

between 20 and 50 percent of the baseline cost. Proposed trail segments were deemed “infeasible” if the cost per linear foot was 50 percent more than the baseline cost.

### **3.2.3.1 Cost**

The estimated cost includes construction, signs, and crossings. Rough construction cost estimates for potential segments were based on previous development of trails in the surrounding area for developers and public agencies within the County and the surrounding National Forests.<sup>15,16</sup> The estimates assumed 12-foot-wide trails, except on areas where the grade of the side hill of a trail would exceed 20 percent, in which case, the trail width would be reduced to no more than 6 feet. The grade of a side hill is the existing natural slope of a hill that a trail is traversing. The estimated construction costs represent rough grading costs.

Additional costs for trail amenities were calculated for both existing and potential segments. Cost estimates for signage and construction of parking areas were provided by Troller Mayer Associates, LLP, and the Dangermond Group based on prior knowledge and experience regarding construction of recreational resources. Costs for restoration were provided by Sapphos Environmental, Inc. based on past restoration efforts in similar park and recreational settings. Restoration costs were evaluated based on a typical cost of \$40,000 per acre for restoration of coastal sage scrub/chaparral, which includes plants, installation, temporary irrigation, monitoring, and one year of maintenance. Costs assumed an average 1-foot buffer on each side of the trail for restoration of vegetation.

### **3.2.4 Social Factors**

Social feasibility was based on the recreational needs of the area and the ability to meet the current and future recreational goals for the surrounding communities. Proposed trail segments were deemed “feasible” if the trail segment would meet recreational needs. Proposed trail segments were deemed “feasible, but constrained” if they would provide for the recreational needs of many individuals but may not prove to be accessible for all user groups. Proposed trail segments were deemed “infeasible” when they did not meet the recreational needs of the community. The recreational needs of the surrounding community are discussed in the section below.

The length of the trail, the number of plant communities encountered alongside it, and an indication of the diversity of the scenery were presented as a means of determining the recreational quality of the trail.

#### **3.2.4.1 Recreational Need**

Recreational need was defined based on the previously completed SAMP prepared for the County Department of Parks and Recreation, which determined the needs for recreational resources in the County. Parkland and open space needs are based on recent survey documentation for regional and local recreation demands completed for the County of Los Angeles and the City of

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<sup>15</sup> Bell, Roger. 4 August 2005. Letter to Edward Belden, Sapphos Environmental, Inc., from Bellfree Contractors, Inc., Redlands, CA.

<sup>16</sup> Bell, Roger. 8 August 2005. Letter to Edward Belden, Sapphos Environmental, Inc., from Bellfree Contractors, Inc., Redlands, CA.

Pasadena.<sup>17,18</sup> Both documents serve as guidelines for where trail development is most needed and where community residents prefer to utilize proposed facilities for hiking trails based on recreational use, frequency, and participation rates.

According to the SAMP, the County expects a 30-percent increase in the population between 2000 and 2020.<sup>19</sup> The SAMP needs are provided specifically for each Supervisorial District with the County (Figure 2.2.1-1, *County of Los Angeles Supervisorial Districts*).

The proposed project is located in the County of Los Angeles District 5 Recreational Planning Area (RPA) 3. This district is adjacent to District 1, which currently has the highest population density and the highest projected population growth for 2020 (40 percent).<sup>20</sup> District 5 provides the most natural resources and available park space to meet the demands triggered by growth in the neighboring districts, including District 1.

In March 2005, a Recreation Needs Assessment Survey was completed for the City of Pasadena.<sup>21</sup> Recreational use of trails and open space was ranked by 67 percent of respondents as having the highest participation rate. Residents also reported the need for new facilities for bicycling and jogging paths. Therefore, the Recreation Needs Assessment Survey indicates a clear need for increased availability of parks, hiking trails, and open space.

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<sup>17</sup> County of Los Angeles Department of Parks and Recreation. 30 January 2004. *Strategic Asset Management Plan (SAMP) for 2020*. Los Angeles, CA.

<sup>18</sup> City of Pasadena. March 2005. *Recreation Needs Assessment Survey*. Prepared by: Research Network, Ltd., Mission Viejo, CA.

<sup>19</sup> County of Los Angeles Department of Parks and Recreation. 30 January 2004. *Strategic Asset Management Plan (SAMP) for 2020*. Los Angeles, CA.

<sup>20</sup> County of Los Angeles Department of Parks and Recreation. 30 January 2004. *Strategic Asset Management Plan (SAMP) for 2020*. Los Angeles, CA.

<sup>21</sup> City of Pasadena. March 2005. *Recreation Needs Assessment Survey*. Prepared by: Research Network, Ltd., Mission Viejo, CA.

**SECTION 4.0**  
**FEASIBILITY ANALYSIS**

All of the 14 trail segments were determined to be feasible: Millard Canyon Gap Trail, La Vina EIR Trail West, La Vina EIR Trail East, La Vina West Alternative, La Vina North Alternative, Chaney Trail and Chaney Trail South, Skylane Gap Option No. 1, Skylane Gap Option No. 2, Skylane Gap Option No. 3, Rubio Canyon Gap Option No. 1, Rubio Canyon Gap Option No. 2, Rubio Canyon Gap Option No. 3, Cobb Estate Trail, and Loma Alta Trail. All but two of the potential segments, La Vina EIR Trail West and Rubio Canyon Gap Option No. 2, were determined to be capable of meeting most of the basic objectives of the Altadena Crest Trail Improvements (proposed project).

Although determined to be feasible, 9 of the 14 segments have at least one constraint, requiring the consideration of special design measures: Millard Canyon Gap Trail, La Vina EIR Trail West, La Vina EIR Trail East, Skylane Gap Option No. 1, Skylane Gap Option No. 2, Skylane Gap Option No. 3, Rubio Canyon Gap Option No. 1, Rubio Canyon Gap Option No. 2, and Rubio Canyon Gap Option No. 3. Only the La Vina West Alternative, La Vina North Alternative, Chaney Trail and Chaney Trail South, Cobb Estate Trail, and Loma Alta Trail are feasible and unconstrained.

The feasibility of each trail segment was evaluated in relation to the engineering, environmental, economic, and social parameters. The results are presented in Table 4-1, *Trail Segment Feasibility*.

**TABLE 4-1**  
**TRAIL SEGMENT FEASIBILITY**

	<b>Engineering Feasibility</b>	<b>Environmental Feasibility</b>	<b>Economic Feasibility</b>	<b>Social Feasibility</b>
Millard Canyon Gap Trail	Yes*	Yes*	Yes	Yes
La Vina EIR Trail West	Yes*	Yes*	Yes	Yes
La Vina EIR Trail East	Yes*	Yes*	Yes	Yes
La Vina West Alternative	Yes	Yes	Yes	Yes
La Vina North Alternative	Yes	Yes	Yes	Yes
Chaney Trail and Chaney Trail South	Yes	Yes	Yes	Yes
Skylane Gap Option No. 1	Yes	Yes*	Yes	Yes
Skylane Gap Option No. 2	Yes*	Yes*	Yes*	Yes
Skylane Gap Option No. 3	Yes*	Yes*	Yes	Yes
Cobb Estate Trail	Yes	Yes	Yes	Yes
Rubio Canyon Gap Option No. 1	Yes*	Yes*	Yes*	Yes
Rubio Canyon Gap Option No. 2	Yes	Yes	Yes*	Yes
Rubio Canyon Gap Option No. 3	Yes*	Yes*	Yes*	Yes
Loma Alta Trail	Yes	Yes	Yes	Yes

**NOTE:**

\* Denotes constraint in parameter

Each of the four feasibility parameters was developed for evaluation. The criteria and the values utilized are presented in Table 4-2, *Trail Segment Criteria*. Descriptions of the results for each feasibility parameter are provided in the text corresponding to individual trail segments.

**TABLE 4-2  
TRAIL SEGMENT CRITERIA**

	Millard Canyon Gap Trail	La Vina EIR Trail West	La Vina EIR Trail East	La Vina West Alternative	La Vina North Alternative	Chaney Trail and Chaney Trail South	Skylane Gap Option No. 1	Skylane Gap Option No. 2	Skylane Gap Option No. 3	Cobb Estate Trail	Rubio Canyon Gap Option No. 1	Rubio Canyon Gap Option No. 2	Rubio Canyon Gap Option No. 3	Loma Alta Trail
<b>Engineering</b>														
Geology and Soils														
Opportunities ranking	8	5	6	9	10	3	7	11	12	2	14	1	13	4
<b>Environmental</b>														
Aesthetics														
Percentage visible from the residences	17%	0%	40%	0%	0%	90%	85%	98%	100%	89%	93%	95%	100%	90%
Biological and Hydrological Resources														
Number of potentially occurring endangered species	3	3	2	2	3	2	2	2	2	3	3	3	2	2
Number of potentially occurring sensitive species	22	22	18	15	22	18	18	18	18	22	22	21	18	16
Blue-line stream crossings	3	2	3	None	None	1	1	None	1	1	1	1	None	None
Cultural Resources														
Number of historical resources	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Number of archeological resources	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hazards and Hazardous Materials														
Known sites	No	No	No	No	No	No	No	No	No	No	No	No	No	No
Land Use and Land Ownership														
Dedicated Trail Easement	No	No	No	No	No	Yes	No	No	No	Yes	No	Partial	No	Yes
Ownership (Homeowners Association [HOA], private, County, City of Pasadena, USFS)	City, Private, County	HOA	Private, County, HOA	HOA, County	HOA, USFS	Private, County, USFS	Private, USFS	USFS	Private, USFS	Private, USFS	Private, USFS	Private, County	Private, USFS	Private, USFS, County
Distance to closest residence (feet)	66	174	77	115	843	148	59	705	266	16	92	16	522	33
<b>Economic</b>														
Cost														
Cost per linear feet*	\$7.00	\$5.00	\$7.00	\$5.00	\$7.00	N/A	\$7.00	\$7.50	\$7.00	N/A	\$8.50	\$8.50	\$7.50	N/A
Total cost**	\$51,787.00	\$62,768.00	\$94,152.00	\$86,645.00	\$65,235.00	\$64,083.00	\$63,417.00	\$183,662.00	\$105,279.00	\$64,600.00	\$135,735.00	\$200,547.00	\$74,545.00	\$46,465.00
<b>Social</b>														
Recreational Need														
Length of trail (feet)	3,196	3,081*** (5,541 total)	6,375	1,467	5,030	10,574	4,180	13,140	7,549	11,155	8,235	7,065	4,934	9,813
Number of plant communities/scenery	3	4	3	2	3	4	3	3	3	5	5	4	3	3

**NOTES:**

N/A = Not applicable because the trail is existing and does not require construction.

\* This is rough grading cost only, and it excludes additional costs such as design, bridges, signage, permitting, and mitigation/restoration.

\*\* This includes construction, maintenance, signage, restoration/vegetation buffer, and parking, if applicable.

\*\*\* The portion of the trail that is outside the developed area of the La Vina development.

## **4.1 FEASIBILITY OF MILLARD CANYON GAP TRAIL**

### **4.1.1 Engineering Feasibility**

This potential trail segment was determined from an engineering perspective to be feasible but constrained. The majority of the slopes are predominantly shallow. However, a constraint was identified due to the trail's proximity to a blue-line stream. The trail width would need to be reduced to 6 feet, and three stream crossings would need to be constructed. It is anticipated that prefabricated bridges would be used to avoid the three areas subject to the jurisdiction of the U.S. Army Corps of Engineers (USACOE) and the California Department of Fish and Game (CDFG).

#### **4.1.1.1 Geology and Soils**

Alluvial units (Qof), granitic rocks (gr), and fault zone material are the three geologic units present along the Millard Canyon Gap Trail (Appendix C). Together these layers represent a moderately stable geologic layer, with Qof occurring throughout the entire segment, gr occurring along only part of the segment, and fault materials occurring along only a small portion of the segment (Figure 4.1.1.1-1, *Geologic Map*). Slopes range from shallow, less than 27 degrees, to very steep, greater than 53 degrees, with a significant dominance of shallow slopes and a mix of moderate to very steep slopes (Figure 4.1.1.1-2, *Slope Analysis*, and Figure 4.1.1.1-3, *Elevation Range*). Most slopes in this segment are not susceptible to earthquake-induced landslides; however, the very steep slopes are susceptible to landslides during earthquakes with a magnitude 6.0 or greater. This potential trail segment also has multiple canyon crossings.

### **4.1.2 Environmental Feasibility**

Millard Canyon Gap Trail was found to be environmentally feasible but constrained due to its close proximity to a blue-line stream and the necessity for the construction of three bridge crossings. The Millard Canyon Gap Trail was found to also be constrained due to the private property ownership for which an easement must be secured.

#### **4.1.2.1 Aesthetics**

Millard Canyon Gap Trail is expected to be 17 percent visible from area residents (Figure 4.1.2.1-1, *Visibility Analysis*).

#### **4.1.2.2 Biological and Hydrological Resources**

This potential trail segment is located within three plant communities (chamise chaparral, coast live oak woodland, and southern sycamore–alder riparian woodland) (*Appendix A*). These plant communities provide suitable habitat for 3 listed species (two plants, one fish) and 22 sensitive species (seven plants, seven herpetofauna, seven birds, and one mammal) with moderate to high potential to occur on the trail project footprint based on the vegetation along the trail segment (Figure 4.1.2.2-1, *Plant Communities Map*). Should any of these species be determined to be present as a result of subsequent directed surveys, the potential trail segment would be modified to avoid impacts to occupied habitat. There are numerous oak trees (*Quercus* spp.) in the vicinity of this trail segment that are afforded protection pursuant to the County's Oak Tree Ordinance. Oak trees would provide a visual amenity and shade for trail users. Thus, as with the sensitive species, the trail segment would be modified to avoid grading within the canopy of mature oak trees. In addition, this trail would cross a blue-line stream three times, requiring of the use of three bridges