spanning the San Gabriel River.

The shared-use bridge over the San Gabriel River (540 feet long and 15 feet wide) will be flush with the proposed adjoining shared-use paths. The shared-use bridge over San Jose Creek (250 feet long and 12 feet wide) will also be flush with the proposed adjoining shared-use paths on the levees. The bridges will be tied into the surrounding trail connections through a Class I bike path and improved multi-use path extension between the two proposed bridges and a formalized underpass below I-605. The project also includes a Class I shared-use path extension between the San Jose Creek bridge and the existing Class I San Jose Creek bike path with a formalized underpass below the Workman Mill Road bridge.

11. Multi-Use Trail from San Jose Creek to the Duck Farm on the San Gabriel River

This project will connect the existing and proposed San Jose Creek Class I bicycle path and the multi-use trail to Phase 1 of the Duck Farm on the San Gabriel River when it opens to the public in the spring of 2018. The extension of the multi-use trail will utilize the existing flood control maintenance road. When the proposed San Gabriel River shared-use bridge is constructed as part of Project 10, public use of the multi-use trail will increase from the west side of the San Gabriel River.

12. Alhambra Wash from State Route 60 to the Garvey Community Center
The Westside Multi-Use Trail Project from SR-60 to the Garvey Community Center will improve approximately 1.25 miles or 6,700 linear feet of multi-use trail utilizing the DPR riding and hiking easement. Approximately half of the project trail length is located within the natural area of the Rio Hondo. This project will formalize and better define the multi-use trail with a combination of fencing, trail footing improvements, landscaping with native trees and shrubs, and signage. These improvements will attract more recreational users and deter the vagrant camps that have steadily increased in number on the west side of the Rio Hondo.

13. Rosemead Boulevard Access Ramp
This project will construct an ADA accessible ramp on the east side of Rosemead Boulevard and connect to the Westside Multi-Use Trail (now named the Rio Hondo River Trail) on the Rio Hondo Channel. Rosemead Boulevard rises on an embankment to cross the Rio Hondo; the ramp will be constructed adjacent to the sidewalk on the embankment in the Caltrans ROW. The ramp will be approximately 300 feet in length. Materials for construction of the ramp will match the Garvey Bridge ramp, consisting of concrete and metal. The ramp will require retaining walls and will be separated from the road by a fence with a gate for security.

14. Rosemead Boulevard Underpass

This project is the re-contouring of the backside of the levee and improving the underpass at Rosemead Boulevard to ensure a wide and safe multi-use trail on the west side of the Rio Hondo. Trail construction will meet Los Angeles County Trails Manual standards. Project coordination with the construction of a ramp or ramps on the back side of the levee is necessary to ensure that the design and final location of the ramp(s) conform to the underpass improvements.

15. Multi-Use Trail from Rosemead Boulevard to Valley Boulevard

This project will assemble a continuous, unimpeded trail (now called the Rio Hondo River Trail) on the west side of the Rio Hondo from Rosemead Boulevard to Valley Boulevard for equestrians, hikers, and mountain bikers. This project will formalize and better define the multi-use trail with a combination of fencing, trail footing improvements, landscaping with native trees and shrubs, and signage. The multi-use trail will be constructed in the DPR riding and hiking easement located behind the asphalt levee maintenance road following the river channel alignment.

16. Interstate 10 Freeway Underpass Improvements

Development of the West Side Multi-Use Trail (now named the Rio Hondo River Trail) will require trail improvements at the I-10 underpass currently utilized LACFCD maintenance vehicles. This project will connect the new multi-use trail in the hiking and riding easement to the maintenance roadway, allowing passage of recreational trail users through the renovated underpass tunnel.

THE QUARRY CLASP:
Quarry Clasp Park Development

Project Description Summary

This project is the acquisition of land for the development of a public park at the intersection of Durfee Ave. and Clark St. in the City of Arcadia. The land is currently zoned CM. The City of Arcadia will change the zoning to accommodate recreation. With the acquisition of land, a conceptual park design that features equestrian amenities such as trailer parking, picnic areas, restroom facilities, a potable water source, trail maps, native plantings and interpretive signage will be developed. The park will be constructed per the County of Los Angeles Department of Parks and Recreation Guidelines, the County of Los Angeles Trails Manual, and the County of Los Angeles Equestrian Design Guidelines.

Fig. 1. Proposed five-acre park/trailhead on the southern edge of Hanson Quarry.

Land acquisition for the park will provide for the expansion of an existing 15-foot easement at the end of Clark Street to accommodate a 30-foot wide passage for a Class I bicycle path and a multi-use trail. The need for acquiring properties as well as changing zoning will require substantial effort and time. Such effort is warranted as this project is critical to creating a viable Emerald Necklace loop trail which is considered to be the highest priority of the overall implementation plan. In addition, soil conditions at the project site may be contaminated and the Geotechnical and Materials Engineering Division suggests a Phase 2 investigation that includes soil sampling and testing of materials.

Site Ownership & Easements

The proposed park site encompasses seven parcels and extends north into the Hanson Quarry. The seven parcels are privately owned.

Los Angeles County Assessor Identification Numbers (AIN):

AIN	Ownership	Acres
8532-013-026	Private	.08
8532-013-027	Private	.59
8532-013-029	Private	1.16
8532-014-007	Private	.94
8532-014-002	Private	1.9
8532-014-001	Private – Residential	.17
8532-013-025	Private – Proposed Hanson Quarry Easement	.2
	Total Acres	*5.04*

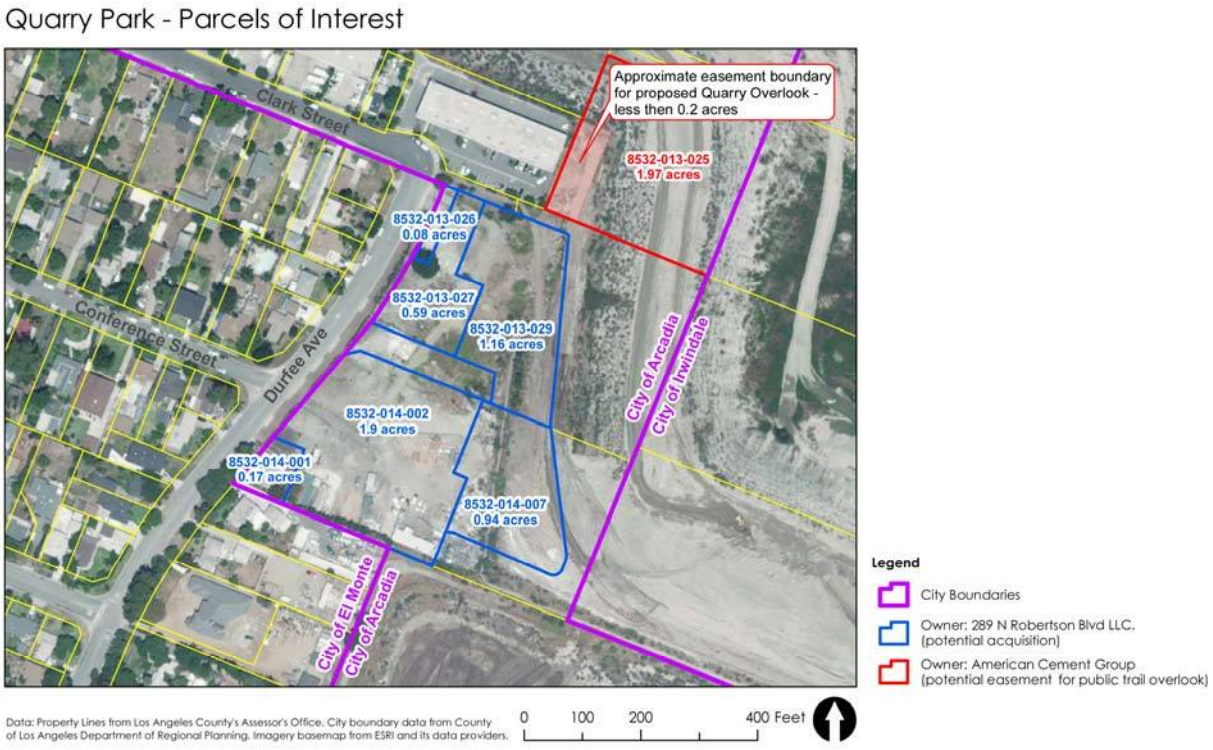


Fig. 2. Map of the parcels assembled to create the proposed park.

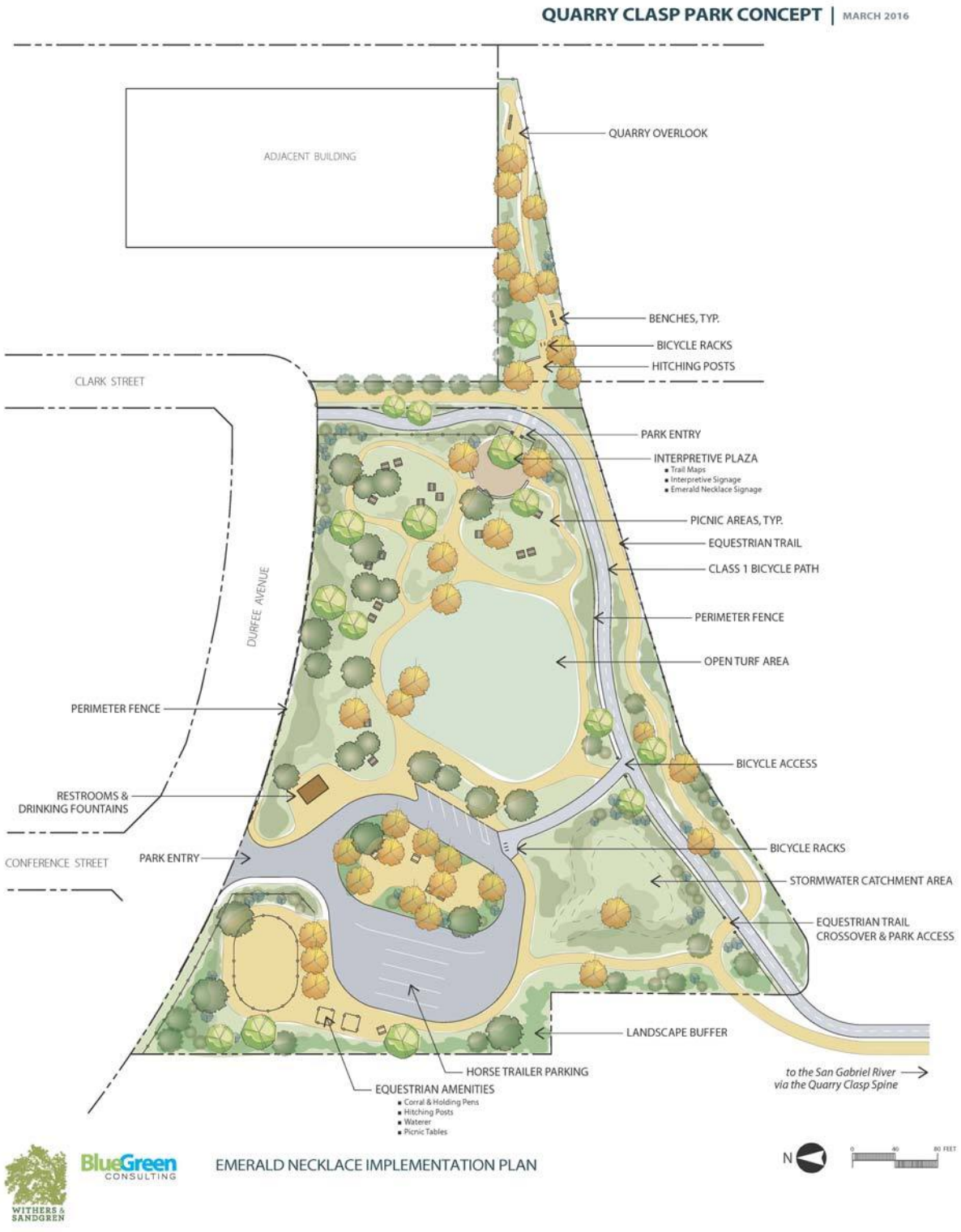


Fig. 3. Proposed Quarry Clasp Park Concept

Demolition will involve the removal of approximately 1,200 square feet of concrete driveway aprons and approximately 1,600 linear feet of 6 foot chain link fencing and gating. The entire site will require miscellaneous weed removal and fine grading. Purchase of a residential property at the southern end of the site may involve either building renovation or demolition depending on the design development of the park.

The new park elements will include a new concrete curb cut and drive entrance, parking space for approximately five horse trailers and five cars, bicycle racks, drinking fountain, a viewing and seating plaza approximately 100 feet by 100 feet in size, two interpretive signs, and approximately three acres of turf area. The remaining landscape would be planted with native trees and shrubs. Approximately 60 linear feet of concrete curbing will be replaced. As this park will be utilized as a trailhead area, a restroom facility with an approximate building area of 600 square feet has been included. Safety lighting will be associated with the building. Both dry and wet utilities will be brought into the site.

The northern and eastern park boundaries of the park will feature both a 10-foot wide multi-use trail and a 12-foot wide, striped Class I bicycle trail. The multi-use trail will be designed and constructed per the County of Los Angeles Trails Manual. The Class I bicycle path will be designed and constructed per the CalTrans Highway Design Manual standards and AASHTO guidelines.

Fig. 4. Proposed five acre park/trailhead on the southern edge of Hanson Quarry.

Fencing will include approximately 2,300 linear feet of 6-foot tubular steel with two 16-foot wide decorative gates to control park access, and two 16-foot wide service gates. A new park entry monument, regulatory, and wayfinding signage will be located adjacent to the entry parking lot.

The project includes but is not limited to:

- Land acquisition
- Zoning change
- Title reports
- Geotechnical investigation – hazardous materials and percolation
- Agricultural suitability soils tests
- Passive park development with amenities, including vehicular parking
- Wet and dry utilities implementation
- Class I bicycle path development
- Multi-use trail development
- Equestrian amenities, including trailer parking
- Interpretive elements
- Decorative gates
- Fencing
- Bio-swale or other LID stormwater management system
- Equine- and dog-friendly landscape and irrigation
- Street improvements
- Security lighting
- Regulatory signage
- Monument signage
- Emerald Necklace signage
- Regulatory and safety signage as required

Fig. 5. View of the quarry looking northeast.

Fig. 6. The project, located in the northern portion of the Emerald Necklace, is a significant equestrian park and part of the Quarry Clasp that connects the San Gabriel and Rio Hondo River trails.

Project Implementation Changes

The feasibility study indicated a park space that was a minimum of three acres. The project area has expanded from approximately 3.5 acres to 5 acres. A portion of the additional acreage to be purchased is a single family residence. Depending on existing conditions, costs and park design development, the structure may be either renovated or demolished. A small portion of Hanson Quarry at the northern point of the proposed park area is proposed as an interpretive walking and viewing area. This additional .02 acres is reliant on a R.O.W agreement from Hanson Quarry.

Project Implementation Challenges

Maximizing the park size requires acquisition of properties from several land owners including a single family residence located on one of the properties that is also commercially used. Depending on existing condition and cost the structure may be either renovated and used for park

operations or demolished. A small portion of Hanson Quarry at the northern point of the proposed park area is proposed as an interpretive walking and viewing area. The additional .02 acres requires a R.O.W agreement from Hanson Quarry.

Emerald Necklace Signage

Refer to the Emerald Necklace Signage Guidelines for the County of Los Angeles Department of Public Works for specific signage design, usage and placement and the County of Los Angeles Department of Parks and Recreation Signage Guidelines.

Emerald Necklace signage depicted below indicates a bicycle path and a multi-use trail. Technically, mountain bikes are allowed on the multi-use trail and should be depicted as a graphic on the trail sign. In order to avoid confusion, when the trails are directly adjacent to each other, the bicycle graphic will remain a separate sign in order to clearly mark a Class I or Class IV bike way. When the trails are separated the multi-use trail sign will also include a bicycle graphic.

Signage Type	Quantity	Location
Wayfinding	One each equestrian and bike	Clark Street and Durfee Avenue
Quarry Park Wayfinding Identification Sign	One	Clark Street and Durfee Avenue
Monument Sign	One	Staging area
Trailhead Map	One	Staging area
Mile Markers		Every quarter-mile on trails

Fig. 7. Appropriate wayfinding signage to be installed at the intersection of Clark Street and Durfee Ave.

Emerald Necklace Phase 1 Implementation Costs

EMERALD NECKLACE PHASE I PROJECTS -PROJECT 1

Quarry Clasp Park

	Item	Qty.	Units	Unit Costs	*Sub-Total*	Total
1.0	Title Reports and Easements	1	LS	$30,000.00	$30,000.00	
2.0	City of Arcadia Zoning Change	1	LS	$1,700.00	$1,700.00	
3.0	Geotechnical Report	1	LS	$24,000.00	$24,000.00	
	Total 1.0 - 3.0					**$55,700.00**
4.0	**Demolition**					
4.1	Site Preparation Clearing and Grubbing	217,800	SF	$0.12	$26,136.00	
4.2	Remove Chain Link Fencing, Footings, Debris	1	LS	$15,000.00	$15,000.00	
4.3	Temporary Construction Fencing	3,000	LF	$1.20	$3,600.00	
	Total 5.0					**$44,736.00**
5.0	**Streetwork**					
5.1	Curb Cuts and Repair	80	SF	$14.00	$1,120.00	
5.2	Sidewalk and Driveway Aprons	1,200	SF	$8.00	$9,600.00	
	Total 6.0					**$10,720.00**
6.0	**Park Construction including Utilities**					
6.1	Passive park construction (LACPR cost per acre)	5	EA	$700,000.00	$3,780,000.00	
6.2	Decorative Gates - 16 feet	2	LS	$30,000.00	$60,000.00	
6.3	Interpretive Signage	2	EA	$4,000.00	$8,000.00	
6.4	Tubular Steel Fencing	3,000	LF	$120.00	$360,000.00	
	Total 7.0					**$4,208,000.00**
7.0	**Trail Construction - North and East Boundaries**					
7.1	Multi-Use Trail w/lodge pole fence	800	LF	$120.00	$96,000.00	
7.2	Class I bicycle path	1,300	LF	$315.00	$409,500.00	
7.3	Provide & install Wayfinding signage	1	LS	$5,000.00	$5,000.00	
7.4	Provide & install Park Monument signage	1	LS	$4,000.00	$4,000.00	
7.5	Provide & install Required Regulatory signage	1	LS	$2,000.00	$2,000.00	
	Total 8.0					**$516,500.00**
	SUB-TOTAL					**$4,835,656.00**
	MOBILIZATION & PROFIT (15%)				**$725,348.40**	
	DESIGN AND PERMITTING (20%)				**$967,131.20**	
	CONTINGENCY (30%)				**$1,450,696.80**	
	TOTAL PROJECT COSTS					**$7,978,832.40**
8.0	Land Acquisition and securing R.O.W (Hanson)	1	LS	$6,200,000.00		

This opinion of probable cost of construction is made on experience and best judgement for a concept design only. Land availability, field conditions, design development and construction document production will invariably alter costs. Concept costs have been developed for the purpose of an Emerald Necklace Phase I Cost Benefit Analysis.

Emerald Necklace Phase 1 Benefit-Cost Analysis

Benefit-Cost Analysis Project 1: Quarry Clasp Park			
Cost			
Construction Cost:	$ 7,978,832		
Land Acquisition:	$ 6,200,000		
Total Cost:	$ 14,178,832		
Annual Maintenance:	$ 26,408		
Discount Rate:	7%		
Total Cost (30 yr. in 2016 $)	$ 13,554,262		
Improvements			
Linear Path (Bike only):	1,300 ft		
Linear (Multi only):	800 ft		
Total Linear Path:	1,300 ft		
Staging/Park Areas	5 acres		
Recreational Value:	Medium		
Population in 2400 m Buffer			
Assumed Population Density	7,068		
Commute Share	0.63		
Residents in Buffer	54,570		
Existing Commuters	138		
New Commuters	40		
	Low	Mid	High
Total Cyclists	683	9442	14055
Total new Cyclists	242	2819	4176
Annual Benefits			
	Low	Mid	High
Recreation Benefits	$ 733,829	$ 10,141,381	$ 15,096,253
Health Benefits	$ 30,914	$ 360,823	$ 534,583
Mobility Benefits		$ 170,649	
Decreased Auto Use		$ 608	
Multi-Use Health Benefits	$ 114,611		
Multi-Use Recreation Benefits	$ 1,364,005.0		
Total Annual Benefits		$ 12,152,077	
Total Annual Transportation Benefits		$ 532,080	
Benefit-Cost Ratios			
Total Discounted Benefits (30yrs)		$ 150,795,626	
Benefit-Cost Ratio		**11.13**	
Discounted Benefits Transportation		$ 6,602,603	
Benefit-Cost Ratio Transportation		**0.49**	
*Numbers shaded in grey were used for caculation of B-C Ratios			

THE QUARRY CLASP:
Quarry Clasp Multi-Use Trail and Bike Path

Project Description Summary

The intent of this project is to connect both a multi-use trail and a combination of Class I bicycle path and Class IV bikeway from the Foothill Transit parking lot on Peck Road to the existing Class I bicycle path on the San Gabriel River. These trails will connect to the Peck Road Signalized Crossing (Project 3) and the Rio Hondo Class I bicycle path in the Peck Road Water Conservation Park.

Trail alignment follows the southern edge of the Hanson Quarry, turning south behind the Transit Center and then east to parallel Clark Street. Approximately mid-way towards the San Gabriel River, industrial buildings at the quarry edge force the trails into the Clark Street right-of-way. The trail alignments continue on Clark Street through the intersection of Clark Street and Durfee Avenue.

From the Clark Street and Durfee Avenue intersection and cul-de sac, both trails continue east through the Clark Street easement and proposed Quarry Clasp Park (Project 1) to a narrow passageway between the active Hanson Quarry and an inactive quarry site slated for industrial building development to the south. This area is referred to as the “spine”. The existing

Fig. 1. Quarry Clasp Trail Alignment.

maintenance road bed of the spine is approximately 16 feet wide and 1,500 feet long. In order to accommodate both a trail and a bike path on the spine, easements from both north and south property owners are required. The spine is the ideal location for trail users who will have views of the quarry. The spine is also at a high enough elevation which will only require minimal ramping to connect to the San Gabriel River levee along the San Gabriel River Bike Trail.

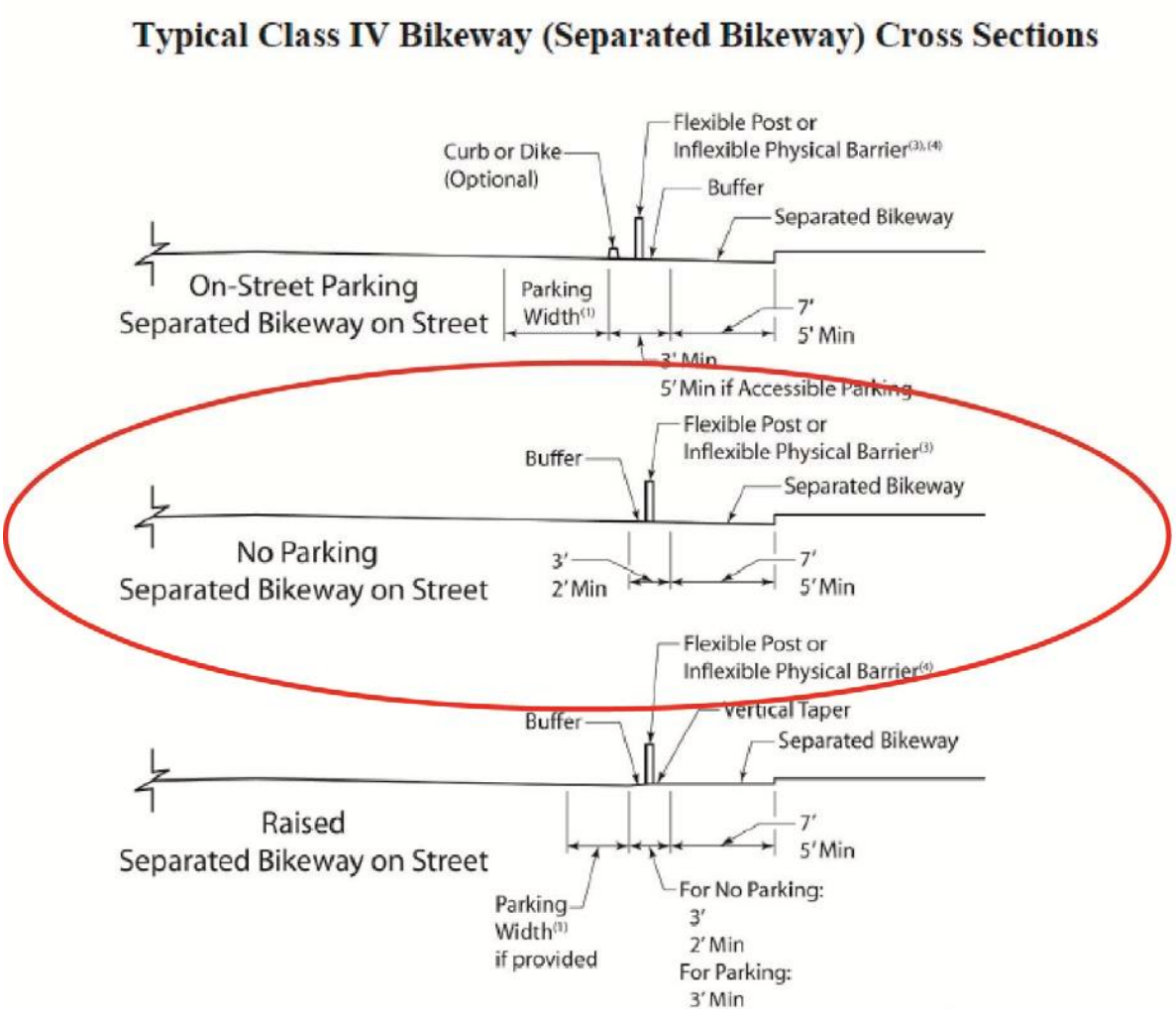


Fig. 2. CalTrans diagrams of Class IV bikeway. The circled diagram most closely resembles the proposed layout for the bike path in the Clark St right-of-way illustrated in Figs. 12, 13, and 14.

Due to the limited space for trails in this area, trail widths, trail materials and trail classifications will vary several times along this alignment. Where feasible, the width of the bicycle path will follow CalTrans Class I bicycle path standards. When the bicycle path turns from the Hanson Quarry property to Clark Street, the bicycle path will become a Class IV bikeway defined by lane separators, bollards and striping. At the turn the multi-use trail will narrow to 6 feet and be constructed of non-skid concrete surfacing with a wood rail fence separating the bikeway and the multi-use trail.

At the ten existing commercial/industrial driveways traffic barriers and trail fencing setbacks will accommodate adequate ingress and egress of wide turning trucks. The concrete pavement will increase to a minimum of 6” thickness to support truck traffic. It is anticipated that all street lighting, street trees, and street drains will remain in place with little or no modifications. On-street parking will be eliminated in the section of Clark Street that will accommodate the two trails.

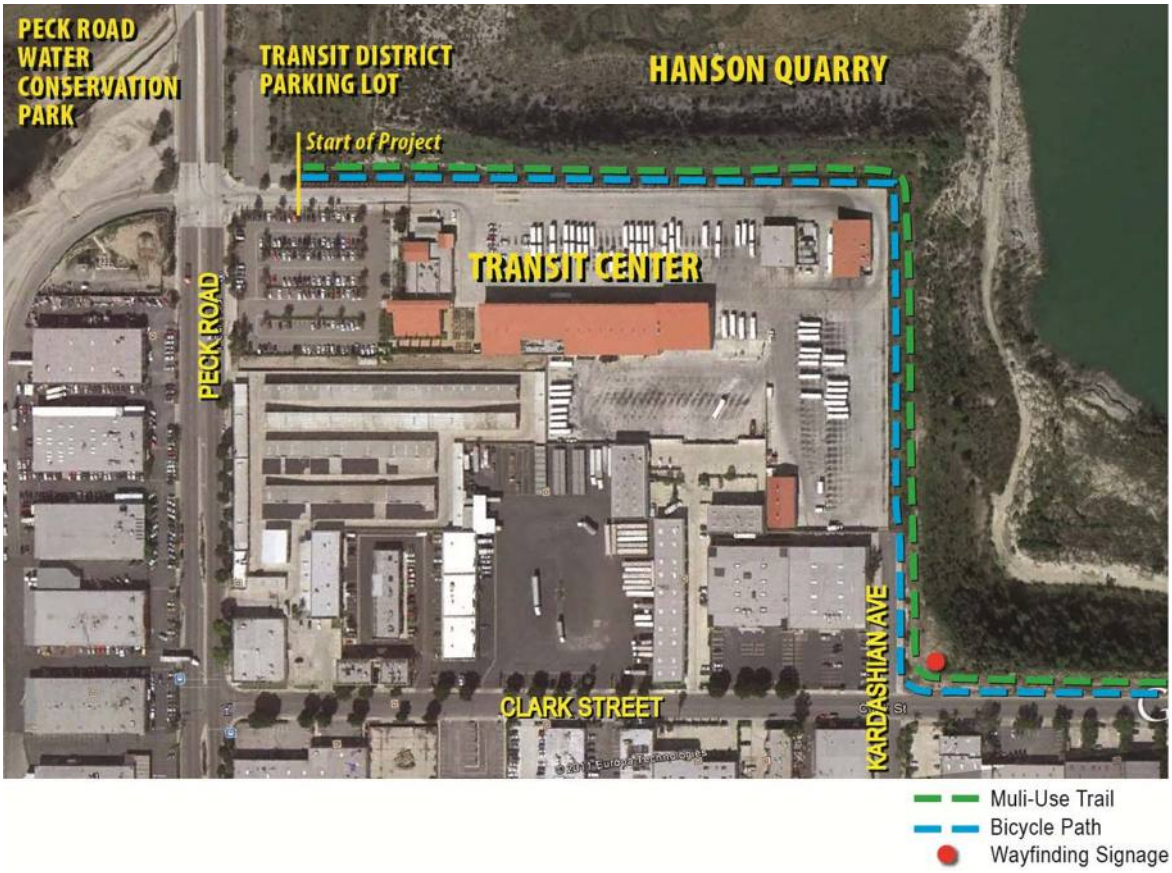
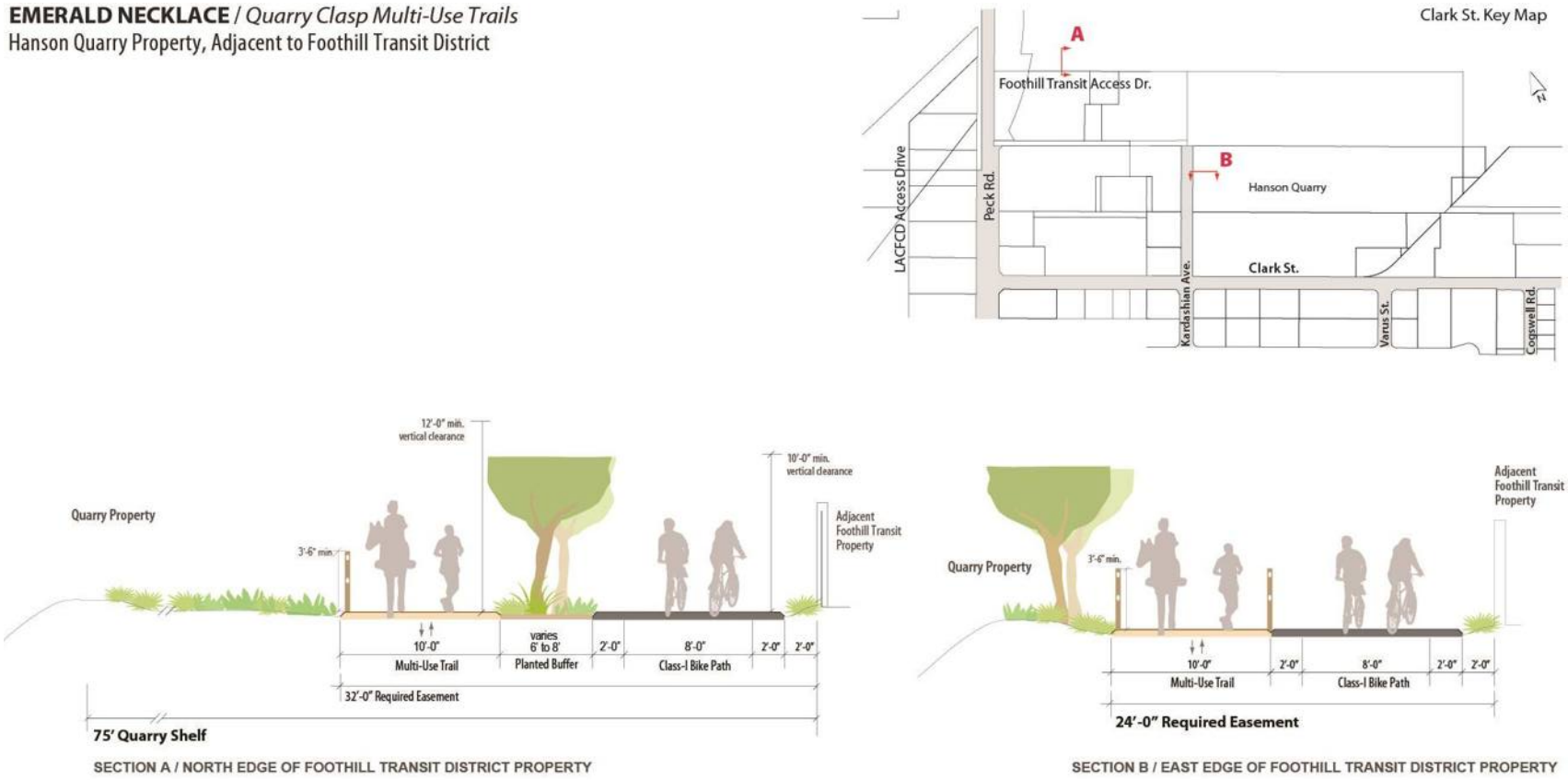


Fig. 3. Proposed trail alignments around the Foothill Transit Center and in Hanson Quarry.

Fig. 4. Proposed trail location between Foothill Transit, and Hanson Quarry, looking east.

Fig. 5. Proposed trail locations in Hanson Quarry adjacent to Clark Street, looking east.

EMERALD NECKLACE / *Quarry Clasp Multi-Use Trails*
Hanson Quarry Property, Adjacent to Foothill Transit District



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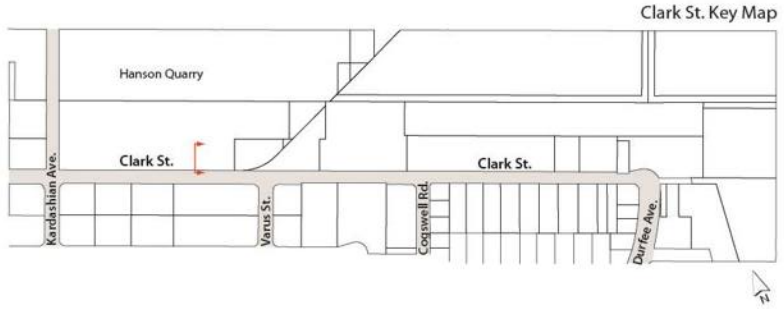
EMERALD NECKLACE IMPLEMENTATION PLAN

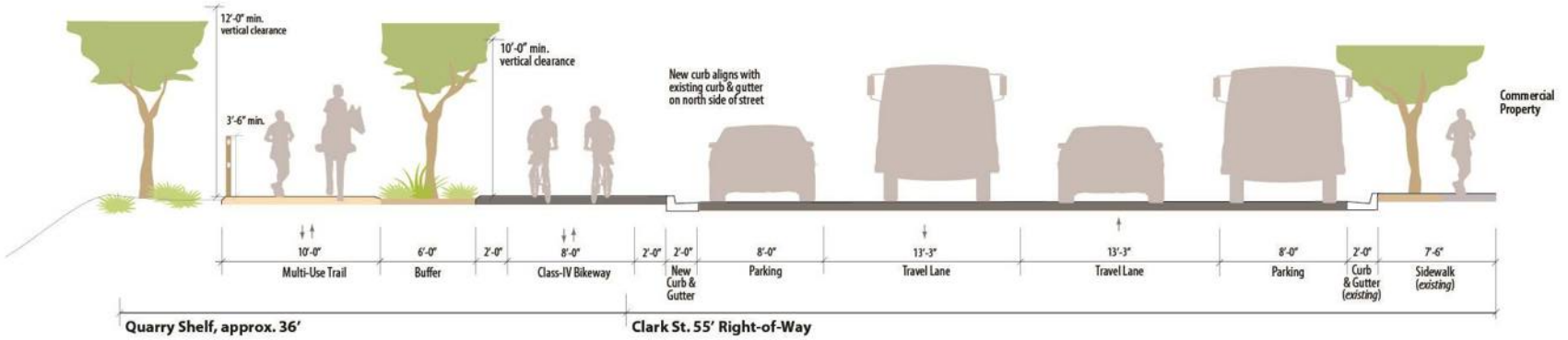
0' 2' 4' 8'
Scale: 1/8" = 1'-0"

Fig. 6. Cross section of multi-use trail and Class-I bike path on the south and east side of the Transit District.

EMERALD NECKLACE / *Quarry Clasp Multi-Use Trails*

Clark Street Between Kardachian Ave. & Varnus St.





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BlueGreen CONSULTING

EMERALD NECKLACE IMPLEMENTATION PLAN

0' 2' 4' 8'

Scale: 1/8" = 1'-0"

Fig. 7. Cross section of trails on south edge of Hanson Quarry

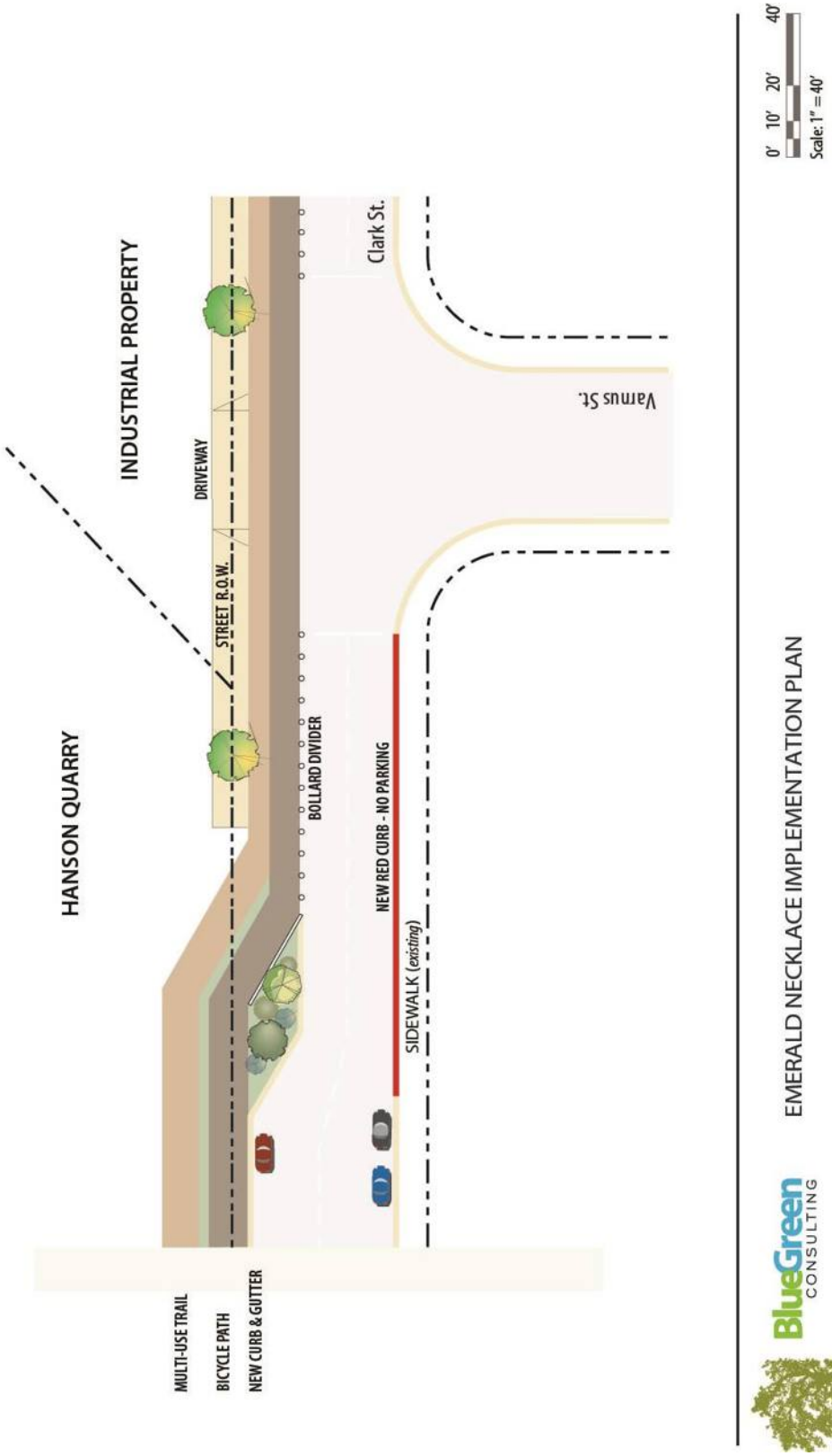


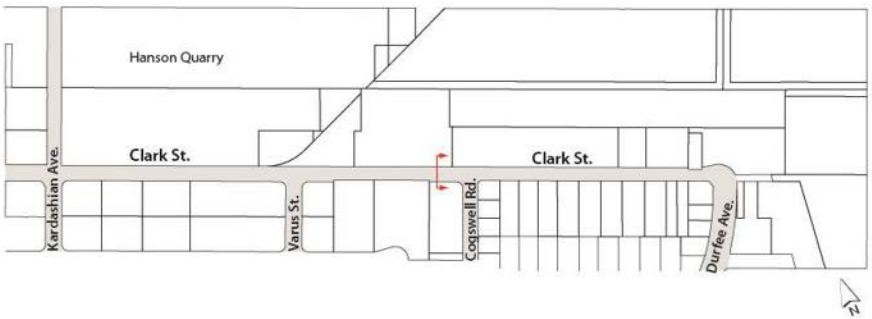
Fig. 8. Plan view of trails, shifting south into the Clark St. right-of-way.

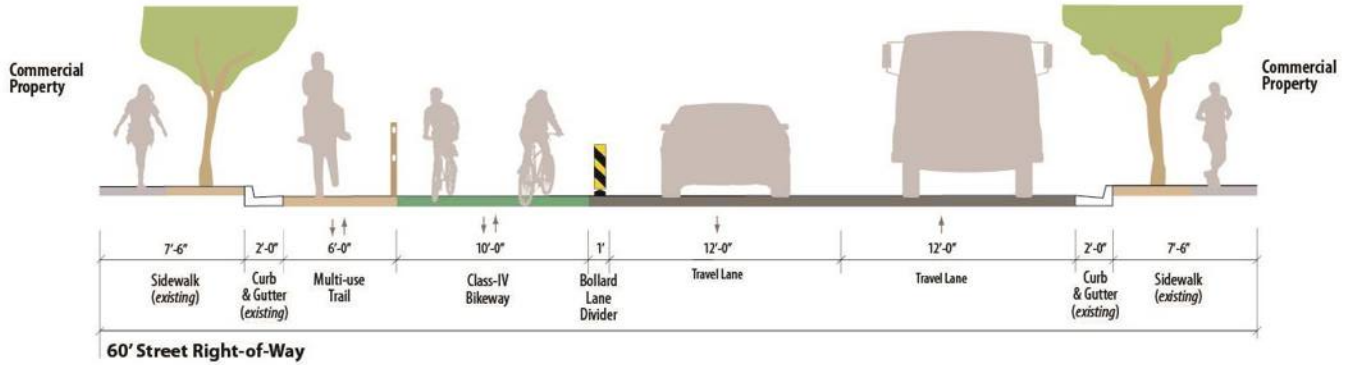
Fig. 9. Proposed trail alignments along Clark Street and through the Quarry Clasp Park on the Rio-Hondo San Gabriel River connection.

Figs 10 & 11. When the trails are located within the Clark St. right-of-way, alternating lane markers (left) and flexible hazard markers (right) will separate the trails from the adjacent traffic lane as shown above.

EMERALD NECKLACE / *Quarry Clasp Multi-Use Trails*
Clark Street Between Varus St. & Cogswell Rd.
60′ Street Right-of-Way

Clark St. Key Map





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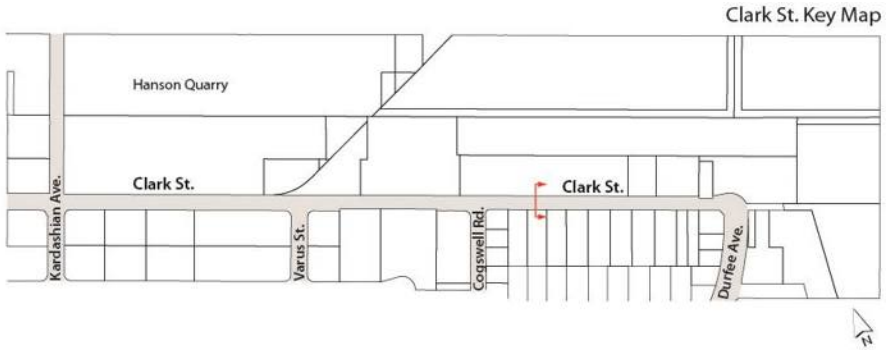
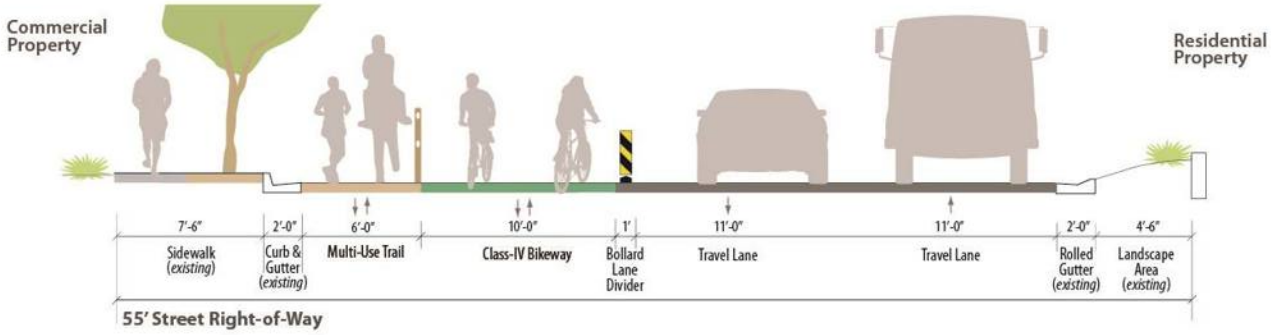
EMERALD NECKLACE IMPLEMENTATION PLAN

0′ 2′ 4′ 8′
Scale: 1/8″ = 1′-0″

Fig. 12. Cross section of multi-use trail and Class-IV bikeway in the commercial section of Clark St.

EMERALD NECKLACE / *Quarry Clasp Multi-Use Trails*
Clark Street Between Cogswell Rd. & Durfee Ave.
55′ Street Right-of-Way





16 November 2015

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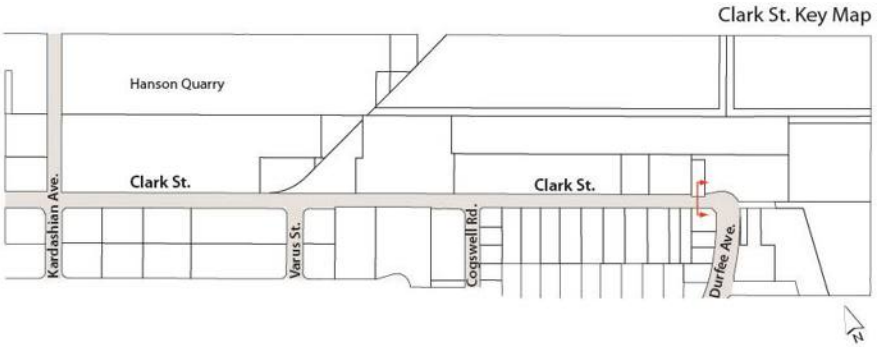
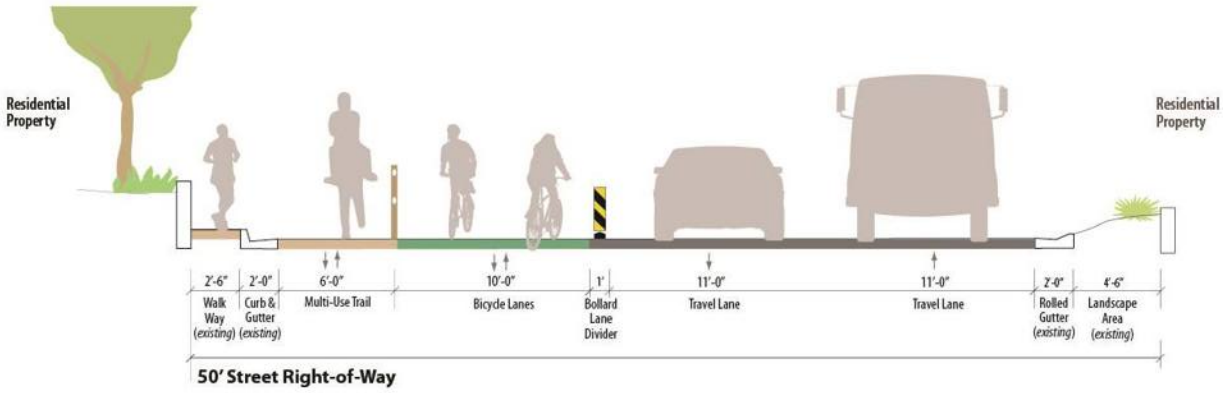
EMERALD NECKLACE IMPLEMENTATION PLAN

0′ 2′ 4′ 8′
Scale: 1/8″ = 1′-0″

Fig. 13. Cross section multi-use trail and Class-IV bikeway on Clark St. with residential properties to the south.

EMERALD NECKLACE / *Quarry Clasp Multi-Use Trails*
Clark Street Between Cogswell Rd. & Durfee Ave.
50′ Street Right-of-Way





16 November 2015

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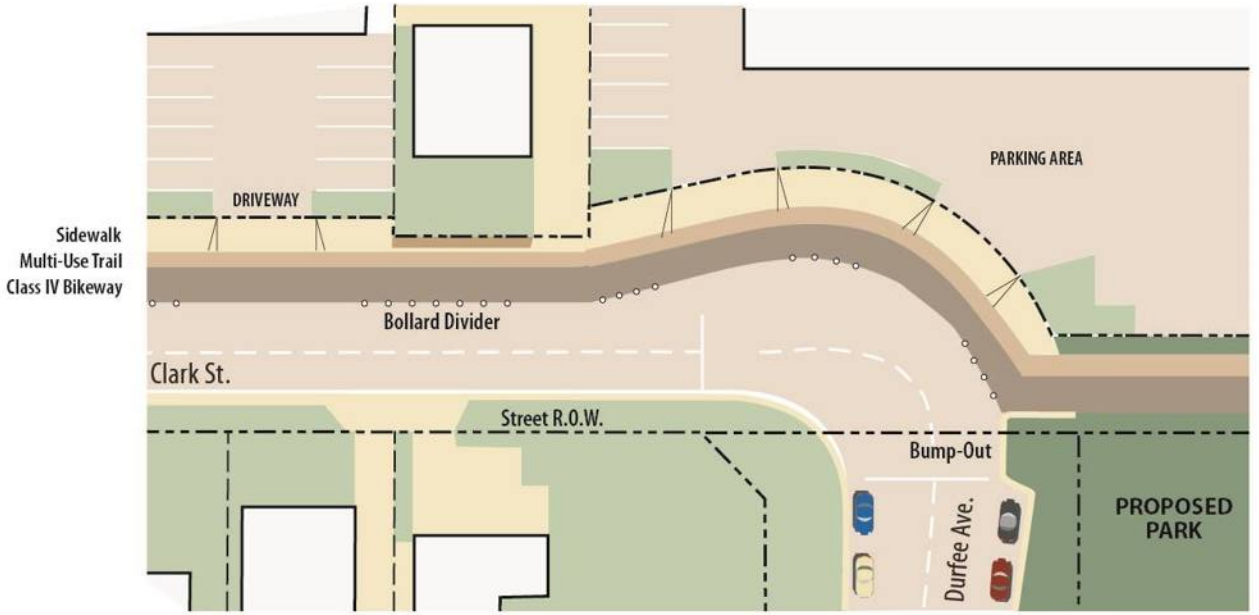
EMERALD NECKLACE IMPLEMENTATION PLAN

0′ 2′ 4′ 8′
Scale: 1/8″ = 1′-0″

Fig. 14. Cross section of trails at the narrowest section of the Clark St. right-of-way.

EMERALD NECCKLACE / *Quarry Clasp Multi-Use Trails*

Intersection of Clark St. & Durfee Ave.



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EMERALD NECKLACE IMPLEMENTATION PLAN

0′ 10′ 20′ 40′

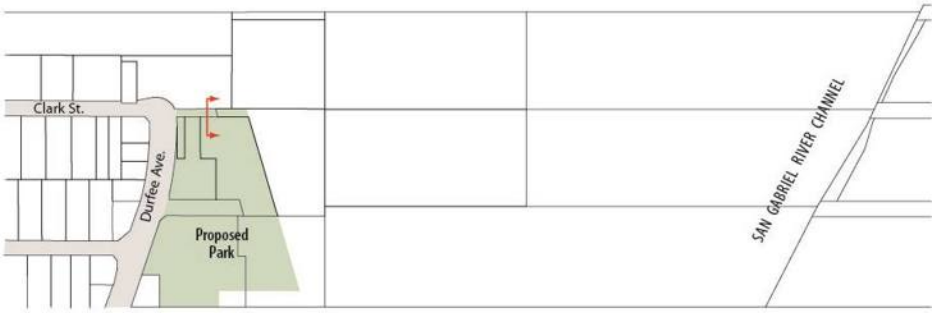
Scale: 1″ = 40′

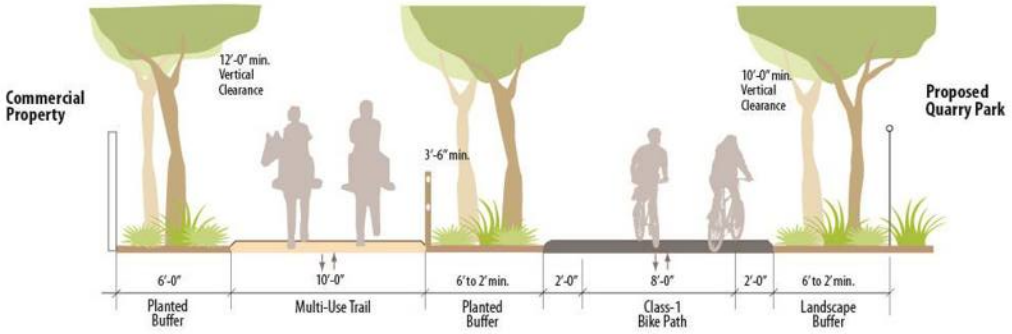
Fig. 15. Plan view of trails at intersection of Clark St. and Durfee Ave.

EMERALD NECCKLACE / *Quarry Clasp Multi-Use Trails*

North edge of Park, adjacent to commercial property

Quarry Spine Key Map





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EMERALD NECKLACE IMPLEMENTATION PLAN

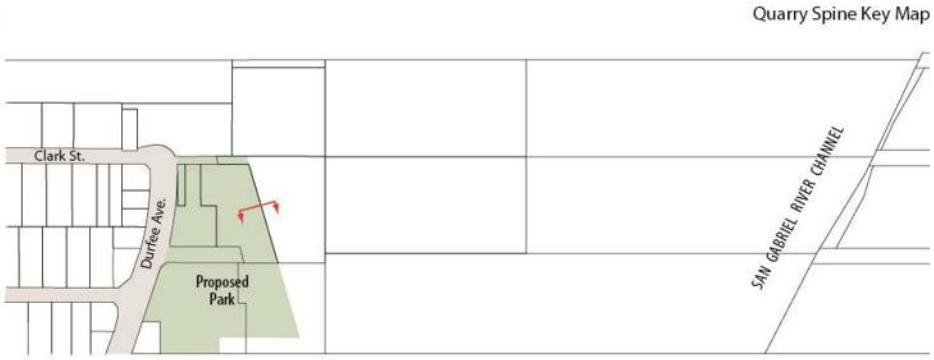
0' 2' 4' 8'

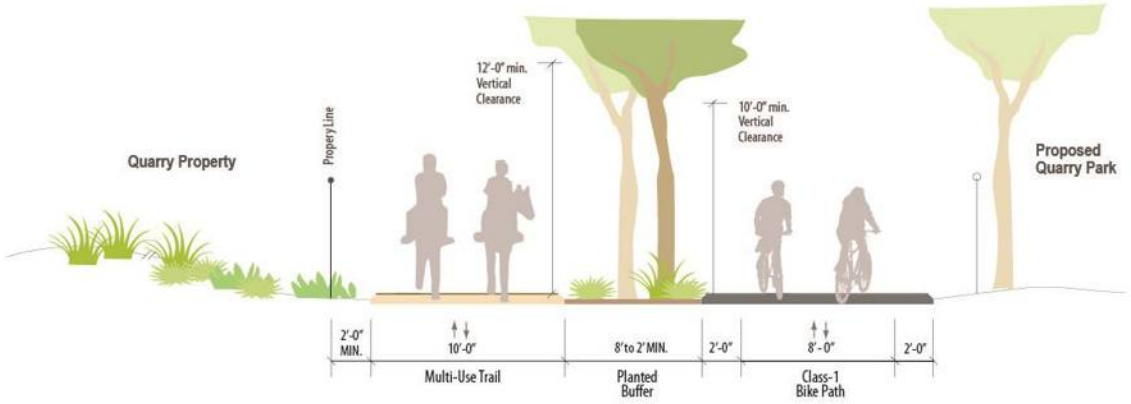
Scale: 1/8" = 1'-0"

Fig. 16. Cross section of multi-use trail and Class I bike path on the north edge of the proposed park.

EMERALD NECCKLACE / *Quarry Clasp Multi-Use Trails*

East edge of Park, adjacent to Hanson Quarry





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EMERALD NECKLACE IMPLEMENTATION PLAN

0' 2' 4' 8'

Scale: 1/8" = 1'-0"

Fig. 17. Cross section of multi-use trail and Class I bike path on the eastern edge of the proposed park.

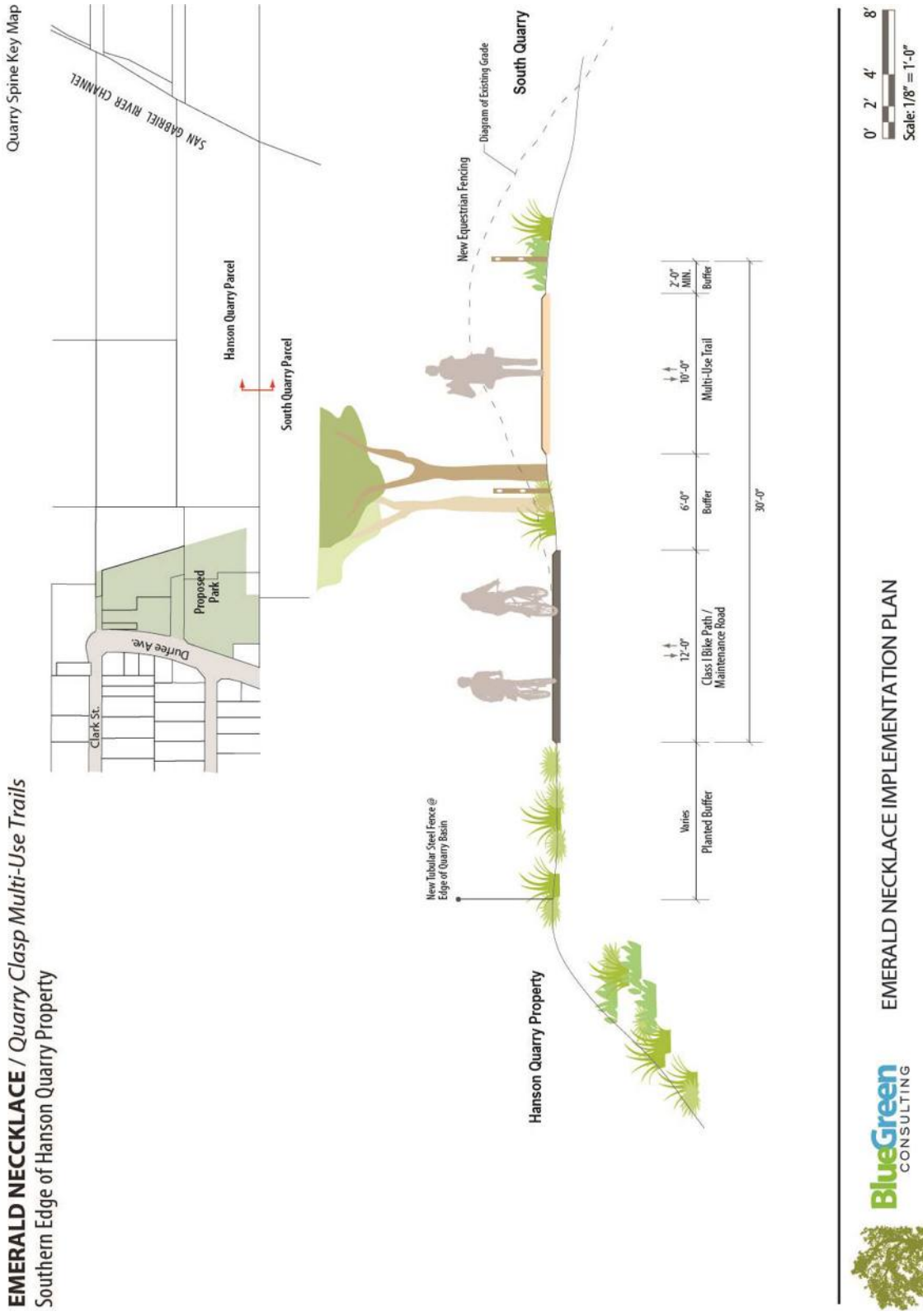


Fig. 18. Cross section of multi-use trail and Class-I bike path on the Quarry Spine.

Fig. 19. Proposed trail alignments along the proposed Quarry Clasp Park and quarry spine on the Rio Hondo-San Gabriel River connection. Two ADA ramps on the levee will accommodate a soft trail and a Class I bicycle path up to the existing Class I bicycle path at the top.

Safety and regulatory signage as well as other appropriate trail signage will be included in the project to the specifications of the County of Los Angeles Trails Manual. Emerald Necklace wayfinding and signage will follow the County of Los Angeles Department of Public Works Emerald Necklace Signage Guidelines.

The multi-use trail utilized by riders and hikers will be designed to the specifications of the County of Los Angeles Trails Manual. The Class I bicycle path and the Class IV bikeway will be designed to CalTrans Highway Design Manual standards and AASHTO guidelines and include such safety measure as stop signs, striping and speed calming measures. The County will continue to coordinate with private property owners for R.O.W. easement agreements and with the City of Arcadia for the significant alterations to Clark Street to accommodate the trails in the street from approximately Varnus Ave. to Durfee Ave.

The Peck Water Conservation Project proposes a pipeline route on Clark Street. It is highly recommended that the pipeline project and construction schedule be coordinated with this trails project to ensure the benefits of shared project management during construction. Coordination includes management of local traffic, street demolition, and construction impact mitigation measures. No trail should be disturbed due to lack of project timeline coordination and cooperation by the agencies involved.

The project will include but not be limited to:

- Class I bicycle path
- Class IV bikeway
- Multi-use trail constructed with various surfacing
- Plastic warning shields
- Plastic bollards
- Warning bumps
- Wooden rail divider fencing
- Street modifications, striping, signage, curbing
- LID stormwater treatment
- Equine- and dog-friendly landscape and irrigation
- Regulatory and safety signage as required
- Emerald Necklace signage
- Tubular steel fencing
- ADA ramps

Fig. 20. The project would form the northern "clasp" of the Emerald Necklace, a recreation trail and park system on the San Gabriel and Rio Hondo Rivers.

Project Implementation Changes

The Emerald Necklace Feasibility Study indicated that the trail begins just after the Peck Road crossing. The project boundary has changed. The Quarry Clasp Multi-Use Trail and Class I Bicycle Path begins at the property line between the Foothill Transit parking lot and Hanson Quarry.

The end of the trails up to the San Gabriel River must include an ADA ramp up the side of the San Gabriel River levee per the requirements of County of Los Angeles Department of Public Works. A ramp was not specified in the project feasibility study.

The Feasibility Study calls for a multi-use trail along Clark Street. Due to extremely limited widths on the existing sidewalk, the multi-use trail is in Clark Street. The multi-use trail will be constructed of non-skid concrete surfacing for equestrian use. Concrete and plastic bollard barriers to delineate the Class IV bikeway are proposed along Clark Street.

The Feasibility Study does not indicate LID stormwater treatment options regarding Clark Street drainage. City of Arcadia remains concerned about stormwater treatment and use of the multi-use trail by the equestrian community. The Los Angeles County Department of Public Works (DPW) has indicated that Low Impact Development (LID) stormwater treatment be included in this project.

Fig. 21. View of Hanson Quarry from the "Spine".

Emerald Necklace Signage

Refer to the Emerald Necklace Signage Guidelines for the County of Los Angeles Department of Public Works for specific signage design, usage and placement and the County of Los Angeles Department of Parks and Recreation Signage Guidelines.

Emerald Necklace signage depicted below indicates a bicycle path and a multi-use trail. Technically, mountain bikes are allowed on the multi-use trail and should be depicted as a graphic on the trail sign. In order to avoid confusion, when the trails are directly adjacent to each other, the bicycle graphic will remain a separate sign in order to clearly mark the Class I bike path or the Class IV bikeway. When the trails are separated i.e. on opposite sides of the river, the multi-use trail sign will also include a bicycle graphic.

Signage Type	Quantity	Location
Wayfinding	Four	Clark Street and San Gabriel River
Quarry wayfinding identification sign	Two	Clark Street and San Gabriel River
Mile Markers		Every quarter-mile on trails

Fig. 22. Appropriate wayfinding signage to be installed on the trail.

Emerald Necklace Phase 1 Implementation Costs

EMERALD NECKLACE PHASE I PROJECTS -PROJECT 2

Quarry Clasp Multi-Use Trail/Bike Path (*Trails in the Quarry Park not included*)

	Item	Qty.	Units	Unit Costs	*Sub-Total*	Total
1.0	**Demolition**					
1.1	Site PrepClearing,Grubbing, Conc./Asphalt removal	210,000	SF	$3.00	$630,000.00	
1.2	Saw Cutting -Clark Street	1,600	LF	$12.00	$19,200.00	
1.3	Remove Chain Link Fencing, Footings, Debris	1	LS	$20,000.00	$20,000.00	
1.4	Temporary Construction Fencing	8,000	LF	$1.20	$9,600.00	
	Total 1.0					**$678,800.00**
2.0	**Streetwork**					
2.1	Misc. Curb Cuts and Repair	200	LF	$14.00	$2,800.00	
2.2	Clark Street Driveway Conc. Apron/Street Resurfacing	3,000	SF	$12.00	$36,000.00	
2.3	Landscaped Safety Island - west Clark St	375	SF	$12.00	$4,500.00	
2.4	New Curb and Gutter including landscape island	175	LF	$14.00	$2,450.00	
2.5	Plastic Bollards - Durfee Ave Cul-de-sac	45	LF	$45.00	$2,025.00	
2.6	Plastic bumps	270	EA	$75.00	$20,250.00	
2.7	Plastic warning strips	135	EA	$300.00	$40,500.00	
2.8	Plastic bollards	20	EA	$65.00	$1,300.00	
	Total 2.0					**$109,825.00**
3.0	**Utilities**					
3.1	L.I.D. Tree well/Sand filter and drainage mondifications	3	EA	$50,000.00	$150,000.00	
3.2	Misc. existing utility relocation/retrofit	1	LS	$60,000.00	$60,000.00	
	Total 3.0					**$210,000.00**
4.0	**Trail Construction - Minus trails thru Quarry Park**					
4.1	Multi-Use Trail w/lodge pole fence along spine	4,312	LF	$120.00	$517,440.00	
4.2	Multi-Use Trail w/textured thickened concrete surfacing	1,200	LF	$40.00	$48,000.00	
4.3	Trail separator w/42 inch lodgepole wooden fencing	1,200	LF	$80.00	$96,000.00	
4.4	Class I bicycle path	4,312	LF	$315.00	$1,358,280.00	
4.5	Class IV Striped Bikeway on exist. Pavement	1	LS	$15,000.00	$15,000.00	
4.6	Provide & install Wayfinding signage	1	LS	$2,400.00	$2,400.00	
4.7	Tubular Steel Fencing	5,820	LF	$120.00	$698,400.00	
4.8	Top Soil Import	28	CY	$38.00	$1,064.00	
4.9	Landscape and Irrigation	27,000	SF	$7.00	$189,000.00	
4.10	Levee ramps for Class I bike path and multi-use trail	2	LS	$30,000.00	$60,000.00	
4.11	Street, Regulatory and Emerald Necklace Signage	1	LS	$15,000.00	$15,000.00	
	Total 4.0					**$3,000,584.00**
	SUB-TOTAL					**$3,999,209.00**
	TRAFFIC CONTROL AND PLANS (3%)				**$119,976.27**	
	MOBILIZATION & PROFIT (15%)				**$599,881.35**	
	DESIGN AND PERMITTING (20%)				**$799,841.80**	
	CONTINGENCY (30%)				**$1,199,762.70**	
	TOTAL PROJECT COSTS					**$6,718,671.12**
5.0	Securing R.O.W (DPW est. for East & West Hanson)	1	LS	$6,000,000.00		

This opinion of probable cost of construction is made on experience and best judgement for a concept design only. Land availability, field conditions, design development and construction document production will invariably alter costs. Concept costs have been developed for the purpose of an Emerald Necklace Phase I Cost Benefit Analysis.

Emerald Necklace Phase 1 Benefit-Cost Analysis

Benefit-Cost Analysis Project 2: Quarry Clasp Trail and Bike Path			
Cost			
Construction Cost:	$ 6,718,671		
Land Acquisition:	$ 6,000,000		
Total Cost:	$ 12,718,671		
Annual Maintenance:	$ 10,973		
Discount Rate:	7%		
Total Cost (30 yr. in 2016 $)	$ 12,012,523		
Improvements			
Linear Path (Bike only):	4,320 ft		
Linear (Multi only):	4,320 ft		
Total Linear Path:	4,320 ft		
Staging/Park Areas			
Recreational Value:	Medium		
Population in 2400 m Buffer			
Assumed Population Density	7,068		
Commute Share	0.63		
Residents in Buffer	66,634		
Existing Commuters	168		
New Commuters	52		
	Low	Mid	High
Total Cyclists	834	11529	17162
Total new Cyclists	308	3595	5327
Annual Benefits			
	Low	Mid	High
Recreation Benefits	$ 935,977	$ 12,935,020	$ 19,254,808
Health Benefits	$ 39,430	$ 460,218	$ 681,844
Mobility Benefits		$ 185,723	
Decreased Auto Use		$ 2,581	
Multi-Use Health Benefits	$ 145,869		
Multi-Use Recreation Benefits	$ 1,728,640.0		
Total Annual Benefits		$ 15,458,051	
Total Annual Transportation Benefits		$ 648,522	
Benefit-Cost Ratios			
Total Discounted Benefits (30yrs)		$ 191,819,589	
Benefit-Cost Ratio		**15.97**	
Discounted Benefits Transportation		$ 8,047,536	
Benefit-Cost Ratio Transportation		**0.67**	
*Numbers shaded in grey were used for caculation of B-C Ratios			

THE QUARRY CLASP:
Peck Road Signalized Crossing and Trail Connectivity

Project Description Summary

The Peck Road Signalized Crossing Project in conjunction with Project 2, the Quarry Clasp Multi-Use Trail and Bike Path will connect Peck Road Water Conservation Park, a regional recreation area on the Rio Hondo, to the San Gabriel River Trail. This connection is referred to as the Quarry Clasp. The project will modify an existing lighted intersection on Peck Road to accommodate a safe crossing for all trail users. In addition, the Foothill Transit parking lot entrance will be modified to accommodate both the Class I bike path and the multi-use trail.

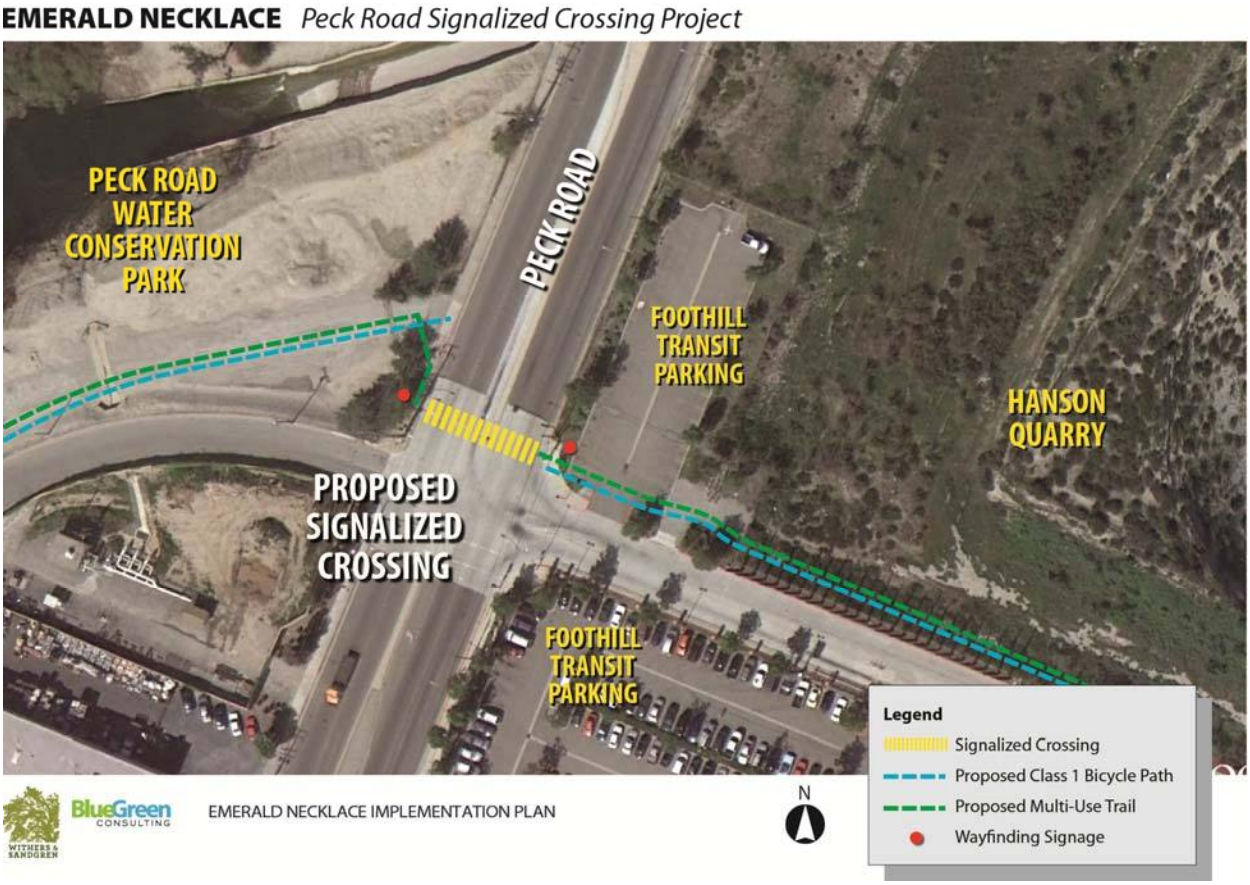


Fig. 1. Intersection at Peck Road and Foothill Transit parking.

Modifications to the intersection will follow the Manual on Uniform Traffic Control Devices and other applicable requirements including the Federal Highway Administration, US Department of Transportation, and US Forest Service specific recommendations for equestrian crossings.

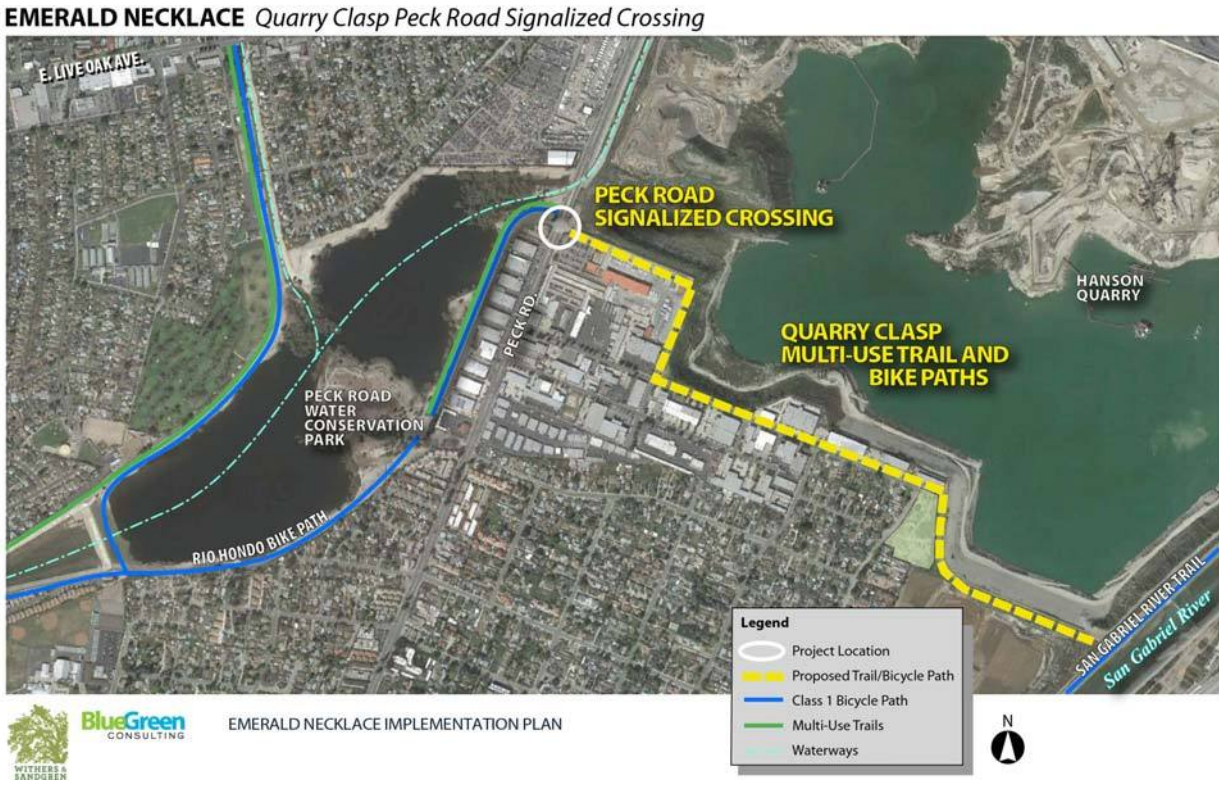


Fig. 2. The Project will connect the Peck Road Water Conservation Park trails to the proposed Project 2, Quarry Clasp Multi-Use Trail and Bike Path.

The multi-use trail will be designed and constructed per the County of Los Angeles Trails Manual. The Class I bicycle path will be designed and constructed per the CalTrans Highway Design Manual standards and AASHTO guidelines.

Crossing elements include safety pads behind the curbs that will accommodate an equestrian waiting area, the installation of push button signal actuators for equestrians, bicyclists and pedestrians on each side of the Peck Road. Additional details include the addition of standard traffic and regulatory signs, new warning signs indicating horse crossing, re-construction of the street curb and gutter, installation of textured accessible ramps, median modification to accommodate a wider safe crossing for equestrians, crossing striping and street paint stencils.

Street work excavation, trenching, filling and patching will be necessary for new electrical signal activation, signal post relocation, and raised median nose reduction. Approximately 60 linear feet of curbing will be removed to be replaced by waiting areas for equestrians and bicyclists with ADA standard curb cuts for ramps. Approximately 1500 square feet of non-skid concrete will be required to form the two waiting areas on each side of the crossing. It is anticipated that the existing wooden power pole located at the northwest corner will be protected in place. Approximately 400 square feet of existing landscape area will be impacted during construction. The entry of the parking lot will be modified. The parking lot will be diminished by 4 parking spaces to accommodate trails and new landscaping. A gas line under the asphalt of the parking

lot bi-sects the proposed trail alignment. The gas line will need to be protected in place at all times, especially under the proposed soft multi-use trail.

Street striping will include horse crossing warnings and will be painted on the street in each direction a set distance from the actual crossing. The crosswalk striping will be widened to provide a safe crossing zone for equestrians. The widened crossing will require that the nose of the median be moved back approximately 12 feet requiring demolition and replacement of 120 square feet of concrete pavement.

Fig. 3. Proposed crossing location at the Peck Rd. traffic light, looking east.

Signage will include 2 metal signs on 8 foot metal poles, one in each direction to indicate the location for the crossing. In addition, 2 metal signs on 8 foot metal poles will indicate a pedestrian crossing to be placed on Peck Road. Emerald Necklace wayfinding signage will also be included.

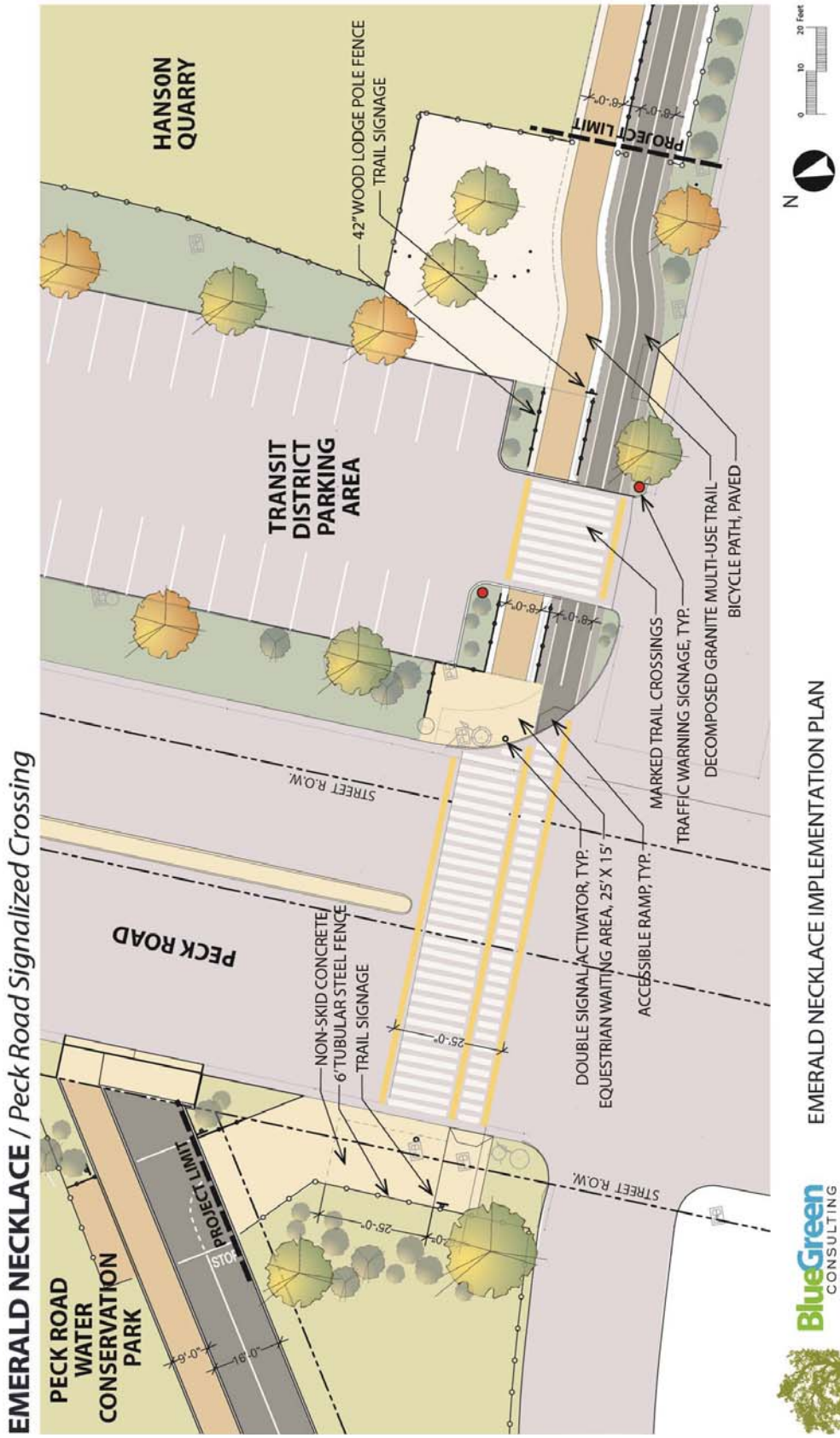


Fig. 4. This project connects the new trails in Peck Park to the proposed Quarry Clasp trails, completing the north portion of the Emerald Necklace.

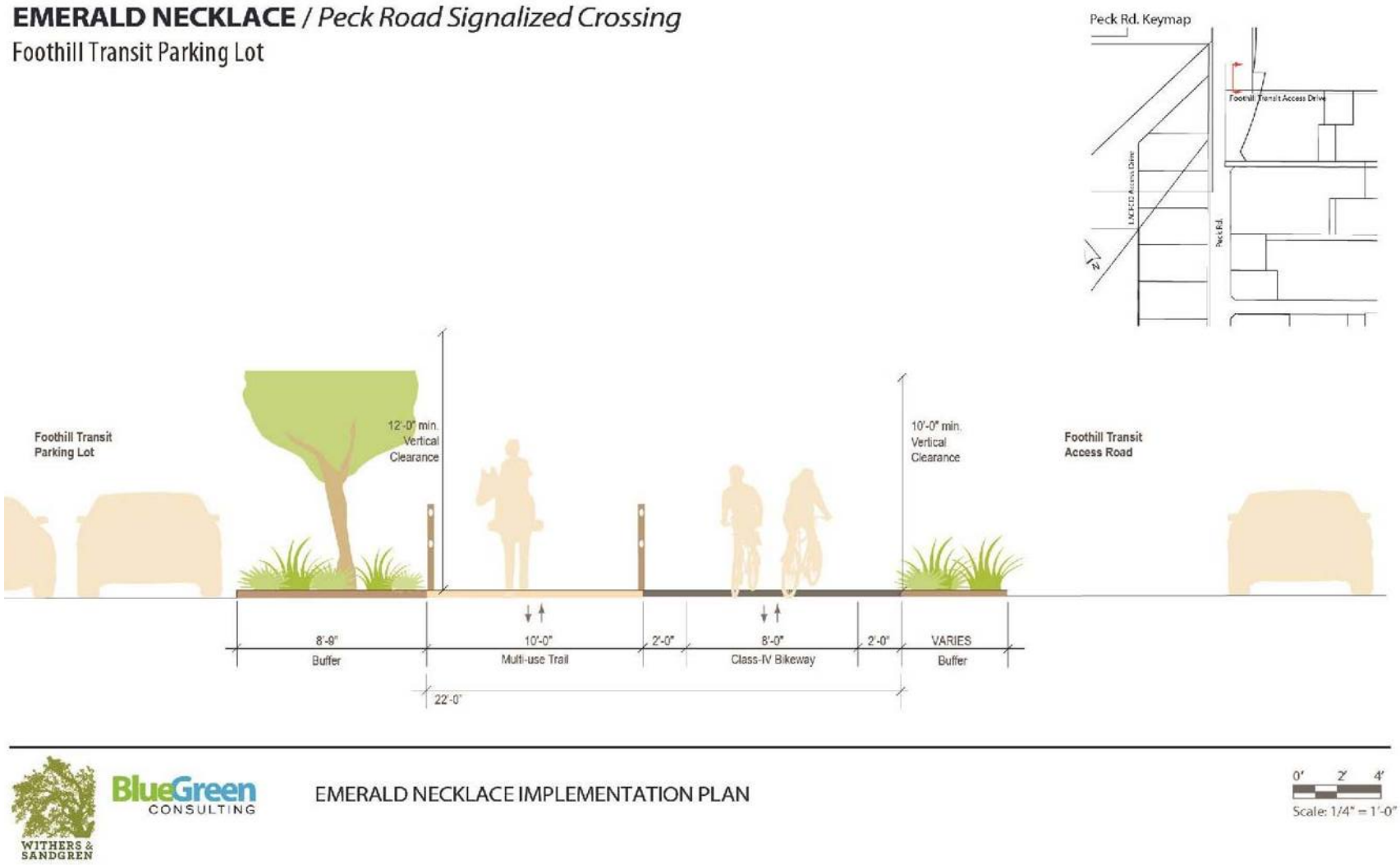


Fig. 5. Cross section of the trails on the expanded parkway of the Transit Center parking lot.

Easements through the Foothill Transit property have to be obtained. Further development of this project requires the setting of the easement and obtaining use agreements before project finalization.

The project includes but is not limited to:

- Additional matching fencing and gating, as needed, connecting to the Peck Water Conservation Park fencing on the west side of the street crossing
- Additional fencing and multi-use trail construction as necessary to create a safe crossing for equestrians
- Removal of concrete, asphalt, curb and concrete median removal
- ADA ramps
- Signalized street crossing w/high/low actuators including all electrical (in street and above ground) as necessary. Actuators located 6 feet back from curb.
- Decomposed granite waiting areas at each crossing location
- Class I bicycle path
- Multi-use trail with wood fencing utilized in the Foothill Transit Parking area and extending into the Emerald Necklace Project 2
- Construction of new curbing, asphaltic pavement and a modified concrete median
- Implementation of a protective slurry or additional pipe sleeve to protect the gas line
- Equine- and dog-friendly landscaping and irrigation
- Striping and road stenciling
- Road warning signage
- Emerald Necklace signage
- Regulatory and safety signage as required

Fig. 6. Fenceline at Hanson Quarry looking east.

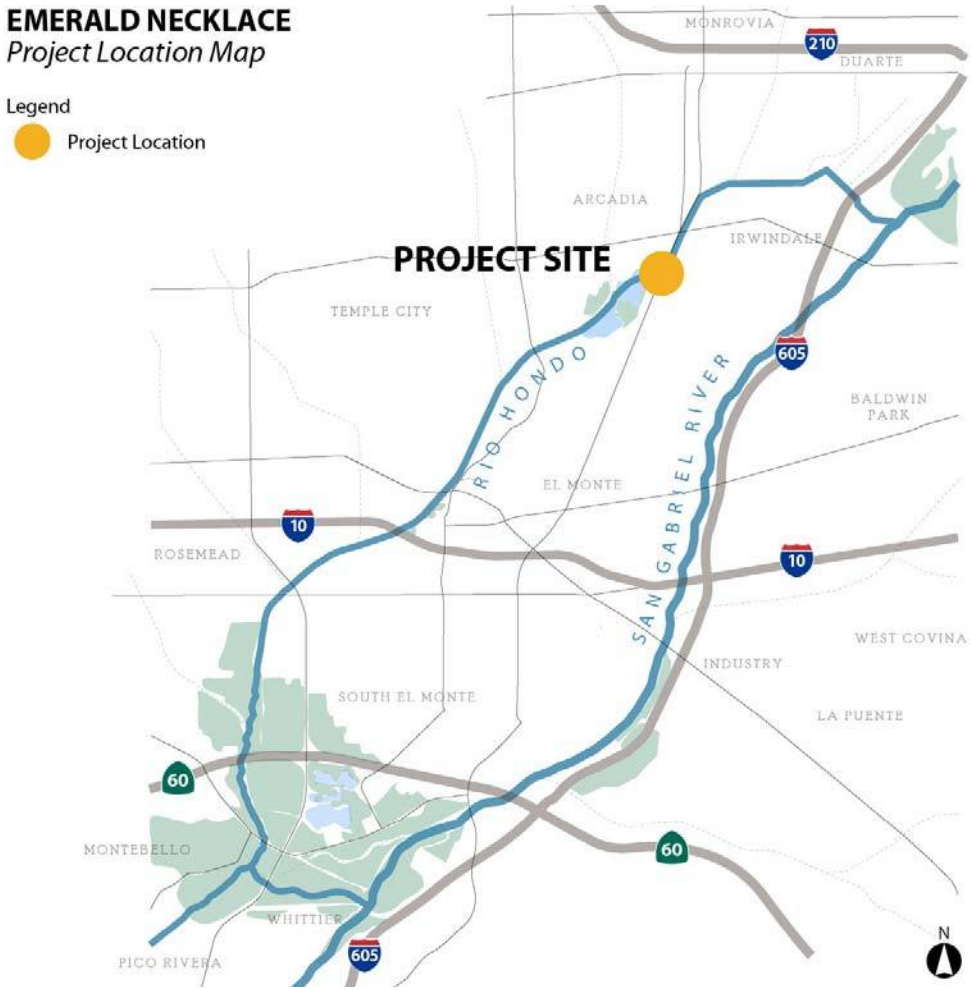


Fig. 7. The project would form the northern "clasp" of the Emerald Necklace, a recreation trail and park system on the San Gabriel and Rio Hondo Rivers.

Project Implementation Changes

The feasibility study proposed a street bulbout on each side of the crossing which narrows Peck Road. Bulbouts will not be implemented. The bulbouts would impede bus ingress and egress from the Foothill Transit Center. Therefore, waiting areas for all trail users located behind the curbs are proposed.

Due to the width and depth of the new waiting areas at the Peck Road crossing, additional impacts to the existing Foothill Transit parking lot are anticipated. Impacts to landscaping, curbing, and existing parking stalls will be necessary.

Additional fencing, gating, and trail construction within the Peck Road Water Conservation Park may be necessary for final trail connectivity that is safe for equestrian users approaching the crosswalk from the park side. These adjacent projects are expected to be installed at different times depending on funding availability.

Signage was reduced on Peck Road to only warn of a pedestrian crossing. Separate signage for horses and pedestrians is not required for signalized crossings. Warning signs for a horse crossing for ingress and egress at the entrance of the parking lot will be maintained.

Emerald Necklace Signage

Refer to the Emerald Necklace Signage Guidelines for the County of Los Angeles Department of Public Works for specific signage design, usage and placement and the County of Los Angeles Parks and Recreation Signage Guidelines.

Emerald Necklace signage depicted below indicates a bicycle path and a multi-use trail. Technically, mountain bikes are allowed on the multi-use trail and should be depicted as a graphic on the trail sign. In order to avoid confusion, when the trails are directly adjacent to each other, the bicycle graphic will remain a separate sign in order to clearly mark the Class I bike path or the Class IV bikeway. When the trails are separated i.e. on opposite sides of the river, the multi-use trail sign will also include a bicycle graphic.

Signage Type	Quantity	Location
Wayfinding	Two	At boundary of Peck Water Conservation Park on the west side and at gate into Hanson Quarry on the east side
Peck Road Water Conservation Park on the Rio Hondo identification sign	One	At gate into Hanson Quarry on the east side
Traffic Warning	Two	Horse Crossing/Slow on Peck Road – each side and at parking lot ingress and egress
Mile Markers		Every quarter-mile on trails

Fig. 8. Wayfinding at the Peck Road intersection will include signage for both river trail systems as well as traffic warning/safety signage.

Emerald Necklace Phase 1 Implementation Costs

EMERALD NECKLACE PHASE I PROJECTS -PROJECT 3

Peck Road Signalized Crossing and Trail Connectivity

	Item	Qty.	Units	Unit Costs	*Sub-Total*	Total
1.0	**Demolition**					
1.1	Site Preparation Clearing and Grubbing	8,000	SF	$ 0.12	$ 960.00	
1.2	Remove Chain Link Fencing, Footings, Debris	1	LS	$ 2,000.00	$ 2,000.00	
1.3	Concrete and Asphalt Saw Cutting and Removal	1	LS	$ 30,000.00	$ 30,000.00	
1.4	Temporary Construction Fencing	10,000	LF	$ 1.20	$ 12,000.00	
	Total 1.0					**$ 44,960.00**
2.0	**EarthworkSite Grading**					
2.1	Fine grading for trails and waiting pads	10,000	SF	$ 0.40	$ 4,000.00	
	Total 2.0					**$ 4,000.00**
3.0	**Site Construction**					
3.1	Signalized Intersection (inc. electrical and striping)	1	LS	$225,000.00	$ 225,000.00	
3.2	Multi-Use Trail w/42 inch lodge pole fencing	150	LF	$ 120.00	$ 18,000.00	
3.3	Class I Bicycle Path	150	LF	$ 315.00	$ 47,250.00	
3.4	Rough Textured Concrete waiting pads	1,500	SF	$ 40.00	$ 60,000.00	
3.5	ADA Ramps	2	EA	$ 3,000.00	$ 6,000.00	
3.6	Curbing and median to match existing	400	LF	$ 30.00	$ 12,000.00	
3.7	Misc. chain link fencing for Peck Park (reconfiguratic	1	LS	$ 5,000.00	$ 5,000.00	
3.8	Concrete and Asphalt Patching and Repair	1	LS	$ 8,000.00	$ 8,000.00	
3.9	Provide & install Wayfinding signage	4	LS	$ 800.00	$ 3,200.00	
3.10	Provide & install Traffic Warning signage	4	LS	$ 800.00	$ 3,200.00	
3.11	Parking Lot entry/stall striping & Misc. stenciling	1	LS	$ 6,000.00	$ 6,000.00	
	Total 3.0					**$ 393,650.00**
4.0	**Utilities**					
4.1	Erosion control	4,000	SF	$ 0.05	$ 200.00	
4.2	Install Water Mainline to site w/repairs	1	LS	$ 30,000.00	$ 30,000.00	
4.3	Install 1" Water Meter	1	LS	$ 8,000.00	$ 8,000.00	
	Total 4.0					**$ 38,200.00**
5.0	**Irrigation**					
5.1	Parking Lot& Peck Rd. Park Landscape Restoration	1,500	SF	$ 3.00	$ 4,500.00	
	Total 5.0					**$ 4,500.00**
6.0	**Planting / Landscape**					
6.1	Soils Test	1	LS	$ 1,200.00	$ 1,200.00	
6.2	Mycorrhizal Treatment	1,400	SF	$0.20	$ 280.00	
6.3	24 inch box	6	EA	$ 400.00	$ 2,400.00	
6.4	Shrubs--1 Gal.	500	EA	$ 35.00	$ 17,500.00	
6.5	Landscape trail hydroseed (wildflower)	1,000	SF	$2.00	$ 2,000.00	
6.6	Landscape Mulch - 3 inch depth	16	CY	$ 16.00	$ 256.00	
	Total 6.0					**$ 23,636.00**
	SUB-TOTAL					**$ 508,946.00**
	TRAFFIC CONTROL AND PLANS (3%)				**$ 15,268.38**	
	MOBILIZATION & PROFIT (15%)				**$ 76,341.90**	
	DESIGN AND PERMITTING (20%)				**$ 101,789.20**	
	CONTINGENCY (30%)				**$ 152,683.80**	
	TOTAL PROJECT COSTS					**$ 855,029.28**

This opinion of probable cost of construction is made on experience and best judgement for a concept design only. Land availability, field conditions, design development and construction document production will invariably alter costs. Concept costs have been developed for the purpose of an Emerald Necklace Phase I Cost Benefit Analysis.

Emerald Necklace Phase 1 Benefit-Cost Analysis

Benefit-Cost Analysis Project 3: Peck Road Signalized Crossing			
Cost			
Construction Cost:	$ 855,029		
Land Acquisition:			
Total Cost:	$ 855,029		
Annual Maintenance:	$ 762		
Discount Rate:	7%		
Total Cost (30 yr. in 2016 $)	$ 807,836		
Improvements			
Linear Path (Bike only):	300 ft		
Linear (Multi only):	300 ft		
Total Linear Path:	300 ft		
Staging/Park Areas			
Recreational Value:	Low		
Population in 2400 m Buffer			
Assumed Population Density	7,068		
Commute Share	0.63		
Residents in Buffer	50,574		
Existing Commuters	127		
New Commuters	37		
	Low	Mid	High
Total Cyclists	633	8751	13026
Total new Cyclists	219	2562	3795
Annual Benefits			
	Low	Mid	High
Recreation Benefits	$ 666,886	$ 9,216,234	$ 13,719,099
Health Benefits	$ 28,094	$ 327,907	$ 485,815
Mobility Benefits		$ 138,932	
Decreased Auto Use		$ 127	
Multi-Use Health Benefits	$ 103,718		
Multi-Use Recreation Benefit	$ 1,228,955.0		
Total Annual Benefits		$ 1,499,826	
Total Annual Transportation Benefits		$ 167,153	
Benefit-Cost Ratios			
Total Discounted Benefits (30yrs)		$ 18,611,408	
Benefit-Cost Ratio		**23.04**	
Discounted Benefits Transportation		$ 2,074,208	
Benefit-Cost Ratio Transportation		**2.57**	
*Numbers shaded in grey were used for caculation of B-C Ratios			

WHITTIER NARROWS CONNECTIVITY:
Class I Bicycle Path on Rosemead Blvd. to Legg Lake

Project Description

The intent of this project is to improve recreational connectivity on Rosemead Blvd. from San Gabriel Blvd. to Whittier Narrows Recreation Area. This Project calls for the development of a Class I bicycle path and a multi-use trail on the eastern shoulder of Rosemead Blvd. and partially on the adjacent strawberry field, leased from the US Army Corps of Engineers. Securing the R.O.W for this project will be necessary from the US Army Corps of Engineers. The proposed bicycle path and multi-use trail will link the El Bosque del Rio Hondo Park and a western spur of the San Gabriel River Trail on Siphon Road to Legg Lake and will be designed to CalTrans Highway Design manual standards and AASHTO Guidelines.

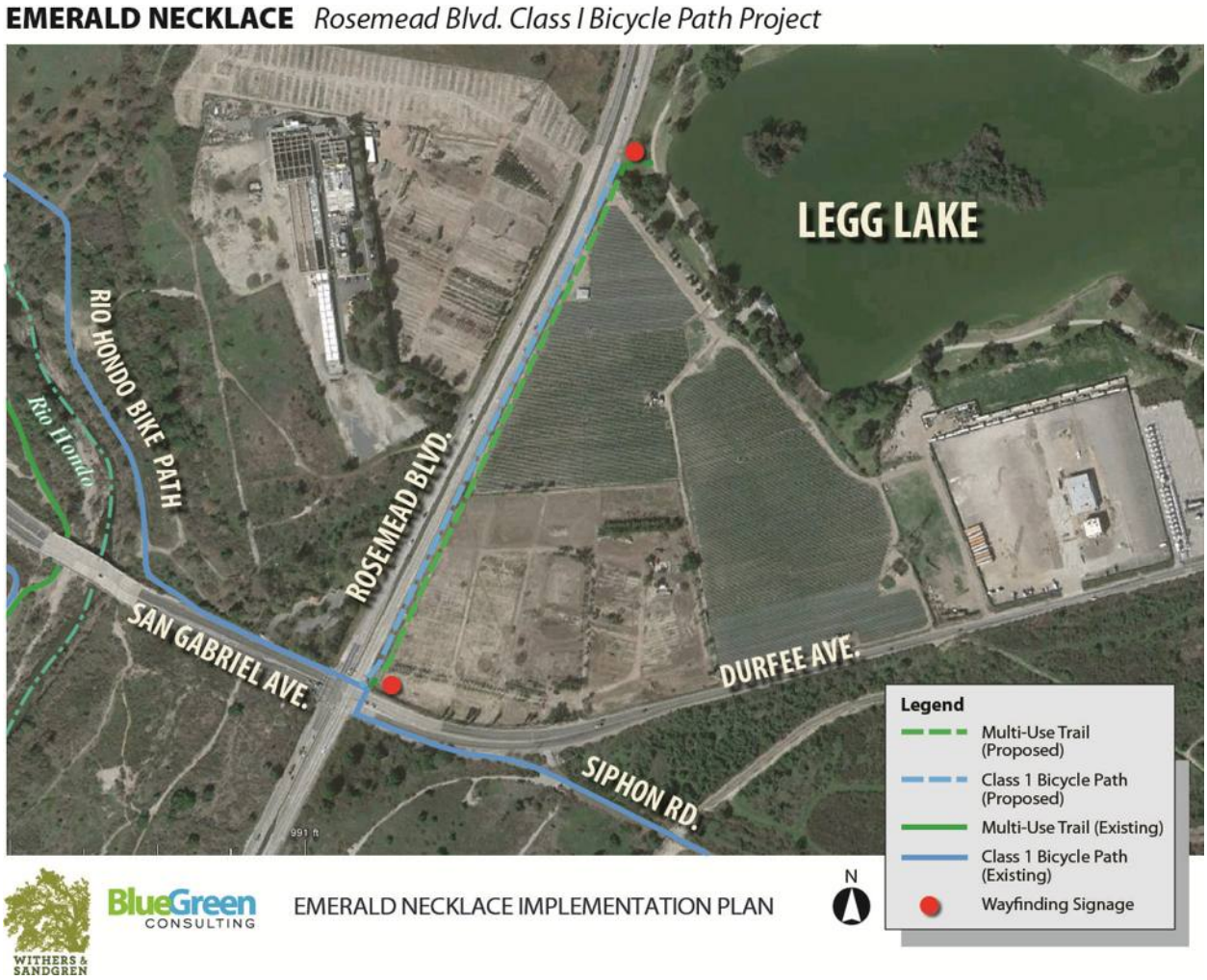


Fig. 1. The project site is located on the east shoulder of Rosemead Blvd. and on US Army Corp of Engineers leased agricultural land.

Approximately 1,900 linear feet of proposed bicycle path will be constructed starting at the corner of Rosemead and Durfee Ave. opposite the end of Siphon Road. The road shoulder will be raised and expanded to accommodate improvements to the existing bus stop area and the start of the bicycle path and multi-use trail. In order to balance cut and fill, most of the bicycle path and multi-use trail length will be below the grade of the roadway. At the north end of the project area, the proposed bicycle path will meet grade at the existing SCE gate and driveway into the agricultural area.

Fig. 2. Rosemead Blvd. looking north toward Legg Lake area.

The Class I bike path will be approximately 1,900 foot long, 12-foot wide, and striped to accommodate two way bicycle travel. An approximately 1,900 foot long, eight-foot wide decomposed granite multi-use trail will be constructed adjacent to the bicycle path. At Legg Lake an approximately 145 foot long, 15-foot wide decomposed granite path into the Whittier Narrows Recreation Area will intersect with the internal pathways of the park and approximately 2,400 square feet of turf will be removed to accommodate the new path. Hitching posts will be provided at the entrance to Legg Lake since horses are not allowed on the walking path within the park. Approximately 1,900 linear feet of six-foot tall fencing will be removed along the east side of Rosemead. New fencing will be installed between the trails and the agricultural area. Creating a seven stall parking area for the Strawberry patch is part of this project. New signage will include two metal directional and regulatory signs on metal posts and mile markers.

Two benches and a posted sign indicate a bus stop close to the northeast corner of the intersection that will have to be accommodated. Alignment of the bicycle path behind the bus stop will require utilization of the stockpiled soil located directly east of Rosemead Boulevard for approximately a 150’ foot length in order to construct a new bus stop with the Class I bicycle path adjacent to it flush with the existing curb elevation.

Two driveways will be developed into the agricultural area. The first driveway is into a proposed parking lot and vending shack for seasonal use. The second driveway is an improved entry into an existing Southern California Edison easement access location. The trails would cross both driveways and terminate at the park boundary.The project will need to take into consideration the results of a study of Rosemead Boulevard currently in progress. The Los Angeles County Department of Public Works received a grant to study complete streets and will be providing recommendations with the most benefits for bicyclists, pedestrians and vehicles.

Until that time, this project will include but not be limited to:

- Class I bicycle path
- Asphalt ramp
- Multi-use trail
- Bicycle racks and horse ties
- Equine-and dog-friendly landscape and irrigation
- Decomposed granite path
- Decomposed granite expanded bus stop area
- Bus stop design reconfiguration
- Strawberry Shack and parking lot reconfiguration
- Concrete edging
- Concrete curbing
- Fencing and gating
- Driveways
- Grading and drainage
- Emerald Necklace signage
- Regulatory and safety signage as required

Fig. 3 & 4. The bus stop on Rosemead Blvd. and the embankment behind it.

Fig. 5. Class I Bicycle Path and Multi-Use Trail component diagram.

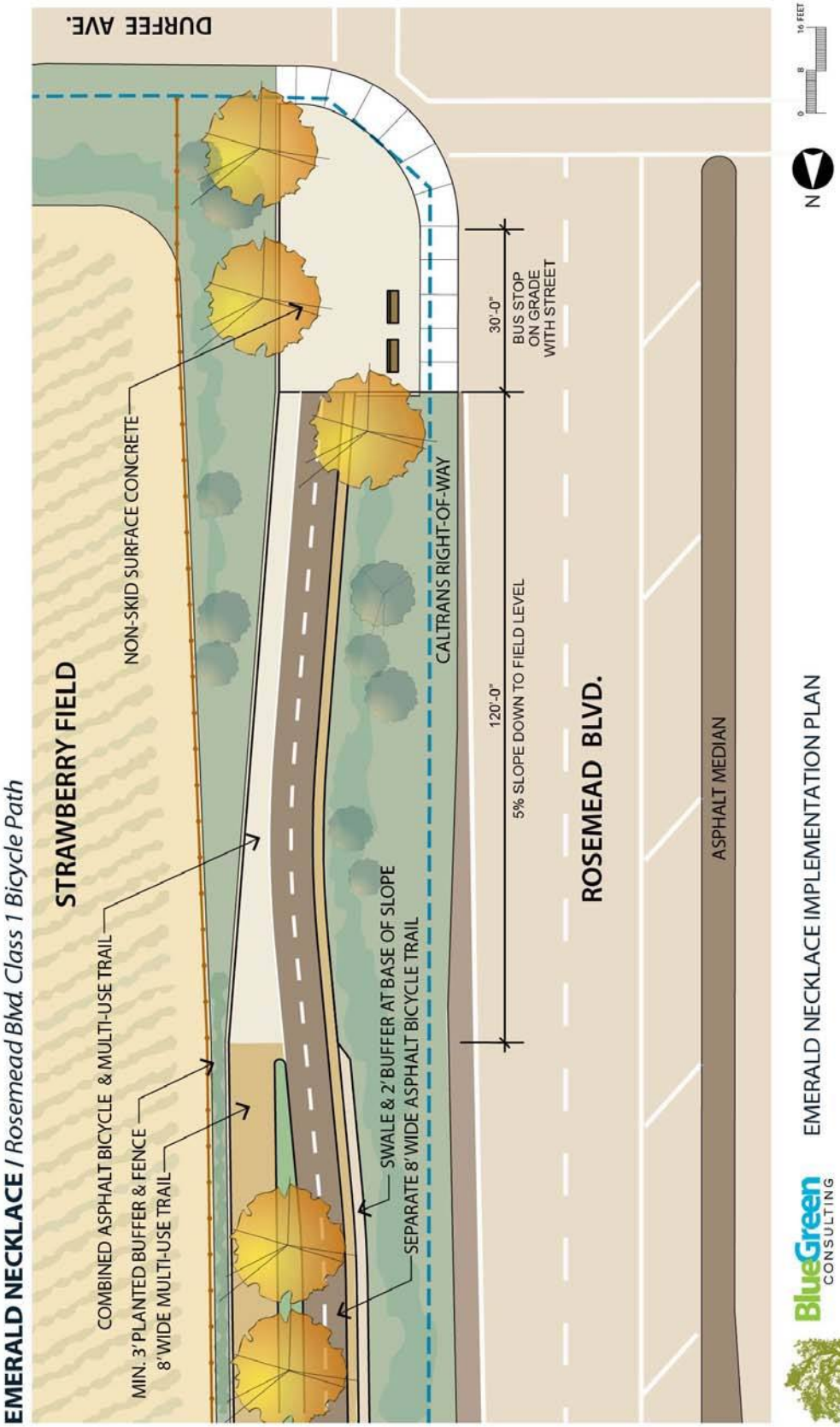


Fig. 6. The new trails extend north from the back of a proposed bus stop.

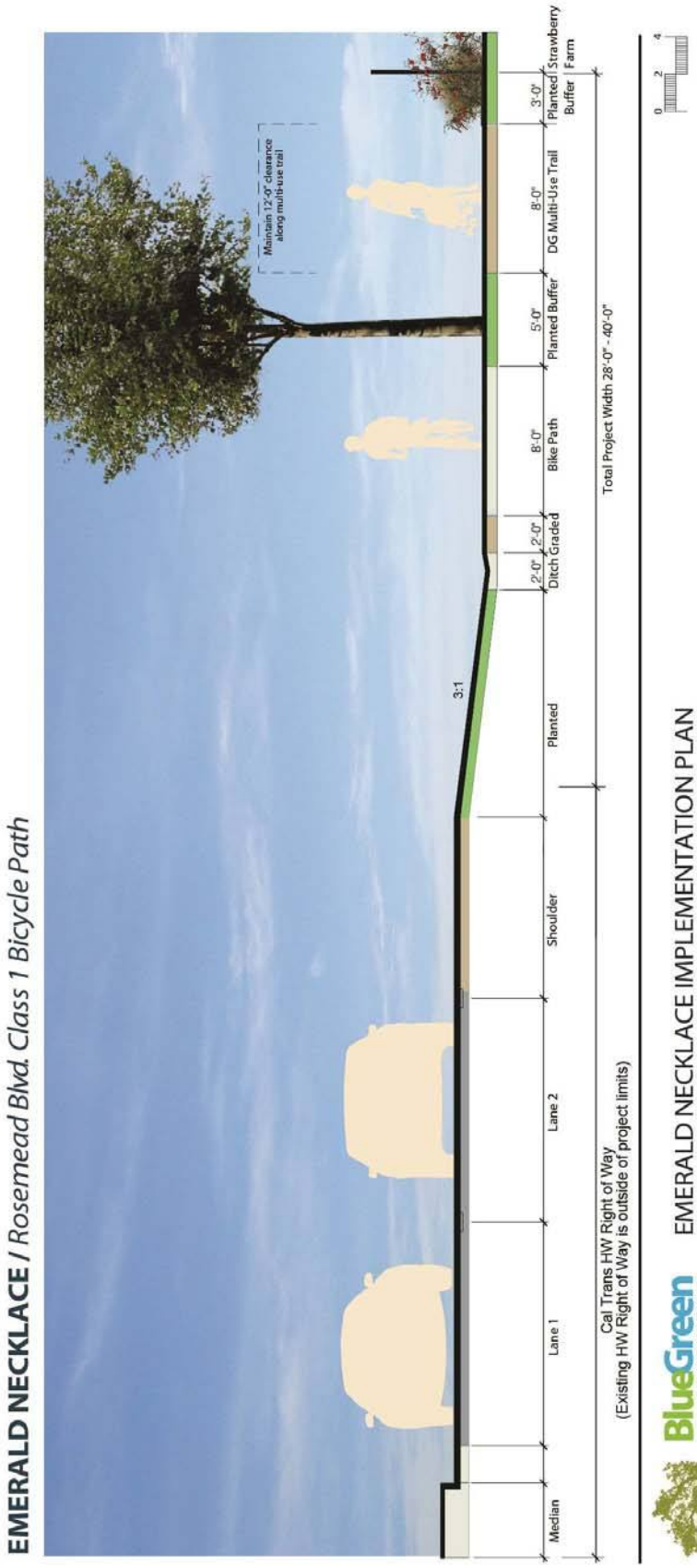


Fig. 7. The proposed grade for the bicycle path and multi-use trail will be below Rosemead Blvd. north of the bus stop.

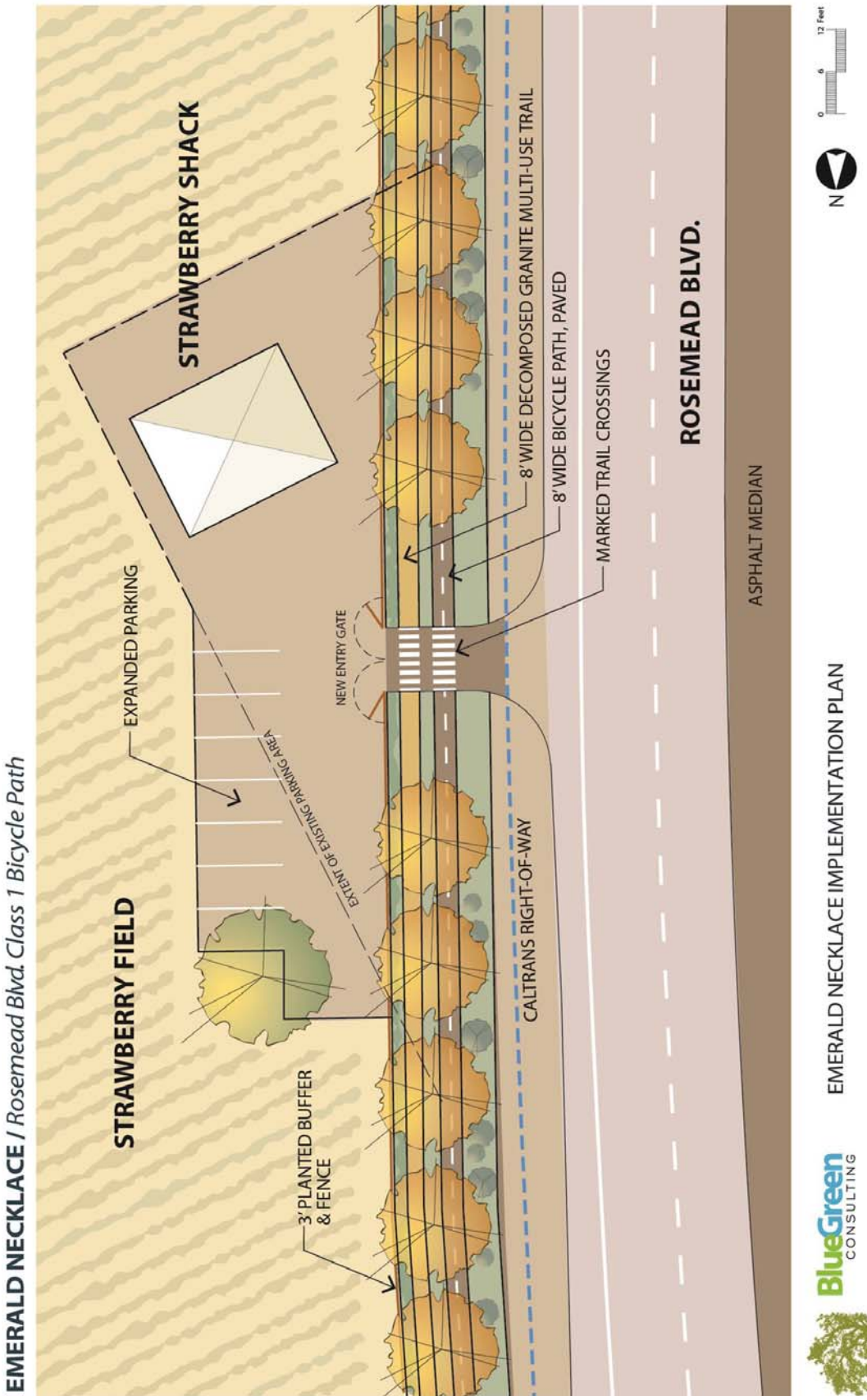


Fig. 8. The existing parking area for the Strawberry Shack will be expanded and new access gates provided as part of the project.

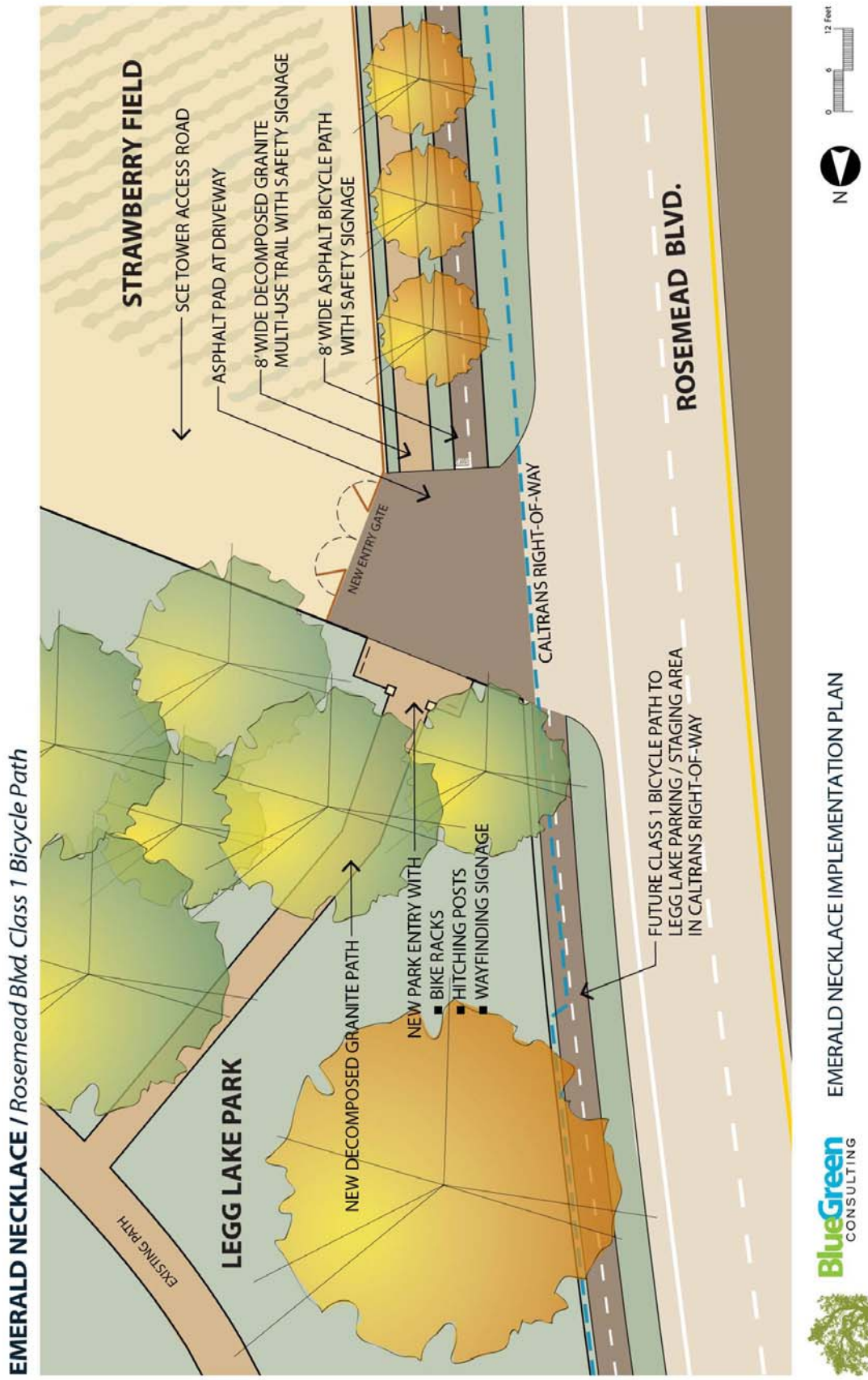


Fig. 9. The proposed trails end at the SCE tower service road on the southern edge of Legg Lake.

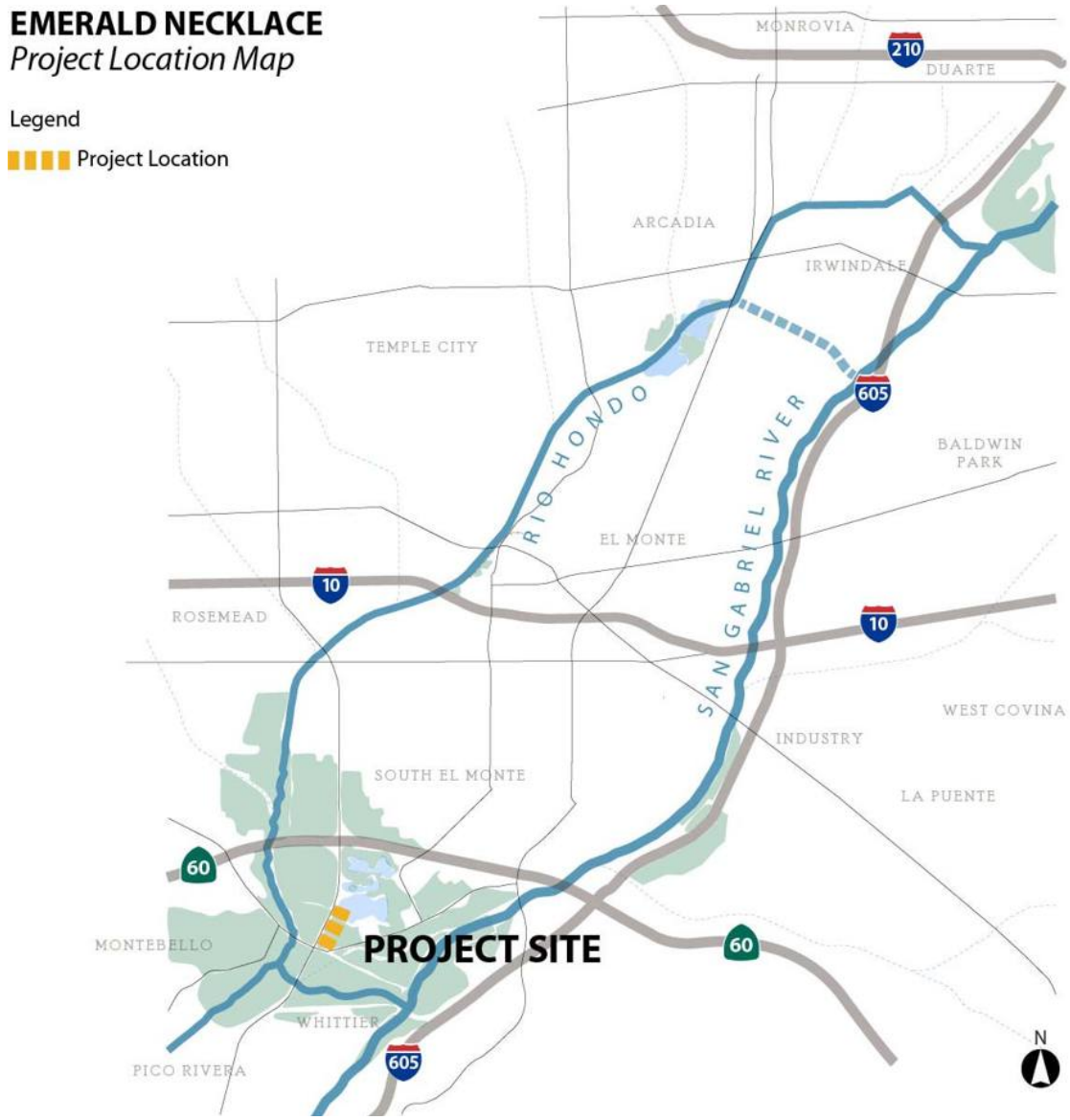


Fig. 10. The project is located in the southern portion of the Emerald Necklace, a recreation trail and park system on the San Gabriel and Rio Hondo Rivers.

Project Implementation Changes

The project feasibility plan calls for a Class I bicycle path to be located within the CalTrans right-of-way on the eastern shoulder of Rosemead Boulevard, and did not include a multi-use trail. Moving the bicycle path and the multi-use trail into the agricultural area will allow enough room for a landscaped buffer along both trails and improvements to the strawberry patch parking lot. Coordination with CalTrans will be limited. Coordination with US Army Corp of Engineers and their agricultural tenant will be necessary.

The northern project limit differs from the feasibility study in several aspects. The feasibility plan indicates a hardened decomposed granite path into Legg Lake in a slightly more northern

location. The implementation project limits stop at the Southern California Edison easement driveway. No Class I bike path is indicated beyond that point. Driveway improvements associated with the bicycle path and multi-use trial were not included in the feasibility study.

Emerald Necklace Signage

Refer to the Emerald Necklace Signage Guidelines for the County of Los Angeles Department of Public Works for specific signage design, usage and placement and the County of Los Angeles Parks and Recreation Signage Guidelines.

Emerald Necklace signage depicted below indicates a bicycle path and a multi-use trail. Technically, mountain bikes are allowed on the multi-use trail and should be depicted as a graphic on the trail sign. In order to avoid confusion, when the trails are directly adjacent to each other, the bicycle graphic will remain a separate sign in order to clearly mark the Class I bike path or the Class IV bikeway. When the trails are separated i.e. on opposite sides of the river, the multi-use trail sign will also include a bicycle graphic.

Signage Type	Quantity	Location
Wayfinding	Two	Rosemead Blvd. and San Gabriel Blvd.
Legg Lake wayfinding sign	One	Rosemead Blvd. and San Gabriel Blvd.
Legg Lake identification sign	One	Rosemead Blvd. and south entry to park
Rio Hondo directional sign	One	Rosemead Blvd. and San Gabriel Blvd.
Mile Markers		Every quarter-mile on trails

Fig. 11. Appropriate wayfinding signage to be installed on the trail.

Emerald Necklace Phase 1 Implementation Costs

EMERALD NECKLACE PHASE I PROJECTS -PROJECT 5

Whittier Rosemead Trails

	Item	Qty.	Units	Unit Costs	*Sub-Total*	Total
1.0	**Demolition**					
1.1	Site Preparation Clearing and Grubbing	71,100	SF	$ 0.12	$ 8,532.00	
1.2	Remove Chain Link Fencing, Footings, Debris	1	LS	$ 6,000.00	$ 6,000.00	
1.3	Temporary Construction Fencing	71,100	LF	$ 1.20	$ 85,320.00	
	Total 1.0					**$ 99,852.00**
2.0	**EarthworkSite Grading**					
2.1	Fine grade for trails, driveways, swale, equest. area	71,100	SF	$ 0.40	$ 28,440.00	
	Total 2.0					**$ 28,440.00**
3.0	**Site Construction**					
3.1	8 ' Stabilized D.G. path w/thickened conc. curbing	1,700	LF	$ 60.00	$ 102,000.00	
3.2	Class I bicycle path	1,900	LF	$ 315.00	$ 598,500.00	
3.3	Conc. New Driveway/Exist. Driveway Impr. & Striping	1	LS	$ 30,000.00	$ 30,000.00	
3.4	Exist. Strawberry Patch Parking Improvements	1	LS	$ 30,000.00	$ 30,000.00	
3.5	Landscaped swale/sump	1,400	LF	$ 45.00	$ 63,000.00	
3.6	Tubular Steel Gates - 16 feet wide	3	EA	$ 12,000.00	$ 36,000.00	
3.7	Tubular Steel Fencing	2,000	LF	$ 120.00	$ 240,000.00	
3.8	Provide & install Wayfinding and signage	1	LS	$ 10,000.00	$ 10,000.00	
3.9	Equestrian and Bicyle Amenities	1	LS	$ 8,000.00	$ 8,000.00	
	Total 3.0					**$ 1,117,500.00**
4.0	**Utilities**					
4.1	Erosion control	71,100	SF	$ 0.05	$ 3,555.00	
4.2	Perforated Pipe for swale	1	LS	$ 10,000.00	$ 10,000.00	
4.3	Temp. water line connection to site w/repairs	1	LS	$ 20,000.00	$ 20,000.00	
4.4	Install Temp. 1" Water Meter (as necessary)	1	LS	$ 8,000.00	$ 8,000.00	
	Total 4.0					**$ 41,555.00**
5.0	**Planting / Landscape**					
5.1	Soils Test	1	LS	$ 2,000.00	$ 2,000.00	
5.2	Mycorrhizal Treatment	10,000	SF	$ 0.20	$ 2,000.00	
5.3	24 " box trees	17	EA	$ 400.00	$ 6,800.00	
5.4	Shrubs--1 Gal.	1,000	EA	$ 35.00	$ 35,000.00	
5.5	Landscape understory planting	32,000	SF	$ 2.00	$ 64,000.00	
5.6	Landscape Mulch - 3 inch depth	300	CY	$ 30.00	$ 9,000.00	
5.7	Temporary landscape Irrigation	33,000	SF	$ 1.50	$ 49,500.00	
	Total 5.0					**$ 168,300.00**
	SUB-TOTAL					**$ 1,455,647.00**
	MOBILIZATION & PROFIT (15%)				**$ 218,347.05**	
	DESIGN AND PERMITTING (20%)				**$ 291,129.40**	
	CONTINGENCY (30%)				**$ 436,694.10**	
	TOTAL PROJECT COSTS					**$ 2,401,817.55**
6.0	Securing R.O.W (US Army Corps of Engineers)	1	LS			**Cost?**

This opinion of probable cost of construction is made on experience and best judgement for a concept design only. Land availability, field conditions, design development and construction document production will invariably alter costs. Concept costs have been developed for the purpose of an Emerald Necklace Phase I Cost Benefit Analysis.

Emerald Necklace Phase 1 Benefit-Cost Analysis

Benefit-Cost Analysis Project 5: Bike Path Rosemead Blvd			
Cost			
Construction Cost:	$ 2,401,818		
Land Acquisition:			
Total Cost:	$ 2,401,818		
Annual Maintenance:	$ 4,826		
Discount Rate:	7%		
Total Cost (30 yr. in 2016 $)	$ 2,300,069		
Improvements			
Linear Path (Bike only):	1,900 ft		
Linear (Multi only):	1,900 ft		
Total Linear Path:	1,900 ft		
Staging/Park Areas			
Recreational Value:	Medium		
Population in 2400 m Buffer			
Assumed Population Density	7,068		
Commute Share	0.63		
Residents in Buffer	56,967		
Existing Commuters	144		
New Commuters	43		
	Low	Mid	High
Total Cyclists	713	9857	14672
Total new Cyclists	255	2973	4405
Annual Benefits			
	Low	Mid	High
Recreation Benefits	$ 773,995	$ 10,696,469	$ 15,922,546
Health Benefits	$ 32,606	$ 380,572	$ 563,843
Mobility Benefits		$ 178,565	
Decreased Auto Use		$ 938	
Multi-Use Health Benefits	$ 120,768		
Multi-Use Recreation Benefit	$ 1,431,530.0		
Total Annual Benefits		$ 12,808,842	
Total Annual Transportation Benefits		$ 560,075	
Benefit-Cost Ratios			
Total Discounted Benefits (30yrs)		$ 158,945,448	
Benefit-Cost Ratio		**69.10**	
Discounted Benefits Transportation		$ 6,949,994	
Benefit-Cost Ratio Transportation		**3.02**	
*Numbers shaded in grey were used for caculation of B-C Ratios			

WHITTIER NARROWS CONNECTIVITY: Class IV Bikeway from El Bosque del Rio Hondo to Lincoln Ave. On San Gabriel Blvd.

Project Description Summary

The intent of this project is to fill in the missing gap between the northern and southern portions of the Rio Hondo Class I bicycle path with a Class IV bikeway. Specifically, this project will extend the existing Class I bicycle path on the north side of San Gabriel Blvd. from the end of the Rio Hondo Bicycle Path to Lincoln Ave. To gain the width necessary for the new Class IV bikeway, all traffic lanes will be reduced and the center raised median relocated to allow an expansion of the northern sidewalk. The Class IV bikeway will be designed to CalTrans Highway Design Manual, AASHTO Guidelines, the Manual of Uniform Traffic Control Guidelines and other applicable requirements.

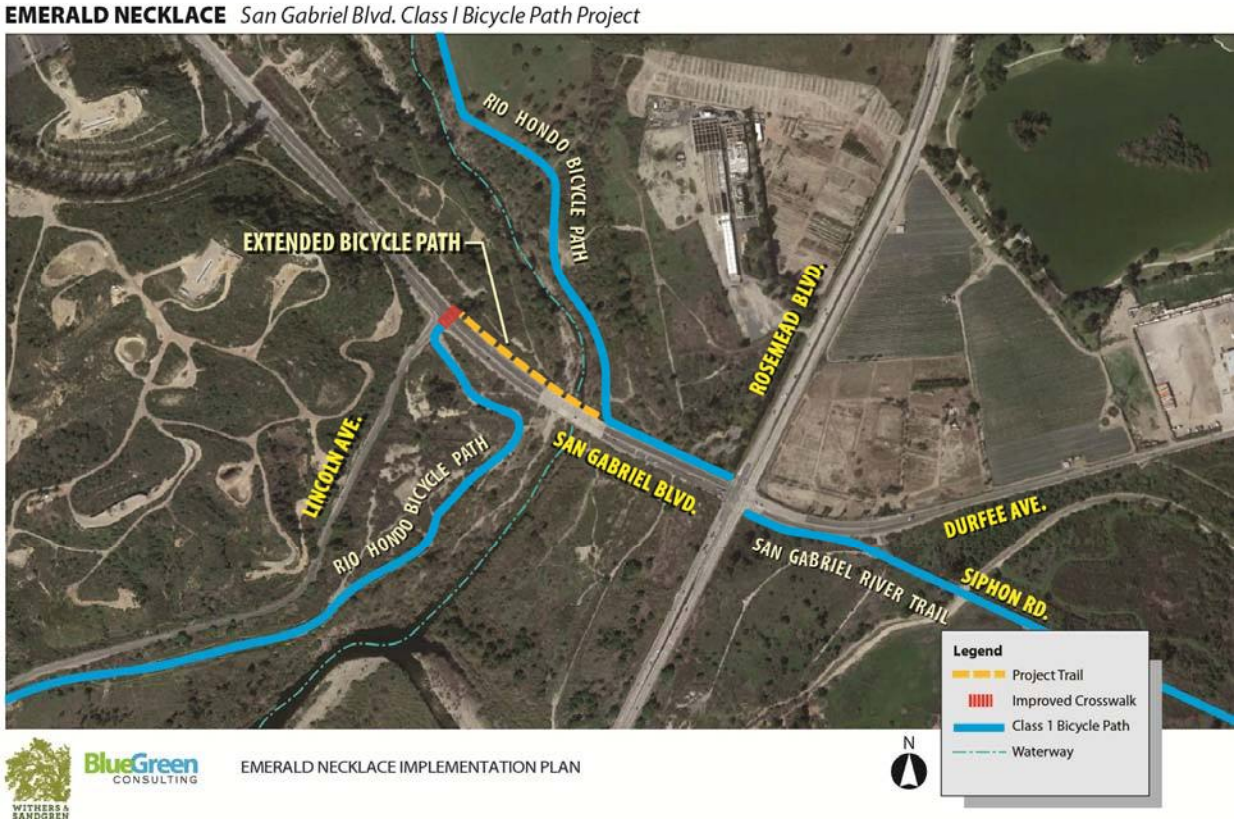


Fig. 1. Project Map.

On the bridge spanning the Rio Hondo, the existing 5-foot wide concrete sidewalk will be expanded to a minimum of 12-feet wide. A continuous concrete barrier approximately 1,200 feet in length will be installed between the bikeway and the adjacent traffic lane (refer to Fig. 8).

This project will require re-striping of traffic lanes. Median width modification for an approximate project length of 915 linear feet will be necessary. Approximately 500 linear feet of concrete will be installed to raise the grade of the Class IV bikeway to a consistent level over the San Gabriel Bridge, then ramping down to street grade to the signalized crossing at Lincoln Avenue. The Class II bike lane and signage on the south side of San Gabriel Boulevard will remain at the existing width of 8 feet. Approximately 660 linear feet of fencing will be installed from the bridge to the Lincoln Ave. at the top of the road embankment to eliminate informal access points to the river.

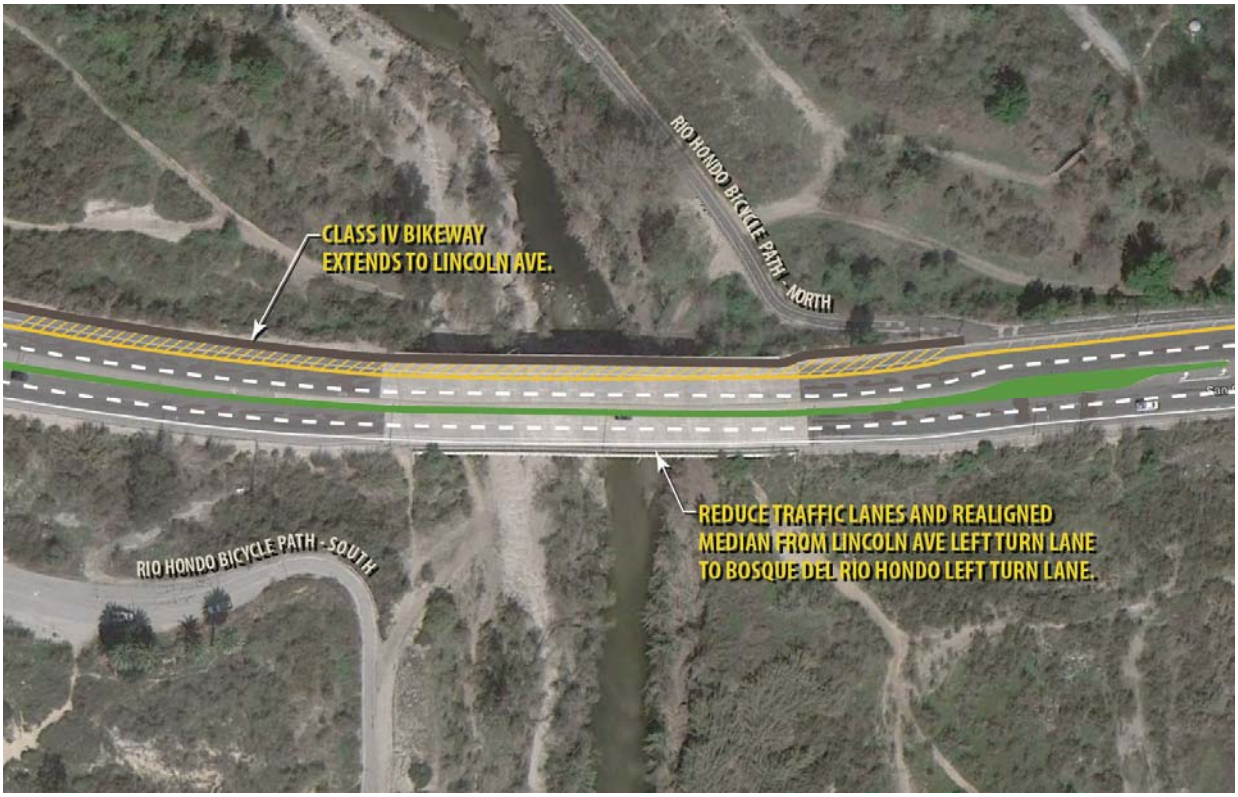


Fig. 2. Proposed modifications to San Gabriel Blvd. and the existing bridge in order to connect the north and south portions of the Rio Hondo Bicycle Path.

Fig.3. El Bosque del Rio Hondo Class I bicycle path on the north side of San Gabriel Blvd. looking east.

Fig. 4. San Gabriel Blvd. bridge over the Rio Hondo at El Bosque with sidewalk and paving striping.

Additionally the signalized crosswalk at the intersection of San Gabriel Blvd. and Lincoln Avenue will be improved with a widened waiting area. ADA accessible ramps, curbing, signage, improved striping and pavement markings to indicate a crossing of the Emerald Necklace, wayfinding signage and banner pole will be installed. Miscellaneous road signage will be removed and relocated per standards. Existing street lighting and utilities will remain in-place.

The Los Angeles County Department of Public Works feasibility study for San Gabriel Blvd., the San Gabriel Bikeway Improvement Project (RDC0015954), considered the elimination of one lane of traffic south of Lincoln Ave. to Rosemead Blvd. If this road diet is implemented the reduction of a traffic lane will impact the project road alignment. With or without a lane reduction, the relocation or widening of the center median will still be required. Additionally, with a wider median, the southern portion of San Gabriel Blvd. could be enhanced to create a gateway entrance to the Whittier Narrows Recreation Area.

Fig. 5. San Gabriel Blvd Bridge with striping and median changes to accommodate the Class IV Bikeway

The project includes but is not limited to:

- Class IV bikeway
- Median re-alignment
- Lane re-striping
- Tubular steel fencing
- Drainage under Class IV bikeway ramp
- Concrete barrier
- Concrete retaining wall
- Signalized intersection waiting area expansion – north side
- Street signage
- Emerald Necklace signage
- Regulatory and safety signage as required

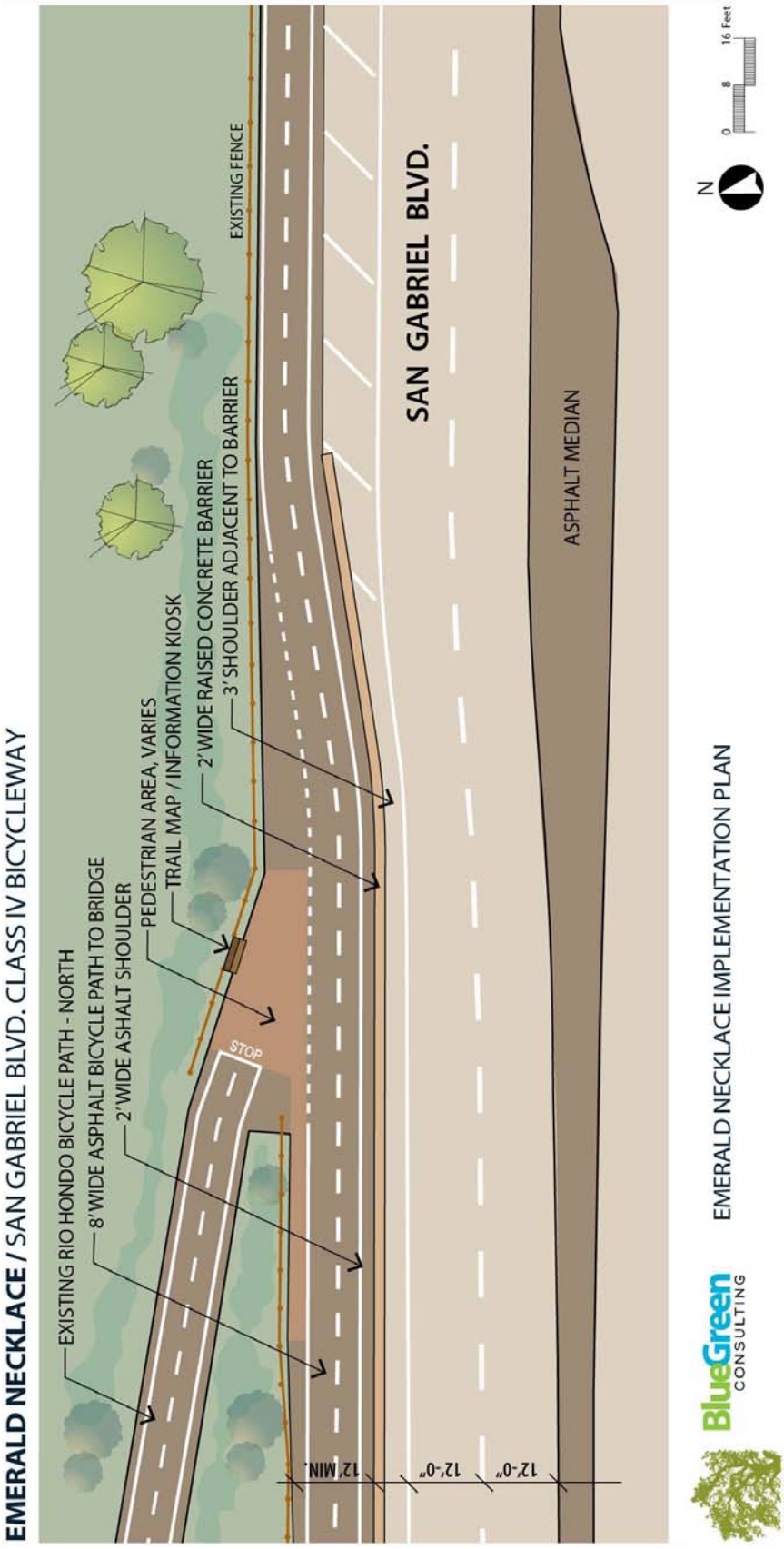


Fig. 6. Plan view of the junction of the Rio Hondo Bicycle Path North with the proposed San Gabriel Blvd. Class IV Bikeway.

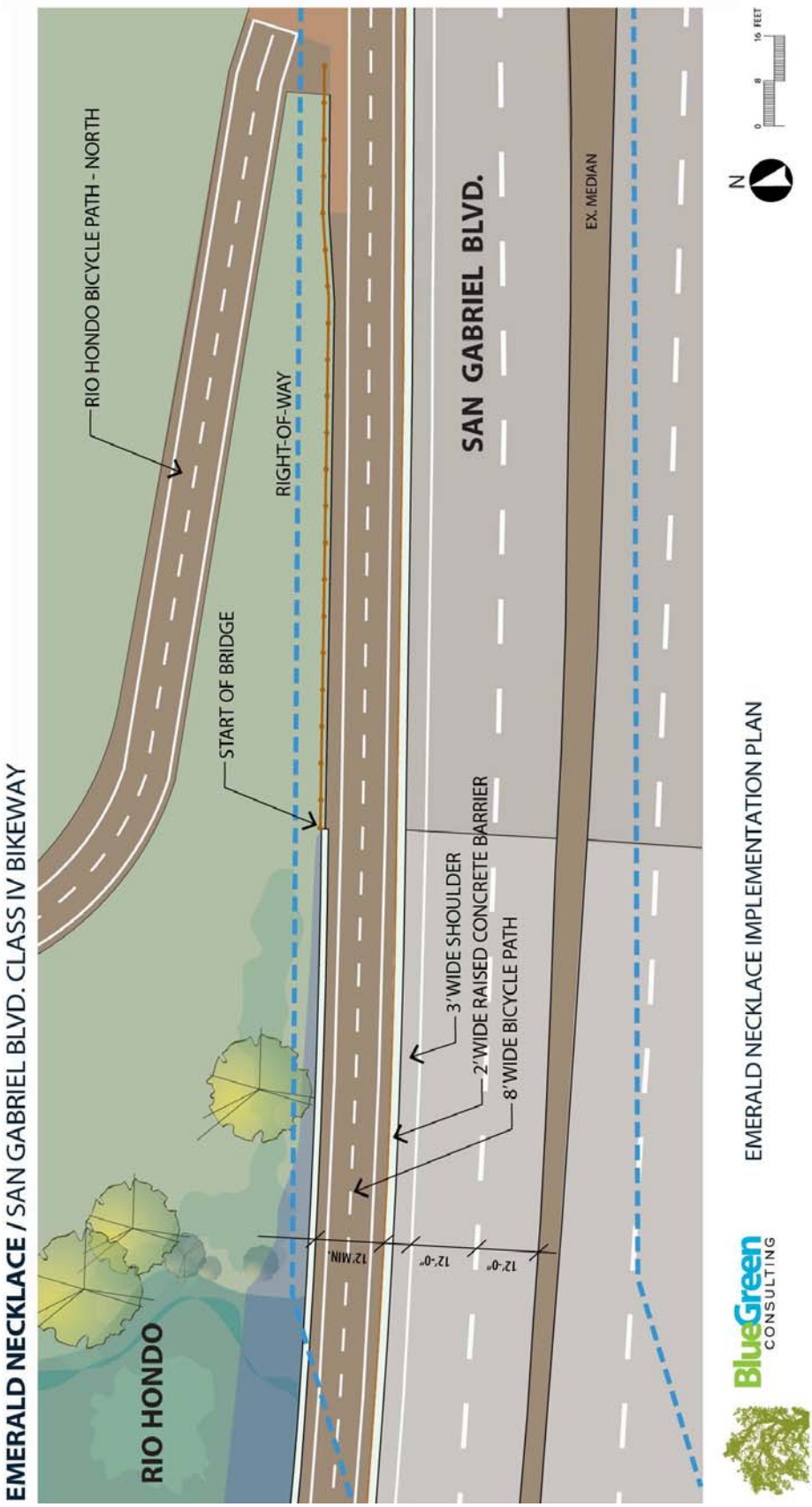


Fig. 7. Plan view of the proposed San Gabriel Blvd. Class IV Bikeway on the existing San Gabriel Blvd. Bridge.

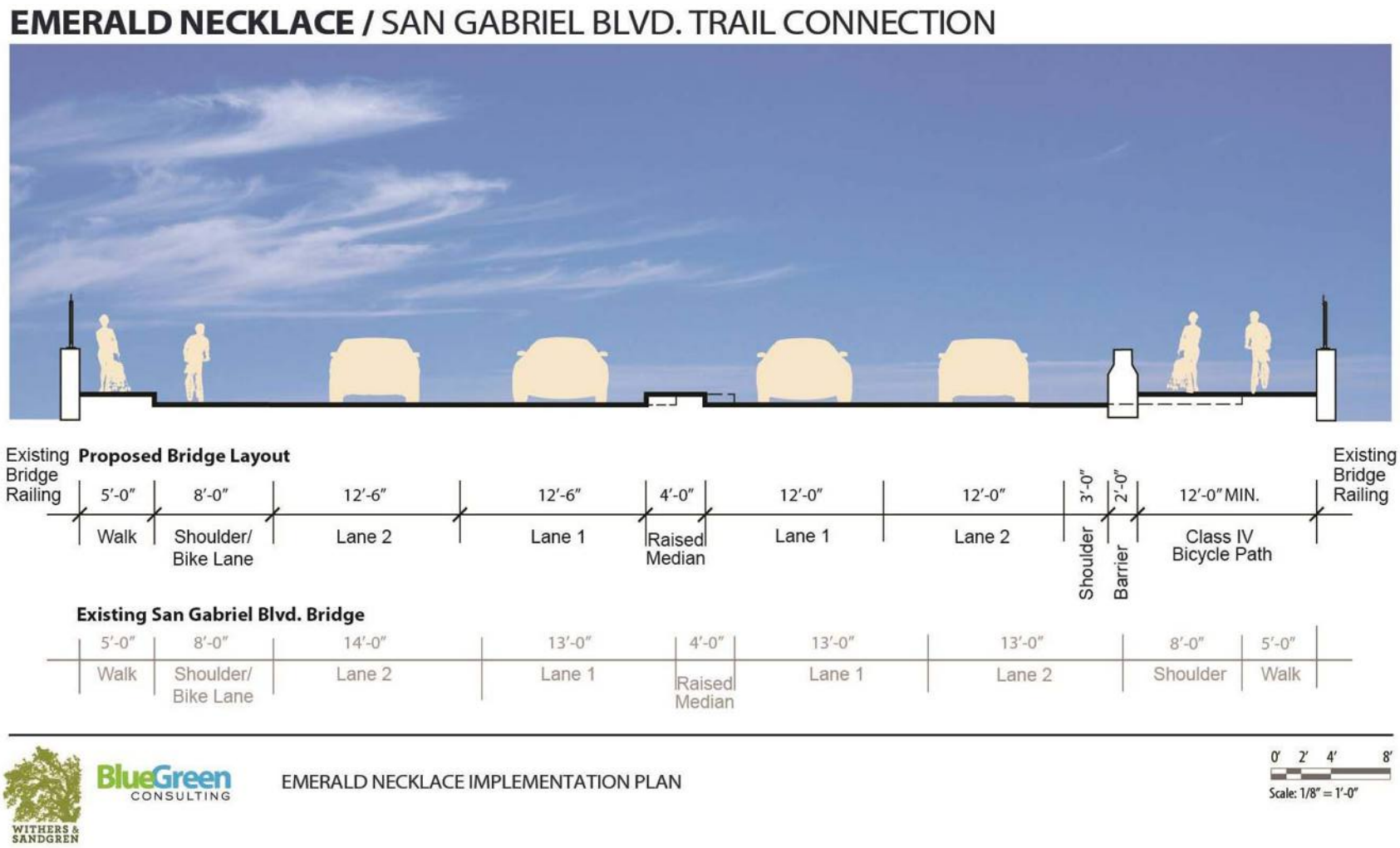


Fig. 8. Section view of the San Gabriel Bridge illustrating the dimensioning of the proposed trail relative to the existing bridge layout.

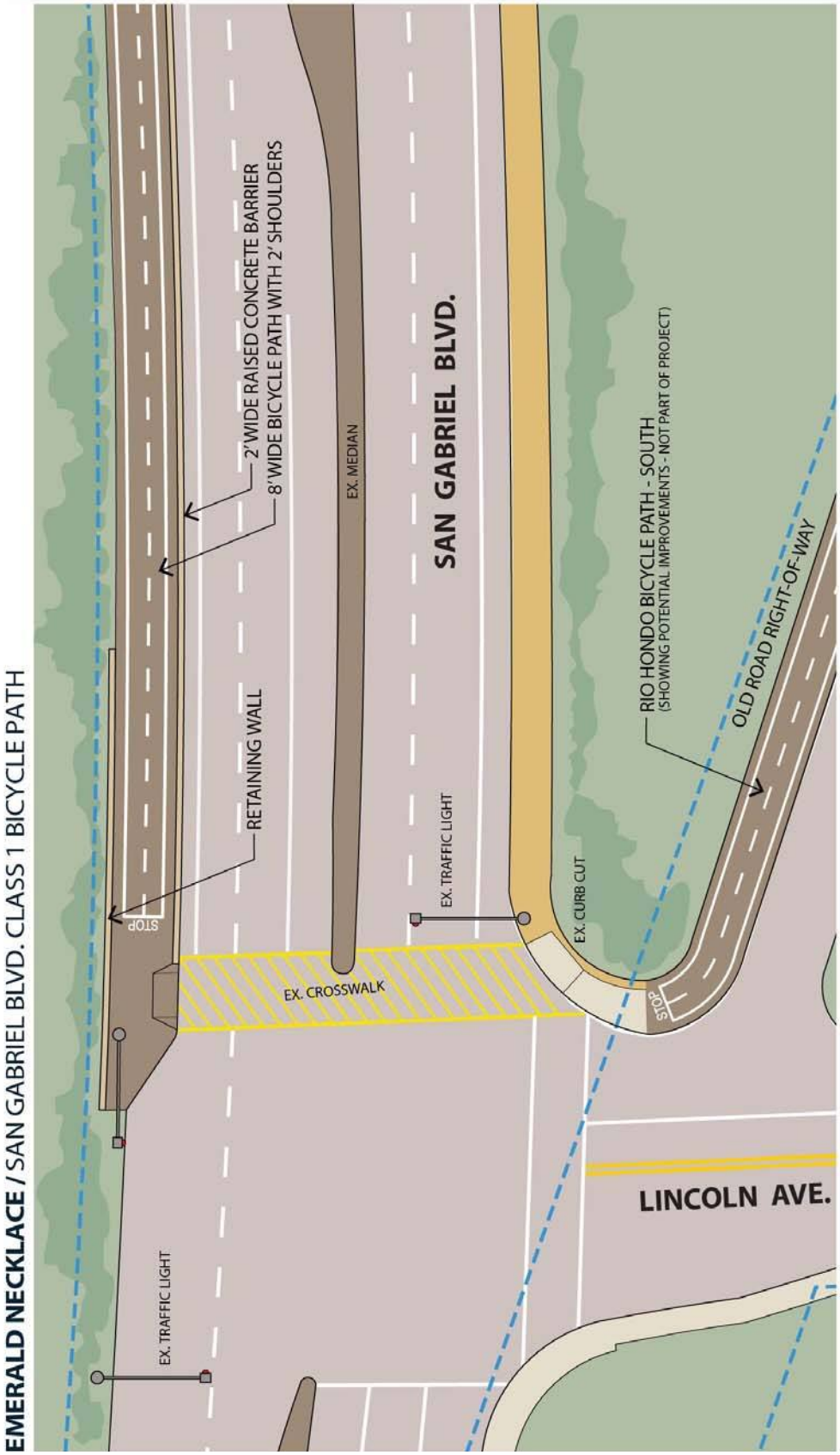


Fig. 9. Plan view of the proposed San Gabriel Blvd. Class IV Bikeway at the intersection with Lincoln Ave.

Fig. 10. The project is located in the southern portion of the Emerald Necklace.

Project Implementation Changes

The project feasibility plan calls for a Class I bicycle path to be located on the north side of San Gabriel Boulevard. Placement of a concrete barrier adjacent to the trail and to a traffic lane would re-classify the bicycle path to a Class IV Bikeway. Also width changes to accommodate pedestrians are proposed which change path from a Class I to a Class IV.

The project feasibility study proposed moving street lighting and utilities. This action and cost is not necessary with the project implementation solution.

At the west end of the project at the street crossing at Lincoln Avenue, a 200 foot retaining wall will be required in order to expand the waiting area at the signal to accommodate bicyclists and pedestrians.

Emerald Necklace Signage

Refer to the Emerald Necklace Signage Guidelines for the County of Los Angeles Department of Public Works for specific signage design, usage and placement and the County of Los Angeles Parks and Recreation Signage Guidelines.

Emerald Necklace signage depicted below indicates a bicycle path and a multi-use trail. Technically, mountain bikes are allowed on the multi-use trail and should be depicted as a graphic on the trail sign. In order to avoid confusion, when the trails are directly adjacent to each other, the bicycle graphic will remain a separate sign in order to clearly mark the Class I bike path or the Class IV bikeway. When the trails are separated i.e. on opposite sides of the river, the multi-use trail sign will also include a bicycle graphic.

Signage Type	Quantity	Location
Wayfinding	Four	Rio Hondo Bikeway North and Lincoln Ave.
Banner Pole sign	One	Lincoln Ave.
General directional sign	One	Rio Hondo Bikeway North
Mile Markers		Every quarter-mile on trails

Fig. 11. Some of the appropriate signage for the project.

Emerald Necklace Phase 1 Implementation Costs

EMERALD NECKLACE PHASE I PROJECTS -PROJECT 6

San Gabriel Bridge Bikeway Connectivity

	Item	Qty.	Units	Unit Costs	*Sub-Total*	Total
1.0	**Demolition**					
1.1	Site Prep Conc./Striping removal	915	LF	$ 3.00	$ 2,745.00	
1.2	Saw Cutting Median	915	LF	$ 12.00	$ 10,980.00	
1.3	Traffic Management	1	LS	$ 20,000.00	$ 20,000.00	
	Total 1.0					**$ 33,725.00**
2.0	**Streetwork**					
2.1	Curb and Median Reconstruction and Repair	915	LF	$ 16.00	$ 14,640.00	
2.2	Street/Bridge Re-striping	1	LS	$ 12,000.00	$ 12,000.00	
	Total 2.0					**$ 26,640.00**
3.0	**Utilities**					
3.1	Drainage mondifications as necessary	1	LS	$ 20,000.00	$ 20,000.00	
3.2	Misc. existing utility relocation/retrofit	1	LS	$ 15,000.00	$ 15,000.00	
	Total 3.0					**$ 35,000.00**
4.0	**Trail Construction**					
4.1	Class IV Bikeway/Conc. raised at existg. sidewalk leve	1,200	LF	$ 350.00	$ 420,000.00	
4.2	Concrete Barrier - Rio Hondo Entrance to Lincoln	1,166	LF	$ 45.00	$ 52,470.00	
4.3	Concrete Retaining Wall	200	LF	$ 200.00	$ 40,000.00	
4.4	Tubular Steel Fencing	660	LF	$ 120.00	$ 79,200.00	
4.5	Emerald Necklace Banner Pole Fabrication/Installatior	1	LS	$ 5,000.00	$ 5,000.00	
4.5	Street, Regulatory and Emerald Necklace Wayfinding	1	LS	$ 8,000.00	$ 8,000.00	
	Total 4.0					**$ 604,670.00**
	SUB-TOTAL					**$ 700,035.00**
	BRIDGE STRUCTURAL REPORT (5%)				**$ 35,001.75**	
	TRAFFIC CONTROL AND PLANS (3%)				**$ 21,001.05**	
	MOBILIZATION & PROFIT (15%)				**$ 105,005.25**	
	DESIGN AND PERMITTING (20%)				**$ 140,007.00**	
	CONTINGENCY (30%)				**$ 210,010.50**	
	TOTAL PROJECT COSTS					**$ 1,211,060.55**

This opinion of probable cost of construction is made on experience and best judgement for a concept design only. Land availability, field conditions, design development and construction document production will invariably alter costs. Concept costs have been developed for the purpose of an Emerald Necklace Phase I Cost Benefit Analysis.

Emerald Necklace Phase 1 Benefit-Cost Analysis

Benefit-Cost Analysis Project 6: Bike Path San Gabriel Blvd.			
Cost			
Construction Cost:	$ 1,211,061		
Land Acquisition:			
Total Cost:	$ 1,211,061		
Annual Maintenance:	$ 1,477		
Discount Rate:	7%		
Total Cost (30 yr. in 2016 $)	$ 1,148,784		
Improvements			
Linear Path (Bike only):	1,200 ft		
Linear (Multi only):			
Total Linear Path:	1,200 ft		
Staging/Park Areas			
Recreational Value:	Medium		
Population in 2400 m Buffer			
Assumed Population Density	7,068		
Commute Share	0.63		
Residents in Buffer	54,177		
Existing Commuters	137		
New Commuters	40		
	Low	Mid	High
Total Cyclists	678	9374	13954
Total new Cyclists	239	2794	4139
Annual Benefits			
	Low	Mid	High
Recreation Benefits	$ 727,245	$ 10,050,383	$ 14,960,795
Health Benefits	$ 30,637	$ 357,585	$ 529,786
Mobility Benefits		$ 169,351	
Decreased Auto Use		$ 557	
Multi-Use Health Benefits	$ 113,190		
Multi-Use Recreation Benefit	$ 1,343,747.5		
Total Annual Benefits		$ 12,034,814	
Total Annual Transportation Benefits		$ 527,493	
Benefit-Cost Ratios			
Total Discounted Benefits (30yrs)		$ 149,340,501	
Benefit-Cost Ratio		**130.00**	
Discounted Benefits Transportation		$ 6,545,682	
Benefit-Cost Ratio Transportation		**5.70**	
*Numbers shaded in grey were used for caculation of B-C Ratios			

WHITTIER NARROWS CONNECTIVITY: Class I Bicycle Path from the Rio Hondo to Legg Lake through the Southern California Edison Easement

Project Description Summary

The project has three components that will connect the northern section of the Rio Hondo Class I bicycle path directly to Legg Lake recreation area parking lot. The first project component would develop an approximately half-mile long Class I bicycle path located on the north side of the Southern California Edison (SCE) transmission line corridor to connect the Rio Hondo Bike Path to Rosemead Boulevard. The 12-foot wide asphalt bicycle path will be designed to CalTrans Highway Design manual standards and AASHTO Guidelines.

Both ends of the new bicycle path will require approximately 100 linear feet of new fencing, master posts and gates for emergency closure during SCE transmission line repairs. Four, 8-foot wide, 48-inch tall chain link gates (match existing fence height) on each side of the bicycle path will be installed with gate posts that lock gates open during times of operation. Both ends of the new bicycle path will receive striping and directional, wayfinding and regulatory/safety signage mounted on metal posts.

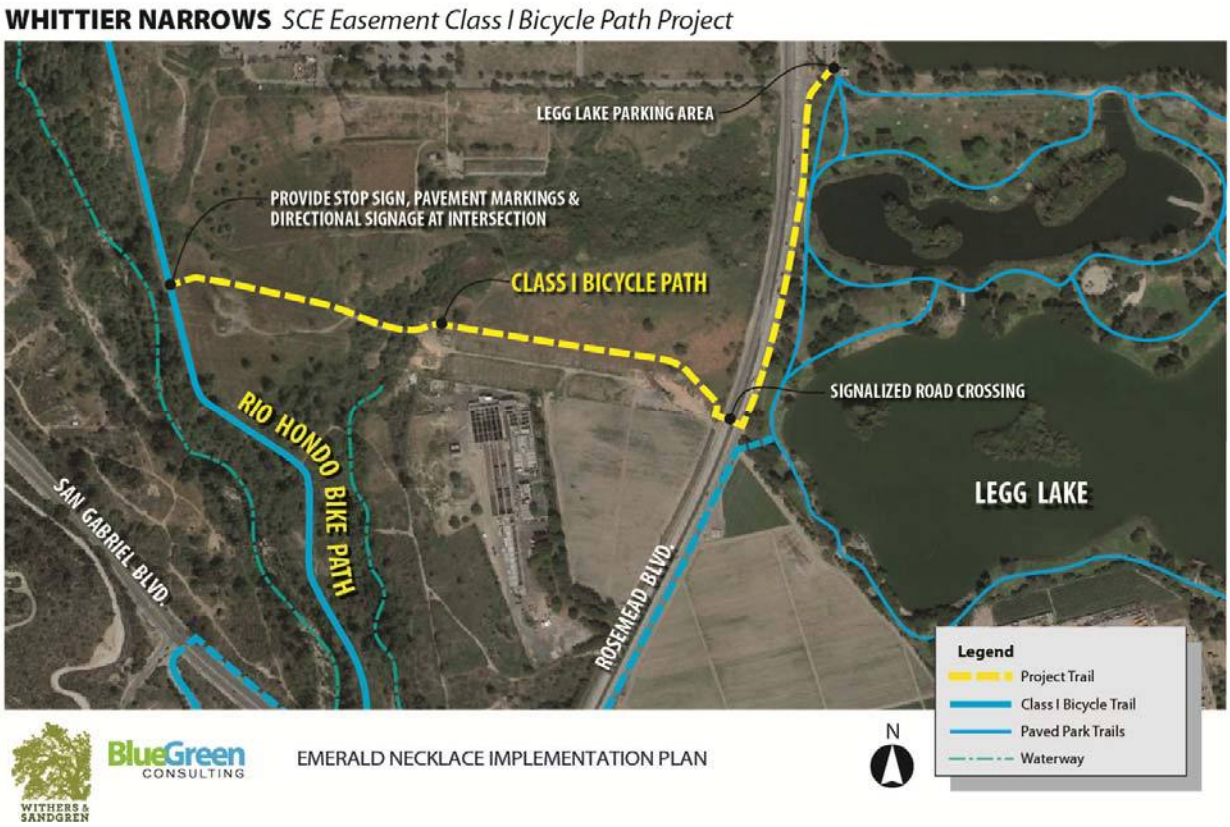


Fig. 1. Project area

The second trail connection component associated with this project is a mid-block signalized pedestrian crossing on Rosemead Boulevard with center median modifications for planting and irrigation. This crosswalk will be designed and constructed per CalTrans design standards. The lighted, pedestrian activated crosswalk from the east edge of the Southern California Edison easement area across to Legg Lake will require modifications to the roadbed, median, and shoulders of Rosemead Boulevard including striping, new curbing, concrete landing pads, ADA ramping, signage and height clearances. Approximately 400 linear feet of the existing asphalted median will be removed and replaced with a new planted and irrigated median on each side of the new crosswalk. Rosemead Boulevard will receive new metal traffic warning signage indicating a lighted pedestrian crossing ahead in both directions per CalTrans standards. The crossing will require the installation of traffic lights, highway warning signs, street striping, and construction of a total of 800 linear feet of landscaped medians (400 feet each side) to calm traffic as it approaches the new signalized crossing.

Fig. 2. The Rio Hondo Bike Path, looking north to the SCE easement.

Fig. 3. Entry to the SCE easement on Rosemead Blvd.

From the signalized crossing a continuation of the Rosemead Boulevard Bicycle Trail will extend north approximately 1,400 linear feet along the street to the parking lot at the main entry to the Legg Lake Recreation Area. This segment of the trail will be a Class I bike path separated from traffic on Rosemead Blvd. by a landscaped buffer (refer to Fig. 5).

The project will need to take into consideration the results of a study of Rosemead Boulevard Complete Streets currently in progress. Until that time, this project will include but not be limited to:

- Class I bicycle path
- Signalized Z crossing
- Fencing and gating
- Stop signs at intersection on bicycle path
- Rosemead median re-construction
- Equine- and dog-friendly landscape and irrigation
- Street and traffic warning signage
- Emerald Necklace signage
- Regulatory and safety signage as required

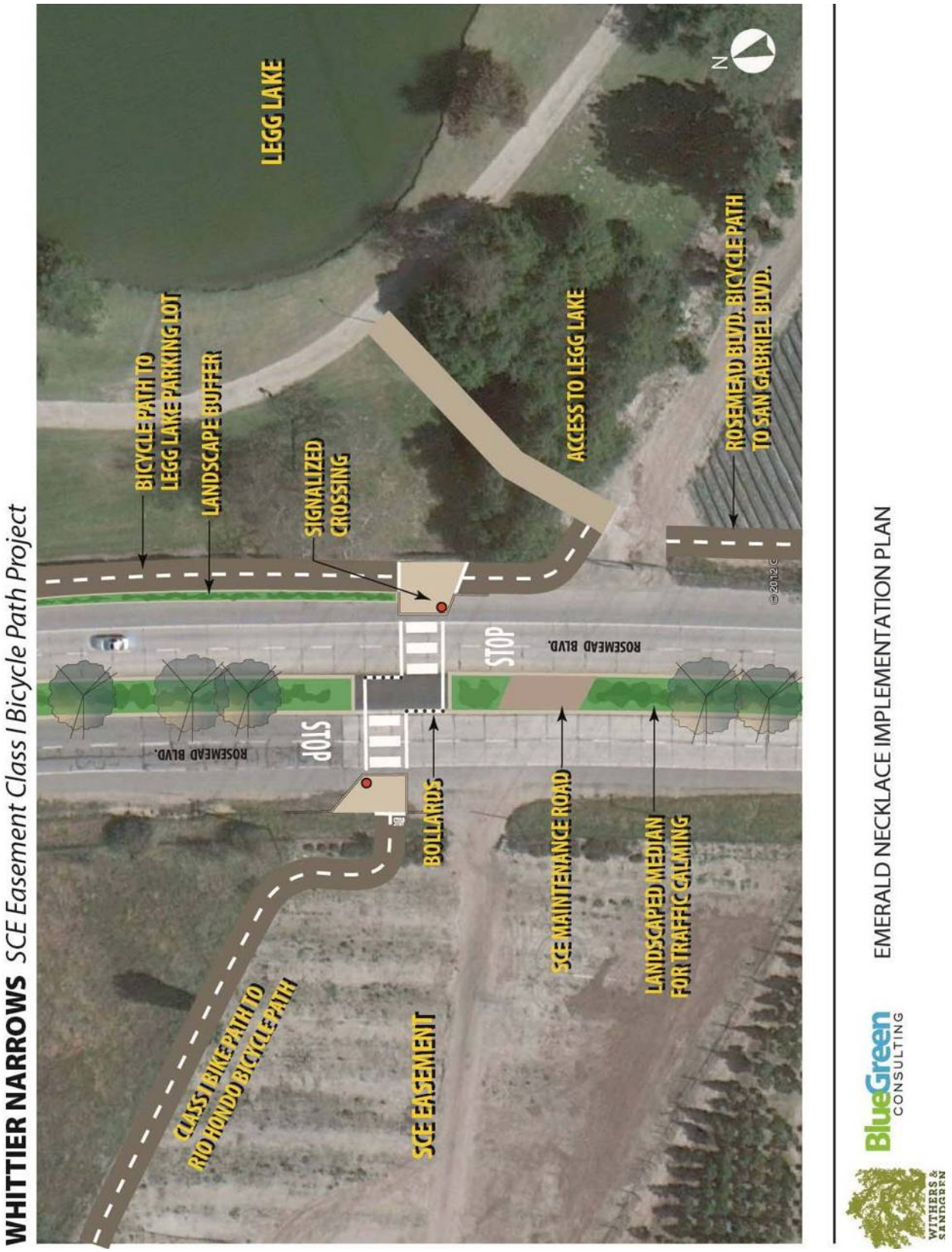


Fig. 4. Existing conditions on Rosemead Blvd. at the proposed crosswalk location.

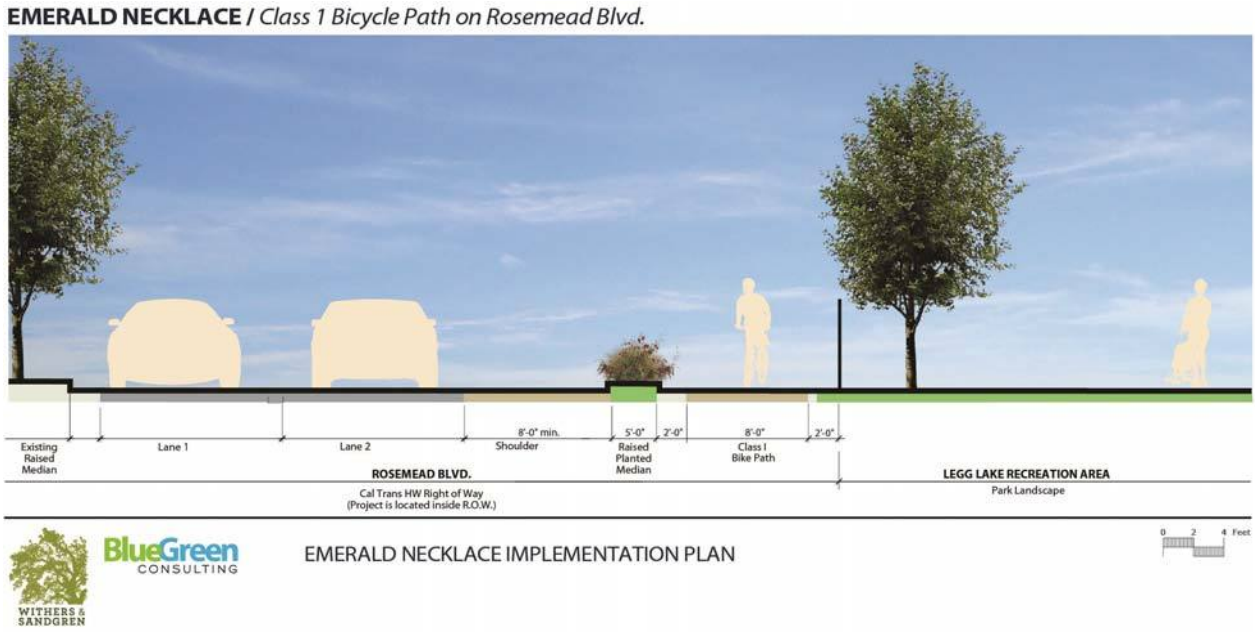


Fig. 5. Section view of the Class I bike path on Rosemead Blvd., looking north.

Project Implementation Changes

After review of the Emerald Necklace Feasibility Study, Southern California Edison requested that the path alignment follow the northern edge of their easement to minimize conflict with on-going maintenance operations. This alignment impacted the location of the Rosemead Blvd. crossing, moving it north.

Additionally, to provide ease of access and connectivity, the extension of the Class I bicycle path along Rosemead Blvd., north to the existing Legg Lake parking lot, is now recommended to be included in the scope of this project. The existing parking lot will service as a trailhead for both the Rio Hondo and the San Gabriel River trail systems.

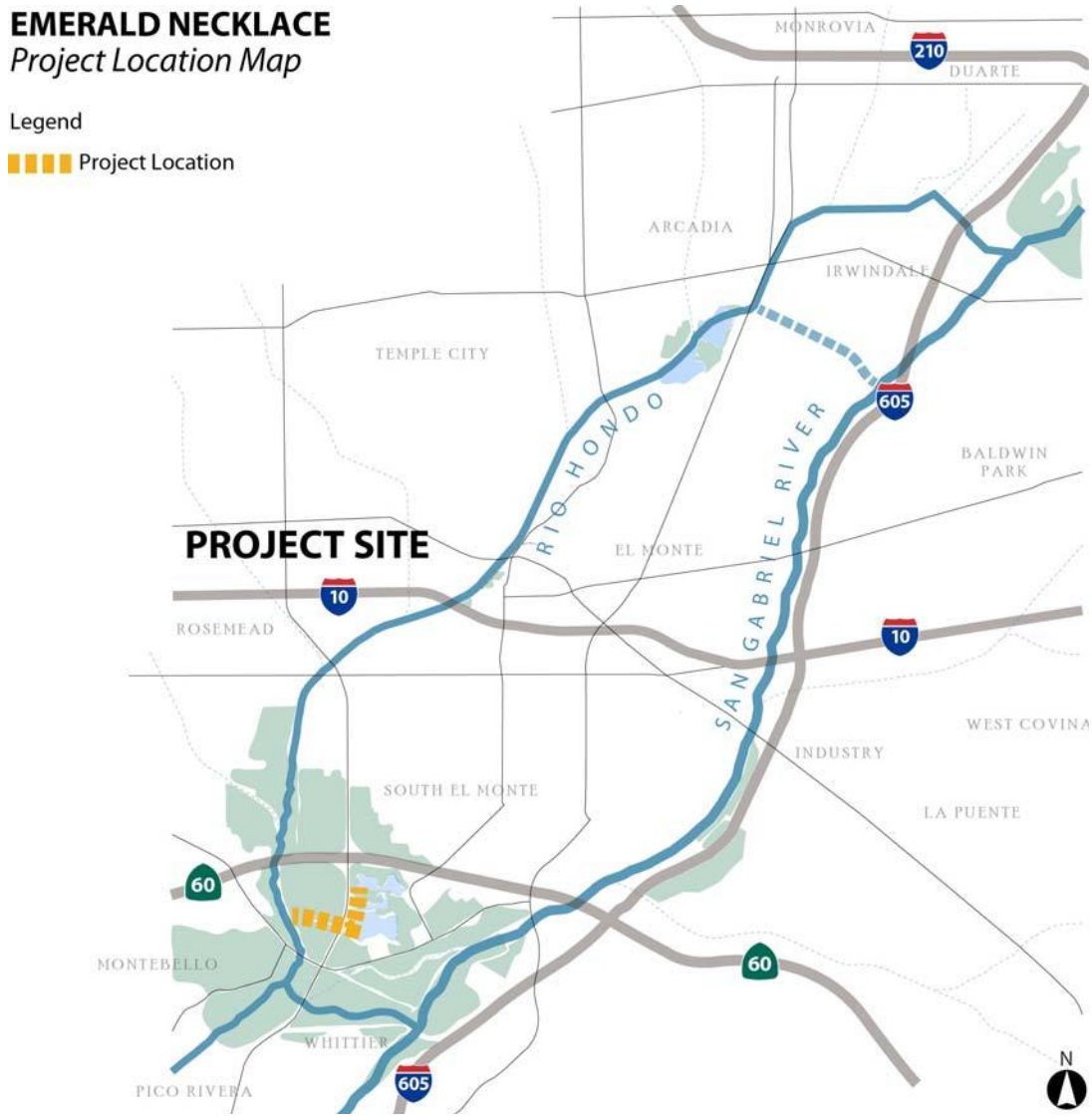


Fig. 6. The project is located in the southern portion of the Emerald Necklace, a recreation trail and park system on the San Gabriel and Rio Hondo Rivers.

Emerald Necklace Signage

Refer to the Emerald Necklace Signage Guidelines for the County of Los Angeles Department of Public Works for specific signage design, usage and placement and the County of Los Angeles Parks and Recreation Signage Guidelines.

Emerald Necklace signage depicted below indicates a bicycle path and a multi-use trail. Technically, mountain bikes are allowed on the multi-use trail and should be depicted as a graphic on the trail sign. In order to avoid confusion, when the trails are directly adjacent to each other, the bicycle graphic will remain a separate sign in order to clearly mark the Class I bike path or the Class IV bikeway. When the trails are separated i.e. on opposite sides of the river, the multi-use trail sign will also include a bicycle graphic.

Signage Type	Quantity	Location
Wayfinding	Two	Rosemead Blvd and bike path intersection on the Rio Hondo
Legg Lake wayfinding identification sign	One	Bike path intersection on the Rio Hondo
Bosque del Rio Hondo and Lashbrook Park wayfinding identification sign	One	Bike path intersection on the Rio Hondo

Fig. 7. Appropriate wayfinding signage to be installed on the trail.

Emerald Necklace Phase 1 Implementation Costs

EMERALD NECKLACE PHASE I PROJECTS -PROJECT 7

Whittier Southern California Edison Easement Bike Path

	Item	Qty.	Units	Unit Costs	*Sub-Total*	Total
1.0	**Demolition**					
1.1	Site Preparation Clearing and Grubbing	53,000	SF	$ 0.12	$ 6,360.00	
1.2	Remove Chain Link Fencing, Footings, Debris	1	LS	$ 6,000.00	$ 6,000.00	
1.3	Remove conc./asphalt median	12,000	SF	$ 16.00	$ 192,000.00	
1.4	Traffic control	1	LS	$ 20,000.00	$ 20,000.00	
	Total 1.0					**$ 224,360.00**
2.0	**EarthworkSite Grading**					
2.1	Fine grade for bike path	53,000	SF	$ 0.40	$ 21,200.00	
2.2	Topsoil for median - assume 18 inch depth	666	CY	$ 36.00	$ 23,976.00	
2.3	Topsoil for bike path planting - assume 18 inch depth	390	CY	$ 36.00	$ 14,040.00	
	Total 2.0					**$ 59,216.00**
3.0	**Site Construction**					
3.1	Class I bicycle path	4,100	LF	$ 315.00	$ 1,291,500.00	
3.2	Median w/curbs	1,640	LF	$ 16.00	$ 26,240.00	
3.3	Signalized Crossing w/median z configuation	1	LS	$ 250,000.00	$ 250,000.00	
3.4	Street striping	1	LS	$ 5,000.00	$ 5,000.00	
3.5	Chainlink gates - 16 feet	2	EA	$ 2,000.00	$ 4,000.00	
3.6	Chainlink fencing	100	LF	$ 30.00	$ 3,000.00	
3.7	Provide & install Traffic/warning signage	1	LS	$ 6,000.00	$ 6,000.00	
3.8	Provide & install Wayfinding and signage	1	LS	$ 2,400.00	$ 2,400.00	
	Total 3.0					**$ 1,588,140.00**
4.0	**Utilities**					
4.1	Erosion control	53,000	SF	$ 0.05	$ 2,650.00	
4.2	Connection to Mainline	1	LS	$ 60,000.00	$ 60,000.00	
4.3	Water line connection to site w/repairs	1	LS	$ 10,000.00	$ 10,000.00	
4.4	Install 1" Water Meter (as necessary)	1	LS	$ 8,000.00	$ 8,000.00	
	Total 4.0					**$ 80,650.00**
5.0	**Planting / Landscape**					
5.1	Soils Test	1	LS	$ 2,000.00	$ 2,000.00	
5.2	Mycorrhizal Treatment	12,000	SF	$ 0.20	$ 2,400.00	
5.3	24 " box trees	26	EA	$ 400.00	$ 10,400.00	
5.4	Shrubs--1 Gal.	2,400	EA	$ 35.00	$ 84,000.00	
5.5	Landscape understory planting	19,000	SF	$ 2.00	$ 38,000.00	
5.6	Landscape Mulch - 3 inch depth	100	CY	$ 16.00	$ 1,600.00	
5.7	Landscape Irrigation	19,000	SF	$ 2.50	$ 47,500.00	
	Total 5.0					**$ 185,900.00**
	SUB-TOTAL					**$ 2,138,266.00**
	MOBILIZATION & PROFIT (15%)				**$ 320,739.90**	
	DESIGN AND PERMITTING (20%)				**$ 427,653.20**	
	CONTINGENCY (30%)				**$ 641,479.80**	
	TOTAL PROJECT COSTS					**$ 3,100,485.70**

This opinion of probable cost of construction is made on experience and best judgement for a concept design only. Land availability, field conditions, design development and construction document production will invariably alter costs. Concept costs have been developed for the purpose of an Emerald Necklace Phase I Cost Benefit Analysis.

Emerald Necklace Phase 1 Benefit-Cost Analysis

Benefit-Cost Analysis Project 7: SCE Bike Path Rio Hondo to Legg Lake			
Cost			
Construction Cost:	$ 3,100,486		
Land Acquisition:			
Total Cost:	$ 3,100,486		
Annual Maintenance:	$ 5,047		
Discount Rate:	7%		
Total Cost (30 yr. in 2016 $)	$ 2,955,566		
Improvements			
Linear Path (Bike only):	4,100 ft		
Linear (Multi only):			
Total Linear Path:	4,100 ft		
Staging/Park Areas			
Recreational Value:	Medium		
Population in 2400 m Buffer			
Assumed Population Density	7,068		
Commute Share	0.63		
Residents in Buffer	65,756		
Existing Commuters	166		
New Commuters	51		
	Low	Mid	High
Total Cyclists	823	11377	16936
Total new Cyclists	303	3539	5243
Annual Benefits			
	Low	Mid	High
Recreation Benefits	$ 921,271	$ 12,731,791	$ 18,952,285
Health Benefits	$ 38,810	$ 452,988	$ 671,131
Mobility Benefits		$ 207,588	
Decreased Auto Use		$ 2,411	
Multi-Use Health Benefits	$ 143,501		
Multi-Use Recreation Benefit	$ 1,701,630.0		
Total Annual Benefits		$ 15,239,909	
Total Annual Transportation Benefits		$ 662,987	
Benefit-Cost Ratios			
Total Discounted Benefits (30yrs)		$ 189,112,656	
Benefit-Cost Ratio		**63.99**	
Discounted Benefits Transportation		$ 8,227,033	
Benefit-Cost Ratio Transportation		**2.78**	
*Numbers shaded in grey were used for caculation of B-C Ratios			

WHITTIER NARROWS CONNECTIVITY: Pellissier Village Multi-Use Trail From State Highway 60 to Peck Road Bridge

Project Description Summary

This project will develop a pedestrian path and include multi-use trail improvements with a stormwater management/water quality component (bio-swale) to reduce pollution running into the San Gabriel River. The hardened pedestrian trail will connect to an ADA accessible ramp on the northeast side of the new Peck Road Bridge.

The project will accommodate the County of Los Angeles Department of Parks and Recreation (DPR) plans for a small arena located at the end of Pellissier Road (*see Fig. 2*). The arena can be constructed to drain to the proposed bio-swale. The bio-swale will tie to the existing stormwater drainage system at the street end and at the edge of an office building parking lot adjacent to Peck Road.

Fig. 1. Pedestrian access to Peck Road Bridge will connect to a hardened pedestrian trail.

Implementation of the widened Peck Road Bridge will include improvements to the existing multi-use trail underneath the bridge. Underpass height clearance will be maintained for equestrian use. Coordination between Los Angeles County Department of Public Works

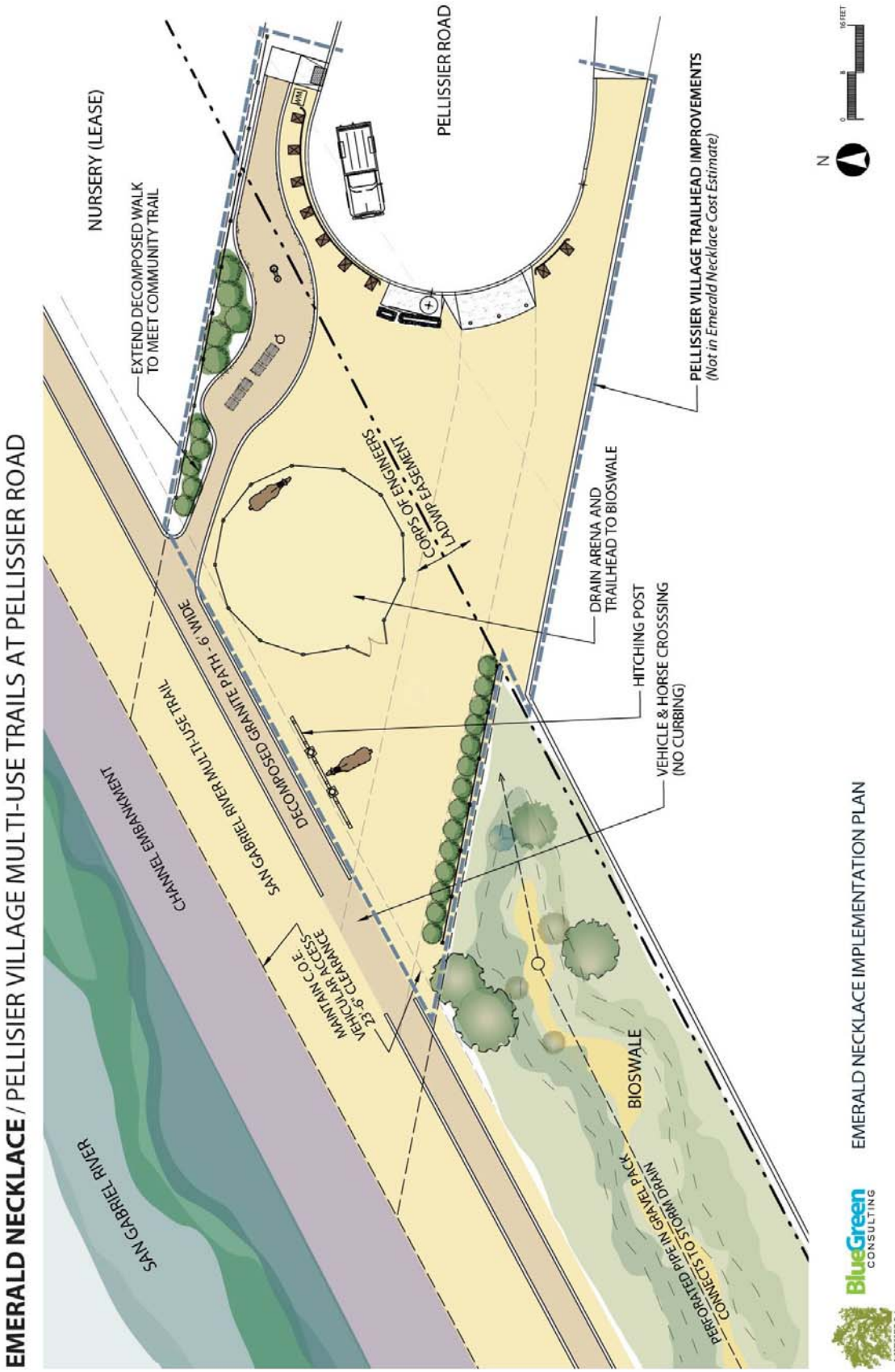


Fig. 2. An illustration of the County's equestrian improvements as they relate to the proposed trails.

(DPW) and DPR is necessary to ensure a continuous multi-use trail. Coordination and approval from the US Army Corp of Engineers is necessary.

The first trail component will be a 6-foot wide hardened decomposed granite path for pedestrians with 6 inch colored concrete curbing on both sides and will parallel the river on the neighborhood side. The soft surface equestrian trail will be maintained on the river side. The trail will reach from State Highway 60 to the Peck Road Bridge with a length of approximately 1,950 linear feet. Between the decomposed granite trail and the neighborhood properties an approximately 1,000 foot long bioswale will be installed to address stormwater quality issues related to contamination with horse related fecal matter. The exact size and layout of the bio-swale is to be determined during the design phase.

The second trail component will be the ADA-compliant concrete ramps constructed on the north side of the Peck Road Bridge (see Fig.4). The proposed concrete and metal ramps will be approximately 5 feet wide with metal railings. The ramp will be approximately 144 feet long with a 12-foot rise to the new Peck Road Bridge sidewalk. Way-finding, regulatory signage and an Emerald Necklace banner will be installed near the trail to promote awareness of the trail system.

Fig. 3 & 4. A decomposed granite path with concrete curbs and concrete ramp with metal railings. Design to match depicted ramp.

Fig. 5. Example of bio-swale.

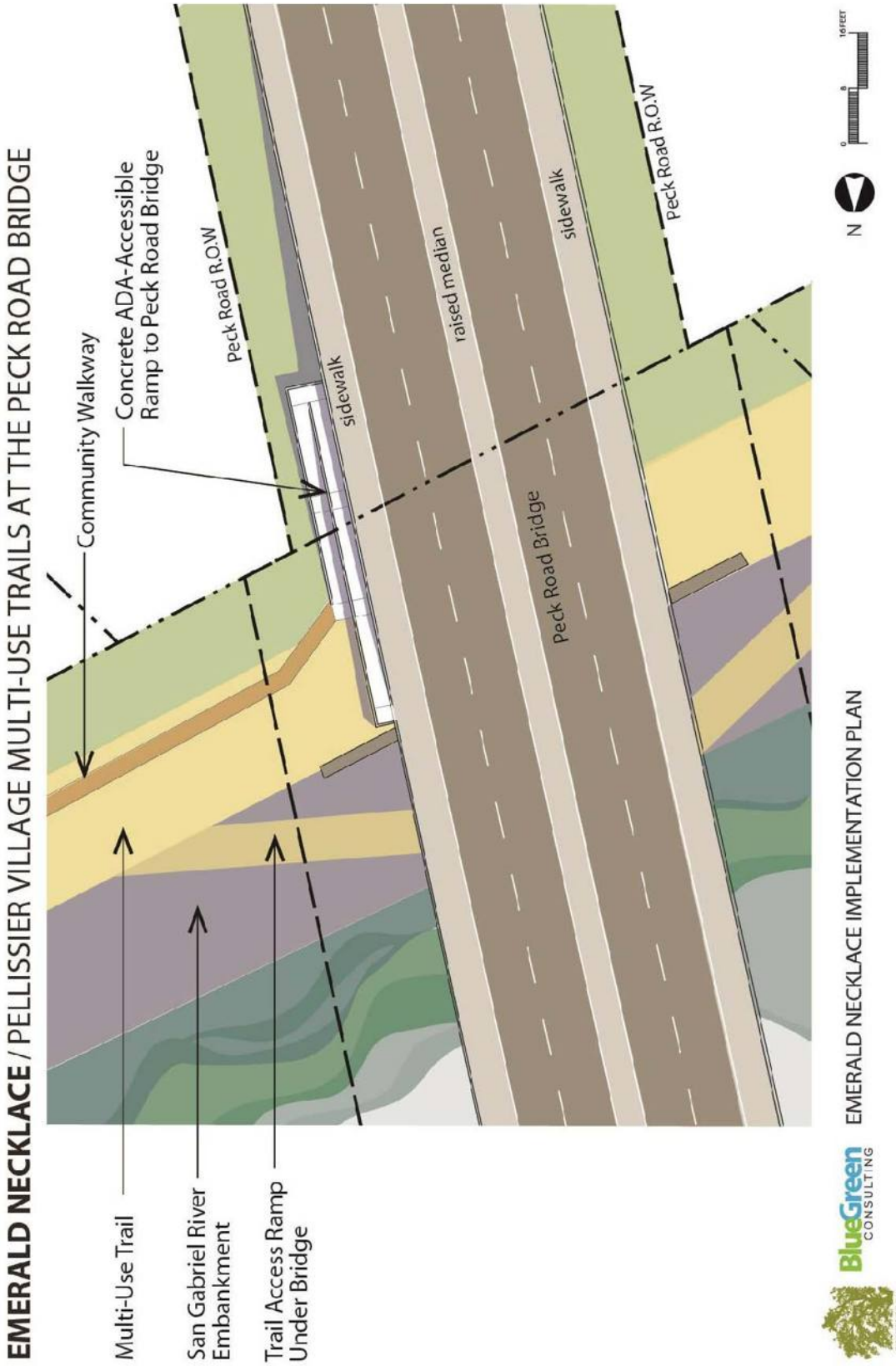


Fig. 6. An accessible ramp from the Peck Road Bridge will connect Pellisser Village to the facilities on the west side of the River

The project includes but is not limited to:

- Construction of an ADA ramp on the northeast side of Peck Road from Peck Road bridge to the multi-use trail, approximately 144 feet in length.
- Construction of a hardened pedestrian path with concrete curbing
- Underpass improvements to the existing multi-use trail
- Installation of chain link fencing as necessary – approximately 30 feet
- Construction of a bio-swale with equine and dog friendly planting, temporary irrigation and drainage pipe
- Emerald Necklace signage and wayfinding
- Regulation and safety signage as required

Fig.7. The project is located in the southern portion of the Emerald Necklace in the Pellissier Village neighborhood.

Project Implementation Changes

A new bridge for Peck Road is in the final design stages. It is significantly wider with improved sidewalks on each side (see plans below) and a raised median. The increased width of the bridge will affect the underpass multi-use trail. Necessary improvement and lengthening of the underpass trail is now included as part of this project.

The feasibility study proposed two ADA ramps from the bridge to the trails. It has been determined that one ramp located on the northeast side of the bridge is sufficient if improvements and lengthening of the underpass trail is accomplished. The underpass will provide the pedestrian connectivity from the Blackwill Arena and Staging Area to the ADA ramp and across the new Peck Road Bridge.

The proposed hardened pedestrian trail on the south side of Peck Road Bridge has been eliminated from Implementation of Project 9, “Pellissier Bridge at Blackwill Arena Staging Area”. It has been determined that with the improvements to Blackwill Arena and Staging Area, the adjacent river trail should remain soft for predominantly equestrian use. A hardened trail in this area would be difficult to maintain.

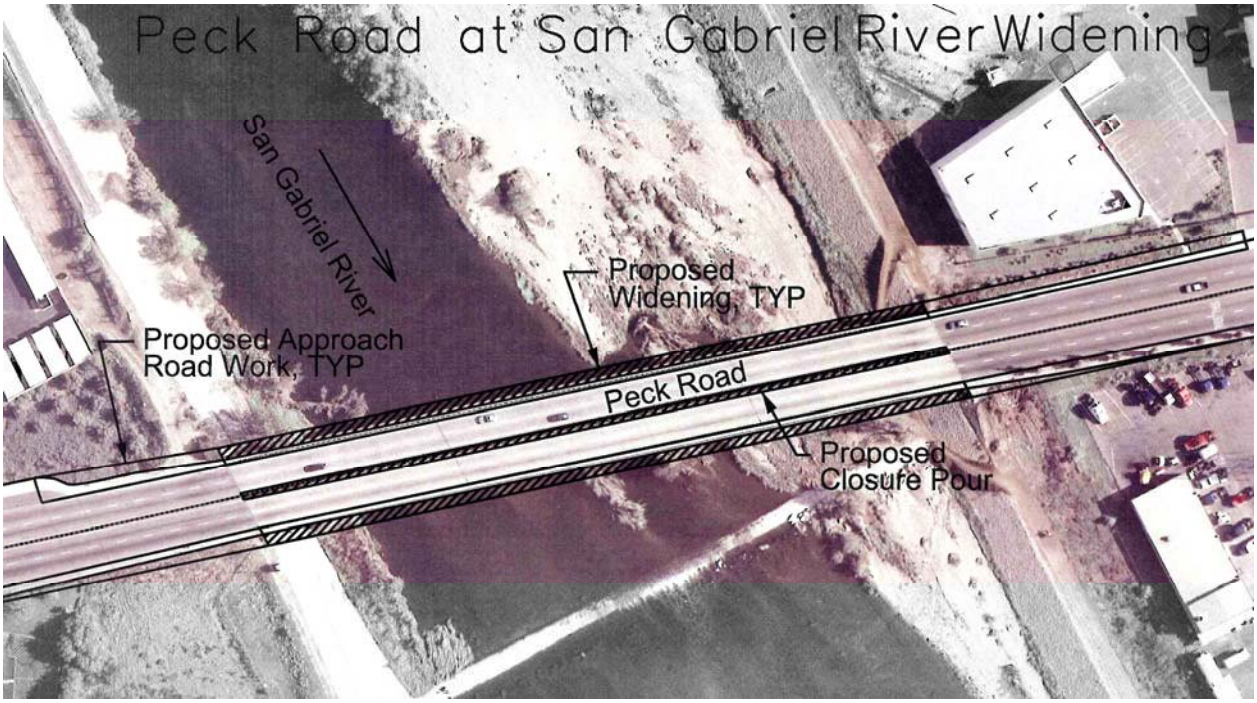


Fig. 8. The County proposal to widen the Peck Road Bridge will impact the Project.

Approximately 30 feet of 4 foot new replacement chain link fencing with top and bottom rail and master posts will be installed to connect to the end of the new bridge. This will lead pedestrians to utilize the underpass and ADA ramp to access the bridge on the northeast side. Bridge improvements and underpass improvements other than landscape architecture coordination will not be part of this project.

Emerald Necklace Signage

Refer to the Emerald Necklace Signage Guidelines for the County of Los Angeles Department of Public Works for specific signage design, usage and placement and the County of Los Angeles Parks and Recreation Signage Guidelines.

Emerald Necklace signage depicted below indicates a bicycle path and a multi-use trail. Technically, mountain bikes are allowed on the multi-use trail and should be depicted as a graphic on the trail sign. In order to avoid confusion, when the trails are directly adjacent to each other, the bicycle graphic will remain a separate sign in order to clearly mark the Class I bike path or the Class IV bikeway. When the trails are separated i.e. on opposite sides of the river, the multi-use trail sign will also include a bicycle graphic.

Signage Type	Quantity	Location
Banner Pole	One	Peck Road bridge – northeast side at ramp on Peck Road
Wayfinding	One	Peck Road bridge – northeast side at ramp at the trail juncture
Underpass stencil	Two	Peck Road bridge underpass – each side
Mile Marker		Every quarter-mile on trails

Fig. 9. Example of appropriate wayfinding signage for this project.

Emerald Necklace Phase 1 Implementation Project Costs

EMERALD NECKLACE PHASE I PROJECTS -PROJECT 8

Pellissier Village Trail Connectivity *(Excludes County Trailhead Improvments)*

	Item	Qty.	Units	Unit Costs	Sub-Total	Total
1.0	**Demolition**					
1.1	Site Preparation Clearing and Grubbing	70,000	SF	$ 0.12	$ 8,400.00	
1.2	Remove Chain Link Fencing, Footings, Debris	1	LS	$ 2,000.00	$ 2,000.00	
1.3	Temporary Construction Fencing	71,000	LF	$ 1.20	$ 85,200.00	
	Total 1.0					**$ 95,600.00**
2.0	**EarthworkSite Grading**					
2.1	Fine grade for trails and street end	32,500	SF	$ 0.40	$ 13,000.00	
2.2	Grade for bio-swale	10,000	SF	$ 3.00	$ 30,000.00	
	Total 2.0					**$ 43,000.00**
3.0	**Site Construction**					
3.1	Concrete ADA ramp w/metal railings/cut and fill	1	LS	$500,000.00	$ 500,000.00	
3.2	6 ' Stabilized D.G. Path w/Thickened conc. curbing	2,000	LF	$ 60.00	$ 120,000.00	
3.3	Landscaped Bio-swale connected to storm drains	1,000	LF	$ 150.00	$ 150,000.00	
3.4	Cobble (large cobble placed, small cobble grouted)	4,000	SF	$ 22.00	$ 88,000.00	
3.5	42 inch high chain link fencing	30	LF	$ 30.00	$ 900.00	
3.6	Emerald Necklace Banner Pole fabrication/installatio	1	EA	$ 5,000.00	$ 5,000.00	
3.7	Provide & install Wayfinding and Stencil signage	1	LS	$ 6,000.00	$ 6,000.00	
	Total 3.0					**$ 869,900.00**
4.0	**Utilities**					
4.1	Erosion control	70,000	SF	$ 0.05	$ 3,500.00	
4.2	Perforated Pipe for Bio-swale	1	LS	$ 5,000.00	$ 5,000.00	
4.3	Utility connections to storm drains	1	LS	$ 30,000.00	$ 30,000.00	
4.4	Install Water Mainline to site w/repairs	1	LS	$ 30,000.00	$ 30,000.00	
4.5	Install 1" Water Meter	1	LS	$ 8,000.00	$ 8,000.00	
	Total 4.0					**$ 76,500.00**
5.0	**Temporary Irrigation**					
5.1	Bio-swale irrigated area	10,000	SF	$ 1.50	$ 15,000.00	
	Total 5.0					**$ 15,000.00**
6.0	**Planting / Landscape**					
6.1	Soils Test	1	LS	$ 2,000.00	$ 2,000.00	
6.2	Mycorrhizal Treatment	10,000	SF	$0.20	$ 2,000.00	
6.3	Shrubs--15 Gal.	7	EA	$ 75.00	$ 525.00	
6.4	Shrubs--1 Gal.	125	EA	$ 35.00	$ 4,375.00	
6.5	Landscape understory bio-swale planting	5,000	SF	$2.00	$ 10,000.00	
6.6	Landscape Mulch - 3 inch depth	92	CY	$ 30.00	$ 2,760.00	
	Total 6.0					**$ 21,660.00**
	SUB-TOTAL					**$ 1,121,660.00**
	MOBILIZATION & PROFIT (15%)				**$ 168,249.00**	
	DESIGN AND PERMITTING (20%)				**$ 224,332.00**	
	CONTINGENCY (30%)				**$ 336,498.00**	
	TOTAL PROJECT COSTS					**$ 1,626,407.00**

This opinion of probable cost of construction is made on experience and best judgement for a concept design only. Land availability, field conditions, design development and construction document production will invariably alter costs. Concept costs have been developed for the purpose of an Emerald Necklace Phase I Cost Benefit Analysis.

Emerald Necklace Phase 1 Benefit-Cost Analysis

Benefit-Cost Analysis Project 8: Pellissier Multi-Use Trail			
Cost			
Construction Cost:	$ 1,626,407		
Land Acquisition:			
Total Cost:	$ 1,626,407		
Annual Maintenance:	$ 7,370		
Discount Rate:	7%		
Total Cost (30 yr. in 2016 $)	$ 1,604,575		
Improvements			
Linear Path (Bike only):			
Linear (Multi only):	2,000 ft		
Total Linear Path:	2,000 ft		
Staging/Park Areas			
Recreational Value:	Medium		
Population in 2400 m Buffer			
Assumed Population Density	7,068		
Commute Share	0.63		
Residents in Buffer	57,373		
Existing Commuters	145		
New Commuters	43		
	Low	Mid	High
Total Cyclists	718	9927	14777
Total new Cyclists	257	2999	4444
Annual Benefits			
	Low	Mid	High
Recreation Benefits	$ 780,800	$ 10,790,500	$ 16,062,519
Health Benefits	$ 32,893	$ 383,918	$ 568,800
Mobility Benefits		$ 179,906	
Decreased Auto Use		$ 997	
Multi-Use Health Benefits	$ 121,715		
Multi-Use Recreation Benefits	$ 1,445,035.0		
Total Annual Benefits		$ 1,566,750	
Total Annual Transportation Benefits		N/A**	
Benefit-Cost Ratios			
Total Discounted Benefits (30yrs)		$ 19,441,868	
Benefit-Cost Ratio		**12.12**	
Discounted Benefits Transportation			
Benefit-Cost Ratio Transportation		N/A**	
*Numbers shaded in grey were used for caculation of B-C Ratios			
**There are only recreational benefits availablefor this Project			

WHITTIER NARROWS CONNECTIVITY:
Pellissier Bridge at Blackwill Arena Staging Area

Project Description Summary

The proposed shared-use Pellissier Bridge will span the San Gabriel River at a critical location to link existing recreational facilities on both the west and east sides of the river. The bridge will emulate a proposed shared-use bridge developed by the Los Angeles County Department of Public Works (DPW) for Emerald Necklace Project 10, the San Jose Creek Regional Access Project. Emerald Necklace way-finding and regulatory signage will be installed at each end of the bridge.

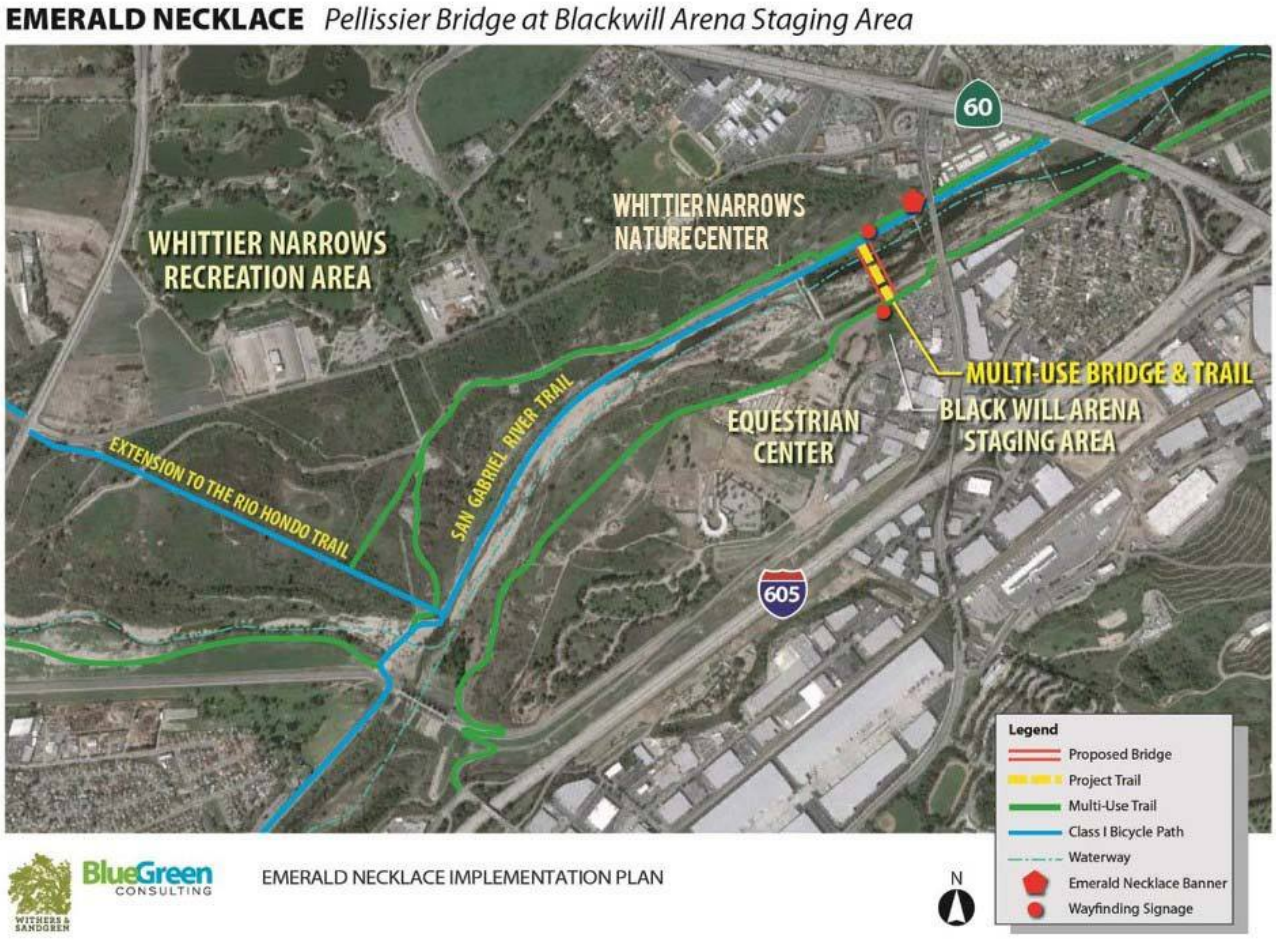


Fig. 1. The project will connect a number of recreation facilities on both sides of the San Gabriel River.

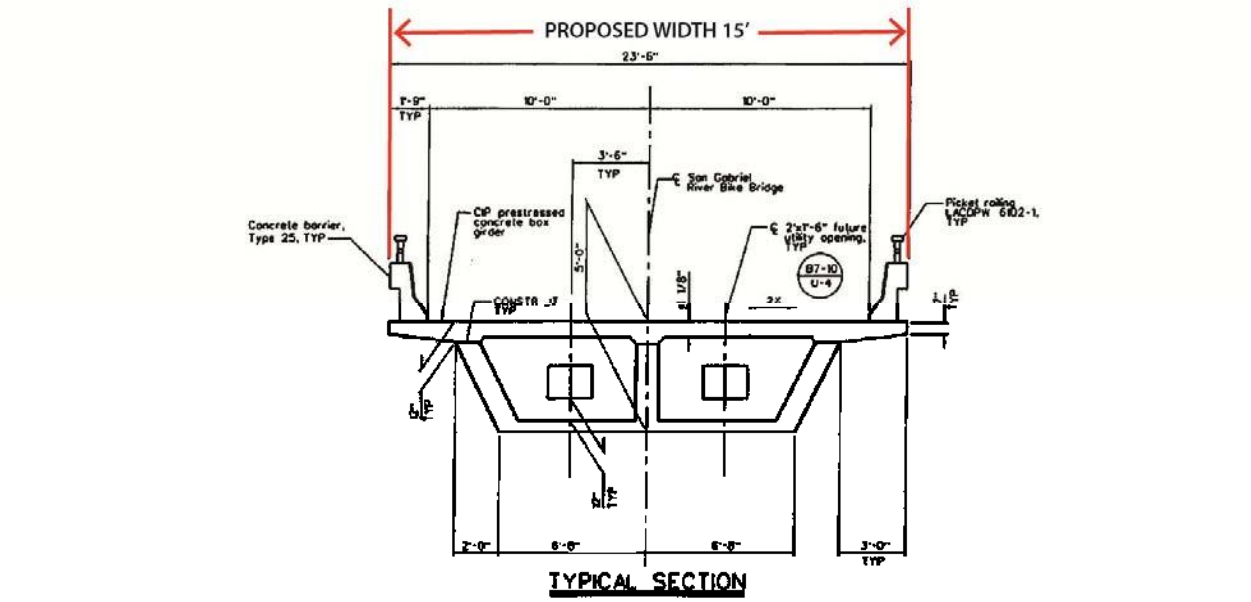


Fig. 2. Typical section detail from the DPW's construction documents for the San Gabriel River Bridge.

The project includes but is not limited to:

- Construction of a shared-use bridge over the San Gabriel River that is flush with the proposed adjoining paths (approx. 540 feet long by 15 feet wide)
- Emerald Necklace signage and wayfinding
- Regulatory and safety signage as required

Fig. 3. Proposed bridge location.

Fig.4. The project is located in the southeastern portion of the Emerald Necklace

Project Implementation Changes

The project feasibility plan calls for a 12-foot wide shared-use bridge. DPW is considering narrowing the proposed San Jose Creek Regional Access Project Bridge over the San Gabriel River from a 23.5-foot width to a 15-foot width to reduce impacts and cost. Because of the need for emergency access and the economies associated with emulating the design the Pellissier Bridge plans will be modified to a 15-foot wide bridge.

The feasibility plan indicates a hardened decomposed granite path adjacent to the existing multi-use trail connecting to the proposed pedestrian access ramp from the Peck Road Bridge. Due to the elimination of the southern pedestrian ramp from the bridge, the implementation and

construction of the decomposed granite path is not necessary for pedestrian connectivity and will be eliminated. The northern pedestrian ramp remains part of Project 8, the Pellissier Village Multi-Use Trail from State Highway 60 to Peck Road Bridge.

The adjacent Blackwill Arena Staging Area has been renovated and the name changed from Horseman's Park. All proposed wayfinding signage will reflect the park's name change.

When the proposed renovation and widening of the Peck Road Bridge is completed, the name will be stenciled on the side of the bridge above the underpass to identify the street.

Fig. 5. New signage reflecting the name change at the Staging Area

Emerald Necklace Signage

Refer to the Emerald Necklace Signage Guidelines for the County of Los Angeles Department of Public Works for specific signage design, usage and placement and the County of Los Angeles Parks and Recreation Signage Guidelines.

Emerald Necklace signage depicted below indicates a bicycle path and a multi-use trail. Technically, mountain bikes are allowed on the multi-use trail and should be depicted as a graphic on the trail sign. In order to avoid confusion, when the trails are directly adjacent to each other, the bicycle graphic will remain a separate sign in order to clearly mark the Class I bike path or the Class IV bikeway. When the trails are separated i.e. on opposite sides of the river, the multi-use trail sign will also include a bicycle graphic.

Signage Type	Quantity	Location
Banner Pole	One	Pellissier Bridge – west side
Wayfinding	Two	Pellissier bridge – each side
Blackwill Area Staging Area wayfinding identification sign	Two	Pellissier bridge – each side
Mile Markers		Every quarter-mile on trails

Fig. 6. Appropriate wayfinding signage to be installed at ends of proposed bridge.

Emerald Necklace Phase 1 Implementation Costs

EMERALD NECKLACE PHASE I PROJECTS - PROJECT 9

Pellissier Bridge at Blackwill Arena Staging Area

	Item	Qty.	Units	Unit Costs	*Sub-Total*	Total
1.0	**DPW San Gabriel River shared-use bridge prototype**					
1.1	Design, Permit and Construction Estimate	1	LS	$ 5,730,690.00	$ 5,730,690.00	
	Total 1.0					**$ 5,730,690.00**
2.0	**Emerald Necklace Signage**					
2.1	Emerald Necklace Banner Pole fabrication/installatio	1	LS	$ 5,000.00	$ 5,000.00	
2.2	Wayfinding and Signage w/poles	5	EA	$ 800.00	$ 4,000.00	
	Total 2.0					**$ 9,000.00**
	CONTINGENCY (30%)				**$ 2,700.00**	
	SUB-TOTAL					**$ 5,742,390.00**
	TOTAL PERMIT, DESIGN & CONSTRUCTION COSTS					**$ 5,742,390.00**

This opinion of probable cost of construction is made on experience and best judgement for a concept design only. Land availability, field conditions, design development and construction document production will invariably alter costs. Concept costs have been developed for the purpose of an Emerald Necklace Phase I Cost Benefit Analysis.

Emerald Necklace Phase 1 Benefit-Cost Analysis

Benefit-Cost Analysis Project 9: Pellessier Bridge			
Cost			
Construction Cost:	$ 5,742,390		
Land Acquisition:			
Total Cost:	$ 5,742,390		
Annual Maintenance:	$ 1,372		
Discount Rate:	7%		
Total Cost (30 yr. in 2016 $)	$ 5,382,463		
Improvements			
Linear Path (Bike only):	540 ft		
Linear (Multi only):	540 ft		
Total Linear Path:	540 ft		
Staging/Park Areas			
Recreational Value:	Medium		
Population in 2400 m Buffer			
Assumed Population Density	7,068		
Commute Share	0.63		
Residents in Buffer	51,544		
Existing Commuters	130		
New Commuters	38		
	Low	Mid	High
Total Cyclists	645	8918	13276
Total new Cyclists	225	2624	3888
Annual Benefits			
	Low	Mid	High
Recreation Benefits	$ 683,128	$ 9,440,696	$ 14,053,228
Health Benefits	$ 28,778	$ 335,893	$ 497,647
Mobility Benefits		$ 160,657	
Decreased Auto Use		$ 236	
Multi-Use Health Benefits	$ 106,560		
Multi-Use Recreation Benefit	$ 1,262,717.5		
Total Annual Benefits		$ 11,306,760	
Total Annual Transportation Benefits		$ 496,786	
Benefit-Cost Ratios			
Total Discounted Benefits (30yrs)		$ 140,306,044	
Benefit-Cost Ratio		**26.07**	
Discounted Benefits Transportation		$ 6,164,638	
Benefit-Cost Ratio Transportation		**1.15**	
*Numbers shaded in grey were used for caculation of B-C Ratios			

SAN JOSE CREEK REGIONAL ACCESS: Multi-Use Trail and Bridge Connections from the San Jose Creek Trail to San Gabriel River Trail

Project Description Summary

The intent of the project is to close the half-mile gap between the San Gabriel River Trail, a Class I bicycle path on the west side of the river and the existing trails along San Jose Creek on the east side. The project includes two multi-use bridges; one located over San Jose Creek and the other spanning the San Gabriel River. Trail connections to these bridges are critical components of the project.

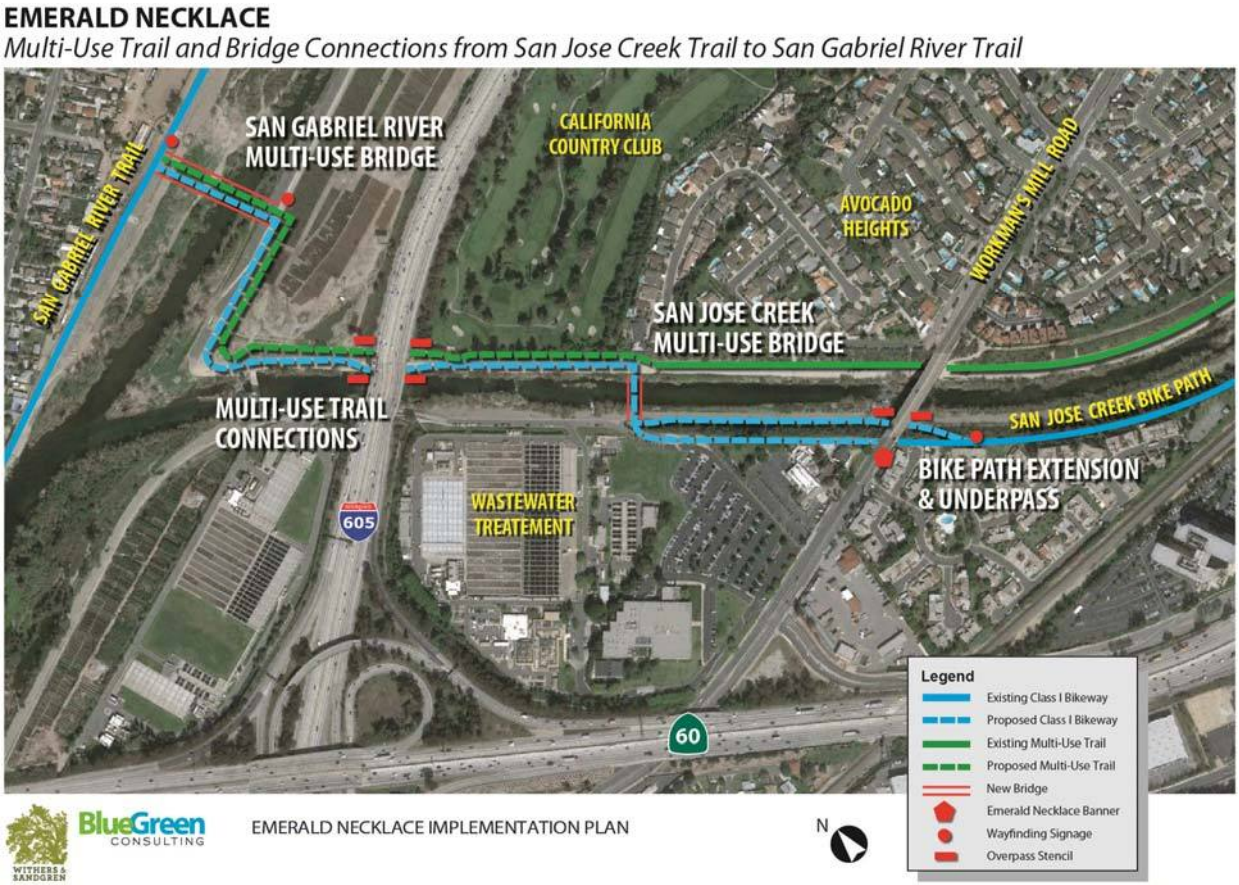


Fig. 1. The connection between the San Jose Creek Trail and the San Gabriel River Trail consists of a series of bridge and trail improvement components.

The project includes but is not limited to:

- Construction of a shared-use bridge over the San Gabriel River that is flush with the levees on both sides

- The bridge (540 feet long by 15 feet wide) will meet a proposed shared-use path on the east side that makes a connection to the San Jose Creek bike path
- Emerald Necklace wayfinding signage on both sides of the bridge
- Class 1 bike path and improved multi-use (horse trail) path extension between the two proposed bridges with formalized underpass below I-605.
- Construction of a shared-use bridge over San Jose Creek that is flush with the proposed adjoining shared-use paths (250 feet long by 15 feet wide).
- Class I shared-use path extension between proposed San Jose Creek shared-use bridge and the existing Class 1 San Jose Creek bike path with a formalized underpass below Workman Mill Road bridge.
- Emerald Necklace signage and wayfinding.

Fig. 2. The project is located in the southern portion of the Emerald Necklace, a recreation trail and park system on the San Gabriel and Rio Hondo Rivers.

Fig. 3. An artist's illustration of the proposed bridge over San Jose Creek.

Project Implementation Changes

The Los Angeles County Department of Public Works (DPW) developed this project for a transportation grant application (ATP) in 2015. Alternative 4 of that grant best describes the Emerald Necklace project for this area. The ATP project design and cost estimate will be utilized for the Emerald Necklace implementation project with two exceptions. DPW will review the option to narrow the bridge over the San Gabriel River from a 23.5-foot width to a 15-foot width to reduce impacts and cost.

TYPICAL SAN GABRIEL BRIDGE SECTION

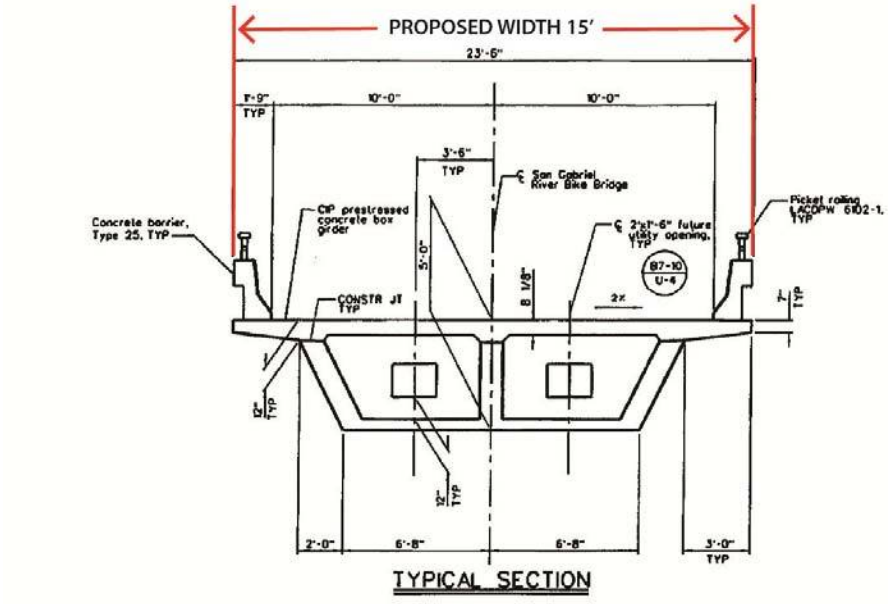


Fig. 4. Proposed change to the section detail from the DWP's construction documents.

In addition, an Emerald Necklace banner pole and Duck Farm wayfinding sign will be added to the DPW wayfinding signage for the project.

Emerald Necklace Signage

Refer to the Emerald Necklace Signage Guidelines for the County of Los Angeles Department of Public Works for specific signage design, usage and placement and the County of Los Angeles Parks and Recreation Signage Guidelines.

Emerald Necklace signage depicted below indicates a bicycle path and a multi-use trail. Technically, mountain bikes are allowed on the multi-use trail and should be depicted as a graphic on the trail sign. In order to avoid confusion, when the trails are directly adjacent to each other, the bicycle graphic will remain a separate sign in order to clearly mark the Class I bike path or the Class IV bikeway. When the trails are separated i.e. on opposite sides of the river, the multi-use trail sign will also include a bicycle graphic.

Signage Type	Quantity	Location
Banner Pole	One	Workman Mill Road
Wayfinding	Three	Workman Mill Road and San Gabriel River at bridge – each side
Underpass stencil	Six	Workman Mill Road and I-605 (both tunnels) – each side
Duck Farm on the San Gabriel River	Two	San Gabriel River at bridge – each side
Mile Markers		Every quarter-mile on trail

Fig. 5. Typical wayfinding signage to be installed as part of project.

DPW ATP Grant - Alternative 4 Project Cost Estimate

Detailed Engineer's Estimate and Total Project Cost

Important: Read the Instructions in the other sheet (tab) before entering data. Do not enter in shaded fields (with formulas).

Project Information:

Agency:	COUNTY OF LOS ANGELES DEPARTMENT OF PUBLIC WORKS				
Application ID:		**Prepared by:**	MARTIN REYES	**Date:**	4/30/2015
Project Description:	New multi-use bridges and trails				
Project Location:	San Gabriel River and San Jose Creek				

Engineer's Estimate and Cost Breakdown:

Engineer's Estimate (for Construction Items Only)

Cost Breakdown

Note: Cost can apply to more than one category. Therefore may be over 100%.

Item No.	Item	Quantity	Units	Unit Cost	Total Item Cost	ATP Eligible Items %	ATP Eligible Items □	Landscaping %	Landscaping □	Non-Participating Items %	Non-Participating Items □	To be Constructed by Corps/CCC %	To be Constructed by Corps/CCC □
1	PCC pavement	173	CY	$360.00	$62,280	100%	$62,280						
2	Rip rap for slope protection	1	LS	$6,000.00	$6,000	100%	$6,000						
3	Concrete removal (non-reinforced)	791	CY	$120.00	$94,920	100%	$94,920						
4	Crushed miscellaneous base	1475	CY	$60.00	$88,500	100%	$88,500						
5	Clearing and grubbing	1	LS	$36,000.00	$36,000	100%	$36,000						
6	Hand railing	3642	LF	$60.00	$218,520	100%	$218,520						
7	AC pavement	1591	TON	$120.00	$190,920	100%	$190,920						
8	Unclassified excavation (multi-use trail)	384	CY	$60.00	$23,040					100%	$23,040		
9	Imported borrow (multi-use trail)	2826	CY	$60.00	$169,560					100%	$169,560		
10	Unclassified fill	1383	CY	$48.00	$66,384	100%	$66,384						
11	Unclassified excavation	2292	CY	$60.00	$137,520	100%	$137,520						
12	12" CMP	6	LF	$600.00	$3,600	100%	$3,600						
13	Flap Gate	6	EA	$4,800.00	$28,800	100%	$28,800						
14	Concrete removal (reinforced)	1	CY	$1,800.00	$1,800	100%	$1,800						
15	Concrete collar (Std. Plan 3080-2)	6	EA	$1,800.00	$10,800	100%	$10,800						
16	48" RCP	96	LF	$360.00	$34,560	100%	$34,560						
17	Logitudinal gutter (Std. Plan B3-9)	50	CY	$240.00	$12,000	100%	$12,000						
18	Catch Basin 305	6	EA	$14,400.00	$86,400	100%	$86,400						
19	Headwall and outlet structure	6	EA	$18,000.00	$108,000	100%	$108,000						
20	18" RCP	192	LF	$240.00	$46,080	100%	$46,080						
21	Relocate existing CLF	700	LF	$14.40	$10,080	100%	$10,080						
22	6"X6" concrete header	45	CY	$360.00	$16,200	100%	$16,200						
23	Crushed decomposed granite	18,400	SF	$6.00	$110,400	100%	$110,400						
24	Tree removals	20	EA	$720.00	$14,400	100%	$14,400						
25	San Jose Creek bike bridge (prefab)	1	LS	$2,000,000.00	$2,000,000	100%	$2,000,000						
26	San Gabriel River bike bridge (prefab)	1	LS	$3,652,173.91	$3,652,174	100%	$3,652,174						
27	Retaining walls	1	LS	$1,913,043.48	$1,913,043	100%	$1,913,043						
					□9,141,981		□8,949,381				□192,600		
	Construction Item Contingencies (% of Construction Items): **Enter in the cell to the right**			**10.00%**	□914,198								
	Total (Construction Items & Contingencies) cost:				□10,056,180								

Project Cost Estimate:

Type of Project Delivery Cost	Cost □		
Preliminary Engineering (PE)			
Environmental Studies and Permits(PA□ED):	$ 200,000		
Plans, Specifications and Estimates (PS□E):	$ 1,400,000		
Total PE:	□ **1,600,000**	**15.91%**	25% Max
Right of Way (RW)			
Right of Way Engineering:	$ -		
Acquisitions and Utilities:	$ -		
Total RW:	□ -		
Construction (CON)			
Construction Engineering (CE):	$ 1,774,620	**15.00%**	15% Max
Total Construction Items □ Contingencies:	$10,056,180		
Total CON:	□ **11,830,799**		
Total Project Cost Estimate:	□ **13,430,799**		

Reduction of San Gabriel Bridge width is estimated to reduce budget by $3M. Total Modified Project: $10,430,799.

Emerald Necklace Phase 1 Implementation Cost Estimate

EMERALD NECKLACE PHASE I PROJECTS - PROJECT 10

San Jose Creek Regional Access

	Item	Qty.	Units	Unit Costs	*Sub-Total*	Total
1.0	**DPW Cost Estimate/San Jose Creek Connectivity**					
1.1	Design, Permit and Construction Estimate	1	LS	$10,430,799.00	$ 10,430,799.00	
	Total 1.0					**$10,430,799.00**
2.0	**Emerald Necklace Signage**					
2.1	Banner Pole - placement, installation and site repair	1	LS	$ 2,500.00	$ 2,500.00	
2.2	Metal Signage w/poles	5	EA	$ 800.00	$ 4,000.00	
2.3	Stencil	6	EA	$ 200.00	$ 1,200.00	
	Total 2.0					**$ 7,700.00**
	CONTINGENCY (10%)				**$ 770.00**	
	SUB-TOTAL					**$10,439,269.00**
	TOTAL PERMIT, DESIGN & CONSTRUCTION COSTS					**$10,439,269.00**

This opinion of probable cost of construction is made on experience and best judgement for a concept design only. Land availability, field conditions, design development and construction document production will invariably alter costs. Concept costs have been developed for the purpose of an Emerald Necklace Phase I Cost Benefit Analysis.

Emerald Necklace Phase 1 Benefit-Cost Analysis

Benefit-Cost Analysis Project 10: San Jose Creek Bridge to SGR Trail			
Cost			
Construction Cost:	$ 10,439,269		
Land Acquisition:			
Total Cost:	$ 10,439,269		
Annual Maintenance:	$ 11,177		
Discount Rate:	7%		
Total Cost (30 yr. in 2016 $)	$ 9,884,572		
Improvements			
Linear Path (Bike only):	4,400 ft		
Linear (Multi only):	4,400 ft		
Total Linear Path:	4,400 ft		
Staging/Park Areas			
Recreational Value:	Medium		
Population in 2400 m Buffer			
Assumed Population Density	7,068		
Commute Share	0.63		
Residents in Buffer	66,948		
Existing Commuters	169		
New Commuters	52		
	Low	Mid	High
Total Cyclists	838	11584	17243
Total new Cyclists	310	3616	5357
Annual Benefits			
	Low	Mid	High
Recreation Benefits	$ 941,245	$ 13,007,819	$ 19,363,174
Health Benefits	$ 39,652	$ 462,808	$ 685,681
Mobility Benefits		$ 211,525	
Decreased Auto Use		$ 2,643	
Multi-Use Health Benefits	$ 146,816		
Multi-Use Recreation Benefits	$ 1,742,145.0		
Total Annual Benefits		$ 15,573,756	
Total Annual Transportation Benefits		$ 676,976	
Benefit-Cost Ratios			
Total Discounted Benefits (30yrs)		$ 193,255,380	
Benefit-Cost Ratio		**19.55**	
Discounted Benefits Transportation		$ 8,400,623	
Benefit-Cost Ratio Transportation		**0.85**	
*Numbers shaded in grey were used for caculation of B-C Ratios			

SAN JOSE CREEK REGIONAL ACCESS: Multi-Use Trail from San Jose Creek to the Duck Farm on the San Gabriel River

Project Description

The intent of this project is to connect the existing and proposed San Jose Creek Class I bicycle path and the multi-use trail to "Phase 1 of the Duck Farm Project" on the east side of the San Gabriel River when it opens to the public in spring of 2018. This extension of the multi-use trail will utilize the existing flood control maintenance road (see yellow dashed line below). This is a trail project that complements the proposed San Gabriel shared-use bridge and Bridge Connections from the San Jose Creek Trail to the San Gabriel River Trail, "Project 10".

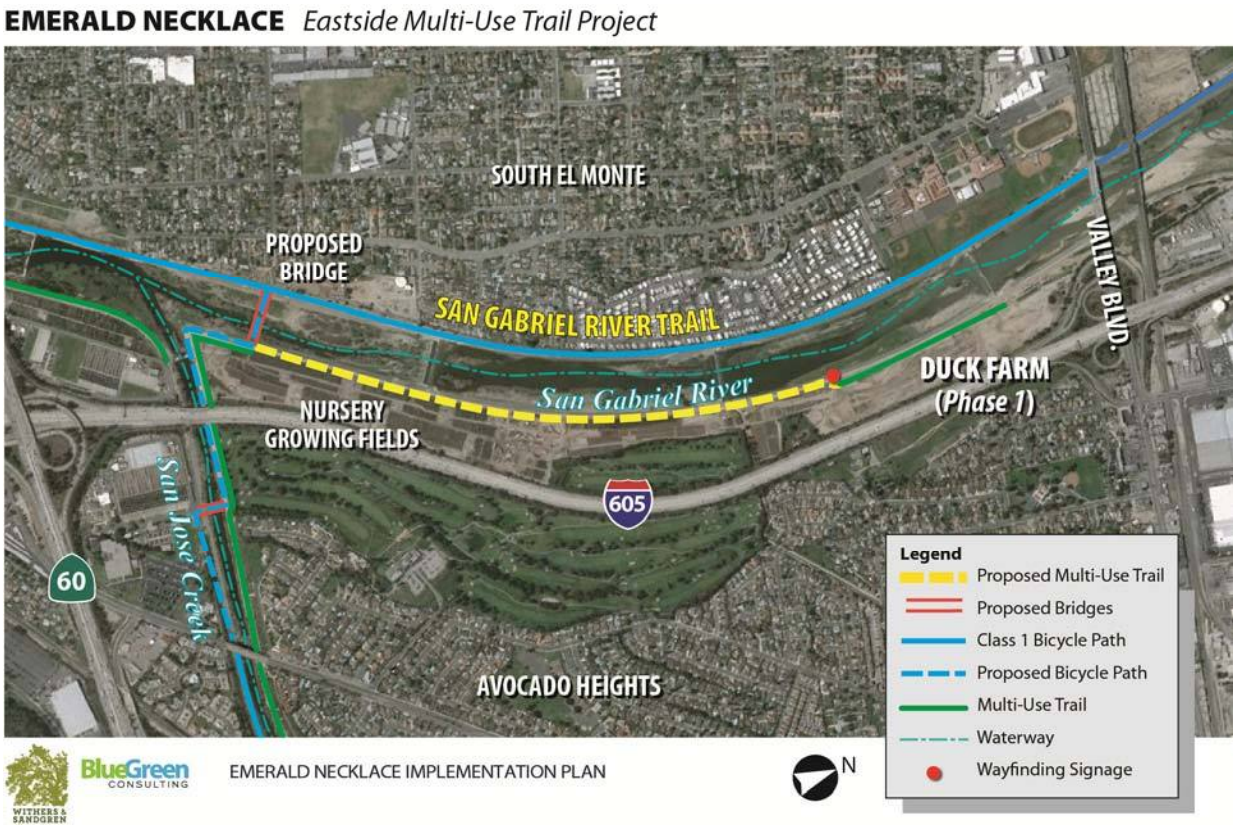


Fig. 1. The proposed multi-use trail alignment connecting the proposed San Jose Creek bike path and multi-use trail in Project 10 to the Duck Farm Phase 1.

The multi-use trail access from San Jose Creek and from the proposed San Gabriel River Bridge to the Duck Farm has been developed in connection with the Duck Farm project per current agreements along this section between the Los Angeles County Department of Parks and Recreation Unit "A-37" and the Los Angeles County Flood Control District (LACFCD) and US Army Corps of Engineers. This project will provide temporary access solutions for the multi-use trail route to the Duck Farm (Phase 1) utilizing the existing paved Los Angeles County

maintenance road on the river levee until all phases of the Duck Farm are completed. Existing fencing on the river side will remain and regulatory signage will direct the public to stay on the levee road. Once the nursery lease is up, and construction of Phase II of the Duck Farm can be completed, the multi-use trail will be incorporated into the final park design. After Phase II is complete, equestrians will be able to access park trails at the south end of the Duck Farm rather than use the existing LACFCD maintenance road.

Temporary chain link fencing to be installed at the south end of the park will guide trail users from the levee maintenance road down the levee and into the park. At the southern end of the park fencing, gating, a textured warning strip, and signage are necessary as trail users will have to cross the nursery service road (refer to Figs. 2 & 3). Delivery trucks will be using this dirt road to access the nursery growing grounds in the SCE easement until 2030. Regulatory signage will also be necessary to warn the public about the commercial traffic. Emerald Necklace signage, including directional, way-finding and trail rules and regulations, will be installed at the trail entry point into the Duck Farm. Signage, rumble strips and warning signs will be removed after all phases of the park are complete.

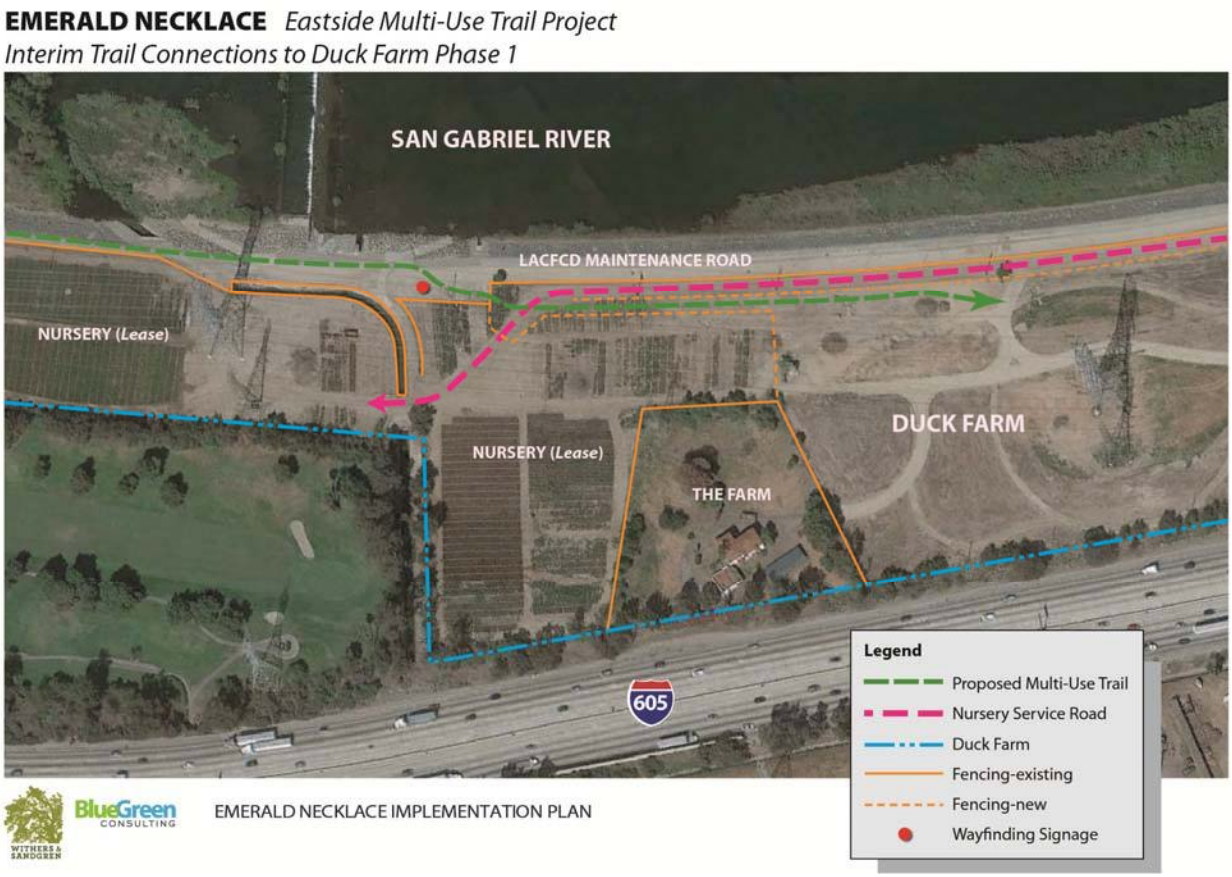


Fig. 2. The temporary trail alignment will require new fencing where it crosses the service road into the park.

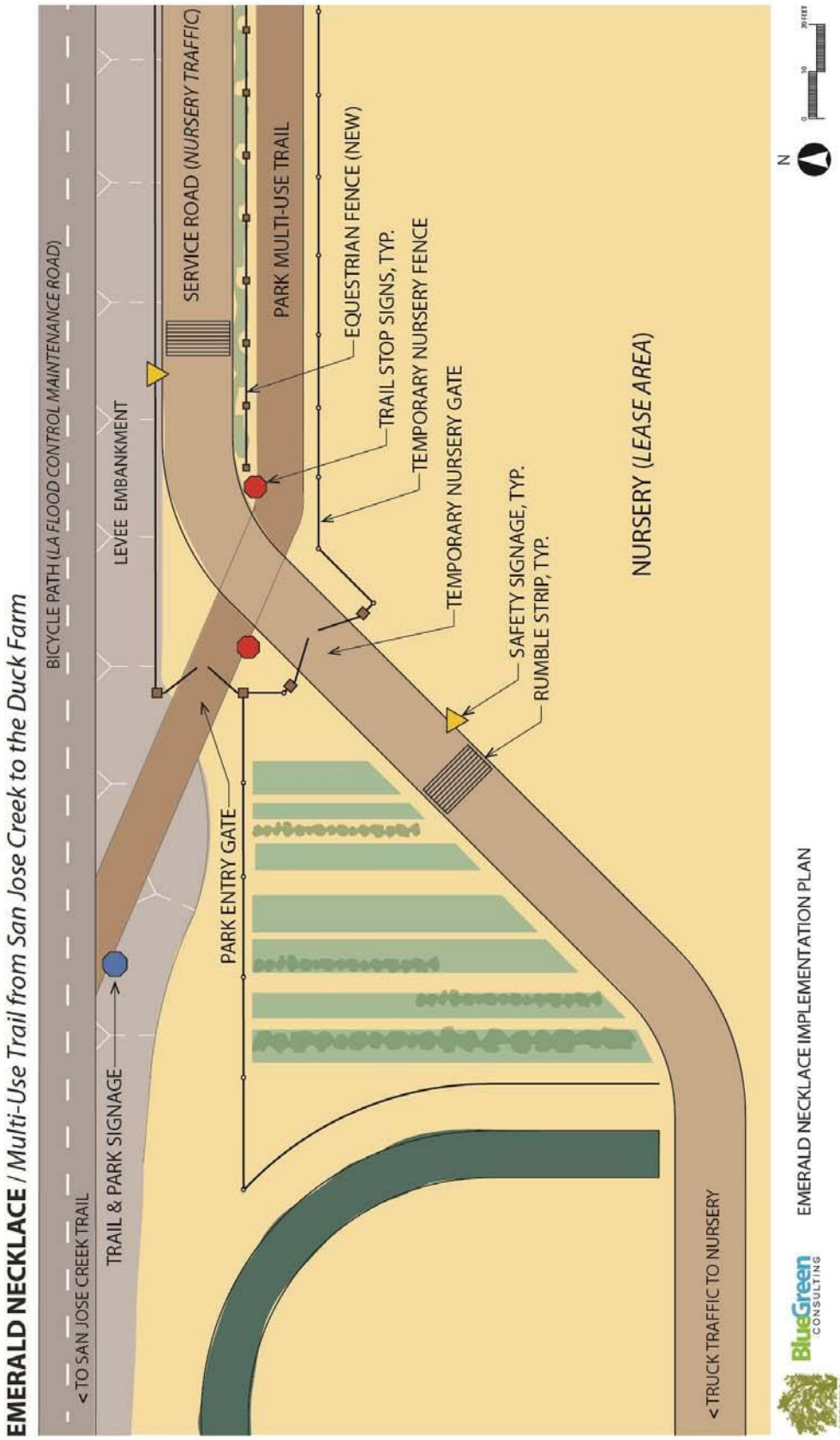


Fig. 3. Temporary fencing is necessary to provide security for the nursery until their lease is finished and Phase 2 of Duck Farn is complete.

The project includes but is not limited to:

- Installation of temporary 48 inch tall chain link fencing at the south boundary of the park
- Installation of two temporary 16 foot chain link gates
- Installation of two temporary rumble (warning strips) across the nursery service road
- Regulatory and temporary warning signage
- Emerald Necklace wayfinding and designation signage
- Emerald Necklace Kiosk (location to be determined)
- Multi-use trail realignment
- Regulatory and safety signage as required

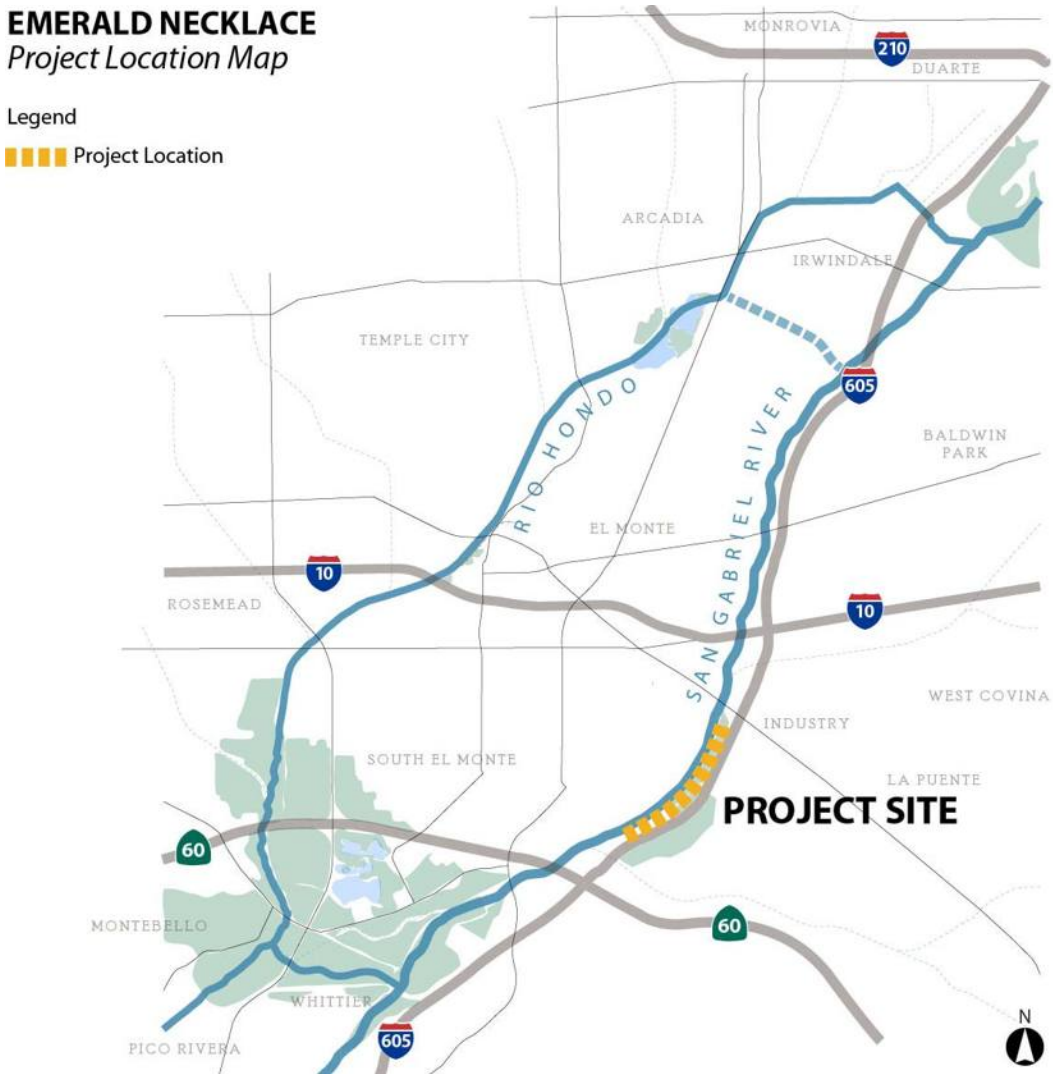


Fig. 4. The project is located in the southern portion of the Emerald Necklace, a recreation trail and park system on the San Gabriel and Rio Hondo Rivers.

Project Implementation Changes

The nursery is currently fenced off from the river levee. New fencing or replacement fencing for the nursery is not necessary as proposed in the feasibility study.

The nursery also has an adequate gating system for their roadway in an out of the Duck Farm to the north. One of the three 12-foot wide chain link gates proposed in the feasibility study is not considered necessary for implementation. Los Angeles County Department of Public Works (DPW) requires 16 foot gates be installed for maintenance access width consistency.

Fencing on the levee adjacent to the river will remain as is until all phases of the Duck Farm are implemented. At that time, the recreational function of the existing levee road will be finalized. Any future fencing and gating will be specific to the Duck Farm park needs.

Fig. 5. A bird's eye view of the Duck Farm Phase 1 under construction. Photo credit: WCA image library.

Emerald Necklace Signage

Refer to the Emerald Necklace Signage Guidelines for the County of Los Angeles Department of Public Works for specific signage design, usage and placement and the County of Los Angeles Parks and Recreation Signage Guidelines.

Emerald Necklace signage depicted below indicates a bicycle path and a multi-use trail. Technically, mountain bikes are allowed on the multi-use trail and should be depicted as a graphic on the trail sign. In order to avoid confusion, when the trails are directly adjacent to each other, the bicycle graphic will remain a separate sign in order to clearly mark the Class I bike path or the Class IV bikeway. When the trails are separated i.e. on opposite sides of the river, the multi-use trail sign will also include a bicycle graphic.

Signage Type	Quantity	Location
Wayfinding	One	South end of Duck Farm Phase 1 at trail juncture from the levee road into the park.
Traffic Warning	Two	Specific signage dedicated to road crossing such as red stop signs or yellow warning signs (to be determined by WCA and DPW.

Fig. 6. Along with wayfinding signage, safety signage will be required at the trail crossing.

Emerald Necklace Phase 1 Implementation Cost Estimate

EMERALD NECKLACE PHASE I PROJECTS - PROJECT 11

San Jose Creek Eastside Trail

	Item	Qty.	Units	Unit Costs	*Sub-Total*	Total
1.0	**Site Construction**					
1.1	Ramp/back of levee modifications as necessary	1	LS	$ 20,000.00	$ 20,000.00	
1.2	48 inch chain link fence	815	LF	$ 30.00	$ 24,450.00	
1.3	16 foot chain link gate, master posts, lock and tiebac	2	EA	$ 8,000.00	$ 16,000.00	
1.4	Traffic Warning rumble strip	2	EA	$ 2,000.00	$ 4,000.00	
1.5	Misc. trail restoration/soil/decomposed granite	1	LS	$ 1,200.00	$ 1,200.00	
1.6	Furnish and install Kiosk (per EN signage guidelines)	1	LS	$ 8,000.00	$ 8,000.00	
	Total 1.0					**$ 73,650.00**
2.0	**Emerald Necklace Signage**					
2.1	Traffic Stop or Warning Sign w/pole	2	LS	$ 1,200.00	$ 2,400.00	
2.2	Metal Signage w/pole	1	EA	$ 800.00	$ 800.00	
2.3	Metal Regulatory Sign	1	EA	$ 600.00	$ 600.00	
	Total 2.0					**$ 3,800.00**
	SUB-TOTAL					**$ 77,450.00**
	MOBILIZATION & PROFIT (15%)				**$ 11,617.50**	
	DESIGN AND PERMITTING (20%)				**$ 15,490.00**	
	CONTINGENCY (30%)				**$ 23,235.00**	
	TOTAL PERMIT, DESIGN & CONSTRUCTION COSTS					**$ 127,792.50**

This opinion of probable cost of construction is made on experience and best judgement for a concept design only. Land availability, field conditions, design development and construction document production will invariably alter costs. Concept costs have been developed for the purpose of an Emerald Necklace Phase I Cost Benefit Analysis.

Emerald Necklace Phase 1 Benefit-Cost Analysis

Benefit-Cost Analysis Project 11: Duck Farm Multi-Use Trail						
Cost						
Construction Cost:	$	127,793				
Land Acquisition:						
Total Cost:	$	127,793				
Annual Maintenance:	$	7,069				
Discount Rate:		7%				
Total Cost (30 yr. in 2016 $)	$	200,547				
Improvements						
Linear Path (Bike only):						
Linear (Multi only):		5,400 ft				
Total Linear Path:		5,400 ft				
Staging/Park Areas						
Recreational Value:		Low				
Population in 2400 m Buffer						
Assumed Population Density		7,068				
Commute Share		0.63				
Residents in Buffer		70,943				
Existing Commuters		179				
New Commuters		56				
		Low		Mid		High
Total Cyclists		888		12275		18272
Total new Cyclists		332		3873		5738
Annual Benefits						
		Low		Mid		High
Recreation Benefits	$	1,008,188	$	13,932,965	$	20,740,328
Health Benefits	$	42,472	$	495,724	$	734,448
Mobility Benefits			$	224,717		
Decreased Auto Use			$	3,475		
Multi-Use Health Benefits	$	157,235				
Multi-Use Recreation Benefits	$	1,863,690.0				
Total Annual Benefits			$	2,020,925		
Total Annual Transportation Benefits			N/A**			
Benefit-Cost Ratios						
Total Discounted Benefits (30yrs)			$	25,077,744		
Benefit-Cost Ratio				**125.05**		
Discounted Benefits Transportation			N/A**			
Benefit-Cost Ratio Transportation						
*Numbers shaded in grey were used for caculation of B-C Ratios **There are only recreational benefits availablefor this Project						

WESTSIDE MULTI-USE TRAIL: Alhambra Wash from State Highway 60 to the Garvey Community Center

Project Description Summary

The Westside Multi-Use Trail Project from California State Highway 60 to the Garvey Community Center will improve approximately 1¼ miles or 6,700 linear feet of multi-use trail within the County of Los Angeles Department of Parks and Recreation (DPR) riding and hiking easement. Approximately half of the project trail length is located within the designated natural area of the Rio Hondo.

Where Alhambra Wash enters this natural area flooding has created a scour pool referred to as the "Alhambra Oasis" due to the presence of a permanent pool of nuisance water at this location. Equestrians and hikers skirt around the "Oasis" as the trail is poorly defined and is in need of improvements. This project intends to formalize and improve the multi-use trail with a combination of fencing, trail footing improvements, landscaping with native trees and shrubs, and signage. These improvements will attract more recreational users and deter negative use patterns. Four segments of this trail were identified that require various levels of improvements.

Figs. 1&2. Deep mud at the south end of the underpass created by drainage from State Highway 60.

Section 1

At the southern end of the project the first section of trail will include improvements to the California State Highway 60 underpass, by providing dry footing for equestrians through a muddy patch created by poor drainage from the highway. Improvements in this area will require approximately 400 square feet of gravel base and decomposed granite or crushed rock footing to de-water and reconstruct the trail.

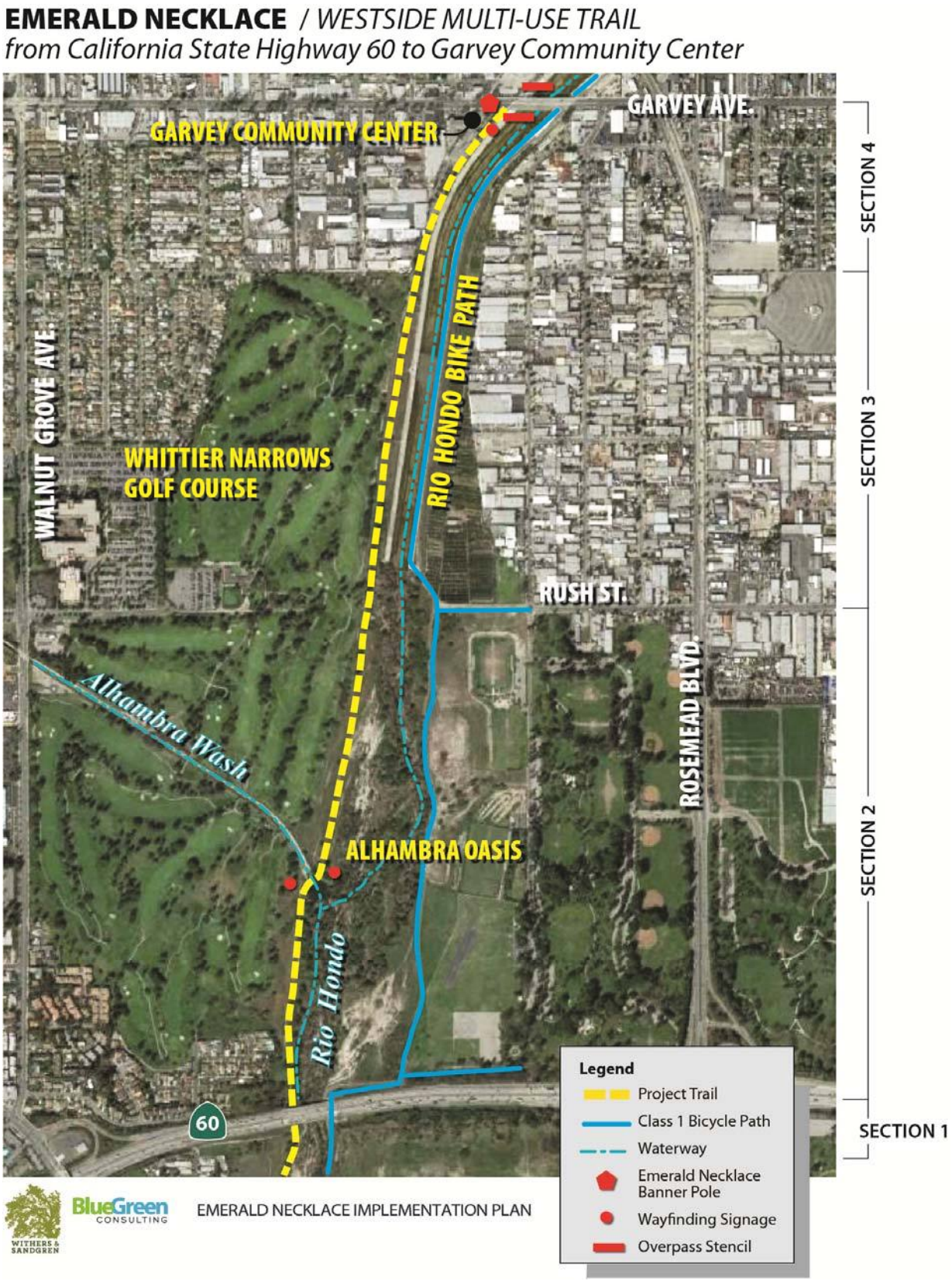


Fig. 3. Project area extending from south of State Highway 60 north to the Garvey Avenue Bridge.

The improved trail area will be 10-feet wide by approximately 30 feet in length. Drains under the trail will be necessary to capture water and convey it to the stream on the other side of the trail. In addition, one hundred feet of fencing, trail widening, non-native plant eradication and trail footing improvements implemented south of State Highway 60 will better connect the trail to the Bosque del Rio Hondo further to the south.

Fig. 4. Project area between the State Highway 60 and the Alhambra Oasis.

Section 2

North of the highway, approximately 3,550 linear feet of trail will formalize an existing informal trail alignment with a trail width of 10 feet minimum on natural soil with a compacted subgrade. Double rail wood fencing in lengths of approximately 100 feet with 25-foot long planted gaps will be placed between the trail and the river.

A temporary irrigation line extending from the County golf course irrigation system will be necessary to establish buffer plantings. New tree planting between the trail and the golf course fence will provide shade along the trail. Riparian areas currently disturbed by trails will be re-seeded and/or re-planted with native riparian plants to control erosion and improve habitat adjacent to the Rio Hondo. The restored area around the trail assumes 20 feet on either side of the 10 foot wide trail.

In the Alhambra Oasis area, the existing informal trails will continue to connect the southern and northern sections of improved riding and hiking trail around the scour pool. Directional wayfinding signage on each side of the oasis will provide trail continuity. Flood warning signage will be necessary in this area.

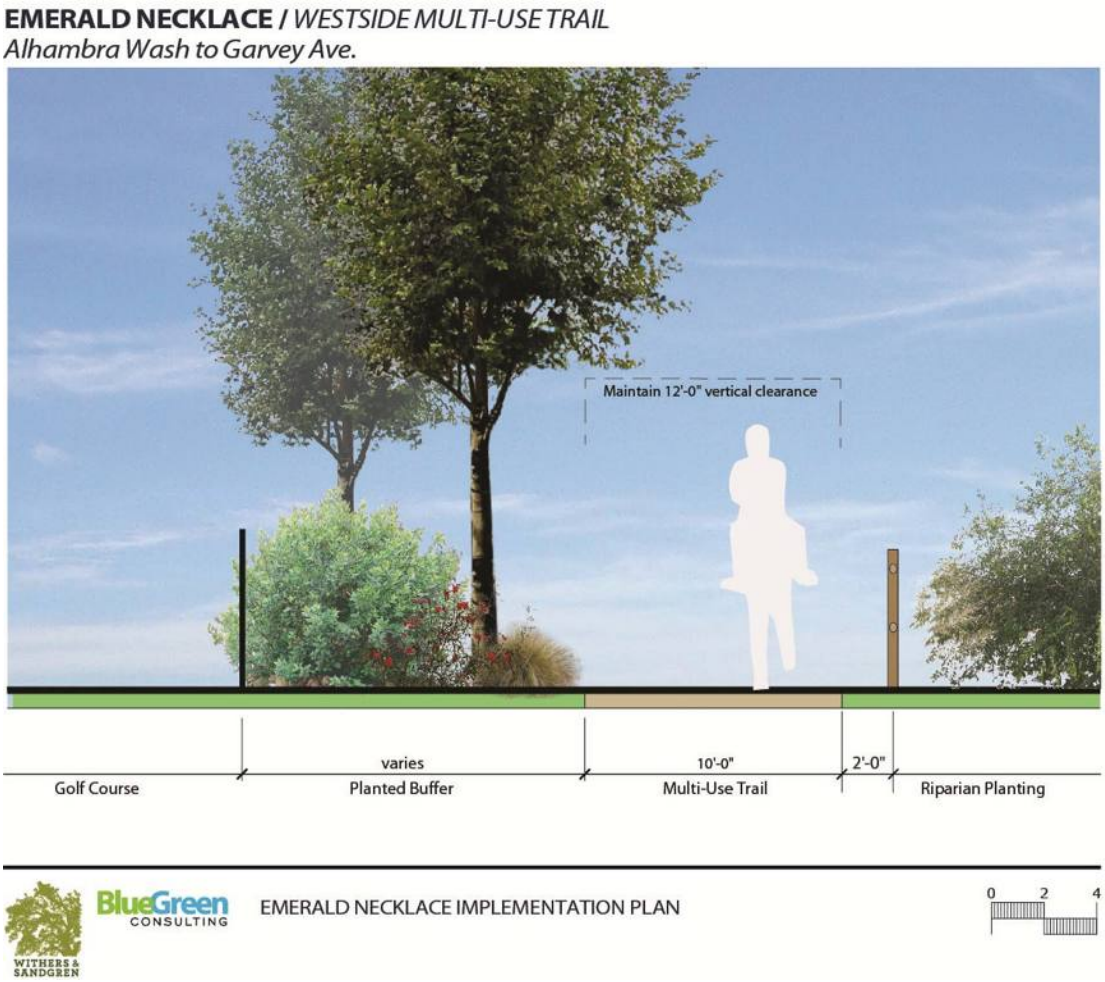


Fig. 5. Proposed multi-use trail improvements for Section 2 of the project area.

Fig. 6. Along the improved portion of the trail native shade trees will be planted.

Section 3

From Rush Street to the Rio Hondo levee, the Los Angeles County Department of Parks and Recreation has made improvements to the trail. Trail tread widths in this section vary from 5 feet to 20 feet. Double rail wood fencing has been installed on the river side of the trail. Additional project improvements to this area will include the installation of native trees and greening with native shrubs that are non-toxic to horses. Restoration efforts will include elimination of non-native plants in the areas around the trail. Because these restoration efforts are outside the trail easement they will require Army Corps of Engineers approval.

Fig. 7. Multi-use trail from the top of the Rio Hondo levee maintenance road looking south.

Section 4

North of the golf course the available open space narrows, and the trail climbs up to the paved levee access road where equestrians and trail users will share the access road for a short distance to the Garvey Community Center. The southern portion of the Garvey Community Center parking lot encroaches on the trail in this section. Widths along the Rio Hondo levee vary from 15 feet to 30 feet. Miscellaneous trail improvements include grading to install new tread material, short lengths of fencing for trail definition and aesthetics, and signage.

The project includes but is not limited to:

- Double rail wood fencing
- Multi-use trail tread improvements, widening, edging and footing material

- Sump or French drain
- Non-native plant eradication
- Native tree, shrub and hydro-seeding
- Temporary irrigation
- Warning signage
- Emerald Necklace signage
- Regulatory and safety signage as required

Fig. 8. The maintenance road and multi-use trail along the edge of the Garvey Community Center.

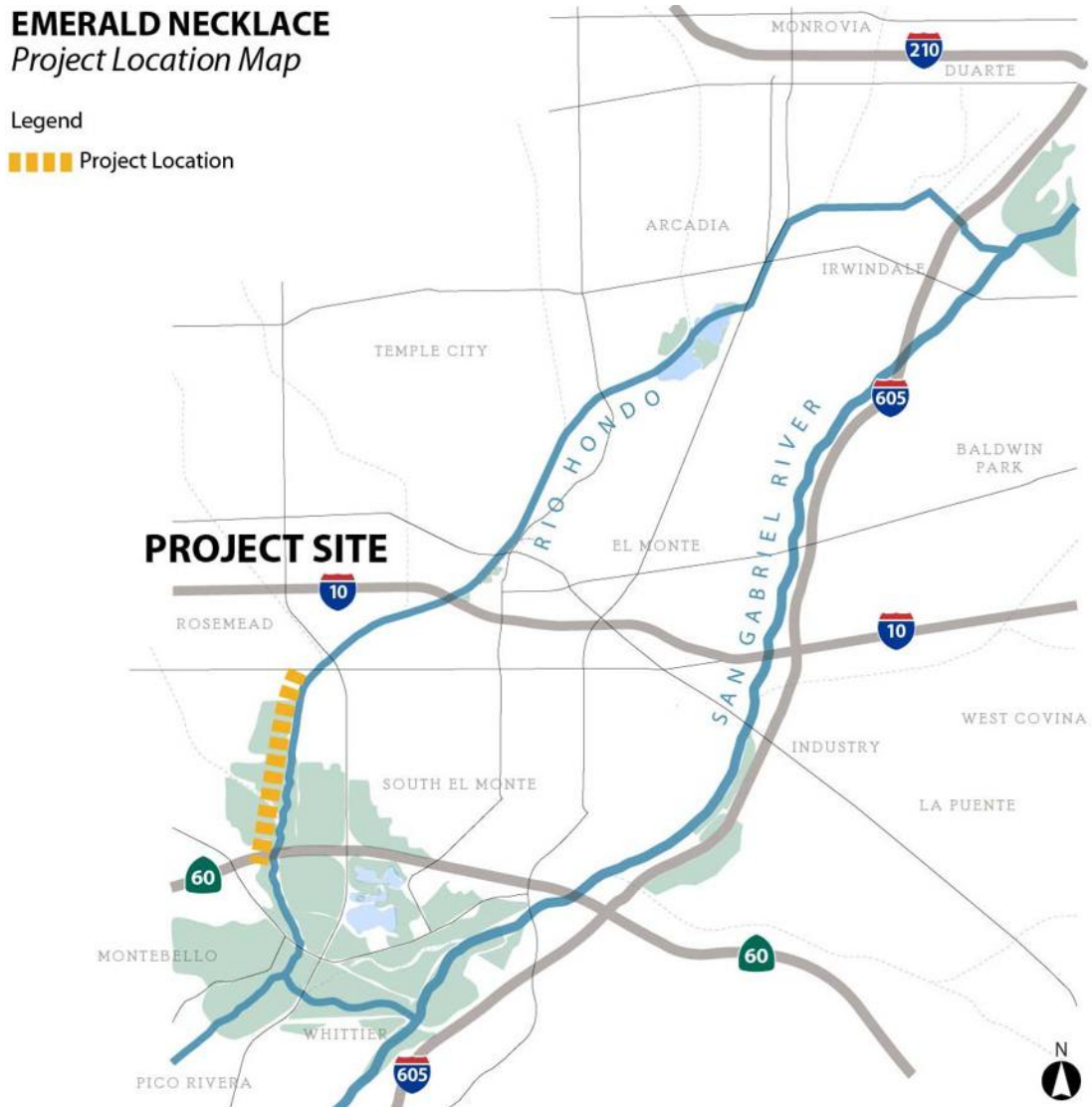


Fig. 9. The project is located in the north-western section of the Whittier Narrows Recreation Area on the Emerald Necklace.

Project Implementation Changes

A recent fire around the Bosque del Rio Hondo has burned the non-native invasive plants and trees. The opportunity exists to continue removing invasive plants and restore the riparian area to a healthy native state. Native plantings along the trail will serve to inhibit invasive plants from returning.

The multi-use trail which was once hidden is exposed and is of renewed interest by the recreating public. Despite continued flooding in the area funding for additional fencing, trail improvements and signage should be invested to protect habitat from informal trail alignment. An additional 100 feet of trail fencing and improvements have been added to the project just south of State Highway 60.

Emerald Necklace Signage

Refer to the Emerald Necklace Signage Guidelines for the County of Los Angeles Department of Public Works for specific signage design, usage and placement and the County of Los Angeles Parks and Recreation Signage Guidelines. The City of Rosemead has requested a Banner pole at the Garvey Center/Bridge location.

Emerald Necklace signage depicted below indicates a bicycle path and a multi-use trail. Technically, mountain bikes are allowed on the multi-use trail and should be depicted as a graphic on the trail sign. In order to avoid confusion, when the trails are directly adjacent to each other, the bicycle graphic will remain a separate sign in order to clearly mark the Class I bike path or the Class IV bikeway. When the trails are separated i.e. on opposite sides of the river, the multi-use trail sign will also include a bicycle graphic.

Signage Type	Quantity	Location
Banner Pole	One	Garvey Avenue Bridge by ADA ramp
Wayfinding	Two	North and south of scour pool,
General directional sign	One	On levee by Garvey Avenue Bridge ADA ramp
Flash Flood Warning	Two	North and south of scour pool
Underpass Stencil	Four	Each side of the State Highway 60 underpass and each side of the Garvey Avenue Bridge
Mileage Markers		Every quarter-mile on trails

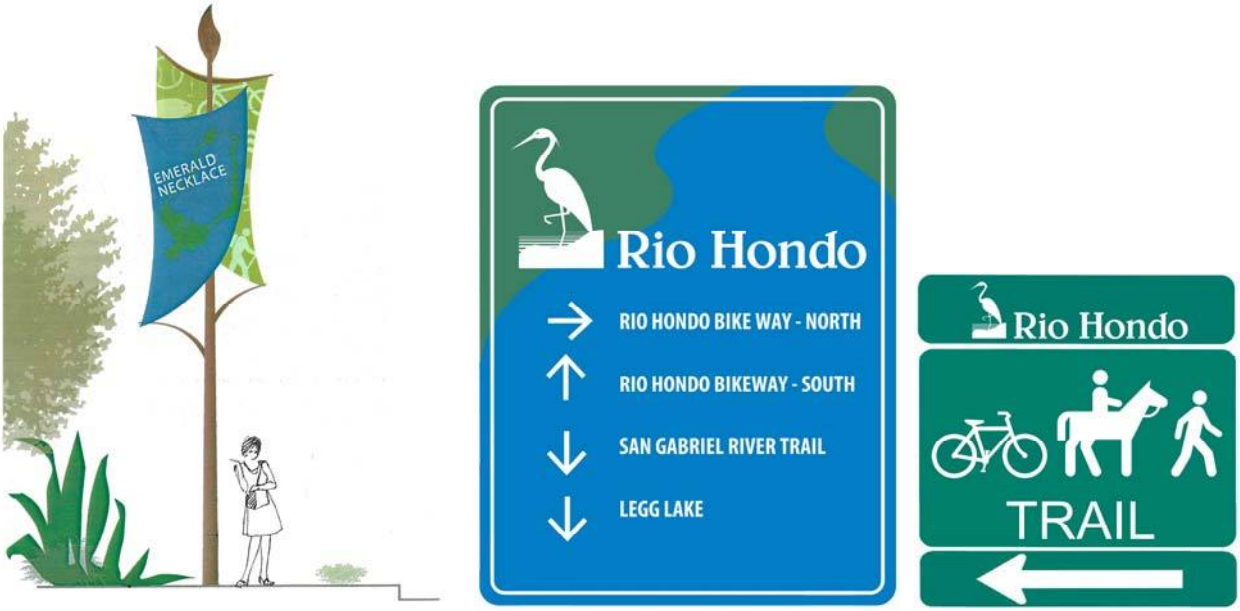


Fig. 10. Some of the appropriate signage for the project.

Emerald Necklace Phase 1 Implementation Costs

EMERALD NECKLACE PHASE I PROJECTS -PROJECT 12

West Side - Alhambra to Garvey

	Item	Qty.	Units	Unit Costs	*Sub-Total*	Total
1.0	**Demolition**					
1.1	Site Preparation Clearing and Grubbing - 40 ft swath	148,000	SF	$ 0.12	$ 17,760.00	
1.2	Remove Debris	1	LS	$ 6,000.00	$ 6,000.00	
	Total 1.0					**$ 23,760.00**
2.0	**EarthworkSite Grading**					
2.1	Fine grade for trails & swale	37,000	SF	$ 0.40	$ 14,800.00	
	Total 2.0					**$ 14,800.00**
3.0	**Site Construction**					
3.1	Multi-use trail w/fencing and improved footing	3,700	LF	$ 80.00	$ 296,000.00	
3.2	Multi-use trail tread improvements	100	LF	$ 20.00	$ 2,000.00	
3.3	Landscaped swale/sump/drainage solution	1	LS	$ 7,000.00	$ 7,000.00	
3.4	Provide & install Wayfinding and signage	1	LS	$ 8,000.00	$ 8,000.00	
	Total 3.0					**$ 313,000.00**
4.0	**Utilities**					
4.1	Temp. water line connection to site w/repairs	1	LS	$ 20,000.00	$ 20,000.00	
4.2	Install Temp. 1" Water Meter (as necessary)	1	LS	$ 8,000.00	$ 8,000.00	
	Total 4.0					**$ 28,000.00**
5.0	**Planting / Landscape**					
5.1	Mycorrhizal Treatment	10,000	SF	$ 0.20	$ 2,000.00	
5.2	15 gallon trees	80	EA	$ 100.00	$ 8,000.00	
5.3	Shrubs--1 Gal.	3,000	EA	$ 35.00	$ 105,000.00	
5.4	Landscape understory hydroseeding - natives	148,000	SF	$ 2.00	$ 296,000.00	
5.5	Temporary landscape Irrigation	3,500	LF	$ 1.50	$ 5,250.00	
	Total 5.0					**$ 416,250.00**
	SUB-TOTAL					**$ 795,810.00**
	MOBILIZATION & PROFIT (15%)				**$ 119,371.50**	
	DESIGN AND PERMITTING (20%)				**$ 159,162.00**	
	CONTINGENCY (30%)				**$ 238,743.00**	
	TOTAL PROJECT COSTS					**$ 1,313,086.50**

This opinion of probable cost of construction is made on experience and best judgement for a concept design only. Land availability, field conditions, design development and construction document production will invariably alter costs. Concept costs have been developed for the purpose of an Emerald Necklace Phase I Cost Benefit Analysis.

Emerald Necklace Phase 1 Benefit-Cost Analysis

Benefit-Cost Analysis Project 12: Alhambra Wash Multi Use Trail						
Cost						
Construction Cost:	$	1,313,087				
Land Acquisition:						
Total Cost:	$	1,313,087				
Annual Maintenance:	$	3,011				
Discount Rate:		7%				
Total Cost (30 yr. in 2016 $)	$	1,261,733				
Improvements						
Linear Path (Bike only):						
Linear (Multi only):		2,300 ft				
Total Linear Path:		2,300 ft				
Staging/Park Areas						
Recreational Value:		Low				
Population in 2400 m Buffer						
Assumed Population Density		7,068				
Commute Share		0.63				
Residents in Buffer		58,565				
Existing Commuters		148				
New Commuters		44				
		Low		Mid		High
Total Cyclists		733		10133		15084
Total new Cyclists		264		3076		4557
Annual Benefits						
		Low		Mid		High
Recreation Benefits	$	800,773	$	11,066,528	$	16,473,407
Health Benefits	$	33,734	$	393,739	$	583,350
Mobility Benefits			$	183,842		
Decreased Auto Use			$	1,175		
Multi-Use Health Benefits	$	125,030				
Multi-Use Recreation Benefits	$	1,485,550.0				
Total Annual Benefits			$	1,610,580		
Total Annual Transportation Benefits			N/A**			
Benefit-Cost Ratios						
Total Discounted Benefits (30yrs)			$	19,985,759		
Benefit-Cost Ratio				**15.84**		
Discounted Benefits Transportation			N/A**			
Benefit-Cost Ratio Transportation						
*Numbers shaded in grey were used for caculation of B-C Ratios **There are only recreational benefits available for this Project						

WESTSIDE MULTI-USE TRAIL: Rosemead Blvd. Access Ramp

Project Description Summary

The Rosemead Blvd. Access Ramp Project will construct an ADA accessible ramp on the east side of Rosemead Blvd. connecting to the Westside Multi-Use Trail also referred to as the Rio Hondo River Trail along the Rio Hondo Channel. The ramp will be constructed adjacent to the sidewalk on the embankment in the CalTrans right-of-way. The ramp will be approximately 300 feet in length and materials will match the Garvey Bridge ramp, using concrete and metal. The ramp will require retaining walls and will be separated from the road by a fence with a gate for security. The reconfiguration of the underpass and grading design of Project 14, the Rosemead Blvd. Underpass, will determine the final layout of the access ramp.

The undeveloped parcel on the west side of Rosemead Blvd. was identified during the feasibility phase of the Emerald Necklace Master Plan for park development. If it is developed for public open space, this project access ramp will not be necessary. An ADA trail access point can be provided as part of the park design.

Fig. 1. Project area

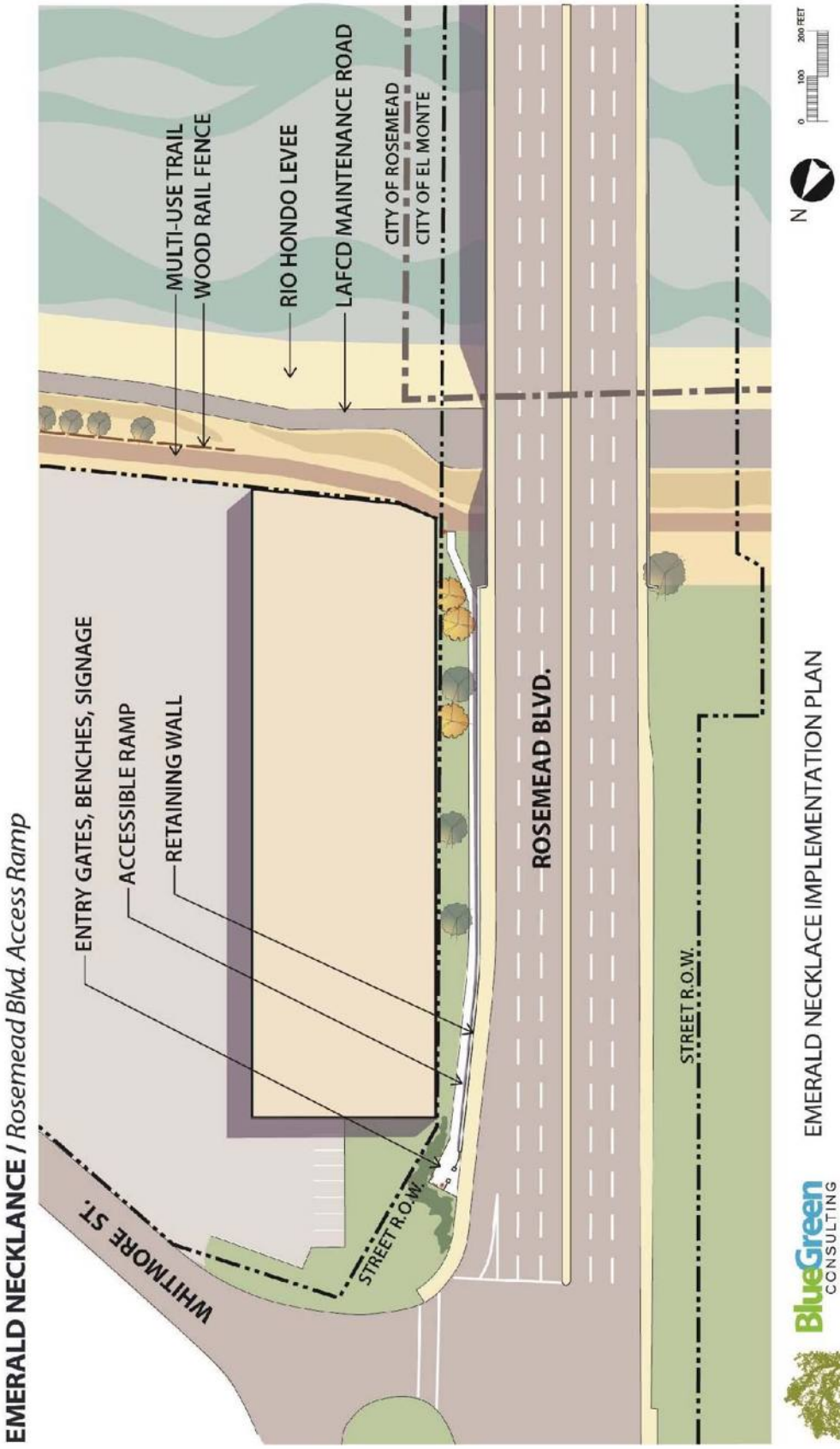


Fig. 2. Plan view of the new access ramp from the north side of Rosemead Blvd. to the West Side Multi-Use Trail.


Figs. 3 & 4. Existing Conditions – Northeast sidewalk of Rosemead Blvd. and embankment and start of bridge.


Figs. 5 & 6. Proposed ramp design. Existing ramp image is the access ramp down to the Rio Hondo channel located at Garvey Avenue just west of the bridge.

Fig. 7. Example of a decorative river steel gate panels by Brett Goldstone.

Decorative gates and fencing, pedestrian seating, and way-finding signage will be incorporated into the project. The application of decorative gates, whether in a future park or at the ramp entrance will invite the public onto the trail from Rosemead Blvd. Improvements to the landscape will require securing a source for irrigation water, possibly from the County of Los Angeles Public Health facility to the north of the site.

The project includes but is not limited to:

- ADA ramp
- Decorative fencing and gate(s)
- Site furnishings
- Emerald Necklace signage
- Regulatory and safety signage as required

Fig. 8. The project is located in the City of El Monte on the southwestern edge of the Emerald Necklace.

Emerald Necklace Signage

Refer to the Emerald Necklace Signage Guidelines for the County of Los Angeles Department of Public Works for specific signage design, usage and placement and the County of Los Angeles Parks and Recreation Signage Guidelines.

Emerald Necklace signage depicted below indicates a bicycle path and a multi-use trail. Technically, mountain bikes are allowed on the multi-use trail and should be depicted as a graphic on the trail sign. In order to avoid confusion, when the trails are directly adjacent to each other, the bicycle graphic will remain a separate sign in order to clearly mark the Class I bike path or the Class IV bikeway. When the trails are separated i.e. on opposite sides of the river, the multi-use trail sign will also include a bicycle graphic.

Signage Type	Quantity	Location
Wayfinding	One	Rosemead Blvd.
Directional	One	Multi-Use Trail
Access Map	One	Rosemead Blvd.

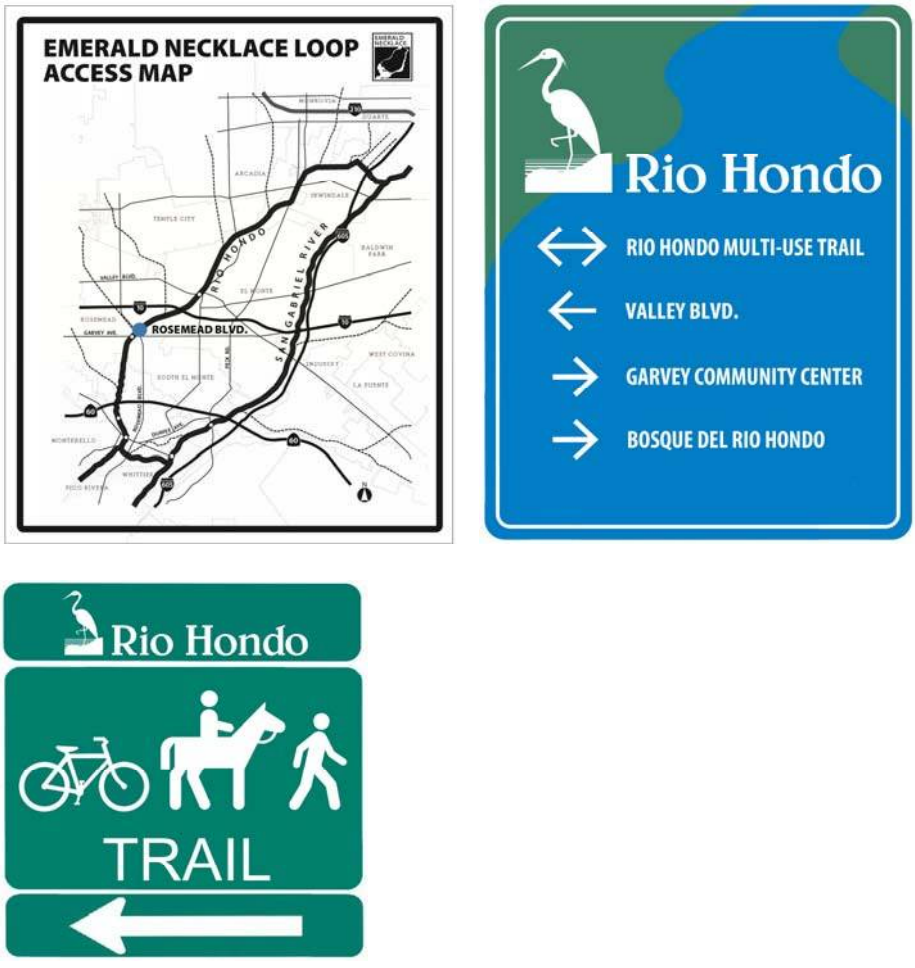


Fig. 9. Some of the appropriate signage for the project.

Emerald Necklace Phase 1 Implementation Costs

EMERALD NECKLACE PHASE I PROJECTS -PROJECT 13

West Side - Rosemead Access

	Item	Qty.	Units	Unit Costs	*Sub-Total*	Total
1.0	**Demolition**					
1.1	Site Preparation Clearing and Grubbing	1,800	SF	$ 0.12	$ 216.00	
1.2	Temporary Construction Fencing	300	LF	$ 1.20	$ 360.00	
	Total 1.0					**$ 576.00**
2.0	**EarthworkSite Grading**					
2.1	Fine grade for ramp and underpass connection	1,800	SF	$ 0.40	$ 720.00	
	Total 2.0					**$ 720.00**
3.0	**Site Construction**					
3.1	Concrete ADA ramp w/metal railings/cut and fill	1	LS	$ 600,000.00	$ 600,000.00	
3.2	Underpass Improvement connectivity/site repair	1	LS	$ 5,000.00	$ 5,000.00	
3.3	Decorative Gate and ramp side panels	1	LS	$ 30,000.00	$ 30,000.00	
3.4	Site Furniture	1	LS	$ 6,000.00	$ 6,000.00	
3.5	Provide & install Wayfinding and Directional Signage	1	LS	$ 2,000.00	$ 2,000.00	
	Total 3.0					**$ 643,000.00**
	SUB-TOTAL					**$ 644,296.00**
	MOBILIZATION & PROFIT (15%)				**$ 96,644.40**	
	DESIGN AND PERMITTING (20%)				**$ 128,859.20**	
	CONTINGENCY (30%)				**$ 193,288.80**	
	TOTAL PROJECT COSTS					**$ 1,063,088.40**

This opinion of probable cost of construction is made on experience and best judgement for a concept design only. Land availability, field conditions, design development and construction document production will invariably alter costs. Concept costs have been developed for the purpose of an Emerald Necklace Phase I Cost Benefit Analysis.

Emerald Necklace Phase 1 Benefit-Cost Analysis

Benefit-Cost Analysis Project 13: Rosemead Blvd. Access Ramp			
Cost			
Construction Cost:	$ 1,063,088		
Land Acquisition:			
Total Cost:	$ 1,063,088		
Annual Maintenance:	$ 589		
Discount Rate:	7%		
Total Cost (30 yr. in 2016 $)	$ 1,000,300		
Improvements			
Linear Path (Bike only):			
Linear (Multi only):	450 ft		
Total Linear Path:	450 ft		
Staging/Park Areas			
Recreational Value:	Low		
Population in 2400 m Buffer			
Assumed Population Density	7,068		
Commute Share	0.63		
Residents in Buffer	51,177		
Existing Commuters	129		
New Commuters	37		
	Low	Mid	High
Total Cyclists	641	8855	13181
Total new Cyclists	223	2601	3853
Annual Benefits			
	Low	Mid	High
Recreation Benefits	$ 676,982	$ 9,355,765	$ 13,926,801
Health Benefits	$ 28,519	$ 332,871	$ 493,170
Mobility Benefits		$ 159,446	
Decreased Auto Use		$ 194	
Multi-Use Health Benefits	$ 105,613		
Multi-Use Recreation Benefits	$ 1,255,965.0		
Total Annual Benefits		$ 1,361,578	
Total Annual Transportation Benefits		N/A**	
Benefit-Cost Ratios			
Total Discounted Benefits (30yrs)		$ 16,895,875	
Benefit-Cost Ratio		**16.89**	
Discounted Benefits Transportation		N/A**	
Benefit-Cost Ratio Transportation			
*Numbers shaded in grey were used for caculation of B-C Ratios			
**There are only recreational benefits availablefor this Project			

WESTSIDE MULTI-USE TRAIL: Rosemead Blvd. Underpass

Project Description Summary

This project provides for an improved underpass under Rosemead Blvd. to establish a continuous wide and safe multi-use trail on the west side of the Rio Hondo. The project requires grading and re-contouring the backside of the levee. Trail construction must meet Los Angeles County Trails Manual standards.

The current vertical clearance of the underpass is 12 feet which meets the Los Angeles County Trails Manual standards. The length of the underpass is approximately 40 feet. A decomposed granite trail through the tunnel will include a drainage system and sumps to provide secure footing for equestrians and trail users. Approximately 75 cubic yards of fine, pulverized dirt will be replaced with graded decomposed granite for trail tread. A structural assessment of the Rosemead Blvd. Bridge underpass will be needed to confirm an engineering approach to the drainage system and re-contouring of the soil abutments on either side so as to not compromise the structural integrity of the bridge or adjacent levee.

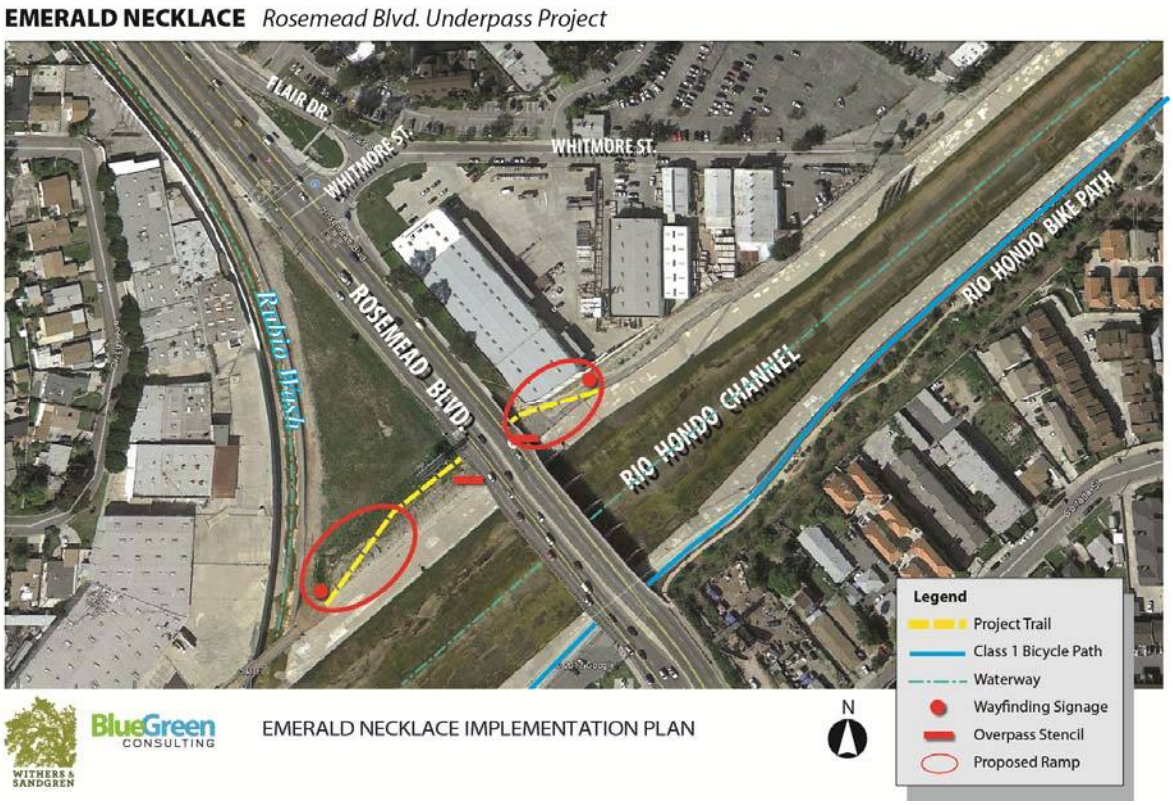


Fig. 1. Project Area

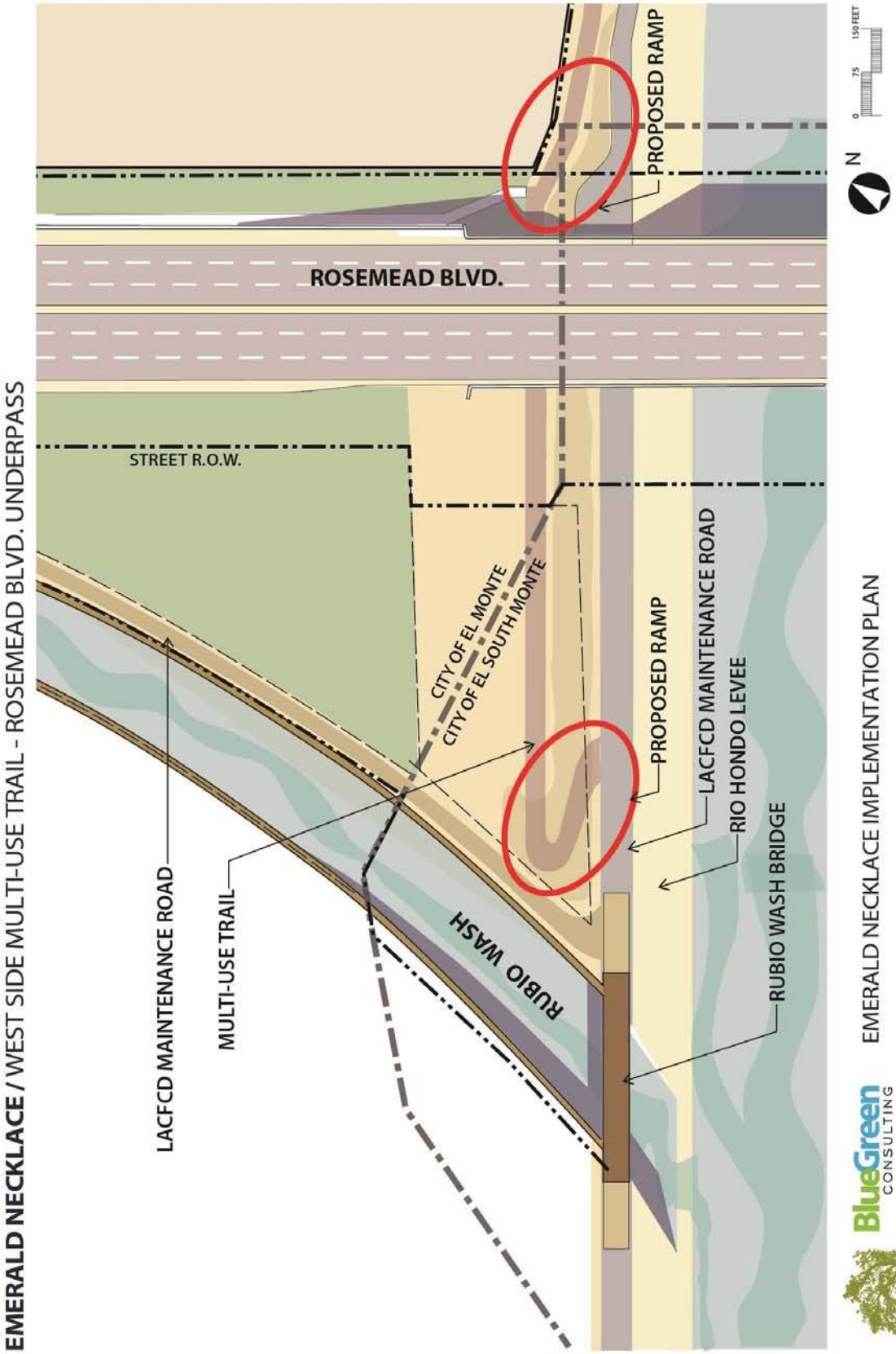


Fig. 2. Plan view of the West Side Multi-Use Trail from the Rubio Wash Bridge to the Rosemead Blvd. underpass.

In order to provide public access from the existing Rubio Wash Bridge to the Rosemead Blvd. underpass, it will be necessary to construct a ramp on the back side of the Rio Hondo levee. The ramp widths will be 8 feet wide with 4 inches of decomposed granite on a compacted subgrade. The access ramp to the underpass will be similar to the trail segment recently constructed as part of the Rubio Wash Bridge restoration. A retaining wall may be necessary for the ramp on the east side of Rosemead.

Development of a public park on the west side of Rosemead may expand this project to include a trail connection up and into the future park from the Rubio Wash bridge. Future shading of the trail with trees and establishment of native plantings will be dependent on a water source for temporary irrigation in this area.

The project includes but is not limited to:

- Rock trail base to match existing Rubio Bridge ramp footing material
- Rock trail base and decomposed granite multi-use trail
- Underpass improvements including soil import/export
- Hydro-seeding with equine and dog friendly native grasses and wildflowers
- Emerald Necklace signage
- Regulatory and safety signage as required

Fig. 3. The Rubio Wash bridge access ramp looking southwest.

Fig. 4. The Rubio Wash Bridge and existing access ramp looking north.

Fig. 5. Rosemead underpass- west side

Fig. 6. Existing conditions of east Rosemead underpass and levee – east side.

Fig. 7. Example of west side underpass improvements including de-watering site along the Rio Hondo at the Interstate 10 Freeway . Similar improvements for the implementation of the trail at the Rosemead underpass are necessary for trail accessibility and continuity.

Fig. 8. Recent west side underpass improvements to the Interstate 10 Freeway along the Rio Hondo. Similar improvements for the implementation of the trail at the Rosemead underpass are anticipated on a smaller scale.

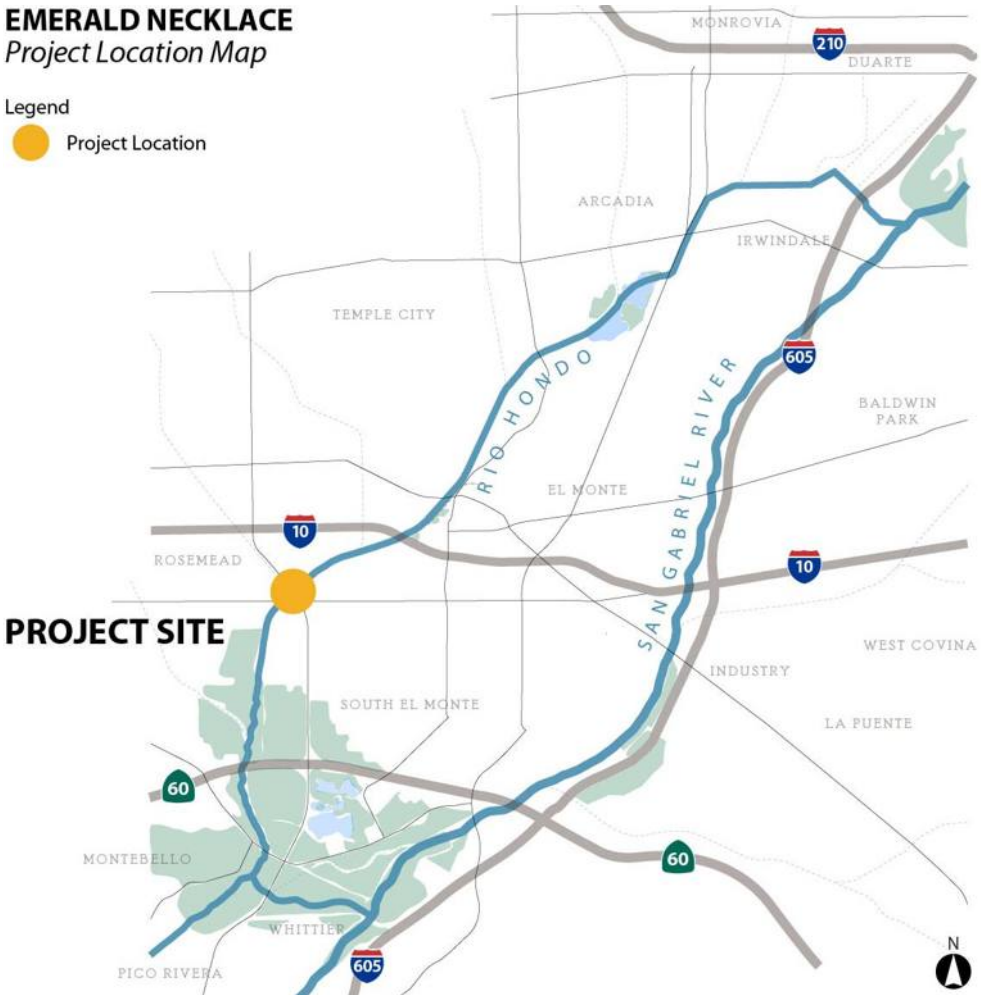


Fig. 9. the project is located on the southwestern edge of the Emerald Necklace in the cities of Rosemead and El Monte.

Project Implementation Changes

The project feasibility plan calls for 300 linear feet of pressure treated lumber utilized as a retaining wall for the ramp at the back of the Rio Hondo levee. This material is not necessary. Soil may be necessary if the re-contouring of the slope requires additional material to construct an ADA compliant multi-use trail ramp.

Emerald Necklace Signage

Refer to the Emerald Necklace Signage Guidelines for the County of Los Angeles Department of Public Works for specific signage design, usage and placement and the County of Los Angeles Parks and Recreation Signage Guidelines.

Emerald Necklace signage depicted below indicates a bicycle path and a multi-use trail. Technically, mountain bikes are allowed on the multi-use trail and should be depicted as a graphic on the trail sign. In order to avoid confusion, when the trails are directly adjacent to each other, the bicycle graphic will remain a separate sign in order to clearly mark the Class I bike path or the Class IV bikeway. When the trails are separated i.e. on opposite sides of the river, the multi-use trail sign will also include a bicycle graphic.

Signage Type	Quantity	Location
Wayfinding	Two	North & south side of Rosemead Blvd. Bridge
Underpass Stencil	Two	North & south side of Rosemead Blvd. Bridge
Mileage Markers		Every quarter-mile on trails

Fig. 10. Some of the appropriate signage for the project.

Emerald Necklace Phase 1 Implementation Costs

EMERALD NECKLACE PHASE I PROJECTS -PROJECT 14

West Side - Rosemead Underpass

	Item	Qty.	Units	Unit Costs	*Sub-Total*	Total
1.0	**Demolition**					
1.1	Site Preparation Clearing and Grubbing	25,200	SF	$ 0.12	$ 3,024.00	
1.2	Temporary Construction Fencing	500	LF	$ 1.20	$ 600.00	
	Total 1.0					**$ 3,624.00**
2.0	**EarthworkSite Grading**					
2.1	Fine grade for trail and underpass	32,500	SF	$ 0.40	$ 13,000.00	
	Total 2.0					**$ 13,000.00**
3.0	**Site Construction**					
3.1	8 ' Stabilized Rock or D.G. Path w/edging	500	LF	$ 32.00	$ 16,000.00	
3.2	Underpass Improvements including drainage	1	LS	$ 80,000.00	$ 80,000.00	
3.3	Hydroseeding - native grass and wildflower	25,200	SF	$ 2.00	$ 50,400.00	
3.4	Provide & install Wayfinding and Stencil signage	1	LS	$ 2,000.00	$ 2,000.00	
	Total 3.0					**$ 148,400.00**
	SUB-TOTAL					**$ 165,024.00**
	MOBILIZATION & PROFIT (15%)				**$ 24,753.60**	
	DESIGN AND PERMITTING (20%)				**$ 33,004.80**	
	CONTINGENCY (30%)				**$ 49,507.20**	
	TOTAL PROJECT COSTS					**$ 272,289.60**

This opinion of probable cost of construction is made on experience and best judgement for a concept design only. Land availability, field conditions, design development and construction document production will invariably alter costs. Concept costs have been developed for the purpose of an Emerald Necklace Phase I Cost Benefit Analysis.

Emerald Necklace Phase 1 Benefit-Cost Analysis

Benefit-Cost Analysis Project 14: Rosemead Blvd. Underpass			
Cost			
Construction Cost:	$ 272,290		
Land Acquisition:			
Total Cost:	$ 272,290		
Annual Maintenance:	$ 655		
Discount Rate:	7%		
Total Cost (30 yr. in 2016 $)	$ 261,987		
Improvements			
Linear Path (Bike only):			
Linear (Multi only):	500 ft		
Total Linear Path:	500 ft		
Staging/Park Areas			
Recreational Value:	Low		
Population in 2400 m Buffer			
Assumed Population Density	7,068		
Commute Share	0.63		
Residents in Buffer	51,373		
Existing Commuters	129		
New Commuters	38		
	Low	Mid	High
Total Cyclists	643	8889	13232
Total new Cyclists	224	2613	3872
Annual Benefits			
	Low	Mid	High
Recreation Benefits	$ 680,275	$ 9,401,264	$ 13,994,530
Health Benefits	$ 28,658	$ 334,490	$ 495,569
Mobility Benefits		$ 160,095	
Decreased Auto Use		$ 216	
Multi-Use Health Benefits	$ 106,086		
Multi-Use Recreation Benefits	$ 1,255,965.0		
Total Annual Benefits		$ 1,362,051	
Total Annual Transportation Benefits		N/A**	
Benefit-Cost Ratios			
Total Discounted Benefits (30yrs)		$ 16,901,752	
Benefit-Cost Ratio		**64.51**	
Discounted Benefits Transportation		N/A**	
Benefit-Cost Ratio Transportation			
*Numbers shaded in grey were used for caculation of B-C Ratios			
**There are only recreational benefits availablefor this Project			

WEST SIDE MULTI-USE TRAIL SOUTH:
Multi-Use Trail from Rosemead Blvd. to Valley Blvd.

Project Description Summary

The Westside Multi-Use Trail South from Rosemead Blvd. to Valley Blvd. is a segment of the future Rio Hondo River Trail envisioned to be a continuous, unimpeded trail on the west side of the Rio Hondo for equestrians, hikers and mountain bikers. This project is to formalize and better define the multi-use trail with a combination of fencing, trail footing improvements, landscaping with native trees and shrubs, and signage. The multi-use trail will be constructed in the County of Los Angeles Department of Parks and Recreation (DPR) riding and hiking easement located next to the asphalt maintenance road on the levee.

Approximately 7,000 linear feet of trail will be constructed or upgraded in the easement. The trail tread will vary in width from 5 feet to 10 feet. Trail material will be 4 inches of decomposed granite over compacted subgrade. Some sections of the trail will require drainage improvements. Improvements vary and are specified by section indicated in Fig. 1.

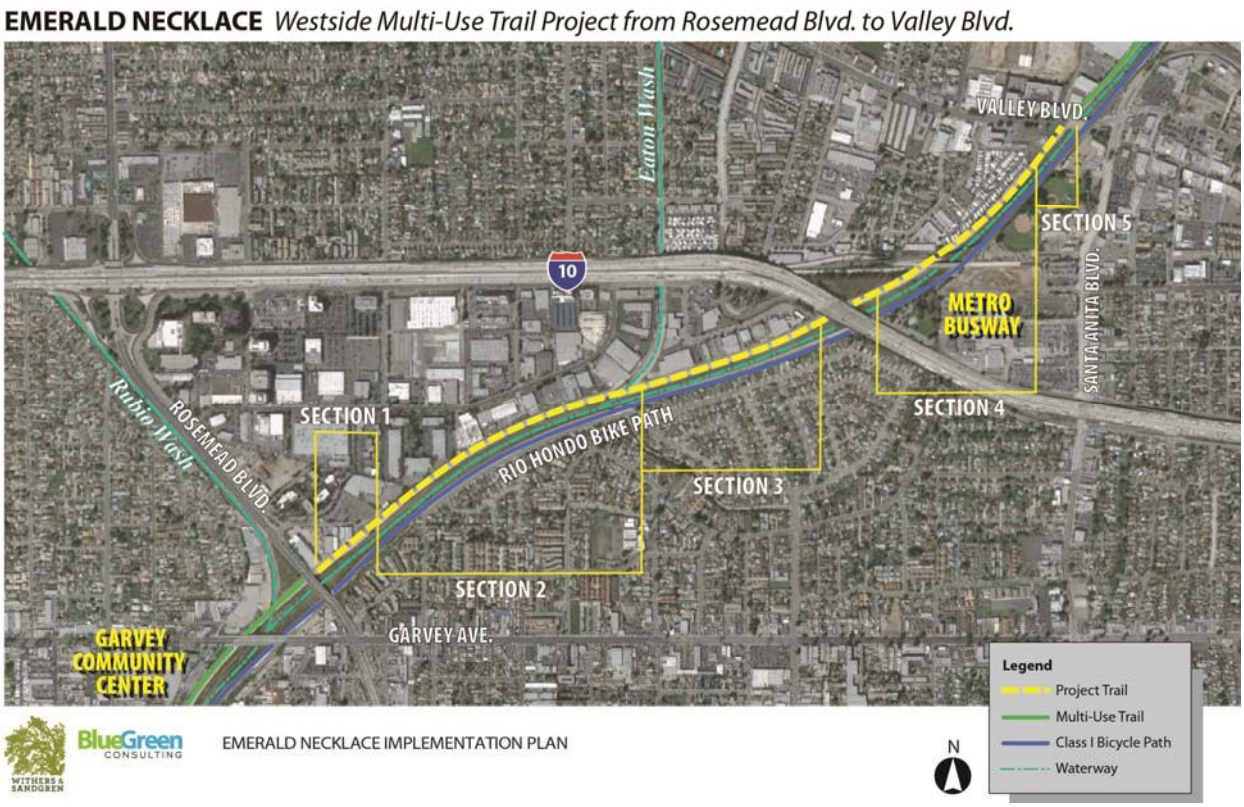


Fig. 1. West Side Multi-Use Trail-South from the Rosemead Blvd. underpass to Valley Blvd.

Figs. 2 & 3. Exposed pipe, culverts, sharp objects, encroaching utilities and walls along the trail alignment will be removed or modified to protect trail users.

All miscellaneous exposed metal piping, corrugated drainage pipe, abandoned or live utilities impeding the trail will be removed or modified to provide safe access for trail users.

Section 1

This section includes 850 linear feet North of the Rosemead Blvd. and is the narrowest portion of trail. The existing trail adjacent to the maintenance road is operated and maintained under an agreement with the Flood Control District. The multi-use trail in this section will be regraded to meet ADA requirements. New decomposed granite trail material with edging will be installed. There will be no wood fencing in this section of the trail due to flood control maintenance needs. Design and implementation needs to be coordinated with Project 13 and 14.

Fig. 4. Trail pinch point north east of the Rosemead Blvd. underpass

Fig. 5. Rosemead Blvd. underpass project

Fig. 6. View of existing hiking and riding easement between Whitmore Street and Easton Wash.

Section 2

From the end of Whitmore Street, north of Rosemead Blvd., to Easton Wash, the riding and hiking easement is 2 to 3 feet below the levee maintenance road. Approximately 2,300 feet of existing chain link fence will be removed and replaced with 100-foot long segments of 48-inch tall wood double rail fencing, spaced 25 feet apart. The County will work with adjacent property owners to modify the tops of their fences in order to remove hazardous over hangs. A standard of 12-foot vertical clearance is required for safe equestrian use.

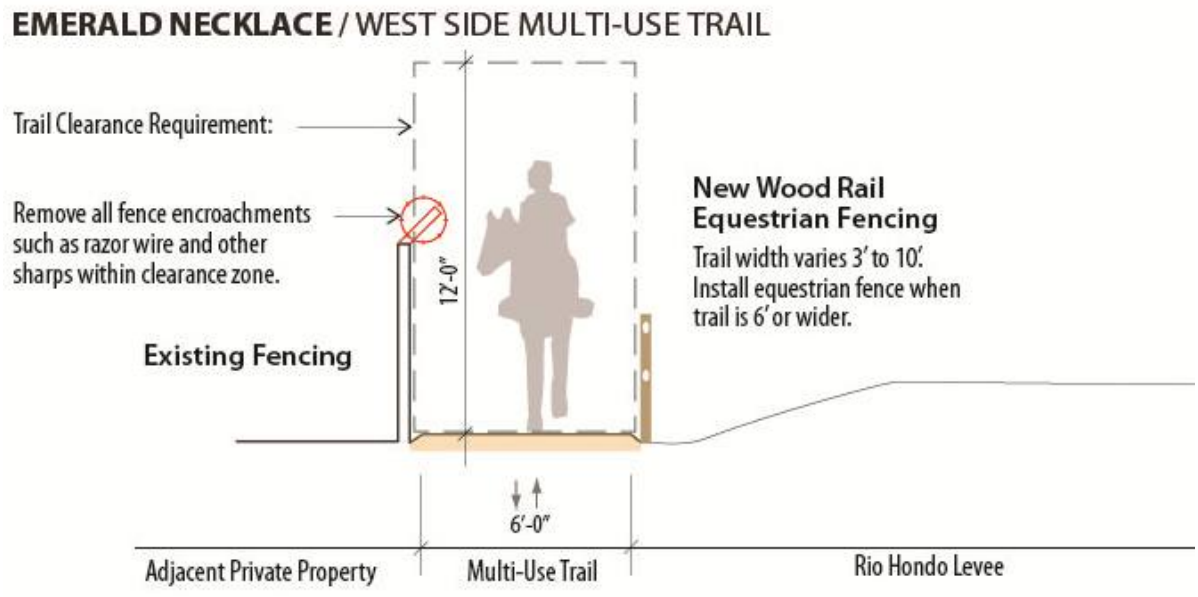


Fig. 7. Section depicting fence and trail encroachment into trail clearance zone.

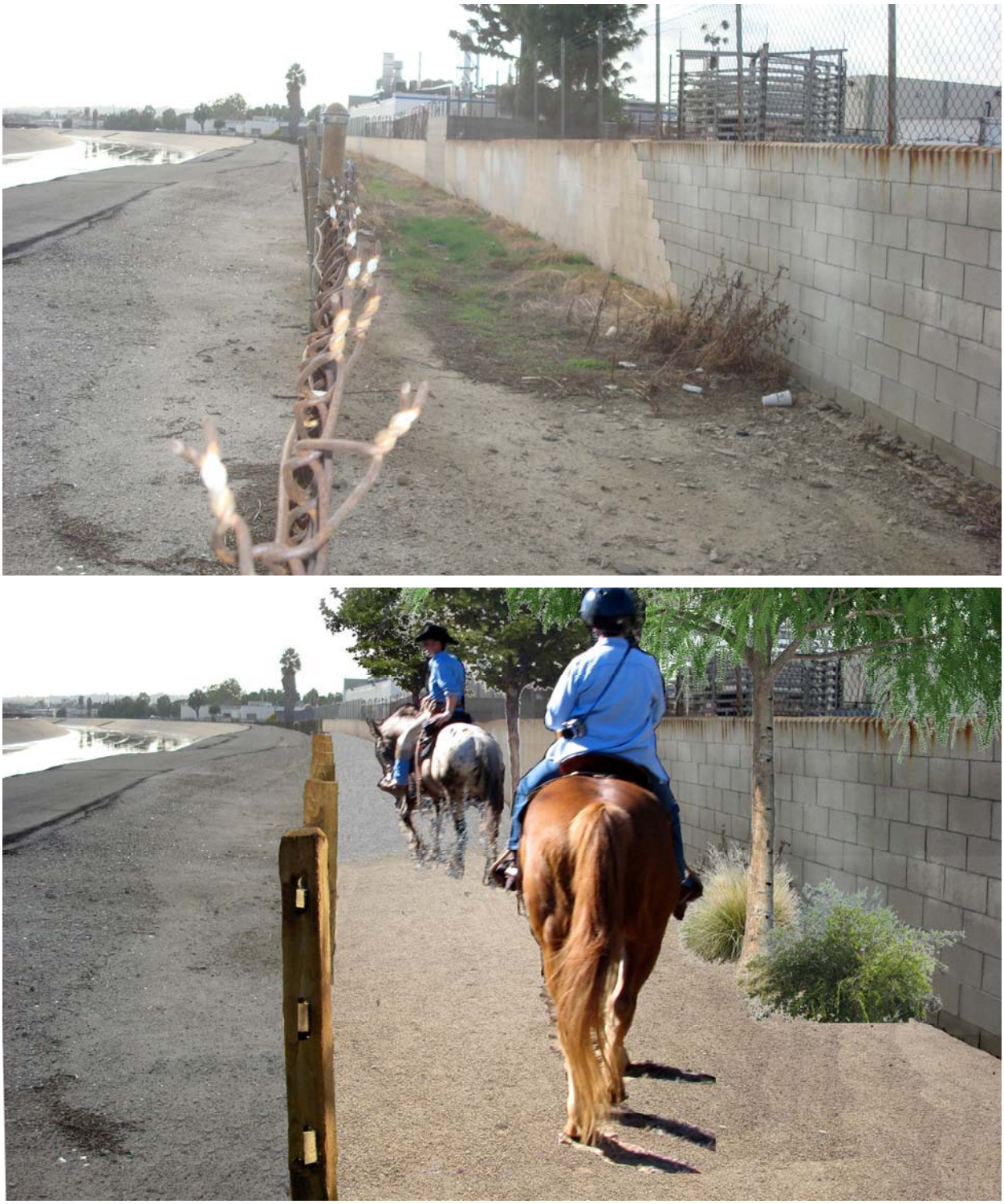


Fig. 8 & 9. Before and after illustration of the hiking and riding easement south of Eaton Wash.

Where the trail widens to 10 feet or greater, greening can occur. A native plant palette, non-toxic to horses and dogs, will be implemented in these wider trail areas adjacent to the private properties. Temporary irrigation is necessary to establish plantings. Temporary irrigation

connection to a water source located at Flare Drive would extend down the Eaton Wash maintenance easement for this trail segment.

At the Eaton Wash Bridge approximately 600 square feet of damaged or missing wood deck will be replaced to provide safe and even footing for all recreational trail users. Wood decking would be similar to the Rubio Wash Bridge.

Fig. 10. Eaton Wash Bridge to be restored as a component of Section 2 trail implementation.

Fig.11. The improved Rubio Wash Bridge.

Section 3

North of Eaton Wash to Interstate 10 the riding and hiking easement drops significantly below the top of the levee easement currently constitutes a drainage swale. This approximately 1,700-foot long section requires a drainage redesign and installation of a buried drain pipe to replace the swale. The surface can then be raised with fill to construct a functional trail. Approximately 525 cubic yards of imported structural fill material will be needed.

Along the easement 1,425 linear feet of 48 inch tall wood double rail fencing will be installed in approximately 100' segments with 25' gaps as previously described. Greening with landscape and irrigation will be included where adequate width is available. A temporary irrigation connection located at Flare Drive or Baldwin Place would extend down to this trail segment. The multi-use trail would be identical to the one shown in Fig. 9 above.

Fig. 12. The hiking and riding easement between Eaton Wash and Interstate 10.

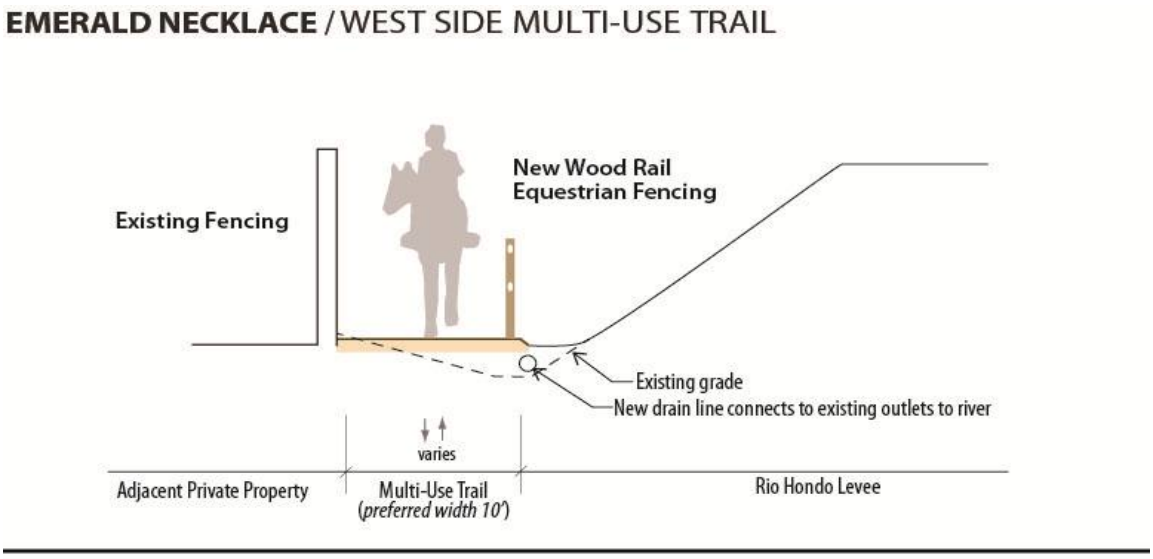


Fig.13. The proposed multi-use trail and drainage system between Eaton Wash and Interstate 10.

Section 4

North of Interstate 10 and the Los Angeles County Metropolitan Transportation Authority busway and railroad bridges the hiking and riding easement is essentially level with the adjacent maintenance road for approximately 1,200 feet and will only require minor grading to provide an even trail bed. Approximately 1,000 feet of wood railing will be required in this section. The application of new sections of chain link fencing next to the property boundary may be necessary for public safety.

Fig.14. The hiking and riding easement between Interstate 10 and Valley Boulevard looking southwest. This location may allow for planting of native trees for shade.

Wherever possible, large native trees should be planted to shade the multi-use trail. A native plant palette, non-toxic to horses, will be implemented in these wider trail areas adjacent to the private properties. Temporary irrigation is necessary to establish trees and plantings. Temporary irrigation connection to a water source located along Valley Boulevard Drive would extend down the access ramp for this trail segment.

Section 5

The entrance to the maintenance road at Valley Blvd. is currently closed to public use. Access will be provided through an agreement with LA County Flood Control District. The existing ramp will be modified to meet ADA requirements. New concrete retaining walls, fencing and gates will be installed. The access road grade will be altered over a length of approximately 160 feet to meet ADA requirements. Emerald Necklace way-finding signage and trail rules and regulations will be installed on or near the Valley Blvd trail entrance.

Fig. 15. The existing entry from Valley Blvd. will be graded and reconstructed to meet accessibility standards for a multi-use trail access point.

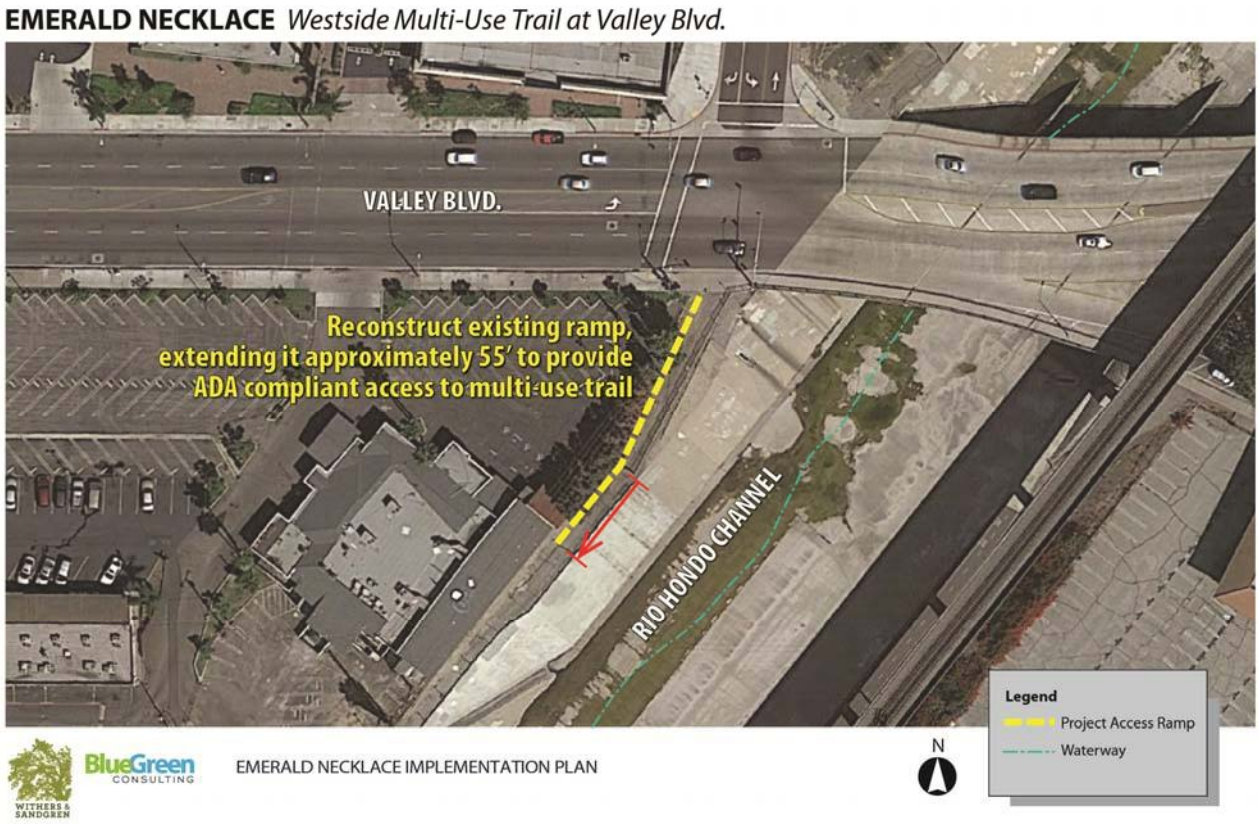


Fig. 16. Aerial view of the existing entry from Valley Blvd. to be reconstructed to meet accessibility standards for a public multi-use trail access point.

The project includes but is not limited to:

- Multi-use trail w/wooden fence
- Multi-use trail footing w/edging
- Encroachments removal including sharp objects, fencing, utility poles, walls, etc. from the riding and hiking easement
- Bridge restoration (existing bridge over Eaton Wash)
- Drainage improvements
- Trail entry ADA ramp from Valley Boulevard
- Equine and dog friendly landscape
- Decorative fencing
- Regulatory signage
- Emerald Necklace signage
- Regulatory and safety signage as required

Note – property acquisition between the Interstate 10 and the Metro bridges is recommended for a trailhead park on the west side of the Rio Hondo.

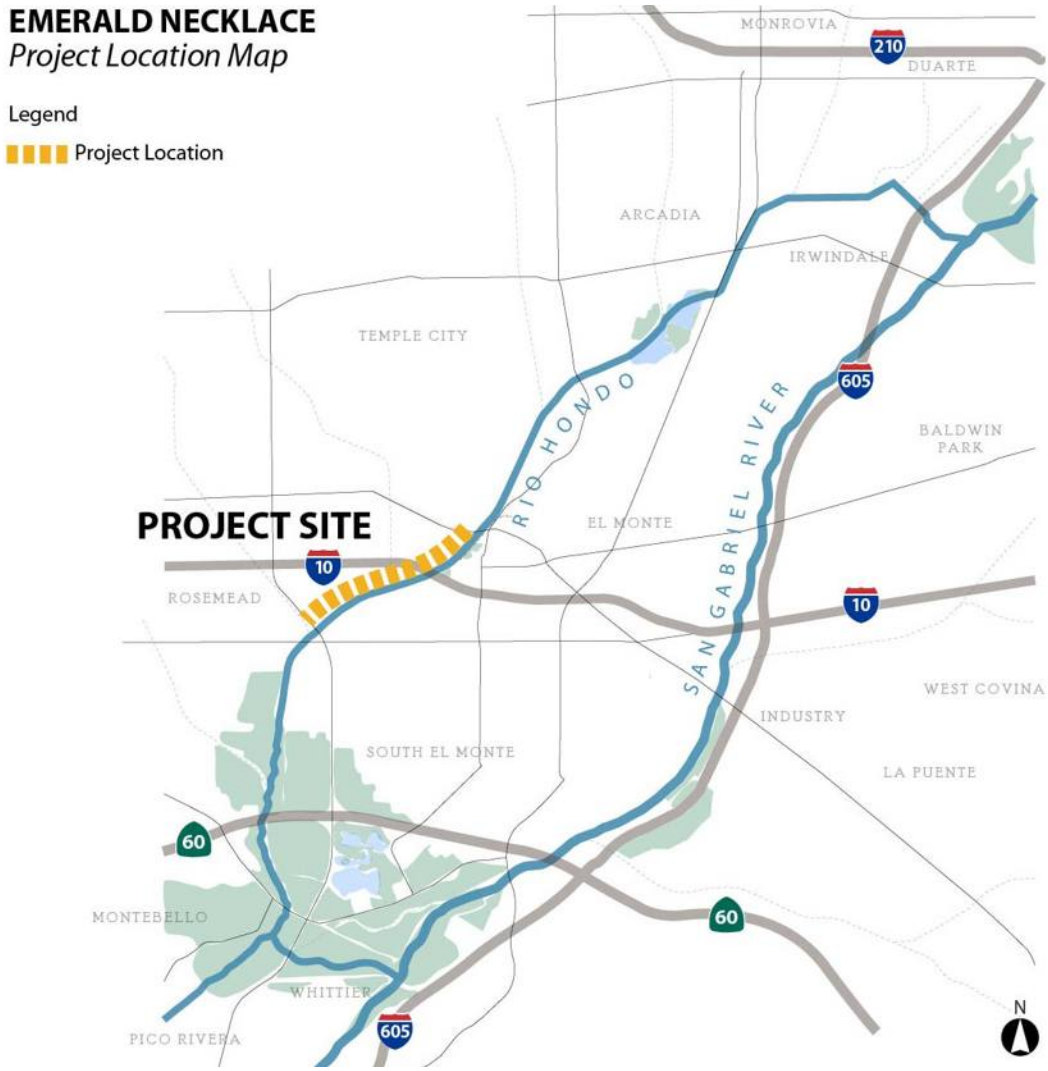


Fig. 17. The project is located in the City of El Monte on the western bank of the Rio Hondo.

Fig. 18. Proposed property acquisition for a trailhead park on the west side Rio Hondo.

Emerald Necklace Signage

Refer to the Emerald Necklace Signage Guidelines for the County of Los Angeles Department of Public Works for specific signage design, usage and placement and the County of Los Angeles Parks and Recreation Signage Guidelines.

Emerald Necklace signage depicted below indicates a bicycle path and a multi-use trail. Technically, mountain bikes are allowed on the multi-use trail and should be depicted as a graphic on the trail sign. In order to avoid confusion, when the trails are directly adjacent to each other, the bicycle graphic will remain a separate sign in order to clearly mark the Class I bike path or the Class IV bikeway. When the trails are separated i.e. on opposite sides of the river, the multi-use trail sign will also include a bicycle graphic.

Signage Type	Quantity	Location
Wayfinding	Two	Valley Blvd.
Banner Pole sign	One	Valley Blvd.
General directional sign	One	Valley Blvd.
Mile Markers		Every quarter-mile on trails

Fig. 19. Some of the appropriate signage for the project.

Emerald Necklace Phase 1 Implementation Costs

EMERALD NECKLACE PHASE I PROJECTS -PROJECT 15

West Side - Rosemead to Valley

	Item	Qty.	Units	Unit Costs	*Sub-Total*	Total
1.0	**Demolition**					
1.1	Site Preparation Clearing and Grubbing - 40 ft swath	148,000	SF	$ 0.12	$ 17,760.00	
1.2	Remove Debris, Sharps and Misc. trail impediments	1	LS	$ 10,000.00	$ 10,000.00	
1.3	Remove and relocate utility pole(s)	1	LS	$ 60,000.00	$ 60,000.00	
1.4	Boundary surveys - encroachment adjustments/demo	1	LS	$ 30,000.00	$ 30,000.00	
	Total 1.0					**$ 117,760.00**
2.0	**EarthworkSite Grading**					
2.1	Fine grade for trails	37,000	SF	$ 0.40	$ 14,800.00	
	Total 2.0					**$ 14,800.00**
3.0	**Site Construction**					
3.1	Eaton Wash Bridge (bailey bridge) restoration	1	LS	$ 250,000.00	$ 250,000.00	
3.2	Valley maintenance road access modifications for ADA	1	LS	$ 60,000.00	$ 60,000.00	
3.3	Multi-use trail w/wood fencing/D.G. footing	2,300	LF	$ 120.00	$ 276,000.00	
3.4	Multi-use trail tread w/edging improvements	200	LF	$ 20.00	$ 4,000.00	
3.5	Multi-use trail Turnpike const./wood fence (limited area)	1,700	LF	$ 100.00	$ 170,000.00	
3.6	Decorative Fencing and Entry Gates	1	LS	$ 60,000.00	$ 60,000.00	
3.7	Provide & install Wayfinding and signage	1	LS	$ 10,000.00	$ 10,000.00	
	Total 3.0					**$ 830,000.00**
4.0	**Utilities**					
4.1	Temp. water line connection to site w/repairs	3	LS	$ 20,000.00	$ 60,000.00	
4.2	Install Temp. 1" Water Meter (as necessary)	3	LS	$ 8,000.00	$ 24,000.00	
	Total 4.0					**$ 84,000.00**
5.0	**Planting / Landscape**					
5.1	Mycorrhizal Treatment	10,000	SF	$ 0.20	$ 2,000.00	
5.2	24 inch box trees w/mulch	30	EA	$ 450.00	$ 13,500.00	
5.3	1 gallon native plant (vines) w/mulch	45	EA	$ 40.00	$ 1,800.00	
5.4	Landscape understory hydroseeding - natives	148,000	SF	$ 2.00	$ 296,000.00	
5.5	Temporary landscape Irrigation	6,000	LF	$ 1.50	$ 9,000.00	
	Total 5.0					**$ 322,300.00**
	SUB-TOTAL					**$ 1,368,860.00**
	MOBILIZATION & PROFIT (15%)				**$ 205,329.00**	
	DESIGN AND PERMITTING (20%)				**$ 273,772.00**	
	CONTINGENCY (30%)				**$ 410,658.00**	
	TOTAL PROJECT COSTS					**$ 2,258,619.00**

This opinion of probable cost of construction is made on experience and best judgement for a concept design only. Land availability, field conditions, design development and construction document production will invariably alter costs. Concept costs have been developed for the purpose of an Emerald Necklace Phase I Cost Benefit Analysis.

Emerald Necklace Phase 1 Benefit-Cost Analysis

Benefit-Cost Analysis Project 15: Multi-Use Trail to Valley Blvd.				
Cost				
Construction Cost:		$ 2,258,619		
Land Acquisition:				
Total Cost:		$ 2,258,619		
Annual Maintenance:		$ 10,669		
Discount Rate:		7%		
Total Cost (30 yr. in 2016 $)		$ 2,233,281		
Improvements				
Linear Path (Bike only):				
Linear (Multi only):		8,150 ft		
Total Linear Path:		8,150 ft		
Staging/Park Areas				
Recreational Value:		Low		
Population in 2400 m Buffer				
Assumed Population Density		7,068		
Commute Share		0.63		
Residents in Buffer		81,920		
Existing Commuters		206		
New Commuters		66		
Total Cyclists		1026	14174	21099
Total new Cyclists		392	4579	6785
Annual Benefits				
Recreation Benefits		$ 1,192,118	$ 16,474,843	$ 24,524,116
Health Benefits		$ 50,220	$ 586,163	$ 868,438
Mobility Benefits			$ 260,964	
Decreased Auto Use			$ 6,200	
Multi-Use Health Benefits		$ 185,651		
Multi-Use Recreation Benefits		$ 2,201,315.0		
Total Annual Benefits			$ 2,386,966	
Total Annual Transportation Benefits			N/A**	
Benefit-Cost Ratios				
Total Discounted Benefits (30yrs)			$ 29,619,962	
Benefit-Cost Ratio			**13.26**	
Discounted Benefits Transportation			N/A**	
Benefit-Cost Ratio Transportation				
*Numbers shaded in grey were used for caculation of B-C Ratios				
**There are only recreational benefits availablefor this Project				

WEST SIDE MULTI-USE TRAIL SOUTH: Interstate 10 Freeway Underpass Improvements

Project Description Summary

Development of the West Side Multi-Use Trail (future Rio Hondo River Trail) will require trail improvements at the Interstate 10 underpass currently utilized by Los Angeles County Flood Control District. The underpass has recently been renovated and the new tunnel height exceeds the County of Los Angeles Trails Manual standard of 12-foot clearance on multi-use trails. This project will connect the new multi-use trail in the hiking and riding easement to the maintenance roadway, allowing recreational trail user access through the renovated underpass tunnel.

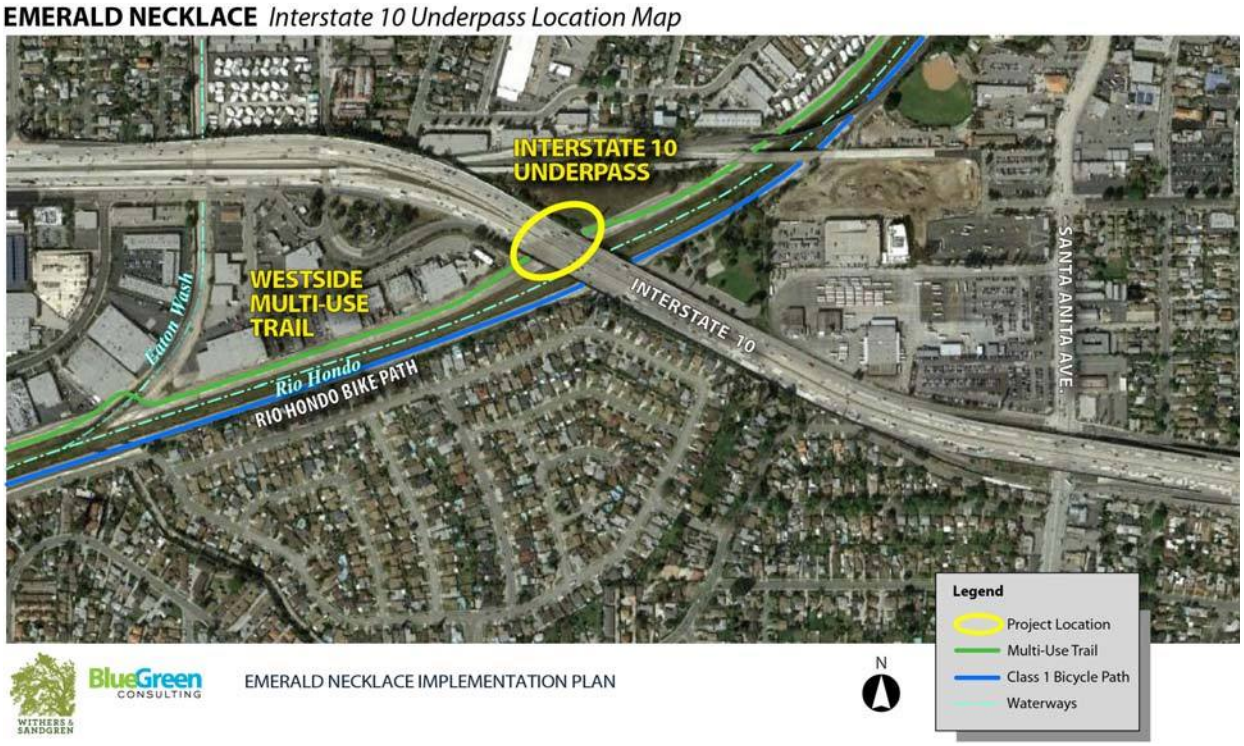


Fig. 1. Project Area

Recent improvements to the levee south of the Interstate 10 included a drainage swale in the middle of the hiking and riding easement. Additional sub-surface drainage will be required to provide an all-season trail connection. Coordination with the multi-use trail drainage solutions in Project 14, West Side Multi-Use Trail South: Multi-Use Trail from Rosemead Blvd. to Valley Blvd. Trail, will be necessary to transition from trail grade to the maintenance road. Wayfinding signage will include stenciling the name of the highway above.

Fig. 2. Recently renovated underpass at Interstate 10 Freeway along the Rio Hondo, looking north.

Fig. 3. Inside the renovated underpass, looking north.

Fig. 4. The recently constructed drainage channel in the hiking and riding easement, looking southwest.

Fig. 5. Recently renovated underpass with new concrete V-ditch.

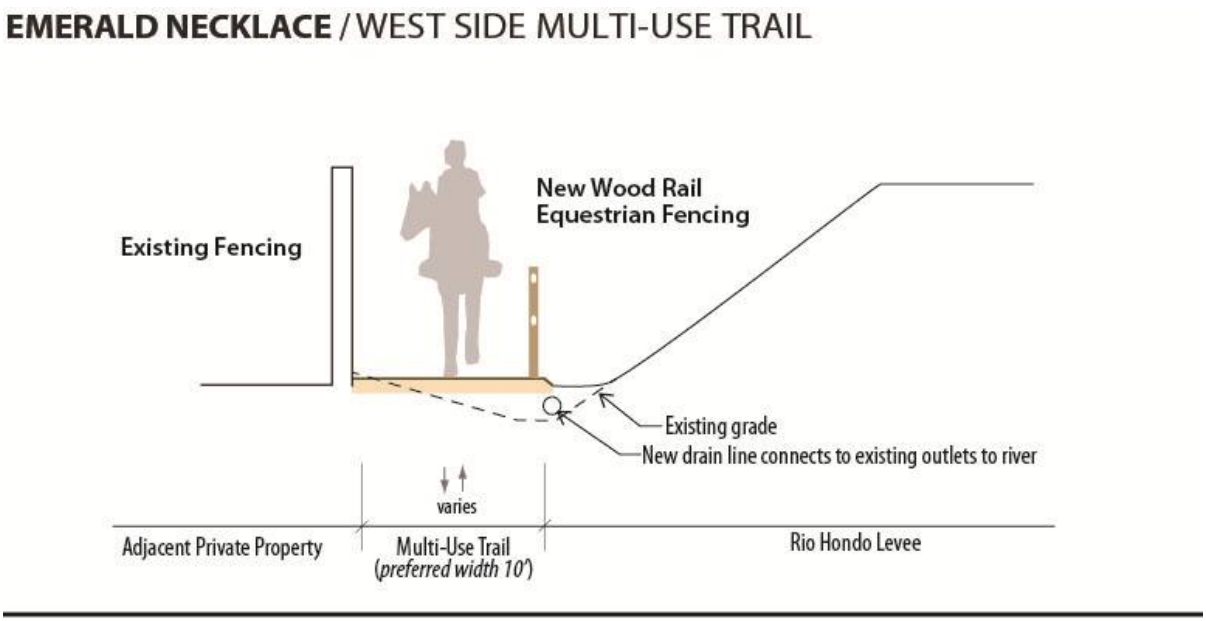


Fig. 6. Multi-use trail drainage solutions to interface with Interstate 10 underpass drainage solutions

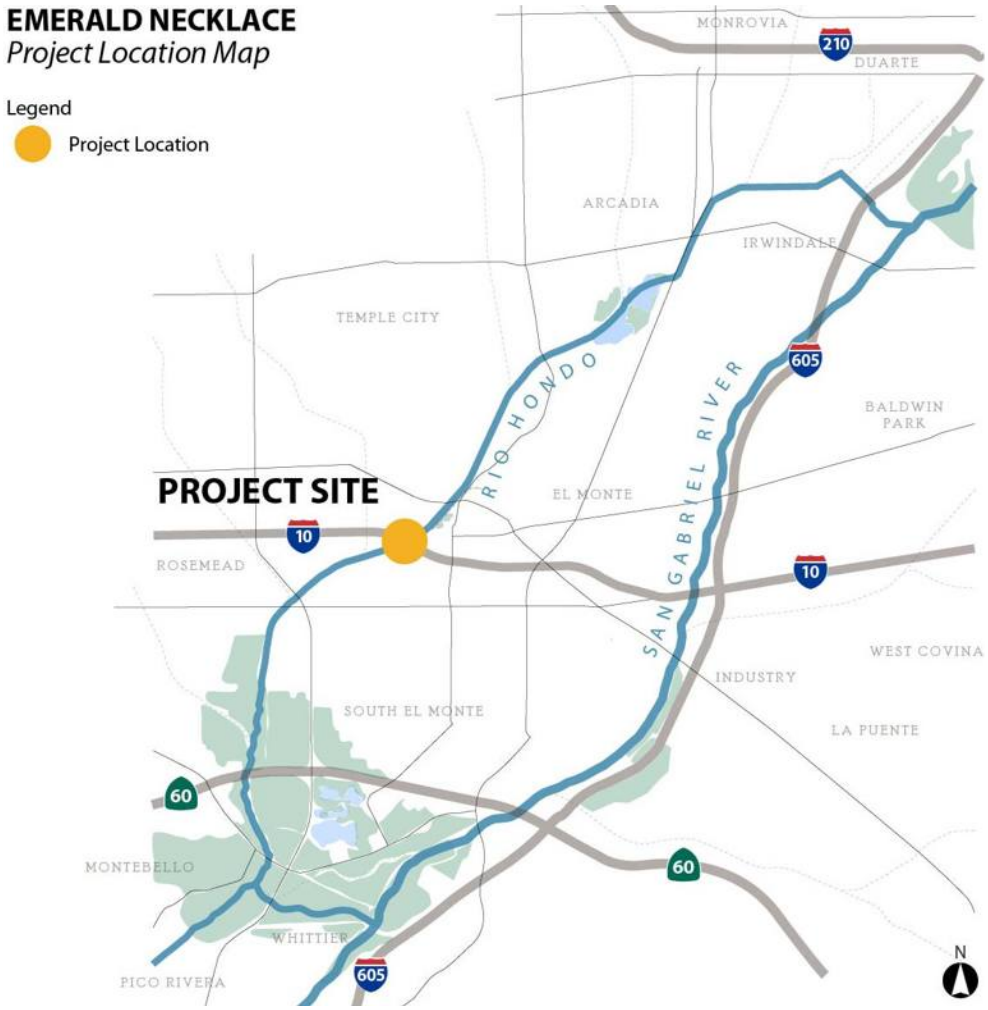


Fig. 7. The Emerald Necklace is a recreation trail and park system along the San Gabriel and Rio Hondo Rivers.

Emerald Necklace Signage

Refer to the Emerald Necklace Signage Guidelines for the County of Los Angeles Department of Public Works for specific signage design, usage and placement and the County of Los Angeles Parks and Recreation Signage Guidelines.

Emerald Necklace signage indicates a bicycle path and a multi-use trail. Technically, mountain bikes are allowed on the multi-use trail and should be depicted as a graphic on the trail sign. In order to avoid confusion, when the trails are directly adjacent to each other, the bicycle graphic will remain a separate sign in order to clearly mark the Class I bike path or the Class IV bikeway. When the trails are separated i.e. on opposite sides of the river, the multi-use trail sign will also include a bicycle graphic.

Signage Type	Quantity	Location
Underpass Stencil	Two	North & south side of Interstate 10 Underpass

Emerald Necklace Phase 1 Implementation Costs

EMERALD NECKLACE PHASE I PROJECTS -PROJECT 16

West Side - Interstate 10 Underpass

	Item	Qty.	Units	Unit Costs	*Sub-Total*	Total
1.0	**Demolition**					
1.1	Site Preparation Clearing and Grubbing	2,000	SF	$ 0.12	$ 240.00	
	Total 1.0					**$ 240.00**
2.0	**EarthworkSite Grading**					
2.1	Fine grade for trail and underpass	2,000	SF	$ 0.40	$ 800.00	
	Total 2.0					**$ 800.00**
3.0	**Site Construction**					
3.1	8 ' Stabilized Decomp Granite Path w/edging	200	LF	$ 32.00	$ 6,400.00	
3.2	Underpass Improvements including drainage	1	LS	$ 30,000.00	$ 30,000.00	
3.3	Hydrodeeding - native grass and wildflower- repair	2,000	SF	$ 2.00	$ 4,000.00	
3.4	Provide & install Stencil signage	1	LS	$ 2,000.00	$ 2,000.00	
	Total 3.0					**$ 42,400.00**
	SUB-TOTAL					**$ 43,440.00**
	MOBILIZATION & PROFIT (15%)				**$ 6,516.00**	
	DESIGN AND PERMITTING (20%)				**$ 8,688.00**	
	CONTINGENCY (30%)				**$ 13,032.00**	
	TOTAL PROJECT COSTS					**$ 71,676.00**

This opinion of probable cost of construction is made on experience and best judgement for a concept design only. Land availability, field conditions, design development and construction document production will invariably alter costs. Concept costs have been developed for the purpose of an Emerald Necklace Phase I Cost Benefit Analysis.

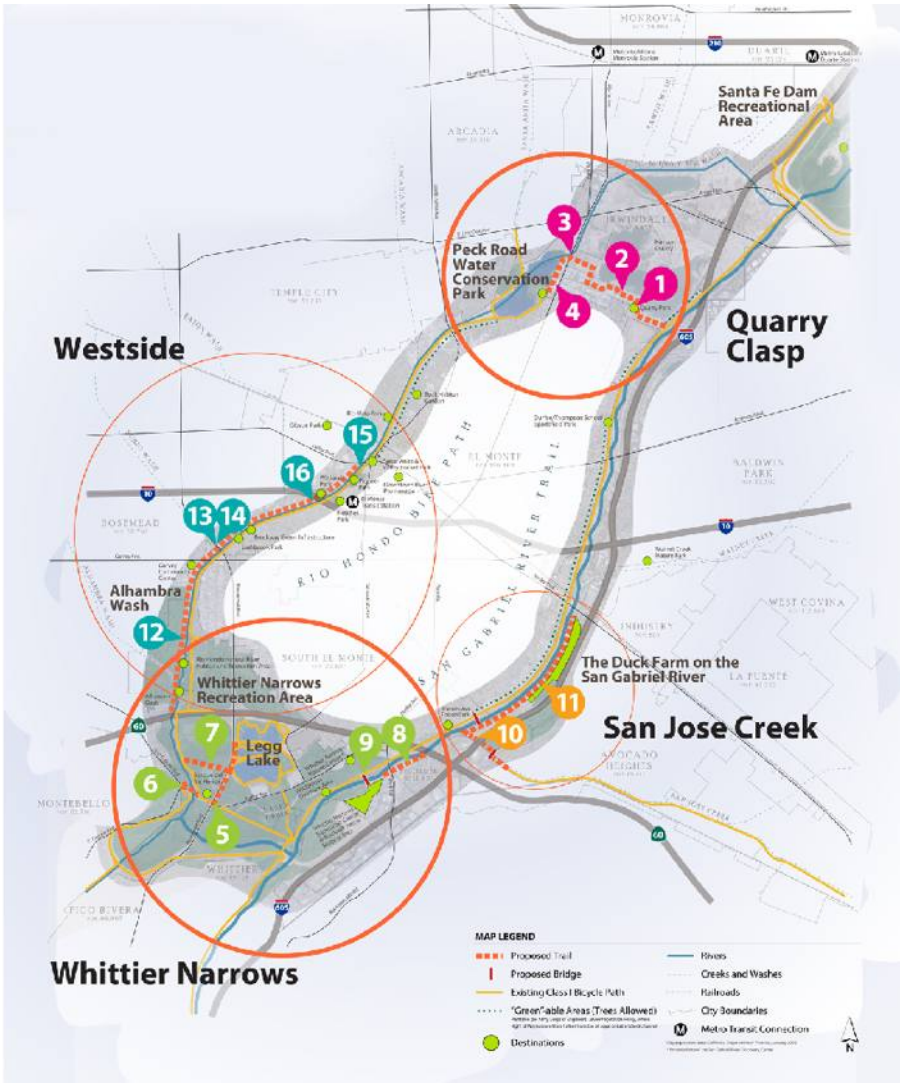
Emerald Necklace Phase 1 Benefit-Cost Analysis

Benefit-Cost Analysis				
Project 16: Interstate 10 Underpass				
Cost				
Construction Cost:		$ 71,676		
Land Acquisition:				
Total Cost:		$ 71,676		
Annual Maintenance:		$ 589		
Discount Rate:		7%		
Total Cost (30 yr. in 2016 $)		$ 73,746		
Improvements				
Linear Path (Bike only):				
Linear (Multi only):		450 ft		
Total Linear Path:		450 ft		
Staging/Park Areas				
Recreational Value:		Low		
Population in 2400 m Buffer				
Assumed Population Density		7,068		
Commute Share		0.63		
Residents in Buffer		51,177		
Existing Commuters		129		
New Commuters		37		
		Low	Mid	High
Total Cyclists		641	8855	13181
Total new Cyclists		223	2601	3853
Annual Benefits				
		Low	Mid	High
Recreation Benefits		$ 676,982	$ 9,355,765	$ 13,926,801
Health Benefits		$ 28,519	$ 332,871	$ 493,170
Mobility Benefits			$ 159,446	
Decreased Auto Use			$ 194	
Multi-Use Health Benefits		$ 114,611		
Multi-Use Recreation Benefits		$ 1,364,005.0		
Total Annual Benefits			$ 1,478,616	
Total Annual Transportation Benefits			N/A**	
Benefit-Cost Ratios				
Total Discounted Benefits (30yrs)			$ 18,348,209	
Benefit-Cost Ratio			**248.80**	
Discounted Benefits Transportation			N/A**	
Benefit-Cost Ratio Transportation				
*Numbers shaded in grey were used for caculation of B-C Ratios				
**There are only recreational benefits availablefor this Project				

APPENDIX A: BENEFIT COST ANALYSIS

SUMMARY

This work utilizes the online model of Benefit-Cost Analysis (BCA) of Bicycle Facilities to perform the necessary calculations (www.bicyclinginfo.org/bikecost). The online BCA Bikeway Model was funded by the Federal Highway Administration and developed by the Pedestrian and Bicycle Information Center. This tool quantifies available benefits utilizing the standards and principles identified by the National Academy of Sciences Transportation Research Board, National Cooperative Highway Research Program Report 552: Guidelines for Analysis of Investments in Bicycle Facilities (2006).



This is the standard benefit-cost analysis methodology for analysis of bicycle facilities which complies with principles outlined in OMB Circular A-94. Project cost is based on the cost analysis contained in each project chapter in this document. Cost and benefits used represent the Net Present Values calculated assuming a 7% real discount rate, which is the standard 7% real discount rate applied per OMB Circular A-94.

This benefit-cost analysis model only considers the benefits for bicycle commuters and adult cyclists. Because the benefits for pedestrians and equestrians resulting from implementation of the Emerald Necklace are substantial, we expanded the model by adding a benefit model for pedestrians that is compatible with the base valuation model in the way it monetizes these additional benefits. This is done using data from the "American Community Survey 2008 to 2012 4-year estimates" showing ratios between bicycle commuters and walking commuters for the Los Angeles Metropolitan area.

Because some of the projects provide multi-purpose trails in addition to existing or future bicycle paths the health and recreational benefits attributed to walking and equestrian users are estimated in addition to the bicycle related benefits. In cases where only pedestrian benefits are created, only those benefits are monetized and used in the analysis.

Project Data

Table 1: Project Capital Cost

Project		Construction Cost	Land Acquisition	Total Cost
		$	$	$
A. THE QUARRY CLASP				
1	Quarry Clasp Park	$ 7,978,832	$ 6,200,000	$ 14,178,832
2	Quarry Clasp Trail and Bike Path	$ 6,718,671	$ 6,000,000	$ 12,718,671
3	Peck Road Signalized Crossing	$ 855,029		$ 855,029
B. WHITTIER NARROWS CONNECTIVITY				
5	Bike Path Rosemead Blvd	$ 2,401,818		$ 2,401,818
6	Bike Path San Gabriel Blvd.	$ 1,211,061		$ 1,211,061
7	SCE Bike Path Rio Hondo to Legg Lake	$ 3,100,486		$ 3,100,486
8	Pellissier Multi-Use Trail	$ 1,626,407		$ 1,626,407
9	Pellissier Bridge	$ 5,742,390		$ 5,742,390
C. SAN JOSE CREEK REGIONAL ACCESS				
10	San Jose Creek Bridge to SGR Trail	$ 10,439,269		$ 10,439,269
11	Duck Farm Multi-Use Trail	$ 127,793		$ 127,793
D. WESTSIDE MULTI-USE TRAIL				
12	Alhambra Wash Multi Use Trail	$ 1,313,087		$ 1,313,087
13	Rosemead Blvd. Access Ramp	$ 1,063,088		$ 1,063,088
14	Rosemead Blvd. Underpass	$ 272,290		$ 272,290
15	Multi-Use Trail to Valley Blvd.	$ 2,258,619		$ 2,258,619
16	Interstate 10 Underpass	$ 71,676		$ 71,676

Table 2: Project Dimensions and Maintenance

Project		Annual Maintenance	Linear Bike	Linear Multi	Total Linear	Park Land	Recreational Value
		$	ft	ft	ft	ac	
A. THE QUARRY CLASP							
1	Quarry Clasp Park	$ 26,408	1300	800	1300	5	Med
2	Quarry Clasp Trail and Bike Path	$ 10,973	4320	4320	4320		Med
3	Peck Road Signalized Crossing	$ 762	300	300	300		Med
B. WHITTIER NARROWS CONNECTIVITY							
5	Bike Path Rosemead Blvd	$ 4,826	1900	1900	1900		Med
6	Bike Path San Gabriel Blvd.	$ 1,477	1200	0	1200		Med
7	SCE Bike Path Rio Hondo to Legg Lake	$ 5,047	4100	0	4100		Med
8	Pellissier Multi-Use Trail	$ 7,370		2000	2000	1	Med
9	Pellissier Bridge	$ 1,372	540	540	540		Med
C. SAN JOSE CREEK REGIONAL ACCESS							
10	San Jose Creek Bridge to SGR Trail	$ 11,177	4400	4400	4400		Med
11	Duck Farm Multi-Use Trail	$ 7,069	0	5400	5400		Low
D. WESTSIDE MULTI-USE TRAIL							
12	Alhambra Wash Multi Use Trail	$ 3,011	0	2300	2300		Low
13	Rosemead Blvd. Access Ramp	$ 589	0	450	450		Low
14	Rosemead Blvd. Underpass	$ 655	0	500	500		Low
15	Multi-Use Trail to Valley Blvd.	$ 10,669	0	8150	8150		Low
16	Interstate 10 Underpass	$ 589	0	450	450		Low

Results

Table 3: Benefit Cost Ratios

Project		30 Yr Discounted Project Cost	30 yr Total Discounted Project Benefits	Benefit-Cost Ratio All Benefits	30 yr Total Discounted Transportation Benefits	Benefit-Cost Ratio Transpotation Benefits
		7%, 2016, $	7%, 2016, $			
A. THE QUARRY CLASP						
1	Quarry Clasp Park	$ 13,554,262	$ 150,795,626.44	11.13	$ 6,602,602.63	0.49
2	Quarry Clasp Trail and Bike Path	$ 12,012,523	$ 191,819,588.99	15.97	$ 8,047,536.21	0.67
3	Peck Road Signalized Crossing	$ 807,836	$ 18,611,407.57	23.04	$ 2,074,208.46	2.57
B. WHITTIER NARROWS CONNECTIVITY						
5	Bike Path Rosemead Blvd	$ 2,300,069	$ 158,945,447.89	69.10	$ 6,949,993.74	3.02
6	Bike Path San Gabriel Blvd.	$ 1,148,784	$ 149,340,501.32	130.00	$ 6,545,682.36	5.70
7	SCE Bike Path Rio Hondo to Legg Lake	$ 2,955,566	$ 189,112,655.93	63.99	$ 8,227,032.99	2.78
8	Pellissier Multi-Use Trail	$ 1,604,575	$ 19,441,867.76	12.12	$ -	0.00
9	Pellissier Bridge	$ 5,382,463	$ 140,306,044.29	26.07	$ 6,164,637.93	1.15
C. SAN JOSE CREEK REGIONAL ACCESS						
10	San Jose Creek Bridge to SGR Trail	$ 9,884,572	$ 193,255,379.59	19.55	$ 8,400,623.06	0.85
11	Duck Farm Multi-Use Trail	$ 200,547	$ 25,077,744.04	125.05	$ -	0.00
D. WESTSIDE MULTI-USE TRAIL						
12	Alhambra Wash Multi Use Trail	$ 1,261,733	$ 19,985,758.51	15.84	$ -	0.00
13	Rosemead Blvd. Access Ramp	$ 1,000,300	$ 16,895,874.99	16.89	$ -	0.00
14	Rosemead Blvd. Underpass	$ 261,987	$ 16,901,751.92	64.51	$ -	0.00
15	Multi-Use Trail to Valley Blvd.	$ 2,233,281	$ 29,619,961.88	13.26	$ -	0.00
16	Interstate 10 Underpass	$ 73,746	$ 18,348,209.32	248.80	$ -	0.00

METHODOLOGY

Data and Model Parameters

The BCA Bikeway Model requires several inputs in order to properly quantify benefits and costs associated with a project. The following are the model inputs and reasoning behind making various determinations required for the model:

Metro Area – Urban Region of Los Angeles
The project is located in the highly urbanized San Gabriel Valley with population densities averaging 7,068 persons per square mile.

Mid-Year of Construction – 2017
The projects will start in 2016 and construction is anticipated to be completed in 2017 which serves as year 1 for cost and benefit calculations.

Facility Type
The majority of projects are Off-Street Bicycle Trails in form of a Class I Bike Trails

Residential Density –7068 persons/square mile
To support the calculation of the B-C-A, it is necessary to determine the population density within three buffer zones surrounding each project. The number of new bicyclists and commuters are then calculated based on standard values that bicyclists and walkers are likely to traverse on average.

In this analysis we are using a constant average population density for a number of reasons. Unfortunately, standard analysis reduces benefits without sizable population density in the immediate surroundings. For example, the Whittier Narrows Recreation area is large enough to contain projects that technically have no residents within the buffer areas that are considered walkable distances. Nevertheless the surrounding populations heavily use the area for recreation and commuting. The attractiveness of the area causes them to walk or bike longer distances, because the distance they travel through the park is an attractor, increasing overall travel distance. The unpopulated area they traverse is essentially “felt” as part of the project benefit and not as a barrier. Substantial benefits would be ignored by using the standard approach.

Projects contained in this work are closing gaps and make improvements to a larger project, the “Emerald Necklace”. Completing gaps will have a “multiplier” effect on the surrounding communities and transportation networks by permitting bicycle commuters safe travel and

effective navigability in the regional context. The positive effects of closing gaps will be "felt" over a much greater distance than only the immediately surrounding area.

Standard procedure penalizes projects that close gaps for commuters through less populated areas. For example, the Quarry Clasp project is closing a gap and creates a cross connection between two regional bike ways. To the north lies a complex of gravel pits that effectively reduces population density to half of the surrounding area. To estimate bicycle users based on immediately surrounding population densities ignores the fact that significant populations on both sides of the gap are eager to traverse this gap to reach workplaces, schools, and recreational facilities on the other side. This essentially stretches the length of travel they are willing to embark on.

For the above reasons, we are assuming constant population density across all projects that are being analyzed as the Emerald Necklace. This is the equivalent of defining the Emerald Necklace as "The Project" to derive user population statistics, while still developing benefit-cost-ratios for each of the sixteen projects. This provides more realistic models to compare the relative benefits of the fifteen projects amongst each other. For future grant applications it may be advisable to provide additional baseline studies that evaluate benefits as improvements over "non-project scenarios"

Commute Share – 0.63

The Los Angeles Bicycle Master Plan shows commutes share between 0.6 and 2.0 in the vicinity of the Whittier Narrows (http://dpw.lacounty.gov/bike/docs/bmp/Appendix%20B.pdf). Due to existing bikeways, ridership, and commuters in the project's vicinity the higher value may not be appropriate, especially for projects that aim to address specific gaps in an already existing system. The result would be that areas with a developed ridership would be favored unintentionally in calculating benefits. The model default rate for Los Angeles of 0.63 was used for all project models.

Project Cost

Project cost is the net present value of the capital cost and the annual cost to operate and maintain the projects for 30 years. The net present values of the total annual benefits for the 30-year life of the project is equally estimated and compared to the project cost. To make sure that values are comparable they are discounted to their real value using a 7% discount rate. This also applies to maintenance expenditures. Both cost and benefits are expressed as the dollar value of the year 2016 (net present value).

Maintenance Cost

Operation costs for bicycle facilities typically include the cost of security or policing the facility. Maintenance includes pavement (sweeping, snow removal, and repair), drainage (cleaning and

repair of storm drains), traffic controls (pavement marking, signs, and traffic signal maintenance), and landscape maintenance. When bicycle facilities are elements of other, larger facilities, the maintenance costs are often subsumed into the cost of the maintenance of the larger facility.

A data source that has been widely used by trail proponents to estimate costs is the Rails to Trails Conservancy breakdown of maintenance costs for the year 2000. The cost items include drainage maintenance, sweeping, trash removal, weed control, mowing, minor repairs, supplies, and fuel. The total annual per mile cost is estimated at $6,500. This is consistent with NCHRP 552: Guidelines for Analysis of Investment in Bicycle Facilities.

Since several elements of the trail system of the Emerald Necklace include multi-benefit trails to be maintained by the Department of Parks and Recreation and some of these areas have parkland attached the maintenance cost has been determined based on published data by the National Recreation and Parks Association 2013 Report indicating an upper quartile operating cost of $4,752 per acre for entities with holdings of more than 3500 acres. This value was used for multi-use facilities and parks. Trail maintenance was calculated assuming that a trail would represent a 24-ft right-of-way resulting in annual maintenance costs of $6,912 per mile. For the cost benefit analysis the total future values of maintenance costs were calculated by using a 7% real discount rate for a 30-year period.

Calculating Demand

To identify the number of existing daily bicycle commuters who will shift to a new facility, the model multiplies the number of residents in each buffer (R) by 0.4, assuming that 80 percent of residents are adults and 50 percent of adults are commuters. It then multiplies this number of commuters in each buffer by the region's bicycle commute share (C).

The model also calculates non-commuting bicyclists because adult commuters represent only a portion of adult bicyclists. The National Household Transportation Survey (NHTS) found that the total adult bicycling rate ranges from the Census commute rate (low value T=C) to a high of T=0.6+3C, and a medium of T=0.4+1.2C (Appendix A of the NCHRP Report 552). This allows the use of available Census commute shares to estimate total adult bicycling rates by multiplying the number of adults in each area to arrive at the total number of daily adult cyclists:

$$\text{Total daily existing adult cyclists} = R \bullet T \bullet 0.8$$

To obtain the number of existing daily child cyclists, the model multiplies the number of residents in each buffer by 0.2 to approximate the number of children, then by 0.05 to estimate the number of children who ride a bicycle on a given day (2001 NHTS shows that approximately 5% of children ride a bicycle on a given day).

Daily child cyclists = R • 0.2 • 0.05

The model multiplies each of the existing cycling groups (commuters, total adults, and children) by the "likelihood multipliers" (L) based on the empirical research that is representative of each buffer and yields an estimated number of induced cyclists:

New commuters = existing commuters • L
New adult cyclists = existing adult cyclists • L
New child cyclists = existing child cyclists • L

Where:
L800m = 0.51
L1600m = 0.44
L2400m = 0.15

Mobility Benefit

Research shows that bicycle commuters are willing to spend more time commuting when bike way facilities are present. For example, they are willing to spend 20.38 minutes more time per trip on an off-street bicycle trail in preference to riding on a regular street (Appendix D of the NCHRP Report 552). Commuters are willing to spend 18.02 minutes (M) on an on-street bicycle lane without parking, and 15.83 minutes for a lane with parking. This results in daily mobility benefits over regular streets that can be monetized.

Assuming an hourly value of time (V) of $12, the per-trip benefits are $4.08, $3.60, and $3.17, respectively. The model multiplies the per-trip benefit for the appropriate facility by the number of daily existing and induced commuters, then doubles it to include trips in both directions resulting in a daily mobility benefit. Multiplying the daily benefit by 47 weeks per year and 5 days per week results in an annual benefit as follows:

Annual mobility benefit = M •V/60 • (existing commuters + new commuters) •47 • 5 • 2

This methodology assumes that no bicycle facility previously existed.

Health Benefit for Cyclists

An annual per-capita cost savings from physical activity of $128 is determined by taking the median value of ten studies (Appendix E of the NCHRP Report 552). The model multiplies $128 by the total number of new bicyclists to arrive at an annual health benefit:

Annual health benefit = total new cyclists • $128

Health Benefits for Pedestrian Users

In addition to the bike related benefits calculated by the standard model, it is evident that a substantial portion of the project provides recreational benefits to walkers and equestrians. This is especially true for the multi-use portions of the project. The American Community Survey Report 2014 shows that the commute share for bicycle commuters in Los Angeles is about 1.0% compared to walking commuters with a 3.7% share. This can roughly be taken as an indicator that for every bicycle trip there are 3.7 walking trips to other destinations such as to social and recreational activities. This is used here to estimate the number of new pedestrian that are to be expected in relation to bicycles. Only numbers for the "Low" level census commute rates (T=C) were used to translate cyclist benefits to pedestrian benefits.

Annual health benefits pedestrians = total new $\text{cyclists}_{(LOW)}$ •3.7• $128

Recreation Benefit for Cyclists

Recreational benefits for B-C-A are net benefits above and beyond the value of the time taken by the recreational activity itself. Studies of outdoor recreational activities generated values of about $40 per day in 2004 dollars. Assuming a typical day of recreation includes 4 hours of activity this would suggest $10/hour of benefits. Assuming that a typical day involves about an hour of total bicycling activity, the model values a day at $10 (D). This is multiplied by the number of new cyclists minus the number of new commuters.

Annual recreation benefit = (New bicyclists – New commuters) • D • 365

Recreation Benefit for Pedestrian Users

In addition to the bike related benefits calculated by the standard model, it is evident that a substantial portion of the project provides recreational benefits to walkers and equestrians. This is especially true for the multi-use portions of the project. The American Community Survey Report 2014 shows that the commuter share for bicycle commuters in Los Angeles is about 1.0%

compared to walking commuters with a 3.7% share. This can be taken as an indicator that for every bicycle trip there are approximately 3.7 walking trips to other destinations such as for social and recreational activities. This is used here to estimate the number of new pedestrians that are to be expected in relation to bicycles. Only numbers for the "Low" level census commute rates (T=C) were used to translate cyclist benefits to pedestrian benefits.

We are assuming that for an average walk of 1384 m the average person would spend about 0.35 hrs. With some preparation time an average trip length would be at least 0.5 hrs. Similar to the bike model we value an hour at $10 (D) with the following calculation:

Recreation benefit for pedestrians = (New bicyclists – New commuters) •3.7•0.5•D•365

This calculation is conservative since it does not take into account that for the purpose of exercising, equestrian activity, walking with family, dog walks, after-school activities, and naturalist activities trip length would likely be longer than 0.5 hrs.

Decreased Auto Use Benefit

The decreased auto use benefits applies to commuter and utilitarian travel where a change to bicycling replaces auto travel reducing congestion and air pollution and creating user cost savings. The model monetizes this as total benefit, per mile, by the number of new commuters, multiplied by the average round trip length (L). Savings per mile (S) are 13 cents in urban areas, 8 cents in suburban areas, and 1 cent in small towns and rural areas based on empirical studies adopted by NHTS. The model assumes bicycle commuters work 5 days a week 47 weeks a year.

Annual decreased auto use benefit = new commuters • L • S • 47 • 5

Benefit-Cost Analysis Project 1: Quarry Clasp Park			
Cost			
Construction Cost:	$ 7,978,832		
Land Acquisition:	$ 6,200,000		
Total Cost:	$ 14,178,832		
Annual Maintenance:	$ 26,408		
Discount Rate:	7%		
Total Cost (30 yr. in 2016 $)	$ 13,554,262		
Improvements			
Linear Path (Bike only):	1,300 ft		
Linear (Multi only):	800 ft		
Total Linear Path:	1,300 ft		
Staging/Park Areas	5 acres		
Recreational Value:	Medium		
Population in 2400 m Buffer			
Assumed Population Density	7,068		
Commute Share	0.63		
Residents in Buffer	54,570		
Existing Commuters	138		
New Commuters	40		
	Low	Mid	High
Total Cyclists	683	9442	14055
Total new Cyclists	242	2819	4176
Annual Benefits			
	Low	Mid	High
Recreation Benefits	$ 733,829	$ 10,141,381	$ 15,096,253
Health Benefits	$ 30,914	$ 360,823	$ 534,583
Mobility Benefits		$ 170,649	
Decreased Auto Use		$ 608	
Multi-Use Health Benefits	$ 114,611		
Multi-Use Recreation Benefits	$ 1,364,005.0		
Total Annual Benefits		$ 12,152,077	
Total Annual Transportation Benefits		$ 532,080	
Benefit-Cost Ratios			
Total Discounted Benefits (30yrs)		$ 150,795,626	
Benefit-Cost Ratio		**11.13**	
Discounted Benefits Transportation		$ 6,602,603	
Benefit-Cost Ratio Transportation		**0.49**	
*Numbers shaded in grey were used for caculation of B-C Ratios			

Benefit-Cost Analysis Project 2: Quarry Clasp Trail and Bike Path			
Cost			
Construction Cost:	$ 6,718,671		
Land Acquisition:	$ 6,000,000		
Total Cost:	$ 12,718,671		
Annual Maintenance:	$ 10,973		
Discount Rate:	7%		
Total Cost (30 yr. in 2016 $)	$ 12,012,523		
Improvements			
Linear Path (Bike only):	4,320 ft		
Linear (Multi only):	4,320 ft		
Total Linear Path:	4,320 ft		
Staging/Park Areas			
Recreational Value:	Medium		
Population in 2400 m Buffer			
Assumed Population Density	7,068		
Commute Share	0.63		
Residents in Buffer	66,634		
Existing Commuters	168		
New Commuters	52		
	Low	Mid	High
Total Cyclists	834	11529	17162
Total new Cyclists	308	3595	5327
Annual Benefits			
	Low	Mid	High
Recreation Benefits	$ 935,977	$ 12,935,020	$ 19,254,808
Health Benefits	$ 39,430	$ 460,218	$ 681,844
Mobility Benefits		$ 185,723	
Decreased Auto Use		$ 2,581	
Multi-Use Health Benefits	$ 145,869		
Multi-Use Recreation Benefit	$ 1,728,640.0		
Total Annual Benefits		$ 15,458,051	
Total Annual Transportation Benefits		$ 648,522	
Benefit-Cost Ratios			
Total Discounted Benefits (30yrs)		$ 191,819,589	
Benefit-Cost Ratio		**15.97**	
Discounted Benefits Transportation		$ 8,047,536	
Benefit-Cost Ratio Transportation		**0.67**	
*Numbers shaded in grey were used for caculation of B-C Ratios			

Benefit-Cost Analysis
Project 3: Peck Road Signalized Crossing

Cost			
Construction Cost:	$ 855,029		
Land Acquisition:			
Total Cost:	$ 855,029		
Annual Maintenance:	$ 762		
Discount Rate:	7%		
Total Cost (30 yr. in 2016 $)	$ 807,836		
Improvements			
Linear Path (Bike only):	300 ft		
Linear (Multi only):	300 ft		
Total Linear Path:	300 ft		
Staging/Park Areas			
Recreational Value:	Low		
Population in 2400 m Buffer			
Assumed Population Density	7,068		
Commute Share	0.63		
Residents in Buffer	50,574		
Existing Commuters	127		
New Commuters	37		
	Low	Mid	High
Total Cyclists	633	8751	13026
Total new Cyclists	219	2562	3795
Annual Benefits			
	Low	Mid	High
Recreation Benefits	$ 666,886	$ 9,216,234	$ 13,719,099
Health Benefits	$ 28,094	$ 327,907	$ 485,815
Mobility Benefits		$ 138,932	
Decreased Auto Use		$ 127	
Multi-Use Health Benefits	$ 103,718		
Multi-Use Recreation Benefits	$ 1,228,955.0		
Total Annual Benefits		$ 1,499,826	
Total Annual Transportation Benefits		$ 167,153	
Benefit-Cost Ratios			
Total Discounted Benefits (30yrs)		$ 18,611,408	
Benefit-Cost Ratio		**23.04**	
Discounted Benefits Transportation		$ 2,074,208	
Benefit-Cost Ratio Transportation		**2.57**	

*Numbers shaded in grey were used for caculation of B-C Ratios

Benefit-Cost Analysis Project 5: Bike Path Rosemead Blvd			
Cost			
Construction Cost:	$ 2,401,818		
Land Acquisition:			
Total Cost:	$ 2,401,818		
Annual Maintenance:	$ 4,826		
Discount Rate:	7%		
Total Cost (30 yr. in 2016 $)	$ 2,300,069		
Improvements			
Linear Path (Bike only):	1,900 ft		
Linear (Multi only):	1,900 ft		
Total Linear Path:	1,900 ft		
Staging/Park Areas			
Recreational Value:	Medium		
Population in 2400 m Buffer			
Assumed Population Density	7,068		
Commute Share	0.63		
Residents in Buffer	56,967		
Existing Commuters	144		
New Commuters	43		
	Low	Mid	High
Total Cyclists	713	9857	14672
Total new Cyclists	255	2973	4405
Annual Benefits			
	Low	Mid	High
Recreation Benefits	$ 773,995	$ 10,696,469	$ 15,922,546
Health Benefits	$ 32,606	$ 380,572	$ 563,843
Mobility Benefits		$ 178,565	
Decreased Auto Use		$ 938	
Multi-Use Health Benefits	$ 120,768		
Multi-Use Recreation Benefits	$ 1,431,530.0		
Total Annual Benefits		$ 12,808,842	
Total Annual Transportation Benefits		$ 560,075	
Benefit-Cost Ratios			
Total Discounted Benefits (30yrs)		$ 158,945,448	
Benefit-Cost Ratio		**69.10**	
Discounted Benefits Transportation		$ 6,949,994	
Benefit-Cost Ratio Transportation		**3.02**	
*Numbers shaded in grey were used for caculation of B-C Ratios			

Benefit-Cost Analysis Project 6: Bike Path San Gabriel Blvd.			
Cost			
Construction Cost:	$ 1,211,061		
Land Acquisition:			
Total Cost:	$ 1,211,061		
Annual Maintenance:	$ 1,477		
Discount Rate:	7%		
Total Cost (30 yr. in 2016 $)	$ 1,148,784		
Improvements			
Linear Path (Bike only):	1,200 ft		
Linear (Multi only):			
Total Linear Path:	1,200 ft		
Staging/Park Areas			
Recreational Value:	Medium		
Population in 2400 m Buffer			
Assumed Population Density	7,068		
Commute Share	0.63		
Residents in Buffer	54,177		
Existing Commuters	137		
New Commuters	40		
	Low	Mid	High
Total Cyclists	678	9374	13954
Total new Cyclists	239	2794	4139
Annual Benefits			
	Low	Mid	High
Recreation Benefits	$ 727,245	$ 10,050,383	$ 14,960,795
Health Benefits	$ 30,637	$ 357,585	$ 529,786
Mobility Benefits		$ 169,351	
Decreased Auto Use		$ 557	
Multi-Use Health Benefits	$ 113,190		
Multi-Use Recreation Benefits	$ 1,343,747.5		
Total Annual Benefits		$ 12,034,814	
Total Annual Transportation Benefits		$ 527,493	
Benefit-Cost Ratios			
Total Discounted Benefits (30yrs)		$ 149,340,501	
Benefit-Cost Ratio		**130.00**	
Discounted Benefits Transportation		$ 6,545,682	
Benefit-Cost Ratio Transportation		**5.70**	
*Numbers shaded in grey were used for caculation of B-C Ratios			

Benefit-Cost Analysis
Project 7: SCE Bike Path Rio Hondo to Legg Lake

Cost			
Construction Cost:	$ 3,100,486		
Land Acquisition:			
Total Cost:	$ 3,100,486		
Annual Maintenance:	$ 5,047		
Discount Rate:	7%		
Total Cost (30 yr. in 2016 $)	$ 2,955,566		
Improvements			
Linear Path (Bike only):	4,100 ft		
Linear (Multi only):			
Total Linear Path:	4,100 ft		
Staging/Park Areas			
Recreational Value:	Medium		
Population in 2400 m Buffer			
Assumed Population Density	7,068		
Commute Share	0.63		
Residents in Buffer	65,756		
Existing Commuters	166		
New Commuters	51		
	Low	Mid	High
Total Cyclists	823	11377	16936
Total new Cyclists	303	3539	5243
Annual Benefits			
	Low	Mid	High
Recreation Benefits	$ 921,271	$ 12,731,791	$ 18,952,285
Health Benefits	$ 38,810	$ 452,988	$ 671,131
Mobility Benefits		$ 207,588	
Decreased Auto Use		$ 2,411	
Multi-Use Health Benefits	$ 143,501		
Multi-Use Recreation Benefits	$ 1,701,630.0		
Total Annual Benefits		$ 15,239,909	
Total Annual Transportation Benefits		$ 662,987	
Benefit-Cost Ratios			
Total Discounted Benefits (30yrs)		$ 189,112,656	
Benefit-Cost Ratio		**63.99**	
Discounted Benefits Transportation		$ 8,227,033	
Benefit-Cost Ratio Transportation		**2.78**	
*Numbers shaded in grey were used for caculation of B-C Ratios			

Benefit-Cost Analysis Project 8: Pellissier Multi-Use Trail			
Cost			
Construction Cost:	$ 1,626,407		
Land Acquisition:			
Total Cost:	$ 1,626,407		
Annual Maintenance:	$ 7,370		
Discount Rate:	7%		
Total Cost (30 yr. in 2016 $)	$ 1,604,575		
Improvements			
Linear Path (Bike only):			
Linear (Multi only):	2,000 ft		
Total Linear Path:	2,000 ft		
Staging/Park Areas			
Recreational Value:	Medium		
Population in 2400 m Buffer			
Assumed Population Density	7,068		
Commute Share	0.63		
Residents in Buffer	57,373		
Existing Commuters	145		
New Commuters	43		
	Low	Mid	High
Total Cyclists	718	9927	14777
Total new Cyclists	257	2999	4444
Annual Benefits			
	Low	Mid	High
Recreation Benefits	$ 780,800	$ 10,790,500	$ 16,062,519
Health Benefits	$ 32,893	$ 383,918	$ 568,800
Mobility Benefits		$ 179,906	
Decreased Auto Use		$ 997	
Multi-Use Health Benefits	$ 121,715		
Multi-Use Recreation Benefits	$ 1,445,035.0		
Total Annual Benefits		$ 1,566,750	
Total Annual Transportation Benefits		N/A**	
Benefit-Cost Ratios			
Total Discounted Benefits (30yrs)		$ 19,441,868	
Benefit-Cost Ratio		**12.12**	
Discounted Benefits Transportation			
Benefit-Cost Ratio Transportation		N/A**	
*Numbers shaded in grey were used for caculation of B-C Ratios			
**There are only recreational benefits availablefor this Project			

Benefit-Cost Analysis Project 9: Pellessier Bridge			
Cost			
Construction Cost:	$ 5,742,390		
Land Acquisition:			
Total Cost:	$ 5,742,390		
Annual Maintenance:	$ 1,372		
Discount Rate:	7%		
Total Cost (30 yr. in 2016 $)	$ 5,382,463		
Improvements			
Linear Path (Bike only):	540 ft		
Linear (Multi only):	540 ft		
Total Linear Path:	540 ft		
Staging/Park Areas			
Recreational Value:	Medium		
Population in 2400 m Buffer			
Assumed Population Density	7,068		
Commute Share	0.63		
Residents in Buffer	51,544		
Existing Commuters	130		
New Commuters	38		
	Low	Mid	High
Total Cyclists	645	8918	13276
Total new Cyclists	225	2624	3888
Annual Benefits			
	Low	Mid	High
Recreation Benefits	$ 683,128	$ 9,440,696	$ 14,053,228
Health Benefits	$ 28,778	$ 335,893	$ 497,647
Mobility Benefits		$ 160,657	
Decreased Auto Use		$ 236	
Multi-Use Health Benefits	$ 106,560		
Multi-Use Recreation Benefits	$ 1,262,717.5		
Total Annual Benefits		$ 11,306,760	
Total Annual Transportation Benefits		$ 496,786	
Benefit-Cost Ratios			
Total Discounted Benefits (30yrs)		$ 140,306,044	
Benefit-Cost Ratio		**26.07**	
Discounted Benefits Transportation		$ 6,164,638	
Benefit-Cost Ratio Transportation		**1.15**	
*Numbers shaded in grey were used for caculation of B-C Ratios			

Benefit-Cost Analysis
Project 10: San Jose Creek Bridge to SGR Trail

Cost			
Construction Cost:	$ 10,439,269		
Land Acquisition:			
Total Cost:	$ 10,439,269		
Annual Maintenance:	$ 11,177		
Discount Rate:	7%		
Total Cost (30 yr. in 2016 $)	$ 9,884,572		
Improvements			
Linear Path (Bike only):	4,400 ft		
Linear (Multi only):	4,400 ft		
Total Linear Path:	4,400 ft		
Staging/Park Areas			
Recreational Value:	Medium		
Population in 2400 m Buffer			
Assumed Population Density	7,068		
Commute Share	0.63		
Residents in Buffer	66,948		
Existing Commuters	169		
New Commuters	52		
	Low	Mid	High
Total Cyclists	838	11584	17243
Total new Cyclists	310	3616	5357
Annual Benefits			
	Low	Mid	High
Recreation Benefits	$ 941,245	$ 13,007,819	$ 19,363,174
Health Benefits	$ 39,652	$ 462,808	$ 685,681
Mobility Benefits		$ 211,525	
Decreased Auto Use		$ 2,643	
Multi-Use Health Benefits	$ 146,816		
Multi-Use Recreation Benefits	$ 1,742,145.0		
Total Annual Benefits		$ 15,573,756	
Total Annual Transportation Benefits		$ 676,976	
Benefit-Cost Ratios			
Total Discounted Benefits (30yrs)		$ 193,255,380	
Benefit-Cost Ratio		**19.55**	
Discounted Benefits Transportation		$ 8,400,623	
Benefit-Cost Ratio Transportation		**0.85**	
*Numbers shaded in grey were used for caculation of B-C Ratios			

Benefit-Cost Analysis Project 11: Duck Farm Multi-Use Trail				
Cost				
Construction Cost:		$ 127,793		
Land Acquisition:				
Total Cost:		$ 127,793		
Annual Maintenance:		$ 7,069		
Discount Rate:		7%		
Total Cost (30 yr. in 2016 $)		$ 200,547		
Improvements				
Linear Path (Bike only):				
Linear (Multi only):		5,400 ft		
Total Linear Path:		5,400 ft		
Staging/Park Areas				
Recreational Value:		Low		
Population in 2400 m Buffer				
Assumed Population Density		7,068		
Commute Share		0.63		
Residents in Buffer		70,943		
Existing Commuters		179		
New Commuters		56		
		Low	Mid	High
Total Cyclists		888	12275	18272
Total new Cyclists		332	3873	5738
Annual Benefits				
		Low	Mid	High
Recreation Benefits		$ 1,008,188	$ 13,932,965	$ 20,740,328
Health Benefits		$ 42,472	$ 495,724	$ 734,448
Mobility Benefits			$ 224,717	
Decreased Auto Use			$ 3,475	
Multi-Use Health Benefits		$ 157,235		
Multi-Use Recreation Benefits		$ 1,863,690.0		
Total Annual Benefits			$ 2,020,925	
Total Annual Transportation Benefits			N/A**	
Benefit-Cost Ratios				
Total Discounted Benefits (30yrs)			$ 25,077,744	
Benefit-Cost Ratio			**125.05**	
Discounted Benefits Transportation			N/A**	
Benefit-Cost Ratio Transportation				
*Numbers shaded in grey were used for caculation of B-C Ratios				
**There are only recreational benefits availablefor this Project				

Benefit-Cost Analysis
Project 12: Alhambra Wash Multi Use Trail

Cost			
Construction Cost:	$ 1,313,087		
Land Acquisition:			
Total Cost:	$ 1,313,087		
Annual Maintenance:	$ 3,011		
Discount Rate:	7%		
Total Cost (30 yr. in 2016 $)	$ 1,261,733		
Improvements			
Linear Path (Bike only):			
Linear (Multi only):	2,300 ft		
Total Linear Path:	2,300 ft		
Staging/Park Areas			
Recreational Value:	Low		
Population in 2400 m Buffer			
Assumed Population Density	7,068		
Commute Share	0.63		
Residents in Buffer	58,565		
Existing Commuters	148		
New Commuters	44		
	Low	Mid	High
Total Cyclists	733	10133	15084
Total new Cyclists	264	3076	4557
Annual Benefits			
	Low	Mid	High
Recreation Benefits	$ 800,773	$ 11,066,528	$ 16,473,407
Health Benefits	$ 33,734	$ 393,739	$ 583,350
Mobility Benefits		$ 183,842	
Decreased Auto Use		$ 1,175	
Multi-Use Health Benefits	$ 125,030		
Multi-Use Recreation Benefits	$ 1,485,550.0		
Total Annual Benefits		$ 1,610,580	
Total Annual Transportation Benefits		N/A**	
Benefit-Cost Ratios			
Total Discounted Benefits (30yrs)		$ 19,985,759	
Benefit-Cost Ratio		**15.84**	
Discounted Benefits Transportation		N/A**	
Benefit-Cost Ratio Transportation			
*Numbers shaded in grey were used for caculation of B-C Ratios			
**There are only recreational benefits available for this Project			

Benefit-Cost Analysis Project 13: Rosemead Blvd. Access Ramp				
Cost				
Construction Cost:		$ 1,063,088		
Land Acquisition:				
Total Cost:		$ 1,063,088		
Annual Maintenance:		$ 589		
Discount Rate:		7%		
Total Cost (30 yr. in 2016 $)		$ 1,000,300		
Improvements				
Linear Path (Bike only):				
Linear (Multi only):		450 ft		
Total Linear Path:		450 ft		
Staging/Park Areas				
Recreational Value:		Low		
Population in 2400 m Buffer				
Assumed Population Density		7,068		
Commute Share		0.63		
Residents in Buffer		51,177		
Existing Commuters		129		
New Commuters		37		
		Low	Mid	High
Total Cyclists		641	8855	13181
Total new Cyclists		223	2601	3853
Annual Benefits				
		Low	Mid	High
Recreation Benefits		$ 676,982	$ 9,355,765	$ 13,926,801
Health Benefits		$ 28,519	$ 332,871	$ 493,170
Mobility Benefits			$ 159,446	
Decreased Auto Use			$ 194	
Multi-Use Health Benefits		$ 105,613		
Multi-Use Recreation Benefits		$ 1,255,965.0		
Total Annual Benefits			$ 1,361,578	
Total Annual Transportation Benefits			N/A**	
Benefit-Cost Ratios				
Total Discounted Benefits (30yrs)			$ 16,895,875	
Benefit-Cost Ratio			**16.89**	
Discounted Benefits Transportation			N/A**	
Benefit-Cost Ratio Transportation				
*Numbers shaded in grey were used for caculation of B-C Ratios				
**There are only recreational benefits availablefor this Project				

Benefit-Cost Analysis
Project 14: Rosemead Blvd. Underpass

Cost			
Construction Cost:	$ 272,290		
Land Acquisition:			
Total Cost:	$ 272,290		
Annual Maintenance:	$ 655		
Discount Rate:	7%		
Total Cost (30 yr. in 2016 $)	$ 261,987		
Improvements			
Linear Path (Bike only):			
Linear (Multi only):	500 ft		
Total Linear Path:	500 ft		
Staging/Park Areas			
Recreational Value:	Low		
Population in 2400 m Buffer			
Assumed Population Density	7,068		
Commute Share	0.63		
Residents in Buffer	51,373		
Existing Commuters	129		
New Commuters	38		
	Low	Mid	High
Total Cyclists	643	8889	13232
Total new Cyclists	224	2613	3872
Annual Benefits			
	Low	Mid	High
Recreation Benefits	$ 680,275	$ 9,401,264	$ 13,994,530
Health Benefits	$ 28,658	$ 334,490	$ 495,569
Mobility Benefits		$ 160,095	
Decreased Auto Use		$ 216	
Multi-Use Health Benefits	$ 106,086		
Multi-Use Recreation Benefits	$ 1,255,965.0		
Total Annual Benefits		$ 1,362,051	
Total Annual Transportation Benefits		N/A**	
Benefit-Cost Ratios			
Total Discounted Benefits (30yrs)		$ 16,901,752	
Benefit-Cost Ratio		**64.51**	
Discounted Benefits Transportation		N/A**	
Benefit-Cost Ratio Transportation			

*Numbers shaded in grey were used for caculation of B-C Ratios

**There are only recreational benefits availablefor this Project

Benefit-Cost Analysis Project 15: Multi-Use Trail to Valley Blvd.			
Cost			
Construction Cost:	$ 2,258,619		
Land Acquisition:			
Total Cost:	$ 2,258,619		
Annual Maintenance:	$ 10,669		
Discount Rate:	7%		
Total Cost (30 yr. in 2016 $)	$ 2,233,281		
Improvements			
Linear Path (Bike only):			
Linear (Multi only):	8,150 ft		
Total Linear Path:	8,150 ft		
Staging/Park Areas			
Recreational Value:	Low		
Population in 2400 m Buffer			
Assumed Population Density	7,068		
Commute Share	0.63		
Residents in Buffer	81,920		
Existing Commuters	206		
New Commuters	66		
Total Cyclists	1026	14174	21099
Total new Cyclists	392	4579	6785
Annual Benefits			
Recreation Benefits	$ 1,192,118	$ 16,474,843	$ 24,524,116
Health Benefits	$ 50,220	$ 586,163	$ 868,438
Mobility Benefits		$ 260,964	
Decreased Auto Use		$ 6,200	
Multi-Use Health Benefits	$ 185,651		
Multi-Use Recreation Benefits	$ 2,201,315.0		
Total Annual Benefits		$ 2,386,966	
Total Annual Transportation Benefits		N/A**	
Benefit-Cost Ratios			
Total Discounted Benefits (30yrs)		$ 29,619,962	
Benefit-Cost Ratio		**13.26**	
Discounted Benefits Transportation		N/A**	
Benefit-Cost Ratio Transportation			
*Numbers shaded in grey were used for caculation of B-C Ratios			
**There are only recreational benefits availablefor this Project			

Benefit-Cost Analysis				
Project 16: Interstate 10 Underpass				
Cost				
Construction Cost:		$ 71,676		
Land Acquisition:				
Total Cost:		$ 71,676		
Annual Maintenance:		$ 589		
Discount Rate:		7%		
Total Cost (30 yr. in 2016 $)		$ 73,746		
Improvements				
Linear Path (Bike only):				
Linear (Multi only):		450 ft		
Total Linear Path:		450 ft		
Staging/Park Areas				
Recreational Value:		Low		
Population in 2400 m Buffer				
Assumed Population Density		7,068		
Commute Share		0.63		
Residents in Buffer		51,177		
Existing Commuters		129		
New Commuters		37		
		Low	Mid	High
Total Cyclists		641	8855	13181
Total new Cyclists		223	2601	3853
Annual Benefits				
		Low	Mid	High
Recreation Benefits		$ 676,982	$ 9,355,765	$ 13,926,801
Health Benefits		$ 28,519	$ 332,871	$ 493,170
Mobility Benefits			$ 159,446	
Decreased Auto Use			$ 194	
Multi-Use Health Benefits		$ 114,611		
Multi-Use Recreation Benefits		$ 1,364,005.0		
Total Annual Benefits			$ 1,478,616	
Total Annual Transportation Benefits			N/A**	
Benefit-Cost Ratios				
Total Discounted Benefits (30yrs)			$ 18,348,209	
Benefit-Cost Ratio			**248.80**	
Discounted Benefits Transportation			N/A**	
Benefit-Cost Ratio Transportation				
*Numbers shaded in grey were used for caculation of B-C Ratios				
**There are only recreational benefits availablefor this Project				

References

1. The Los Angeles Bicycle Master Plan: (http://dpw.lacounty.gov/bike/docs/bmp/Appendix%20B.pdf).

2. National Academy of Sciences Transportation Research Board, National Cooperative Highway Research Program Report 552: Guidelines for Analysis of Investments in Bicycle Facilities (2006).

3. Translating Demand and Benefits Research into Guidelines. Appendix to "National Cooperative Highway Research Program Report 552"

4. Guidelines and Discount Rates for Benefit-Cost Analysis of Federal Programs (http://www.whitehouse.gov/omb/circulars_a094).

5. Modes Less Traveled—Bicycling and Walking to Work in the United States: 2008–2012 https://www.census.gov/prod/2014pubs/acs-25.pdf American Community Survey Reports By Brian McKenzie Issued May 2014, ACS-2
U.S. Department of Commerce, The American Community Survey Report 2014

6. University of North Carolina Highway Safety Research Center: Costs Demand Benefits Tool (www.bicyclinginfo.org/bikecost)

7. National Recreation and Parks Association 2013 Report: https://www.nrpa.org/uploadedFiles/PageBuilder_Proragis/Content/common_elelments/PRORAGIS-national-database-report-2013-NRPA.pdf

APPENDIX B:

MITIGATION MONITORING AND REPORTING PROGRAM

Emerald Necklace Implementation Plan Phase I

Final Program Environmental Impact Report

January 2017

State Clearinghouse Number 2013031056

EMERALD NECKLACE

IMPLEMENTATION PLAN – PHASE I

FINAL

PROGRAM ENVIRONMENTAL IMPACT REPORT

JANUARY 2017

State Clearinghouse Number 2013031056

Prepared for:

Watershed Conservation Authority
100 North Old San Gabriel Canyon Road
Azusa, California 91702

Prepared by:

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SECTION 5.0
MITIGATION MONITORING AND REPORTING PROGRAM

In accordance with CEQA, a Program Environmental Impact Report (PEIR) that identified adverse impacts related to the construction and operation of the Emerald Necklace Implementation Plan – Phase I was prepared. The PEIR identified mitigation measures that would reduce or eliminate these impacts.

Section 21081.6 of the Public Resources Code and Sections 15091(d) and 15097 of the State CEQA Guidelines require public agencies to adopt a reporting and monitoring program for changes to the project which it has adopted or made a condition of project approval in order to mitigate or avoid significant effects on the environment. A Mitigation Monitoring and Reporting Program (MMRP) is required for the Proposed Project, because the PEIR identified potentially significant adverse impacts related to implementation of the Proposed Project, and mitigation measures have been identified to mitigate these impacts. Adoption of the MMRP will occur along with approval of the Proposed Project.

5.1 PURPOSE OF THE MITIGATION MONITORING AND REPORTING PROGRAM

This MMRP (Table 5-1) has been prepared to ensure that all required mitigation measures are implemented and completed according to schedule and maintained in a satisfactory manner during the construction and operation of the Proposed Project, as required. The MMRP may be modified by the WCA during project implementation, as necessary, in response to changing conditions or other project refinements. The MMRP table has been prepared to assist the responsible parties in implementing the MMRP. This table identifies the category of significant environmental impact(s), individual mitigation measures, monitoring and mitigation timing, responsible person/agency for implementing the measure, monitoring and reporting procedure, and notation space to confirm implementation of the mitigation measures. The numbering of the mitigation measures follows the numbering sequence in the PEIR.

5.2 ROLES AND RESPONSIBILITIES

The WCA, as Lead Agency, is responsible for oversight of compliance of the mitigation measures in the MMRP.

5.3 MITIGATION MONITORING AND REPORTING PROGRAM

The column categories identified in the MMRP table (Table 5-1) are described below.

- **Mitigation Measure** – This column lists the mitigation measures by number.

- **Responsible for Implementation** – This column identifies the entity responsible for complying with the requirements of the mitigation measure, and provides space for verification initials and date.

- **Timing of Implementation** – This column lists the timing of each activity, and the frequency/schedule of monitoring for each activity.

- **Monitoring Agency** – This column lists any agencies with which the Lead Agency may coordinate for implementation of the mitigation measure.

- **Date Completed** – This column is to be dated and initialed by the Lead Agency representative once the mitigation measure has been completed.

5.4 MITIGATION MEASURE MATRIX

Table 5-2 lists each mitigation measure and what project it applies to.

TABLE 5-1
MITIGATION MONITORING AND REPORTING PROGRAM
EMERALD NECKLACE IMPLEMENTATION PLAN – PHASE I

MITIGATION MEASURES	RESPONSIBLE FOR IMPLEMENTATION	TIMING OF IMPLEMENTATION	MONITORING AGENCY	DATE COMPLETED
AESTHETICS				
A-1: Project structures shall be designed to reduce visual contrast with the project's surroundings by repeating forms, colors, lines and textures of the project's location. This can be achieved by using materials and color schemes that blend with the natural landscape and vegetation.	• Watershed Conservation Authority (WCA)	During the design phase of each individual project.	• Watershed Conservation Authority (WCA)	Initials Date
BIOLOGICAL RESOURCES				
B-1: Conduct Focused Rare Plant Surveys. *Nevin's Barberry* Prior to ground disturbing construction activities (e.g. grading, vegetation removal) for Projects 7, 9, 10, and 12 a focused rare plant survey for Nevin's Barberry shall be conducted. Because this plant is a shrub species that is obvious at any time of the year, the survey may be conducted during any season. *Brand's Phacelia* Prior to ground disturbing construction activities (e.g. grading, vegetation removal) for Projects 2, 7, 8, 9, 10, 11, and 12 a focused rare plant survey for Brand's phacelia shall be conducted. The survey shall take place during the blooming period for Brand's phacelia (March through June). Biologists will use a nearby population as a reference, if feasible, to verify that the target rare plant is blooming at the time of the survey. *Additional Rare Plant Species* During surveys for the aforementioned plant species, prior to	• Watershed Conservation Authority (WCA) • Qualified Plant Ecologist/Biologist	Preconstruction surveys shall be conducted prior to issuance of grading permits for each individual project.	• Watershed Conservation Authority (WCA) • California Department of Fish and Wildlife (CDFW) • United States Fish and Wildlife Service (USFWS)	Initials Date

MITIGATION MEASURES	RESPONSIBLE FOR IMPLEMENTATION	TIMING OF IMPLEMENTATION	MONITORING AGENCY	DATE COMPLETED
ground disturbing construction activities (e.g. grading, vegetation removal) for Projects 2, 7, 8, 9, 10, 11, and 12, biologists shall also seek and identify plant species that are listed as California Species of Special Concern or listed as CNPS List 1A, 1B, or 2. If sensitive plant species are not found during the surveys, then no further mitigation is required. In the event a listed plant is discovered onsite, the location and numbers of the species shall be recorded by a qualified biologist. The California Department of Fish and Wildlife (CDFW), United States Fish and Wildlife Service (USFWS) and Watershed Conservation Authority (WCA) shall be formally notified and consulted regarding the presence of either the federal and/or state listed or candidate species onsite. If the plant can be avoided by construction, a Preservation and Management Plan for the species found will be prepared and shall include, but not be limited to, the following: 1) Provision of protective fencing or buffers between development and any listed plant that may be found onsite as required by CDFW or USFWS. This buffer zone shall be designated with appropriate fencing to exclude construction vehicles and public access, but not wildlife access; 2) The size of the buffer depends upon the use of the immediately adjacent lands, and includes consideration of the plant's ecological requirements (e.g., sunlight, moisture, shade tolerance, edaphic physical and chemical characteristics) that are identified by a qualified plant ecologist and/or botanist. At minimum, the buffer shall be at least ten feet and demarcated by fencing that is installed with the assistance of a qualified plant ecologist. A smaller buffer may be established, provided there are adequate measures in				

MITIGATION MEASURES	RESPONSIBLE FOR IMPLEMENTATION	TIMING OF IMPLEMENTATION	MONITORING AGENCY	DATE COMPLETED
place to avoid the take of the species, with the approval of the USFWS and/or CDFW; 3) Stormwater runoff, irrigation runoff, and other drainage from developed areas shall not pass through areas populated by the listed species; 4) Listed species areas shall not be artificially shaded by structures or landscaping within the adjacent development areas; 5) Pesticide use shall not be permitted within listed plants areas; 6) The WCA will be responsible for monitoring the listed plant areas during construction and after project completion to ensure avoidance. If the plant cannot be avoided by construction, the CDFW and/or USFWS will be consulted. The following steps will be needed: 1) For direct impacts to the federal-listed and state-listed Nevin's barberry, the CDFW will be consulted regarding the potential need for a permit under the CESA and the USFWS will be consulted for the potential need for a permit under the ESA. Mitigation for the impact will be developed through this process and could include payment of in-lieu fee, preservation of another population of the plant, transplantation, or creation of a preserve. 2) For direct impacts to plants that are candidate species for listing (Brand's phacelia), the USFWS will be consulted for the potential need for a permit under the ESA. Mitigation for the impact will be developed through this process and could include payment of in-				

MITIGATION MEASURES	RESPONSIBLE FOR IMPLEMENTATION	TIMING OF IMPLEMENTATION	MONITORING AGENCY	DATE COMPLETED
lieu fee, preservation of another population of the plant, transplantation, or creation of a preserve.				
B-2: Conduct nesting bird surveys to ensure that there would be not significant impacts to nesting birds and no violation of the Migratory Bird Treaty Act. If activities with the potential to destroy nests or cause birds to abandon nests are scheduled to occur during the bird breeding season (February 1 – August 31), a pre-construction nesting bird survey shall be conducted by a qualified biologist within the footprint for all Projects and within a buffer of 500 feet of the Project limits. A qualified biologist is one having at least one year of nesting bird survey experience. The survey area shall include all potential bird nesting areas, including grasslands, scrub habitat, woodlands, and isolated trees that are within 500 feet of ground disturbance and vegetation clearing activities. The survey shall be conducted within the nesting season and no more than 30 days prior to commencement of ground disturbance activities. If active bird nests are found, the qualified biologist will recommend measures to avoid impacts to the nest while it is active. At a minimum the nest itself will be protected while it is active and a no-disturbance buffer will be established around the nest to protect it from indirect Project effects due to noise and dust. Recommended buffers are 500 feet for raptors and sensitive species and 300 feet for all other birds. The biologist can adjust the buffer limits based on the setting, topography, exposure of the nest to adverse effects, and other factors. Direct removal of the nest and construction activities within the buffer zone will be avoided until the nest is deemed no longer active by the qualified biologist.	• Watershed Conservation Authority (WCA) • Qualified Ecologist/Biologist	Preconstruction surveys shall be conducted no more than 30 days before ground disturbing and vegetation clearing activities if they are to occur during the bird breeding season (February 1 – August 31).	• Watershed Conservation Authority (WCA) • California Department of Fish and Wildlife (CDFW) • United States Fish and Wildlife Service (USFWS)	Initials Date

MITIGATION MEASURES	RESPONSIBLE FOR IMPLEMENTATION	TIMING OF IMPLEMENTATION	MONITORING AGENCY	DATE COMPLETED
B-3: Conduct a habitat assessment for Western Yellow-billed Cuckoo. A habitat assessment shall be conducted for Projects 9, 10, and 12 a year prior to planned ground disturbing activities. If the habitat assessment determines that suitable habitat for western yellow-billed cuckoo is present and would be directly impacted by Projects 9, 10, or 12 then a United States Fish and Wildlife (USFWS) protocol survey shall be conducted to ensure compliance with federal and state Endangered Species Acts (ESA and CESA). The survey period for western yellow-billed cuckoo extends from June 15 to August 15, consisting of four surveys. If western yellow-billed cuckoo are located during the survey, and their occupied habitat may be impacted by the Project, a request for take authorization must be submitted, processed, and approved with the USFWS and California Department of Fish and Wildlife (CDFW) prior to the ground disturbance activities that may affect this species. This will involve a consultation process under the ESA and CESA.	• Watershed Conservation Authority (WCA) • Qualified Biologist	A year prior to planned ground disturbing activities for Projects 9, 10, and 12.	• Watershed Conservation Authority (WCA) • California Department of Fish and Wildlife (CDFW) • United States Fish and Wildlife Service (USFWS)	Initials Date
B-4: Conduct a habitat assessment for Southwestern Willow Flycatcher. A habitat assessment shall be conducted for Projects 9, 10, and 12 within a year prior to ground disturbing activities. If the habitat assessment determines that suitable habitat for the southwestern willow flycatcher is present and would be directly impacted by Projects 9, 10, or 12 then United States Fish and Wildlife (USFWS) protocol surveys shall be conducted to ensure compliance with federal and state Endangered Species Acts (ESA and CESA). The survey period for southwestern willow flycatcher extends from May 15 to July 17, consisting of five surveys. If southwestern willow flycatcher are located during the survey, and their occupied habitat may be impacted by a Project, a request for take authorization must be submitted, processed, and approved with the USFWS and California Department of Fish and Wildlife (CDFW) prior to the ground disturbing activities that	• Watershed Conservation Authority (WCA) • Qualified Biologist	A year prior to planned ground disturbing activities for Projects 9, 10, and 12.	• Watershed Conservation Authority (WCA) • California Department of Fish and Wildlife (CDFW) • United States Fish and Wildlife Service (USFWS)	Initials Date

MITIGATION MEASURES	RESPONSIBLE FOR IMPLEMENTATION	TIMING OF IMPLEMENTATION	MONITORING AGENCY	DATE COMPLETED
may affect this species. This will involve a consultation process under the ESA and CESA.				
B-5: Conduct a habitat assessment for Least Bell's Vireo. A habitat assessment shall be conducted for Projects 9, 10, and 12 within a year prior to proposed ground disturbing activities. If the habitat assessment determines that suitable habitat for the least Bell's vireo is present and would be directly impacted by Projects 9, 10, or 12 then United States Fish and Wildlife (USFWS) protocol surveys shall be conducted to ensure compliance with federal and state endangered species acts (ESA and CESA). The survey period for least Bell's vireo extends from April 10 to July 31, consisting of eight surveys. If least Bell's vireo are located during the survey, and their occupied habitat may be impacted by the Project, a request for take authorization must be submitted, processed, and approved with the USFWS and California Department of Fish and Wildlife (CDFW) prior to the ground disturbance activities that may affect this species. This will involve a consultation process under the ESA and CESA.	• Watershed Conservation Authority (WCA) • Qualified Biologist	A year prior to planned ground disturbing activities for Projects 9, 10, and 12.	• Watershed Conservation Authority (WCA) • California Department of Fish and Wildlife (CDFW) • United States Fish and Wildlife Service (USFWS)	Initials Date
B-6: Conduct a habitat assessment and pre-construction survey for burrowing owls. Prior to ground disturbing activities within the burrowing owl breeding season (March 1 through August 31), a habitat assessment and pre-construction burrowing owl survey will be conducted by a qualified biologist within suitable habitat within the Project footprint and a 500-foot buffer surrounding the footprint for Projects 1, 2, 5, 7, 8, 9, 10, 11, and/or 12. A qualified biologist must have at least one year of experience conducting burrowing owl surveys. The assessment and pre-construction survey shall conform to the California Department of Fish and Game (CDFG) Report on Burrowing Owl Mitigation (CDFG 2012). If burrowing owls are located	• Watershed Conservation Authority (WCA) • Qualified Biologist	The habitat assessment and preconstruction surveys shall be conducted prior to ground disturbing activities planned for Projects 1, 2, 5, 7, 8, 9, 10, 11, and/or 12 if they are to occur during the burrowing owl breeding season (March 1 – August 31).	• Watershed Conservation Authority (WCA) • California Department of Fish and Wildlife (CDFW)	Initials Date

MITIGATION MEASURES	RESPONSIBLE FOR IMPLEMENTATION	TIMING OF IMPLEMENTATION	MONITORING AGENCY	DATE COMPLETED
during the survey, and may be impacted by the Projects 1, 2, 5, 7, 8, 9, 10, 11, and/or 12 then measures to avoid the a burrowing owl will be developed prior to any ground disturbance that might affect the owl or it is burrows, as determined by a qualified biologist. At a minimum a burrowing owl mitigation plan shall be prepared to be submitted to the Watershed Conservation Authority (WCA) and the California Department of Fish and Wildlife (CDFW) for review and approval. The approved plan shall be implemented prior to the ground disturbance activities that may affect this species.				
B-7: Conduct a jurisdictional delineation and prepare regulatory permit applications. Due to the potential of Projects 7, 9, 10, and 12 to affect potentially jurisdictional features of the Rio Hondo, San Gabriel River, and San Jose Creek or tributaries thereto, a jurisdictional delineation shall be conducted within each of these project areas prior to the implementation of each Project to determine the extent of jurisdiction present and the extent to which a Project footprint affects jurisdictional resources. If such resources are planned to be impacted by a Project, then regulatory permits will be required for that Project by submitting applications to the United States Army Corps of Engineers (USACE) for a Section 404 Clean Water Act (CWA) Permit, to the California Department of Fish and Wildlife (CDFW) for a Section 1600 Streambed Alteration Agreement, and to the Regional Water Quality Control Board (RWQCB) for a Section 401 Water Quality Certification. Once the permits have been issued, the impacts to jurisdictional features can occur.	• Watershed Conservation Authority (WCA)	Prior to implementation of Projects 7, 9, 10, and 12.	• Watershed Conservation Authority (WCA) • United States Army Corps of Engineers (USACE) • California Department of Fish and Wildlife (CDFW) • Regional Water Quality Control Board (RWQCB)	_____ Initials _____ Date
B-8: Protection of oak trees. An oak tree survey and report shall be conducted by an oak tree consultant, as deemed acceptable by the Los Angeles County Director of Regional Planning and County Forester &	• Watershed Conservation Authority (WCA)	Prior to issuance of grading permits for Projects 7, 9, 10, and 12.	• County of Los Angeles Department of Parks and Recreation (DPR) • County of Los Angeles	_____ Initials

MITIGATION MEASURES	RESPONSIBLE FOR IMPLEMENTATION	TIMING OF IMPLEMENTATION	MONITORING AGENCY	DATE COMPLETED
Fire Warden, to document the trees being proposed to be impacted for Projects 7, 9, 10, and 12. An oak tree permit is required prior to cutting, destroying, removing, relocating, inflicting damage, or encroaching into the protected zone of any oak trees with a dbh of eight inches or more. All protection and replacement measures shall be consistent with the Los Angeles County Oak Tree Ordinance.			Department of Regional Planning (DRP) • County of Los Angeles Forester & Fire Warden	Date
B-9: Conduct a habitat assessment for Western Pond Turtle. A habitat assessment shall be conducted for Projects 9, 10, and 12 a year prior to planned ground disturbing activities. If the habitat assessment determines that suitable habitat for western pond turtle is present and would be directly impacted by Projects 9, 10, or 12 then the California Department of Fish and Wildlife (CDFW) shall be consulted in order to develop mitigation for the species. Mitigation may consist of acquisition and protection in perpetuity of occupied habitat for the species or payment of in-lieu fees for habitat protection to a CDFW-approved entity.	• Watershed Conservation Authority (WCA) • Qualified Biologist	A year prior to planned ground disturbing activities for Projects 9, 10, and 12.	• Watershed Conservation Authority (WCA) • California Department of Fish and Wildlife (CDFW)	Initials Date
B-10: Conduct a habitat assessment for Western Spadefoot Toad. A habitat assessment shall be conducted for Projects 9, 10, and 12 a year prior to planned ground disturbing activities. If the habitat assessment determines that suitable habitat for western spadefoot toad is present and would be directly impacted by Projects 9, 10, or 12 then the California Department of Fish and Wildlife (CDFW) shall be consulted in order to develop mitigation for the species. Mitigation may consist of acquisition and protection in perpetuity of occupied habitat for the species or payment of in-lieu fees for habitat protection to a CDFW-approved entity.	• Watershed Conservation Authority (WCA) • Qualified Biologist	A year prior to planned ground disturbing activities for Projects 9, 10, and 12.	• Watershed Conservation Authority (WCA) • California Department of Fish and Wildlife (CDFW)	Initials Date

MITIGATION MEASURES	RESPONSIBLE FOR IMPLEMENTATION	TIMING OF IMPLEMENTATION	MONITORING AGENCY	DATE COMPLETED
B-11: Conduct a habitat assessment for Two-striped Garter Snake. A habitat assessment shall be conducted for Projects 9, 10, and 12 a year prior to planned ground disturbing activities. If the habitat assessment determines that suitable habitat for two-striped garter snake is present and would be directly impacted by Projects 9, 10, or 12 then the California Department of Fish and Wildlife (CDFW) shall be consulted in order to develop mitigation for the species. Mitigation may consist of acquisition and protection in perpetuity of occupied habitat for the species or payment of in-lieu fees for habitat protection to a CDFW-approved entity.	• Watershed Conservation Authority (WCA) • Qualified Biologist	A year prior to planned ground disturbing activities for Projects 9, 10, and 12.	• Watershed Conservation Authority (WCA) • California Department of Fish and Wildlife (CDFW)	Initials Date
CULTURAL AND PALEONTOLOGICAL RESOURCES				
CR-1: All projects resulting in ground disturbing activities in areas that are unpaved and/or lack ornamental vegetation shall be surveyed by qualified archaeologists and the results shall be provided in subsequent environmental documents that will be prepared for the individual projects of the Emerald Necklace Implementation Plan – Phase I (Projects 1, 2, 6, 7, 8, 9, 10, 11, and 12). If cultural resources are identified as a result of the surveys, they shall be evaluated using California Register of Historical Resources eligibility criteria to determine whether they are Historical Resources for the purposes of CEQA. An impacts analysis shall be carried out for identified Historical Resources and mitigation measures shall be provided for Historical Resources that will be significantly impacted. The results of the evaluation and the impacts analysis, as well as the mitigation measures, shall be provided in the specific environmental document written for the project.	• Watershed Conservation Authority (WCA) • Qualified Archeologist	Shall occur during the preparation of subsequent environmental documents for Projects 1, 2, 6, 7, 8, 9, 10, 11, and 12.	• Watershed Conservation Authority (WCA)	Initials Date
CR-2: All ground-disturbing activities below previously disturbed areas necessary for construction of Projects 6 and 7 shall be monitored by an archaeological monitor and a Native American monitor from a Gabrielino group, as recommended by the cultural resources survey report (CR-1). The	• Watershed Conservation Authority (WCA) • Qualified Archeologist	The archaeological and Native American monitor stop work clause shall be included in the bid specifications.	• Watershed Conservation Authority (WCA) • Gabrielino-San Gabriel	Initials

MITIGATION MEASURES	RESPONSIBLE FOR IMPLEMENTATION	TIMING OF IMPLEMENTATION	MONITORING AGENCY	DATE COMPLETED
archaeological monitor and the Native American monitor shall have the power to temporarily halt or divert equipment to allow for recording and evaluation of any encountered resources. If evaluated as eligible for the California Register of Historical Resources (CRHR) and determined eligible by the Watershed Conservation Authority, the archaeological site must be avoided and preserved. If this is not feasible, an archeological data recovery program shall be developed and implemented by a qualified archaeologist in consultation with the Native American monitor. The data recovery report shall be submitted to the South Central Coastal Information Center.	• Native American Monitor • Construction Manager	Shall be implemented during ground disturbing activities for Projects 6 and 7.	Band of Mission Indians	Date
CR-3: If human remains of any kind are found during construction activities, all activities must cease immediately and the Los Angeles County Coroner must be notified, as required by state law (Section 7050.5 of Health and Safety Code). If the coroner determines the remains to be of Native American origin, he or she will notify the Native American Heritage Commission (NAHC). The NAHC will then identify the most likely descendant(s) (MLD) to be consulted regarding treatment and/or reburial of the remains (Section 5097.98 of the Public Resources Code). Work may resume once the MLD's recommendations have been implemented or the remains have been reburied by the landowner if no agreement can be reached with the MLD (Section 5097.98 of the Public Resources Code).	• Watershed Conservation Authority (WCA) • Construction Manager • Los Angeles County Coroner	Shall be implemented if human remains are discovered during construction.	• Watershed Conservation Authority (WCA) • Native American Heritage Commission (NAHC)	Initials Date
CR-4: A qualified vertebrate paleontologist shall monitor deep excavations that extend into the older Quaternary deposits, as well as any excavations in the exposures of older Quaternary Alluvium or in the exposures of the Fernando formation in the Whittier Narrows area (Projects 6, 7, and 9) and the San Jose Creek area (Project 10). Sediment samples shall be collected and processed to determine the small fossil potential in the project area. The monitor will be equipped to recover fossils and sediment samples during excavation and will have the authority to temporarily halt or divert equipment to allow for recovery of large or numerous fossils. If the final	• Watershed Conservation Authority (WCA) • Qualified Paleontological Monitor	Shall be implemented during deep excavations that extend into the older Quaternary deposits, as well as any excavations in the exposures of older Quaternary Alluvium or in the exposures of the Fernando formation for Projects 6, 7, 9, and 10.	• Watershed Conservation Authority (WCA)	Initials Date

MITIGATION MEASURES	RESPONSIBLE FOR IMPLEMENTATION	TIMING OF IMPLEMENTATION	MONITORING AGENCY	DATE COMPLETED
engineering design of Projects 6 and 7 determine that the older Quaternary alluvium deposits would not be disturbed then paleontological monitoring would not be necessary for Project 6 and 7. Any fossils recovered during monitoring shall be prepared to a point of identification and preservation and be deposited in an accredited and permanent scientific institution. A report detailing the findings with an appended itemized inventory of identified specimens shall be prepared. The report and inventory shall be submitted to the Watershed Conservation Authority and the scientific institution where the fossils are deposited. When the Watershed Conservation Authority receives the report, inventory, and verification of acceptance of the specimens by the scientific institution, mitigation will be complete.				
GEOLOGY AND SOILS				
G-1: A qualified geotechnical firm shall conduct site specific geotechnical investigations during the design of projects that contain a structural component such as bridges and foundations (Projects 1, 3, 6, 7, 9, 10, 13, 14, 15, and 16). The geotechnical firm shall review the site and grading plans for each project that contains a structural component as the Emerald Necklace is implemented and comment further on the geotechnical aspects of the project. Geotechnical investigations shall disclose the geological conditions of project sites and recommend the appropriate measures to be incorporated into the design and construction of each project.	• Watershed Conservation Authority (WCA) • Qualified Geotechnical Firm	Shall be implemented during the design of each project that contains a structural component (Projects 1, 3, 6, 7, 9, 10, 13, 14, 15, and 16).	• Watershed Conservation Authority (WCA)	_____ Initials _____ Date
HAZARDS AND HAZARDOUS MATERIALS				
HM-1: Prior to any lane closures, the Watershed Conservation Authority (or its contractor) shall prepare a Traffic Control Plan to ensure proper access to residences and businesses by emergency vehicles during construction and to maintain traffic flow.	• Watershed Conservation Authority (WCA) • Construction Manager	Shall be implemented prior to any lane closure.	• Watershed Conservation Authority (WCA) • Affected Local Jurisdictions	_____ Initials _____ Date

MITIGATION MEASURES	RESPONSIBLE FOR IMPLEMENTATION	TIMING OF IMPLEMENTATION	MONITORING AGENCY	DATE COMPLETED
HYDROLOGY AND WATER QUALITY				
H-1: Prior to ground disturbing activities or any activity affecting federal or state waters, the Watershed Conservation Authority (WCA) shall submit for approval to the State Water Resources Control Board, a Notice of Intent (NOI) to be covered under a National Pollutant Discharge Elimination System (NPDES) General Permit for Stormwater Discharges Associated with Construction Activity (General Permit) in compliance with Section 402 of the Clean Water Act. As part of the General Permit, the WCA shall prepare a Storm Water Pollution Prevention Plan (SWPPP) which will: (1) require implementation of Best Management Practices (BMPs) so as to prevent a net increase in sediment load in stormwater discharges relative to preconstruction levels; (2) prohibit discharges of stormwater or non-stormwater at levels which would cause or contribute to an exceedance of any applicable water quality standard contained in the regional basin plan; (3) discuss in detail the BMPs for the project related to control of sediment and erosion, non sediment pollutants, and potential pollutants in non-stormwater discharges; (4) describe post-construction BMPs for the project; (5) explain the monitoring and maintenance program for the project's BMPs; (6) require reporting of violations to the RWQCB; and (7) list the parties responsible for SWPPP implementation and BMP maintenance both during and after construction. Upon acceptance of the NOI by the State Board, the WCA shall implement the SWPPP and will modify the SWPPP as directed by the Storm Water Permit.	• Watershed Conservation Authority (WCA)	Prior to ground disturbing activities that would affect federal or state waters.	• Watershed Conservation Authority (WCA) • State Water Resources Control Board	_____ Initials _____ Date
NOISE				
N-1: Prior to approval of grading plans and/or issuance of building permits, plans shall include a note indicating that noise-generating project construction activities shall only occur between the hours of 7:00 a.m. to 7:00 p.m. on weekdays, with no activity allowed on Sundays or holidays. The project construction supervisor shall ensure compliance	• Watershed Conservation Authority (WCA) • Construction Manager	Prior to issuance of grading permits. Shall be included in the bid specifications.	• Watershed Conservation Authority (WCA)	_____ Initials _____ Date

MITIGATION MEASURES	RESPONSIBLE FOR IMPLEMENTATION	TIMING OF IMPLEMENTATION	MONITORING AGENCY	DATE COMPLETED
with the note and the County shall conduct periodic inspection at its discretion.				
N-2: Prior to Proposed Project construction, the construction contractors shall equip all construction equipment, fixed or mobile, with properly operating and maintained mufflers, consistent with manufacturers' standards. The construction contractor shall place all stationary construction equipment so that emitted noise is directed away from the noise sensitive receptors nearest to the project site.	• Watershed Conservation Authority (WCA) • Construction Manager	Prior to issuance of grading permits. Shall be included in the bid specifications.	• Watershed Conservation Authority (WCA)	Initials Date
N-3: The construction contractor shall locate equipment staging in areas that will create the greatest distance between construction-related noise sources and noise-sensitive receivers nearest the project site throughout the project construction period.	• Watershed Conservation Authority (WCA) • Construction Manager	Shall be included in the bid specifications. During construction.	• Watershed Conservation Authority (WCA)	Initials Date
N-4: The construction contractor shall limit haul truck deliveries to the same hours specified for construction equipment (between the hours of 7:00 a.m. to 7:00 p.m. on weekdays, with no activity allowed on Sundays or holidays). The contractor shall prepare a haul route exhibit and shall design delivery routes to minimize the exposure of sensitive land uses or residential dwellings to delivery truck-related noise.	• Watershed Conservation Authority (WCA) • Construction Manager	Shall be included in the bid specifications. During construction.	Watershed Conservation Authority (WCA)	Initials Date

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TABLE 5-2
MITIGATION MEASURE MATRIX
EMERALD NECKLACE IMPLEMENTATION PLAN – PHASE I

MITIGATION MEASURES	PROJECT AREA / PROJECT NUMBER
AESTHETICS	
A-1: Project structures shall be designed to reduce visual contrast with the project's surroundings by repeating forms, colors, lines and textures of the project's location. This can be achieved by using materials and color schemes that blend with the natural landscape and vegetation.	**Whittier Narrows** 9. Pellissier Bridge at Blackwill Arena Staging Area **San Jose Creek** 10. Multi-Use Trail and Bridge Connections
BIOLOGICAL RESOURCES	
B-1: Conduct Focused Rare Plant Surveys. *Nevin's Barberry* Prior to ground disturbing construction activities (e.g. grading, vegetation removal) for Projects 7, 9, 10, and 12 a focused rare plant survey for Nevin's Barberry shall be conducted. Because this plant is a shrub species that is obvious at any time of the year, the survey may be conducted during any season. *Brand's Phacelia* Prior to ground disturbing construction activities (e.g. grading, vegetation removal) for Projects 2, 7, 8, 9, 10, 11, and 12 a focused rare plant survey for Brand's phacelia shall be conducted. The survey shall take place during the blooming period for Brand's phacelia (March through June). Biologists will use a nearby population as a reference, if feasible, to verify that the target rare plant is blooming at the time of the survey. *Additional Rare Plant Species* During surveys for the aforementioned plant species, prior to ground disturbing construction activities (e.g. grading, vegetation removal) for Projects 2, 7, 8, 9, 10,	**Quarry Clasp** 2. Quarry Clasp Multi-Use Trail and Bicycle Paths **Whittier Narrows** 7. Class I Bicycle Path from the Rio Hondo to Legg Lake through the Southern California Edison Easement 8. Pellissier Village Multi-Use Trail from State Route 60 to Peck Road Bridge 9. Pellissier Bridge at Blackwill Arena Staging Area **San Jose Creek** 10. Multi-Use Trail and Bridge Connections 11. Multi-Use Trail from San Jose Creek to the Duck Farm on the San Gabriel River **Westside** 12. Alhambra Wash from State Route 60 to the Garvey Community Center

MITIGATION MEASURES	PROJECT AREA / PROJECT NUMBER
11, and 12, biologists shall also seek and identify plant species that are listed as California Species of Special Concern or listed as CNPS List 1A, 1B, or 2. If sensitive plant species are not found during the surveys, then no further mitigation is required. In the event a listed plant is discovered onsite, the location and numbers of the species shall be recorded by a qualified biologist. The California Department of Fish and Wildlife (CDFW), United States Fish and Wildlife Service (USFWS) and Watershed Conservation Authority (WCA) shall be formally notified and consulted regarding the presence of either the federal and/or state listed or candidate species onsite. If the plant can be avoided by construction, a Preservation and Management Plan for the species found will be prepared and shall include, but not be limited to, the following: 1) Provision of protective fencing or buffers between development and any listed plant that may be found onsite as required by CDFW or USFWS. This buffer zone shall be designated with appropriate fencing to exclude construction vehicles and public access, but not wildlife access; 2) The size of the buffer depends upon the use of the immediately adjacent lands, and includes consideration of the plant's ecological requirements (e.g., sunlight, moisture, shade tolerance, edaphic physical and chemical characteristics) that are identified by a qualified plant ecologist and/or botanist. At minimum, the buffer shall be at least ten feet and demarcated by fencing that is installed with the assistance of a qualified plant ecologist. A smaller buffer may be established, provided there are adequate measures in place to avoid the take of the species, with the approval of the USFWS and/or CDFW; 3) Stormwater runoff, irrigation runoff, and other drainage from developed areas shall not pass through areas populated by the listed species; 4) Listed species areas shall not be artificially shaded by structures or landscaping within the adjacent development areas;	

MITIGATION MEASURES	PROJECT AREA / PROJECT NUMBER
5) Pesticide use shall not be permitted within listed plants areas; 6) The WCA will be responsible for monitoring the listed plant areas during construction and after project completion to ensure avoidance. If the plant cannot be avoided by construction, the CDFW and/or USFWS will be consulted. The following steps will be needed: 1) For direct impacts to the federal-listed and state-listed Nevin's barberry, the CDFW will be consulted regarding the potential need for a permit under the CESA and the USFWS will be consulted for the potential need for a permit under the ESA. Mitigation for the impact will be developed through this process and could include payment of in-lieu fee, preservation of another population of the plant, transplantation, or creation of a preserve. 2) For direct impacts to plants that are candidate species for listing (Brand's phacelia), the USFWS will be consulted for the potential need for a permit under the ESA. Mitigation for the impact will be developed through this process and could include payment of in-lieu fee, preservation of another population of the plant, transplantation, or creation of a preserve.	
B-2: Conduct nesting bird surveys to ensure that there would be not significant impacts to nesting birds and no violation of the Migratory Bird Treaty Act. If activities with the potential to destroy nests or cause birds to abandon nests are scheduled to occur during the bird breeding season (February 1 – August 31), a pre-construction nesting bird survey shall be conducted by a qualified biologist within the footprint for all Projects and within a buffer of 500 feet of the Project limits. A qualified biologist is one having at least one year of nesting bird survey experience. The survey area shall include all potential bird nesting areas, including grasslands, scrub habitat, woodlands, and isolated trees that are within 500 feet of ground disturbance and vegetation clearing activities. The survey shall be conducted within the nesting season and no more than 30 days prior to commencement of ground disturbance activities.	**Quarry Clasp** 1. Quarry Clasp Park Development 2. Quarry Clasp Multi-Use Trail and Bicycle Paths 3. Peck Road Signalized Crossing **Whittier Narrows** 5. Class I Bicycle Path on Rosemead Boulevard to Legg Lake 6. Class IV Bikeway from El Bosque del Rio Hondo to Lincoln Avenue on San Gabriel Boulevard 7. Class I Bicycle Path from the Rio Hondo to Legg Lake through the Southern California Edison Easement 8. Pellissier Village Multi-Use Trail from State Route 60 to Peck Road Bridge 9. Pellissier Bridge at Blackwill Arena Staging Area

MITIGATION MEASURES	PROJECT AREA / PROJECT NUMBER
If active bird nests are found, the qualified biologist will recommend measures to avoid impacts to the nest while it is active. At a minimum the nest itself will be protected while it is active and a no-disturbance buffer will be established around the nest to protect it from indirect Project effects due to noise and dust. Recommended buffers are 500 feet for raptors and sensitive species and 300 feet for all other birds. The biologist can adjust the buffer limits based on the setting, topography, exposure of the nest to adverse effects, and other factors. Direct removal of the nest and construction activities within the buffer zone will be avoided until the nest is deemed no longer active by the qualified biologist.	**San Jose Creek** 10. Multi-Use Trail and Bridge Connections 11. Multi-Use Trail from San Jose Creek to the Duck Farm on the San Gabriel River **Westside** 12. Alhambra Wash from State Route 60 to the Garvey Community Center 13. Rosemead Boulevard Access Ramp 14. Rosemead Boulevard Underpass 15. Multi-Use Trail from Rosemead Boulevard to Valley Boulevard 16. Interstate 10 Freeway Underpass Improvements
B-3: Conduct a habitat assessment for Western Yellow-billed Cuckoo. A habitat assessment shall be conducted for Projects 9, 10, and 12 a year prior to planned ground disturbing activities. If the habitat assessment determines that suitable habitat for western yellow-billed cuckoo is present and would be directly impacted by Projects 9, 10, or 12 then a United States Fish and Wildlife (USFWS) protocol survey shall be conducted to ensure compliance with federal and state Endangered Species Acts (ESA and CESA). The survey period for western yellow-billed cuckoo extends from June 15 to August 15, consisting of four surveys. If western yellow-billed cuckoo are located during the survey, and their occupied habitat may be impacted by the Project, a request for take authorization must be submitted, processed, and approved with the USFWS and California Department of Fish and Wildlife (CDFW) prior to the ground disturbance activities that may affect this species. This will involve a consultation process under the ESA and CESA.	**Whittier Narrows** 9. Pellissier Bridge at Blackwill Arena Staging Area **San Jose Creek** 10. Multi-Use Trail and Bridge Connections **Westside** 12. Alhambra Wash from State Route 60 to the Garvey Community Center
B-4: Conduct a habitat assessment for Southwestern Willow Flycatcher. A habitat assessment shall be conducted for Projects 9, 10, and 12 within a year prior to ground disturbing activities. If the habitat assessment determines that suitable habitat for the southwestern willow flycatcher is present and would be directly impacted by Projects 9, 10, or 12 then United States Fish and Wildlife (USFWS) protocol surveys shall be conducted to ensure compliance with federal and state Endangered Species Acts (ESA and CESA). The survey period for	**Whittier Narrows** 9. Pellissier Bridge at Blackwill Arena Staging Area **San Jose Creek** 10. Multi-Use Trail and Bridge Connections **Westside** 12. Alhambra Wash from State Route 60 to the Garvey Community Center

MITIGATION MEASURES	PROJECT AREA / PROJECT NUMBER
southwestern willow flycatcher extends from May 15 to July 17, consisting of five surveys. If southwestern willow flycatcher are located during the survey, and their occupied habitat may be impacted by a Project, a request for take authorization must be submitted, processed, and approved with the USFWS and California Department of Fish and Wildlife (CDFW) prior to the ground disturbing activities that may affect this species. This will involve a consultation process under the ESA and CESA.	
B-5: Conduct a habitat assessment for Least Bell's Vireo. A habitat assessment shall be conducted for Projects 9, 10, and 12 within a year prior to proposed ground disturbing activities. If the habitat assessment determines that suitable habitat for the least Bell's vireo is present and would be directly impacted by Projects 9, 10, or 12 then United States Fish and Wildlife (USFWS) protocol surveys shall be conducted to ensure compliance with federal and state endangered species acts (ESA and CESA). The survey period for least Bell's vireo extends from April 10 to July 31, consisting of eight surveys. If least Bell's vireo are located during the survey, and their occupied habitat may be impacted by the Project, a request for take authorization must be submitted, processed, and approved with the USFWS and California Department of Fish and Wildlife (CDFW) prior to the ground disturbance activities that may affect this species. This will involve a consultation process under the ESA and CESA.	**Whittier Narrows** 9. Pellissier Bridge at Blackwill Arena Staging Area **San Jose Creek** 10. Multi-Use Trail and Bridge Connections **Westside** 12. Alhambra Wash from State Route 60 to the Garvey Community Center
B-6: Conduct a habitat assessment and pre-construction survey for burrowing owls. Prior to ground disturbing activities within the burrowing owl breeding season (March 1 through August 31), a habitat assessment and pre-construction burrowing owl survey will be conducted by a qualified biologist within suitable habitat within the Project footprint and a 500-foot buffer surrounding the footprint for Projects 1, 2, 5, 7, 8, 9, 10, 11, and/or 12. A qualified biologist must have at least one year of experience conducting burrowing owl surveys. The assessment and pre-construction survey shall conform to the California Department of Fish and Game (CDFG) Report on Burrowing Owl Mitigation (CDFG 2012). If burrowing owls are located during the survey, and may be impacted by the Projects 1, 2, 5, 7, 8, 9, 10,	**Quarry Clasp** 1. Quarry Clasp Park Development 2. Quarry Clasp Multi-Use Trail and Bicycle Paths **Whittier Narrows** 5. Class I Bicycle Path on Rosemead Boulevard to Legg Lake 7. Class I Bicycle Path from the Rio Hondo to Legg Lake through the Southern California Edison Easement 8. Pellissier Village Multi-Use Trail from State Route 60 to Peck Road Bridge 9. Pellissier Bridge at Blackwill Arena Staging Area

MITIGATION MEASURES	PROJECT AREA / PROJECT NUMBER
11, and/or 12 then measures to avoid the a burrowing owl will be developed prior to any ground disturbance that might affect the owl or it is burrows, as determined by a qualified biologist. At a minimum a burrowing owl mitigation plan shall be prepared to be submitted to the Watershed Conservation Authority (WCA) and the California Department of Fish and Wildlife (CDFW) for review and approval. The approved plan shall be implemented prior to the ground disturbance activities that may affect this species.	**San Jose Creek** 10. Multi-Use Trail and Bridge Connections 11. Multi-Use Trail from San Jose Creek to the Duck Farm on the San Gabriel River **Westside** 12. Alhambra Wash from State Route 60 to the Garvey Community Center
B-7: Conduct a jurisdictional delineation and prepare regulatory permit applications. Due to the potential of Projects 7, 9, 10, and 12 to affect potentially jurisdictional features of the Rio Hondo, San Gabriel River, and San Jose Creek or tributaries thereto, a jurisdictional delineation shall be conducted within each of these project areas prior to the implementation of each Project to determine the extent of jurisdiction present and the extent to which a Project footprint affects jurisdictional resources. If such resources are planned to be impacted by a Project, then regulatory permits will be required for that Project by submitting applications to the United States Army Corps of Engineers (USACE) for a Section 404 Clean Water Act (CWA) Permit, to the California Department of Fish and Wildlife (CDFW) for a Section 1600 Streambed Alteration Agreement, and to the Regional Water Quality Control Board (RWQCB) for a Section 401 Water Quality Certification. Once the permits have been issued, the impacts to jurisdictional features can occur.	**Whittier Narrows** 7. Class I Bicycle Path from the Rio Hondo to Legg Lake through the Southern California Edison Easement 9. Pellissier Bridge at Blackwill Arena Staging Area **San Jose Creek** 10. Multi-Use Trail and Bridge Connections **Westside** 12. Alhambra Wash from State Route 60 to the Garvey Community Center
B-8: Protection of oak trees. An oak tree survey and report shall be conducted by an oak tree consultant, as deemed acceptable by the Los Angeles County Director of Regional Planning and County Forester & Fire Warden, to document the trees being proposed to be impacted for Projects 7, 9, 10, and 12. An oak tree permit is required prior to cutting, destroying, removing, relocating, inflicting damage, or encroaching into the protected zone of any oak trees with a dbh of eight inches or more. All protection and replacement measures shall be consistent with the Los Angeles County Oak	**Whittier Narrows** 7. Class I Bicycle Path from the Rio Hondo to Legg Lake through the Southern California Edison Easement 9. Pellissier Bridge at Blackwill Arena Staging Area **San Jose Creek** 10. Multi-Use Trail and Bridge Connections **Westside** 12. Alhambra Wash from State Route 60 to the Garvey Community Center

MITIGATION MEASURES	PROJECT AREA / PROJECT NUMBER
Tree Ordinance.	
B-9: Conduct a habitat assessment for Western Pond Turtle. A habitat assessment shall be conducted for Projects 9, 10, and 12 a year prior to planned ground disturbing activities. If the habitat assessment determines that suitable habitat for western pond turtle is present and would be directly impacted by Projects 9, 10, or 12 then the California Department of Fish and Wildlife (CDFW) shall be consulted in order to develop mitigation for the species. Mitigation may consist of acquisition and protection in perpetuity of occupied habitat for the species or payment of in-lieu fees for habitat protection to a CDFW-approved entity.	**Whittier Narrows** 9. Pellissier Bridge at Blackwill Arena Staging Area **San Jose Creek** 10. Multi-Use Trail and Bridge Connections **Westside** 12. Alhambra Wash from State Route 60 to the Garvey Community Center
B-10: Conduct a habitat assessment for Western Spadefoot Toad. A habitat assessment shall be conducted for Projects 9, 10, and 12 a year prior to planned ground disturbing activities. If the habitat assessment determines that suitable habitat for western spadefoot toad is present and would be directly impacted by Projects 9, 10, or 12 then the California Department of Fish and Wildlife (CDFW) shall be consulted in order to develop mitigation for the species. Mitigation may consist of acquisition and protection in perpetuity of occupied habitat for the species or payment of in-lieu fees for habitat protection to a CDFW-approved entity.	**Whittier Narrows** 9. Pellissier Bridge at Blackwill Arena Staging Area **San Jose Creek** 10. Multi-Use Trail and Bridge Connections **Westside** 12. Alhambra Wash from State Route 60 to the Garvey Community Center
B-11: Conduct a habitat assessment for Two-striped Garter Snake. A habitat assessment shall be conducted for Projects 9, 10, and 12 a year prior to planned ground disturbing activities. If the habitat assessment determines that suitable habitat for two-striped garter snake is present and would be directly impacted by Projects 9, 10, or 12 then the California Department of Fish and Wildlife (CDFW) shall be consulted in order to develop mitigation for the species. Mitigation may consist of acquisition and protection in perpetuity of occupied habitat for the species or payment of in-lieu fees for habitat protection to a CDFW-approved entity.	**Whittier Narrows** 9. Pellissier Bridge at Blackwill Arena Staging Area **San Jose Creek** 10. Multi-Use Trail and Bridge Connections **Westside** 12. Alhambra Wash from State Route 60 to the Garvey Community Center

MITIGATION MEASURES	PROJECT AREA / PROJECT NUMBER
CULTURAL AND PALEONTOLOGICAL RESOURCES	
CR-1: All projects resulting in ground disturbing activities in areas that are unpaved and/or lack ornamental vegetation shall be surveyed by qualified archaeologists and the results shall be provided in subsequent environmental documents that will be prepared for the individual projects of the Emerald Necklace Implementation Plan – Phase I (Projects 1, 2, 6, 7, 8, 9, 10, 11, and 12). If cultural resources are identified as a result of the surveys, they shall be evaluated using California Register of Historical Resources eligibility criteria to determine whether they are Historical Resources for the purposes of CEQA. An impacts analysis shall be carried out for identified Historical Resources and mitigation measures shall be provided for Historical Resources that will be significantly impacted. The results of the evaluation and the impacts analysis, as well as the mitigation measures, shall be provided in the specific environmental document written for the project.	**Quarry Clasp** 1. Quarry Clasp Park Development 2. Quarry Clasp Multi-Use Trail and Bicycle Paths **Whittier Narrows** 6. Class IV Bikeway from El Bosque del Rio Hondo to Lincoln Avenue on San Gabriel Boulevard 7. Class I Bicycle Path from the Rio Hondo to Legg Lake through the Southern California Edison Easement 8. Pellissier Village Multi-Use Trail from State Route 60 to Peck Road Bridge 9. Pellissier Bridge at Blackwill Arena Staging Area **San Jose Creek** 10. Multi-Use Trail and Bridge Connections 11. Multi-Use Trail from San Jose Creek to the Duck Farm on the San Gabriel River **Westside** 12. Alhambra Wash from State Route 60 to the Garvey Community Center
CR-2: All ground-disturbing activities below previously disturbed areas necessary for construction of Projects 6 and 7 shall be monitored by an archaeological monitor and a Native American monitor from a Gabrielino group, as recommended by the cultural resources survey report (CR-1). The archaeological monitor and the Native American monitor shall have the power to temporarily halt or divert equipment to allow for recording and evaluation of any encountered resources. If evaluated as eligible for the California Register of Historical Resources (CRHR) and determined eligible by the Watershed Conservation Authority, the archaeological site must be avoided and preserved. If this is not feasible, an archeological data recovery program shall be developed and implemented by a qualified archaeologist in consultation with the Native American monitor. The data recovery report shall be submitted to the South Central Coastal Information Center.	**Whittier Narrows** 6. Class IV Bikeway from El Bosque del Rio Hondo to Lincoln Avenue on San Gabriel Boulevard 7. Class I Bicycle Path from the Rio Hondo to Legg Lake through the Southern California Edison Easement

MITIGATION MEASURES	PROJECT AREA / PROJECT NUMBER
CR-3: If human remains of any kind are found during construction activities, all activities must cease immediately and the Los Angeles County Coroner must be notified, as required by state law (Section 7050.5 of Health and Safety Code). If the coroner determines the remains to be of Native American origin, he or she will notify the Native American Heritage Commission (NAHC). The NAHC will then identify the most likely descendant(s) (MLD) to be consulted regarding treatment and/or reburial of the remains (Section 5097.98 of the Public Resources Code). Work may resume once the MLD's recommendations have been implemented or the remains have been reburied by the landowner if no agreement can be reached with the MLD (Section 5097.98 of the Public Resources Code).	**Quarry Clasp** 1. Quarry Clasp Park Development 2. Quarry Clasp Multi-Use Trail and Bicycle Paths **Whittier Narrows** 6. Class IV Bikeway from El Bosque del Rio Hondo to Lincoln Avenue on San Gabriel Boulevard 7. Class I Bicycle Path from the Rio Hondo to Legg Lake through the Southern California Edison Easement 9. Pellissier Bridge at Blackwill Arena Staging Area **San Jose Creek** 10. Multi-Use Trail and Bridge Connections **Westside** 12. Alhambra Wash from State Route 60 to the Garvey Community Center
CR-4: A qualified vertebrate paleontologist shall monitor deep excavations that extend into the older Quaternary deposits, as well as any excavations in the exposures of older Quaternary Alluvium or in the exposures of the Fernando formation in the Whittier Narrows area (Projects 6, 7, and 9) and the San Jose Creek area (Project 10). Sediment samples shall be collected and processed to determine the small fossil potential in the project area. The monitor will be equipped to recover fossils and sediment samples during excavation and will have the authority to temporarily halt or divert equipment to allow for recovery of large or numerous fossils. If the final engineering design of Projects 6 and 7 determine that the older Quaternary alluvium deposits would not be disturbed then paleontological monitoring would not be necessary for Project 6 and 7. Any fossils recovered during monitoring shall be prepared to a point of identification and preservation and be deposited in an accredited and permanent scientific institution. A report detailing the findings with an appended itemized inventory of identified specimens shall be prepared. The report and inventory shall be submitted to the Watershed Conservation Authority and the scientific institution where the fossils are deposited. When the Watershed Conservation Authority receives the	**Whittier Narrows** 6. Class IV Bikeway from El Bosque del Rio Hondo to Lincoln Avenue on San Gabriel Boulevard 7. Class I Bicycle Path from the Rio Hondo to Legg Lake through the Southern California Edison Easement 9. Pellissier Bridge at Blackwill Arena Staging Area **San Jose Creek** 10. Multi-Use Trail and Bridge Connections

MITIGATION MEASURES	PROJECT AREA / PROJECT NUMBER
report, inventory, and verification of acceptance of the specimens by the scientific institution, mitigation will be complete.	
GEOLOGY AND SOILS	
G-1: A qualified geotechnical firm shall conduct site specific geotechnical investigations during the design of projects that contain a structural component such as bridges and foundations (Projects 1, 3, 6, 7, 9, 10, 13, 14, 15, and 16). The geotechnical firm shall review the site and grading plans for each project that contains a structural component as the Emerald Necklace is implemented and comment further on the geotechnical aspects of the project. Geotechnical investigations shall disclose the geological conditions of project sites and recommend the appropriate measures to be incorporated into the design and construction of each project.	**Quarry Clasp** 1. Quarry Clasp Park Development 3. Peck Road Signalized Crossing **Whittier Narrows** 6. Class IV Bikeway from El Bosque del Rio Hondo to Lincoln Avenue on San Gabriel Boulevard 7. Class I Bicycle Path from the Rio Hondo to Legg Lake through the Southern California Edison Easement 9. Pellissier Bridge at Blackwill Arena Staging Area **San Jose Creek** 10. Multi-Use Trail and Bridge Connections **Westside** 13. Rosemead Boulevard Access Ramp 14. Rosemead Boulevard Underpass 15. Multi-Use Trail from Rosemead Boulevard to Valley Boulevard 16. Interstate 10 Freeway Underpass Improvements
HAZARDS AND HAZARDOUS MATERIALS	
HM-1: Prior to any lane closures, the Watershed Conservation Authority (or its contractor) shall prepare a Traffic Control Plan to ensure proper access to residences and businesses by emergency vehicles during construction and to maintain traffic flow.	**Quarry Clasp** 1. Quarry Clasp Park Development 2. Quarry Clasp Multi-Use Trail and Bicycle Paths 3. Peck Road Signalized Crossing **Whittier Narrows** 5. Class I Bicycle Path on Rosemead Boulevard to Legg Lake 6. Class IV Bikeway from El Bosque del Rio Hondo to Lincoln Avenue on San

MITIGATION MEASURES	PROJECT AREA / PROJECT NUMBER
	Gabriel Boulevard 7. Class I Bicycle Path from the Rio Hondo to Legg Lake through the Southern California Edison Easement 8. Pellissier Village Multi-Use Trail from State Route 60 to Peck Road Bridge 9. Pellissier Bridge at Blackwill Arena Staging Area **San Jose Creek** 10. Multi-Use Trail and Bridge Connections 11. Multi-Use Trail from San Jose Creek to the Duck Farm on the San Gabriel River **Westside** 12. Alhambra Wash from State Route 60 to the Garvey Community Center 13. Rosemead Boulevard Access Ramp 14. Rosemead Boulevard Underpass 15. Multi-Use Trail from Rosemead Boulevard to Valley Boulevard 16. Interstate 10 Freeway Underpass Improvements
HYDROLOGY AND WATER QUALITY	
H-1: Prior to ground disturbing activities or any activity affecting federal or state waters, the Watershed Conservation Authority (WCA) shall submit for approval to the State Water Resources Control Board, a Notice of Intent (NOI) to be covered under a National Pollutant Discharge Elimination System (NPDES) General Permit for Stormwater Discharges Associated with Construction Activity (General Permit) in compliance with Section 402 of the Clean Water Act. As part of the General Permit, the WCA shall prepare a Storm Water Pollution Prevention Plan (SWPPP) which will: (1) require implementation of Best Management Practices (BMPs) so as to prevent a net increase in sediment load in stormwater discharges relative to preconstruction levels; (2) prohibit discharges of stormwater or non-stormwater at levels which would cause or contribute to an exceedance of any applicable water quality standard contained in the regional basin plan; (3) discuss in detail the BMPs for the project related to control of sediment and erosion, non sediment pollutants, and potential pollutants in non-stormwater discharges; (4) describe post-construction BMPs for the project; (5) explain the monitoring and maintenance program for the project's BMPs; (6) require reporting of violations to the RWQCB; and (7) list the	**Quarry Clasp** 1. Quarry Clasp Park Development 2. Quarry Clasp Multi-Use Trail and Bicycle Paths 3. Peck Road Signalized Crossing **Whittier Narrows** 5. Class I Bicycle Path on Rosemead Boulevard to Legg Lake 6. Class IV Bikeway from El Bosque del Rio Hondo to Lincoln Avenue on San Gabriel Boulevard 7. Class I Bicycle Path from the Rio Hondo to Legg Lake through the Southern California Edison Easement 8. Pellissier Village Multi-Use Trail from State Route 60 to Peck Road Bridge 9. Pellissier Bridge at Blackwill Arena Staging Area **San Jose Creek** 10. Multi-Use Trail and Bridge Connections

MITIGATION MEASURES	PROJECT AREA / PROJECT NUMBER
parties responsible for SWPPP implementation and BMP maintenance both during and after construction. Upon acceptance of the NOI by the State Board, the WCA shall implement the SWPPP and will modify the SWPPP as directed by the Storm Water Permit.	11. Multi-Use Trail from San Jose Creek to the Duck Farm on the San Gabriel River **Westside** 12. Alhambra Wash from State Route 60 to the Garvey Community Center 13. Rosemead Boulevard Access Ramp 14. Rosemead Boulevard Underpass 15. Multi-Use Trail from Rosemead Boulevard to Valley Boulevard 16. Interstate 10 Freeway Underpass Improvements
NOISE	
N-1: Prior to approval of grading plans and/or issuance of building permits, plans shall include a note indicating that noise-generating project construction activities shall only occur between the hours of 7:00 a.m. to 7:00 p.m. on weekdays, with no activity allowed on Sundays or holidays. The project construction supervisor shall ensure compliance with the note and the County shall conduct periodic inspection at its discretion.	**Quarry Clasp** 1. Quarry Clasp Park Development 2. Quarry Clasp Multi-Use Trail and Bicycle Paths 3. Peck Road Signalized Crossing **Whittier Narrows** 5. Class I Bicycle Path on Rosemead Boulevard to Legg Lake 6. Class IV Bikeway from El Bosque del Rio Hondo to Lincoln Avenue on San Gabriel Boulevard 7. Class I Bicycle Path from the Rio Hondo to Legg Lake through the Southern California Edison Easement 8. Pellissier Village Multi-Use Trail from State Route 60 to Peck Road Bridge 9. Pellissier Bridge at Blackwill Arena Staging Area **San Jose Creek** 10. Multi-Use Trail and Bridge Connections 11. Multi-Use Trail from San Jose Creek to the Duck Farm on the San Gabriel River **Westside** 12. Alhambra Wash from State Route 60 to the Garvey Community Center 13. Rosemead Boulevard Access Ramp 14. Rosemead Boulevard Underpass 15. Multi-Use Trail from Rosemead Boulevard to Valley Boulevard

MITIGATION MEASURES	PROJECT AREA / PROJECT NUMBER
	16. Interstate 10 Freeway Underpass Improvements
N-2: Prior to Proposed Project construction, the construction contractors shall equip all construction equipment, fixed or mobile, with properly operating and maintained mufflers, consistent with manufacturers' standards. The construction contractor shall place all stationary construction equipment so that emitted noise is directed away from the noise sensitive receptors nearest to the project site.	**Quarry Clasp** 1. Quarry Clasp Park Development 2. Quarry Clasp Multi-Use Trail and Bicycle Paths 3. Peck Road Signalized Crossing **Whittier Narrows** 5. Class I Bicycle Path on Rosemead Boulevard to Legg Lake 6. Class IV Bikeway from El Bosque del Rio Hondo to Lincoln Avenue on San Gabriel Boulevard 7. Class I Bicycle Path from the Rio Hondo to Legg Lake through the Southern California Edison Easement 8. Pellissier Village Multi-Use Trail from State Route 60 to Peck Road Bridge 9. Pellissier Bridge at Blackwill Arena Staging Area **San Jose Creek** 10. Multi-Use Trail and Bridge Connections 11. Multi-Use Trail from San Jose Creek to the Duck Farm on the San Gabriel River **Westside** 12. Alhambra Wash from State Route 60 to the Garvey Community Center 13. Rosemead Boulevard Access Ramp 14. Rosemead Boulevard Underpass 15. Multi-Use Trail from Rosemead Boulevard to Valley Boulevard 16. Interstate 10 Freeway Underpass Improvements
N-3: The construction contractor shall locate equipment staging in areas that will create the greatest distance between construction-related noise sources and noise-sensitive receivers nearest the project site throughout the project construction period.	**Quarry Clasp** 1. Quarry Clasp Park Development 2. Quarry Clasp Multi-Use Trail and Bicycle Paths 3. Peck Road Signalized Crossing **Whittier Narrows** 5. Class I Bicycle Path on Rosemead Boulevard to Legg Lake 6. Class IV Bikeway from El Bosque del Rio Hondo to Lincoln Avenue on San

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N-4: The construction contractor shall limit haul truck deliveries to the same hours specified for construction equipment (between the hours of 7:00 a.m. to 7:00 p.m. on weekdays, with no activity allowed on Sundays or holidays). The contractor shall prepare a haul route exhibit and shall design delivery routes to minimize the exposure of sensitive land uses or residential dwellings to delivery truck-related noise.	**Quarry Clasp** 1. Quarry Clasp Park Development 2. Quarry Clasp Multi-Use Trail and Bicycle Paths 3. Peck Road Signalized Crossing **Whittier Narrows** 5. Class I Bicycle Path on Rosemead Boulevard to Legg Lake 6. Class IV Bikeway from El Bosque del Rio Hondo to Lincoln Avenue on San Gabriel Boulevard 7. Class I Bicycle Path from the Rio Hondo to Legg Lake through the Southern California Edison Easement 8. Pellissier Village Multi-Use Trail from State Route 60 to Peck Road Bridge 9. Pellissier Bridge at Blackwill Arena Staging Area **San Jose Creek** 10. Multi-Use Trail and Bridge Connections 11. Multi-Use Trail from San Jose Creek to the Duck Farm on the San Gabriel River

MITIGATION MEASURES	PROJECT AREA / PROJECT NUMBER
	Westside 12. Alhambra Wash from State Route 60 to the Garvey Community Center 13. Rosemead Boulevard Access Ramp 14. Rosemead Boulevard Underpass 15. Multi-Use Trail from Rosemead Boulevard to Valley Boulevard 16. Interstate 10 Freeway Underpass Improvements

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