TABLE 3.1-1
ABILITY OF POTENTIAL TRAIL SEGMENTS TO ATTAIN PROJECT OBJECTIVES

Trail Segment	Objective 1	Objective 2*			Objective 3	Objective 4	Objective 5	Objective 6	Objective 7	Objective 8	Objective 9	Objective 10
		Hikers	Equestrians	Mountain Bikers								
Millard Canyon Gap Trail	Yes	Yes	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
La Vina EIR Trail West	Yes	Yes	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
La Vina EIR Trail East	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
La Vina EIR West Alternative*	Yes	Yes	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
La Vina EIR North Alternative	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Chaney Trail and Chaney Trail South	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes
Skylane Gap Option No. 1	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Skylane Gap Option No. 2	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Skylane Gap Option No. 3	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cobb Estate Trail	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Rubio Canyon Gap Option No. 1	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Rubio Canyon Gap Option No. 2	Yes	Yes	Yes	Yes	Yes	Yes	No	No	No	Yes	Yes	Yes
Rubio Canyon Gap Option No. 3	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Loma Alta Trail	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

NOTE:
*Ability to attain objectives was based on the portion outside the developed area of the La Vina development.

3.2 FEASIBILITY ANALYSIS

A feasibility analysis was conducted for each existing and potential segment within the proposed project area according to the following four categories: (1) engineering, (2) environmental, (3) economic, and (4) social factors. The feasibility analysis served as a means of judging potential trail segments and identifying the particular constraints that would make a trail infeasible. Based on the feasibility analysis for each trail segment, each proposed trail was concluded to be either "feasible," "feasible, but constrained," or "infeasible" for development.

Engineering feasibility evaluated the geology and soils of each trail segment and assessed the ability to construct a trail at a grade acceptable to multiple recreational users. Environmental feasibility evaluated five criteria: aesthetics, biological resources, cultural resources, hazards and hazardous materials, and land use and land ownership. Economic feasibility evaluated trail development cost in comparison to industry standards for comparable terrain. Finally, social feasibility evaluated the trail segments' ability to achieve goals and objectives articulated in the original approval process, as well as the ability to address regional deficiencies for recreation opportunities as articulated in the Strategic Asset Management Plan (SAMP)/Park Needs Assessment.[1]

The factors for feasibility were based on the California Environmental Quality Act (CEQA) issue areas that are the most pertinent to the design and construction of the trails for this proposed project. Within each of the four factors, specific criteria were used in evaluating each segment. The criteria were based on consultation with professionals; incorporation of comments from the public, La Vina Homeowners Association (HOA) residents, the Altadena Crest Trail Restoration Working Group, and the County; and a review of existing trail maps[2,3,4,5,6] and literature.[7,8] A thorough description of methodology utilized for the evaluation of each feasibility and criteria parameter is provided.

3.2.1 Engineering Factors

Engineering opportunities and constraints were analyzed by considering the various phases of the permitting, environmental review, design, and feasibility processes that must occur before and during trail construction. Some of these considerations included excavation, grading, and drainage and erosion control for trail construction. A segment deemed "feasible" was one that would not require substantial engineering specifications or review. A "feasible, but constrained" segment would require increased excavation, grading, and drainage and erosion controls, leading to design modifications to trail specifications. An "infeasible segment" was one that physically could not be

[1] County of Los Angeles Department of Parks and Recreation. 30 January 2004. *Strategic Asset Management Plan (SAMP) for 2020*. Los Angeles, CA.

[2] County of Los Angeles Department of Parks and Recreation. 2001. *Los Angeles County Riding and Hiking Trails*. Los Angeles, CA.

[3] Tom Harrison Maps. 2001. *Angeles Front Country Trail Map*. San Rafael, CA.

[4] U.S. Forest Service. [1995] 2002. *Angeles National Forest Map*. Arcadia, CA.

[5] Schad, Jerry. 1996. *Afoot and Afield in Los Angeles County*. Berkeley, CA: Wilderness Press.

[6] Robinson, John W. 1996. *Trails of the Angeles: 100 Hikes in the San Gabriels*. Berkeley, CA: Wilderness Press.

[7] Flink, Charles A., Kristine Olka, and Robert M. Searns. 2001. *Trails for the Twenty-First Century: Planning, Design, and Management Manual for Multi-Use Trails*. Washington, DC: Island Press.

[8] Driskell, David, ed. 1996. *Universal Access to Outdoor Recreation: A Design Guide*. Berkeley, CA: PLAE, Inc.

constructed using standard design. Engineering constraints were based on the geology and soils parameters.

3.2.1.1 Geology and Soils

Geology and soils address issues such as soil erosion, landslides, and earthquakes. For this analysis, a geological ranking system was developed for the evaluation of the geology of each trail segment. The ranking system utilized the collected geologic information, including geologic formations, streams and drainage crossings, earthquake-induced landslide areas,[9] and the surface gradients (slope). The geologic formations, the earthquake-induced landslide areas, the slope stability, and the drainage crossings within each segment were recorded. These four categories were used in a ranking matrix to develop a feasibility score for all trail segments to be evaluated, which were summed for each trail and averaged to develop a trail route ranking for the potential segments. Each score was weighted by the importance attached to the category. These geology-based rankings are more sensitive to ground surface slope and earthquake-induced landslide potential than geologic unit characteristics and stream crossing. For a detailed description of the methodology, refer to Appendix C, *Geological Feasibility Analysis*.

3.2.2 Environmental Factors

Environmental opportunities and constraints were evaluated for the proposed trail segments based on site analysis and input considering the following five factors: (1) aesthetics, (2) biological and hydrological resources, (3) cultural resources, (4) hazards and hazardous materials, and (5) land use and land ownership. The evaluation considered the degree to which environmental documentation and permitting would be required to construct a specified trail segment. Proposed trail segments were expected to be "feasible" if no potential for significant environmental impacts would occur. Proposed trail segments were expected to be "feasible, but constrained" if the potential for significant environmental impacts existed but could be mitigated to below the level of significance. Trail segments were deemed "infeasible" if the potential for significant environmental impacts was identified or if other factors would hinder the placement of the segment.

3.2.2.1 Aesthetics

Aesthetics addresses the visual character and scenic resources of an area. Aesthetic factors in this analysis were analyzed by performing a visibility analysis in ArcGIS Version 9.1 using two different vantage points, one for those trails that cross into the La Vina development and one for all other trails.[10]

The trails that would cross into the La Vina development were analyzed by performing a visibility analysis in ArcGIS to determine if the trail would be visible at vantage points representing the La Vina Specific Plan area residences. A triangulated irregular network (TIN) was created from the 3-meter digital elevation model base layer. The TIN was utilized to evaluate whether the trail elevations would be visible from the La Vina development. The result was presented as a percentage of the trail that would be visible from the La Vina residences. In addition, sections depicting the distance and the elevation of the trails from the La Vina residences were produced to provide a representation of the visibility of the trails by incorporating the landscape and vegetation.

[9] California Division of Mines and Geology. 25 March 1999. Seismic Hazard Zones Map, Pasadena 7.5-Minute Quadrangle, Los Angeles County, CA.

[10] ESRI. 2006. *ArcGIS Version 9.1*. (Software.) Contact: ESRI, 380 New York Street, Redlands, CA 92373.

The trails that would not directly cross into the La Vina development were analyzed by performing a visibility analysis in ArcGIS to determine if the trail would be visible from 200, 400, and 1,000 feet away from the trail. A buffer around the trails at 200, 400, and 1,000 feet was created, with vantage points every 100 feet for the 200- and 400-foot buffers, and every 200 feet for the 1,000-foot buffer. The result was presented as a percentage of the trail that would be visible from any of the vantage points.

3.2.2.2 Biological and Hydrological Resources

Biological resources address the presence of sensitive species, habitats, and plant communities that may occur in the proposed project area. Biological resources were evaluated utilizing an evaluation of potentially occurring species and biological surveys. Hydrological resources address blue-line streams and wetlands as defined by the resource agencies.

The evaluation of biological resources was conducted by determining the plant communities through which the trail segments would pass and the listed and sensitive species with the potential to occur within those plant communities and elevations, including any observed during biological field surveys. The listed and sensitive species were ranked on a basis of "most likely," "likely," and "least likely" to occur in the study area. Only those species deemed "most likely" and "likely" to occur were included in the final numbers of species potentially occurring along a given trail segment.

Biological surveys for plants and wildlife were conducted by Sapphos Environmental, Inc. on June 13 and 23, September 14 and 26, October 18, and November 2, 2005, between 10:00 a.m. and 4:00 p.m. (Appendix A, *Biological Opportunities and Constraints Analysis*). The site was surveyed by walking through sections of the proposed project area. Plant and wildlife species were observed and recorded during each visit. The survey personnel had experience in conducting biological field surveys, as well as knowledge about the identification and ecology of all species surveyed. Although requested by the County, the HOA board did not provide the consulting team with access to open space within the HOA boundary. Therefore, supplemental directed surveys for listed endangered species could not be completed.

The number of times the trail crossed a blue-line stream was determined based on a preliminary analysis and tabulated to formulate any associated constraints from additional permitting for trails intersecting riparian habitat and blue-line streams.

3.2.2.3 Cultural Resources

Cultural resources include historical, archeological, and paleontological resources that may occur in the proposed project area. A literature review for previously recorded archaeological and historical resources within the boundaries of the proposed project area was conducted at the South Central Coastal Information Center (SCCIC) on June 8 and December 6, 2005 (Appendix B, *Cultural Resources Evaluation*). This search included a review of all known relevant cultural resource survey and excavation reports to determine potential impacts to archaeological and historical resources in the proposed project area, also known as the area of potential effect (APE). As part of the literature review, the 2005 editions of the California Historical Resources Inventory (CHRI), the National Register of Historic Places (NRHP), the listing of California Historic Landmarks (CHL), and the California Points of Historical Interest (CPHI) were searched to determine the presence of historic resources potentially impacted as a result of the proposed project. The results

were recorded as the number of historic and archaeological sites occurring within a 25-foot buffer of each trail segment.

3.2.2.4 Hazards and Hazardous Materials

Hazards and hazardous materials are defined as those materials and situations that would pose a significant risk to the public, including exposure to toxic substances. Relevant sources of information considered in the evaluation of hazards and hazardous materials included a review of historical aerial photographs, historic topographic maps, and a compilation of federal, state, and local government records.[11] In addition, site surveys were conducted for the proposed project. A Phase I Environmental Site Assessment for the project is included in Appendix D, *Phase I Environmental Site Assessment*. The locations of all possible sites were incorporated into the GIS database and were utilized to determine if any potential hazards or hazardous materials occurred along the trail segments. Hazards and hazardous materials constraints were determined if the proposed trail segment was adjacent to listed hazardous sites.

3.2.2.5 Land Use and Land Ownership

Land use and land ownership address the existing land use plans and conservation plan produced by the agency with jurisdiction and the existing owners of the lands in the study area. Land use considerations for this feasibility analysis were determined through the review of the County General Plan and Altadena Community Plan Map,[12] which assisted in identifying land use allowances and restrictions critical to the viability of the proposed project. In addition, zoning limitations and borders were determined through the use of the County of Los Angeles Altadena Zoning Map,[13] which was used to determine exact boundaries and property lines that could affect the proposed project's course. If the consulted documents reveal land use restrictions incompatible with trail usage, the project proponent will pursue either a change in land use designation or a trail easement for the proposed trail segment. Land ownership information for the report was based on the parcel information obtained from the County Office of the Assessor (Assessor).[14] A GIS database with data layers from the Assessor maps was utilized to determine the distance from the trail to the closest residence within the proposed project area.

3.2.3 Economic Factors

Economic and fiscal opportunities and constraints were analyzed according to the costs of trail construction. These figures included rough construction costs and estimates of the expected costs for completion of the trail. Cost was evaluated as a percentage above the baseline average cost for rough grading, which is set at $6.00 per linear feet of trail. Proposed trail segments were deemed "feasible" if the cost did not exceed by more than 20 percent the baseline cost per linear feet. Proposed trail segments were deemed "feasible, but constrained" if the cost per linear foot was

[11] Environmental Data Resources, Inc. 29 June 2005. Data Map Area Study, Altadena, CA. (Inquiry Number 01455501.5r.) Milford, CT.

[12] County of Los Angeles Department of Regional Planning. 1986. *Los Angeles County Altadena Community Plan*. Prepared by Envicom Corp., Agoura Hills, CA; Greer & Company, Santa Ana, CA; Economics Research Associates, Los Angeles, CA; and Opinion Research of California, CA.

[13] County of Los Angeles Department of Regional Planning. 2005. *Los Angeles County Altadena Zoning*. Los Angeles, CA.

[14] County of Los Angeles Office of the Assessor. 2005. Property Maps and Information, County Assessor, Rick Auerbach. Available at: http://www.lacountyassessor.com/extranet/default.aspx