

5. ROAD AND TRAIL DECISION-MAKING PROCESS

This chapter describes the decision-making process the MCOSD will use to determine the road and trail system it will designate, manage, and maintain. Existing roads and trails will be evaluated to determine whether they should be maintained in their current location and footprint, or be rerouted, reconstructed, or decommissioned. Road and trail projects proposed by the public will be screened and evaluated to determine whether they should be implemented, thereby incrementally changing the MCOSD's road and trail system over time. The primary objectives of all *Road and Trail Management Plan* projects and the drivers of all decisions regarding project selection and prioritization are to:

- achieve continuous measurable reductions in physical and environmental impacts associated with the road and trail network, and
- enhance visitor experience and safety

The MCOSD annually receives many more requests to construct new trails; reconstruct existing trails; and decommission others than it can either fund or undertake. A key guiding principle of this plan is that road and trail management projects will be the result of an objective and transparent decision-making process. Requisite to this principle is continuing public involvement, both in suggesting road and trail projects and by participating in the processes that lead to their prioritization and funding.

This plan is, in essence, a contract between the MCOSD and the individuals, organizations, trail user groups, and public agencies that participated in its development to achieve the plan's three primary goals articulated in chapter 1. Indispensable elements of this plan, and central to this contract, are two complementary road and trail decision making processes, one conducted immediately after adoption of this plan, and the other conducted annually. The combined outputs of these processes will be:

- the future designated road and trail system. An initial public outreach process will identify changes and improvements to the existing road and trail network (roads and trails currently managed by the MCOSD, plus all other roads and trails identified in the *Road and Trail Assessment* [MCOSD 2011d]). This initial outreach process will yield a comprehensive, but not complete, picture of the designated road and trail system, and a list of prioritized road and trail improvement projects and actions, and

- annual lists of prioritized road and trail construction, decommissioning, and restoration projects aligned with the designated system of roads and trails. An annual six-step process will complete and refine the picture of the designated road and trail system, and result in its incremental implementation. New proposals not brought forth in the initial public outreach process will be considered in the annual process.

Both processes will be conducted in a transparent, objective, and collaborative manner.

Decisions regarding changes to the road and trail system start with the *Road and Trail Assessment*, which informs this plan. Existing roads or trails not included in the *Road and Trail Assessment* will not be considered for inclusion in the designated system, and will be decommissioned.

The remainder of this chapter will introduce the various categories of road and trail improvement projects emerging from this *Road and Trail Management Plan*, describe the initial outreach process, and describe the annual process to refine the designated system and identify priority road and trail improvement projects.

Project Categories

The types of road and trail projects and actions that the MCOSD plans, manages, and implements can be organized into two broad groups: those that compete in the project evaluation and prioritization process described below, and those that do not. Both groups are summarized in table 5.1. Planned road and trail maintenance does not need to compete because it is an essential function and service of the MCOSD that must take place. It consists of scores of multiple small stewardship projects and actions that take place on a daily basis and are typically, though not always, exempt from environmental review and permitting. With the exception of emergency actions, all road and trail projects in the non-competing group will still be internally evaluated using the same screening process applied to all *Road and Trail Management Plan* projects to insure compliance with existing goals and policies, and to confirm that such actions will not increase net environmental and physical impacts.

Table 5.1 Road and Trail Project Types

Project Type	Definition
Project Types that Compete in the Annual Project Review, Selection, and Funding Process	
Reconstruction	Actions taken to correct significant defects or to repair, replace, or restore major components of a road or trail that have been destroyed, damaged, or significantly deteriorated during the life of the facility. Reconstruction activities may include resurfacing, replacing, or restoring trail tread; installing new water bars and other drainage features; stabilizing a severely eroded hillside, and replacing a bridge. Reopening a trail or road that has not been maintained is also considered reconstruction.
Rerouting	Actions taken to change the alignment of a road or trail on any portion of its length.
Active Decommissioning	Actions taken to restore nonsystem roads or trails to a more natural and stabilized state. Active decommissioning involves full obliteration of the road or trail, including ripping the road bed, recontouring, revegetating, and restoring natural slopes.
Active Road to Trail Conversion	Actions taken to encourage the evolution of a road to a trail. Actions may include recontouring, revegetating, and restoring the unused portion of the former roadbed to a more natural condition.
New Construction	A project to build a new road or trail on previously undisturbed land, to connect previously unconnected points.
Projects Types That Need Not Compete in the Annual Project Review, Selection, and Funding Process	
Planned Maintenance	Planned maintenance refers to periodic upkeep that allows for the smooth and safe functioning of a road or trail. It includes grading, cleaning water bars and other drainage features, cleaning culverts, replacing or adding signs, and pruning trees and shrubs to allow access. Generally, planned maintenance is conducted only on trails that are in good or fair-good condition; trails in fair or worse condition generally require different actions other than planned maintenance. The difference between planned maintenance and day to day maintenance is a matter of scope. The area or linear feet of planned maintenance projects is larger and costs are greater than day to day maintenance. Planned maintenance projects must be prioritized in the overall district budget development process, and they must be evaluated by staff to determine whether environmental review and permits are required.
Passive Decommissioning	Passive decommissioning is defined as actions that result in a road or trail converting to a more natural state. Actions may include blocking entrance points, signing the road or trail as closed, or permitting vegetation to naturally encroach along the road or trail. Passive decommissioning activities are typically associated with other types of road and trail projects, and for this reason do not compete on their own in the annual project selection and prioritization process.
Passive Road to Trail Conversion	Passive conversion is the result of the deliberate evolution of a road to a trail. Actions may include allowing vegetation to naturally encroach into the unused portions of the former roadbed. Passive road to trail conversion activities are typically associated with other types of road and trail projects, and for this reason do not compete on their own in the annual project selection and prioritization process.
Other Management Actions not Requiring Construction	Management actions consist of those temporary or permanent activities necessary to implement the visitor use and environmental protection policies set forth in chapter 4 that would not involve any construction and are not already included in the description of passive decommissioning or passive road to trail conversion in the rows above. Management actions, as defined by this plan, may include changing the types of permitted recreational activities (i.e., pedestrian travel, equestrian use, or mountain biking) along a road or trail, changing the access granted to other agencies for special administrative uses, and seasonal trail closures.
Emergency Actions	Road and trail work likely to qualify as emergency actions may include repairs to road and trail segments and related infrastructure, such as foot bridges or culverts, severely damaged by a natural disaster and impeding visitor use of the segment. Examples of natural disasters are wildland fire, flood, mudslide, or other natural disasters proclaimed by the governor in compliance with the California Emergency Management Act. Emergency actions could result in budget impacts that prevent initiation, progress on, or completion of road and trail projects approved for funding in an annual budget.

Initial Public Outreach

Shortly after adoption of this plan, staff of the MCOSD will initiate a 24 to 30 month process to identify projects and other changes to the existing road and trail network that, when implemented over time, will yield adjustments to the designated trail system. The initial outreach process will consist of a series of meetings focused on each of the regions identified in chapter 2, in the order listed below:

Region 1: Baltimore Canyon, King Mountain, Blithedale Summit, Camino Alto, Horse Hill, Alto Bowl

Region 2: French Ranch, Maurice Thorner Memorial, Roy's Redwoods, Gary Giacomini, Loma Alta, White Hill, Cascade Canyon

Region 3: Indian Valley, Lucas Valley, Loma Verde, Pacheco Valle, Ignacio Valley

Region 4: Mount Burdell, Rush Creek, Little Mountain, Verissimo Hills, Indian Tree, Deer Island

Region 5: Terra Linda/Sleepy Hollow Divide, Santa Margarita Island, Santa Venetia, San Pedro Mountain, Bald Hill

Region 6: Ring Mountain, Old St Hilary's, Bothin Marsh, Bolinas Lagoon, Tiburon Ridge

Preserves in each region, or "planning unit", share geographic proximity. Grouping the preserves also assures that road and trail decisions take into account watershed boundaries, proximity to other public lands and regional trails, and inter- and intra-preserve opportunities and constraints.

The meetings for each group of preserves will include time spent indoors at an initial workshop to review data and outputs of the road and trail evaluation tool, as well as field visits, where appropriate, to review and discuss opportunities and constraints. At this time, it is not possible to determine the number of meetings associated with each region, or to characterize the conduct of subsequent meetings.

At the initial workshop for each group, staff will:

- Present baseline information for the existing network of roads and trails. The baseline information consists of:
 - » mapped alignments of the existing system of roads and trails that the MCOSD currently manages, and all other roads and trails identified in the *Road and Trail Assessment*. (Trails will be shown as segments, as they are in the *Road and Trail Assessment*. A single road or trail may consist of one or more segments); and

- » a numeric coefficient associated with each trail segment that represents the biophysical impacts and social characteristics of that segment. To determine this coefficient, large amounts of spatial and quantitative data, derived from the *Road and Trail Assessment*, will be collated and entered into a mathematical Road and Trail Evaluation Tool. A description of this tool can be found at the end of this chapter.
- Share public input relevant to that planning unit that was collected in workshops conducted in 2010 and 2011.
- Solicit specific proposals for road and trail projects and management actions, including adjustments to the network of system roads and trails and changes in use. Following the initial workshop, staff will begin to evaluate project proposals according to steps 2 and 3 of the annual project review and selection process, described below.

In subsequent meetings and updates, staff will share its evaluation of project proposals, including their respective coefficients, compare them to each other and to existing conditions, and work to identify the projects within each region that will reduce environmental impacts, improve the visitor experience, and/or improve visitor safety compared to existing conditions. Primary outputs of each meeting (or series of meetings) will be:

- a map of proposed road and trail projects, or other actions that will constitute adjustments to the designated trail system, and
- a prioritized list of road and trail projects aligned with the map.

As noted above, neither the map nor the prioritized project list will be complete or final. The designated system will continue to evolve and be refined in successive years, as new proposals for road and trail improvements (ones not considered in the initial outreach process) are put forth in an annual road and trail decision making process.

Figure 5.1 summarizes the annual decision-making process for road and trail project proposals.

Figure 5.1 Annual Decision-Making Process for Road and Trail Project Proposals



Development of Potential Road and Trail Projects

Process Used

The MCOSD staff follows an annual six-step decision making process to develop potential road and trail projects.

Step 1: Solicit Road and Trail Project Proposals

The public will be encouraged to participate in an annual process of identifying potential projects that meet the primary *Road and Trail Management Plan* goals of progressively reducing physical and environmental impacts of system and non-system roads and trails while enhancing visitor experience and safety. Potential projects may involve maintenance, construction (including decommissioning and restoration), new facilities, or management, as defined above.

It is anticipated that the first and likely the second annual project review and selection process will occur while the initial outreach process is still underway. Until the latter process is completed, only those projects emerging from planning units for which the initial outreach process has been undertaken will be considered in the annual project review and selection process.

The MCOSD will accept project proposals from the public at any time; however, projects will be formally reviewed once per year. The MCOSD will determine the information required in a project proposal, and will create a form to be completed by the project proponent. Proposals received from April through August will be evaluated and considered in the Marin County Parks annual budget development process that runs from November through March. Proposals received September through March will be considered in the next budget development cycle. For example, if a proposal is received in August 2016, it will be considered in the budget development process that begins in November 2016. If a proposal is received in September 2016, it will be considered in the budget development process that begins in November 2017.

New project proposals must be submitted on a form developed by the MCOSD. Staff will review all proposals for completeness, and will return incomplete proposals to project proponents. Depending on the number of project proposals received, the MCOSD may host meetings with all project proponents and/or meet with individual project proponents in an attempt to revise the nature or scope of their projects to the mutual satisfaction of each.

The evaluation of all proposals submitted by August each year will be completed by November, in time for high priority projects to be considered in the MCOSD's annual budget development process.

Step 2: Screen Project Proposals for Consistency with Policies

Steps 2 and 3 involve the progressive screening and evaluation of road and trail project proposals by Marin County Parks staff. Prioritized projects emerging from the initial outreach process will

already have been screened for consistency with policies and evaluated for biophysical and social impacts. Such projects will skip steps 2 and 3, unless new information becomes available that affects their prioritization. All new projects not previously proposed in the initial outreach process or in previous annual project solicitations will proceed through steps 2 and 3.

Step 2 involves an initial screening of all submitted potential road and trail management projects to filter out those projects that would be inconsistent in their design, location, or any other factor with adopted MCOSD policies and goals, including the specific goals and policies adopted as part of this plan.

Step 3: Screen Project Proposals Using the Evaluation Tool, and Reprioritize All Projects

Proposals successfully emerging from step 2 will be evaluated using the same data-intensive model used in the initial outreach process to measure the baseline impact of existing road and trail segments. Those proposals that yield a net reduction, or no net increase, in a planning unit's baseline of biophysical impacts and that enhance visitor experience and safety will be integrated into a reprioritized list of road and trail projects. Proposals for projects that increase biophysical impacts will not be prioritized or will need to be amended and resubmitted. A single proposal may bundle two or more projects if doing so could reduce their combined overall impact compared to the baseline impact. For example, a proposal may combine the construction of a new trail with the decommissioning of an existing, poorly performing trail. Once integrated into the list, "proposals" become unfunded "projects."

The outputs of step 3 will be:

- new map of prioritized road and trail projects, and
- a newly prioritized list of unfunded road and trail improvements aligned with the map, which is equivalent to a multi-year road and trail work plan.

In a manner and at a time yet to be determined, but no later than October of each year, staff will inform the public of the outcome of step 3.

Step 4: Highest Priority Road and Trail Projects Compete in MCOSD and Measure A Budget Development Processes

Step 4 is a process that is conducted internally, among Marin County Parks staff.

From November through March of each year, staff develops multiple budgets, including the budgets for the Open Space District and Measure A. These two budgets, together with available grants, are the sources of funding for MCOSD's road and trail projects. Each year, Marin County Parks staff evaluates scores of internally generated budget requests competing for Open Space District and Measure A funding. These budget requests originate from all department programs:

natural resources, capital projects, volunteers, planning and acquisition, landscape architecture, parks and open space maintenance and operations, and environmental education. In this step, the highest priority road and trail projects (from the reprioritized list of road and trail projects) compete for funding against all other requests.

Because budget requests typically exceed available funds, Marin County Parks has developed a rigorous system to evaluate, score and rank competing requests. Staff determines whether requests are considered in the Open Space District budget or Measure A budget. Because of legal requirements, certain requests may not be eligible for Measure A funding. Some requests may be funded by either Measure A or the Open Space District, or both. The criteria used to evaluate requests for funding from the Open Space District are as follows:

- Project is a priority in a current adopted plan, or has been identified as a priority through this *Road and Trail Management Plan* process
- Engages volunteers or raises awareness of department's benefits, mission
- Removes, reduces threat to health and safety
- Legal mandate, such as accessibility
- Grant funding or other outside funding likely or committed
- Board priority
- Project is already underway and is a one-time, multi-year expenditure
- Generates revenues or leads to savings, efficiency

If a request competes in the Measure A budget development process, three additional criteria apply, in addition to the eight listed above:

- Engages underserved communities
- Contributes to community health and wellness
- Contributes to increasing visitor diversity

Competition is greater in the Measure A budget development process compared to the MCOSD budget development process because requests for county parks and landscape services are considered in addition to requests from the MCOSD. However, the amount of funding from Measure A far exceeds the amount from the Open Space District, after basic operating revenues are subtracted from anticipated annual revenues.

The output of each process, a draft budget, is reviewed by department managers, and then by the department's executive team. The latter team is responsible for making adjustments to each budget, and recommending the proposed Measure A budget to the Marin County Board of Supervisors, and recommending the proposed Open Space District budget to the MCOSD Board of Directors. Given the significance of this *Road and Trail Management Plan* and the public interest in it, it is highly likely that there will always be successful road and trail projects emerging from step 4, though it would be difficult to mandate a minimum number of projects per-year or pre-allocate a certain amount of annual funding for them because of changing priorities, unanticipated needs, and emergencies. The only certainty regarding future budgets is that the department's capacity to fund any project will be substantially reduced if Measure A is not renewed prior to its expiration.

The list of prioritized road and trail projects submitted in each year's draft budget will yield a net reduction in the combined index of environmental and physical impacts compared to the previous year's index, as measured at the planning unit level. Not every planning unit will have budgeted road and trail projects in every year. A planning unit with no budgeted projects will show no change in its index of biophysical impacts for that year. When advancing projects in Sensitive Resource Areas, as these are described in chapter 4, the MCOSD project staff will seek to maximize the reduction of physical and environmental impacts. This does not mean that decisions regarding projects in these areas will disregard considerations of fiscal responsibility or visitor experience and safety, but it does mean that considerations of net environmental impacts and sustainability will receive disproportionate weight in these decisions and that, measured on both an annual and cumulative basis, the reductions in physical and environmental impacts should be significantly greater for Sensitive Resource Areas as compared to other areas.

Step 5: Public Review of Proposed Annual Budgets, including Road and Trail Projects Recommended for Funding

The development of proposed budgets is largely completed by mid-March, when the public will get its first look at staff's proposed MCOSD and Measure A budgets, though they are still subject to change based on public input provided in this and the following step. In mid-March, or until such time that Marin County government budget procedures change, staff will present an overview of the proposed Measure A budget at public budget hearings conducted by the Marin County Board of Supervisors. It is also in mid-March when Marin County Parks staff reports on the department's proposed budgets to the Marin County Parks and Open Space Commission, and the commission solicits public input on the budget. The department's presentations in both instances will include a list of road and trail projects recommended for funding, along with a description of any refinements to the system of designated roads and trails that would result from implementation of those projects.

Step 6: Adoption of Annual Budgets and Commencement of Work

The Marin County Board of Supervisors and the Board of Directors of the Marin County Open Space District typically adopt their respective budgets for the coming fiscal year at public meetings in mid to late June. This is the public's last opportunity to comment on proposed expenditures included in the budget. Expenditures for items such as road and trail projects are typically described in the staff reports accompanying the proposed budgets. Once the board adopts a budget, the MCOSD's work plan for the coming fiscal year, which is aligned with its budget, is finalized.

Construction work to improve the road and trail system must be preceded by planning, design, and the fulfillment of environmental review and permitting requirements. In many cases it is anticipated that these tasks can occur in the same fiscal year as construction. More complex projects may require additional environmental review and/or multiple permits, which could take up to a year to obtain. In this circumstance, staff would phase a project by budgeting its planning and design in one year, and its construction in the following year. The commencement of actual road and trail construction is dependent on a number of factors including grant availability, weather, and project mitigation and permitting requirements.

Notes Regarding the Processes

The above processes should be considered a general framework for the MCOSD's road and trail decision-making. Additional detail is intentionally left open to allow for refinement and adaptation within the transparent public process as needed and appropriate. Improvement of both processes will be incremental, and most is expected to occur over the course of the first two to three years after this *Road and Trail Management Plan* is adopted.

This *Road and Trail Management Plan* will inform an Open Space Accessibility Plan for the preserves for individuals with mobility and other impairments. It is not within the scope of this plan to address road and trail access for individuals with mobility or other impairments. The MCOSD will develop a separate Open Space Accessibility Plan aligned with this *Road and Trail Management Plan*.

The Road and Trail Evaluation Tool

The MCOSD will use a mathematical model, the Road and Trail Evaluation Tool, to evaluate the following characteristics of existing roads and trails, and proposed road and trail projects:

- environmental (potential for natural and cultural resource impacts)
- physical (slope, orientation to the fall line, redundancy, and the existing physical conditions that affect sustainability)
- social (potential contribution to the visitor experience)

Environmental and physical criteria are related to the general sustainability of the road or trail within the context of the surrounding preserve. Scores for these two categories of criteria will be added together to yield the total “biophysical” impact of a road or trail segment, or collection of segments.

Social criteria are by their very nature more subjective, and it is virtually impossible to devise any single set of criteria that could comprehensively measure in a single number the utility and inherent worth of a road or trail for all potential users. The social criteria incorporated here measure basic features that are likely to be regarded as meaningful by many, if not most, preserve visitors: variability of the road or trail grade, distance of sight lines, diversity of the surrounding vegetation, opportunities for challenge and exercise, and connections to other roads or trails that provide opportunities for extending a trail experience into longer trips. Taken together and alone, these criteria tell us something useful, but they will not substitute for the feedback that the MCOSD receives directly from members of the public through the public process described in this chapter, or in the regular course of administering the system of preserves.

Figures 5.2 and 5.3 graphically summarize the Road and Trail Evaluation Tool.

Large amounts of spatial and quantitative data related to each criterion will be used to establish the numeric coefficients described in previous sections of this chapter. The data for these calculations will be derived from the *Road and Trail Assessment*. Data inputs for each category are summarized in table 5.2, along with the rationale for each item.

The inputs listed in table 5.2 are measured many different ways (linear miles, percent slope, feet in distance from a certain point, number of vegetation types) or simply judged qualitatively (good-poor, yes/no). In order to synthesize all these data into a meaningful, comparable scoring system, the raw measurements for each criterion are converted into a relative scale using the ModelBuilder program in ArcGIS. Additional information about how the individual criteria were measured and scored in the model is provided in the appendix.

Table 5.2 Inputs to the Road and Trail Evaluation Tool

Criterion	Rationale for Criterion	Applicability	
		New Road/Trail	Existing Road/Trail
Environmental Criteria			
Vegetation management zone	Vegetation management zones (MCOSD 2012) are proxies for the relative importance and level of intactness of the vegetation communities surrounding the road or trail. The greater the importance and intactness, the greater the potential for resource impacts associated with trail development and use.	X	X
Stream conservation areas	Marin County designates stream conservation areas to protect active channels, water quality, flood control functions, and fish and wildlife habitat values of and associated with streams. Development in these areas has a relatively high potential for resource impacts.	X	X
Stream intersections	Trails that cross directly over existing drainages and streams can lead to accelerated erosion at crossing points, thereby leading to potential increases in sediment loads to receiving local and downstream water bodies. Even improved crossings may have the potential for adverse effects if the 50-year design flow cannot be adequately conveyed without flooding or a sharp increase in velocities or shear stress.	X	X
Stream intersections on special-status fish-bearing streams	If not designed properly, some stream crossings may create impediments to fish passage, as well as sediment loading, which can adversely affect habitat.	X	X
Northern spotted owl habitat	Northern spotted owls (<i>Strix occidentalis caurina</i>), federally listed as threatened, are found within dense, old-growth forests. Nesting habitat or nesting buffers have been identified in some preserves. Development in these areas has a high potential for impact.	X	X
Rare plant areas	Proximity to habitat of a threatened, endangered, or rare species is an indicator of potential for resource impacts.	X	X
Rare wildlife areas	Proximity to habitat of a threatened, endangered, or rare species is an indicator of potential for resource impacts.	X	X
Serpentine soils	Serpentine soils support unique serpentine grasslands and serpentine chaparral. Both of these vegetation types are strongly correlated with special-status species that are tolerant of extreme soil conditions. The degree of overlap of road or trail alignments with serpentine soils is an indicator of potential impacts on sensitive resources.	X	X
Wetlands	Wetlands are present in many preserves, where they may provide critical habitat for special-status species. Development in these areas has a high potential for impact.	X	X
Noxious weeds	The presence of noxious weeds increases the potential for their spread as a result of road or trail management activities.	X	X
Average road/trail density ¹	The surface area occupied by roads and trails reduces the available habitat for plants and animals. By facilitating the movement of people and domestic animals into natural areas, the network of roads and trails in a given area also disrupts wildlife activity in that area in roughly direct proportion to its density.	X	X
Physical Criteria			
Hydrological slope	Hydrological slope is the percent of slope along the fall line at any given location along a road or trail. (The fall line is the steepest line drawn downhill at any given location, which is the path where water would flow in a natural environment.) Steeper hydrological slopes pose greater challenges for road and trail design to maintain natural drainage patterns.	X	X
Directional slope	Directional slope is the actual (user-experienced) slope of the road or trail at any given location. Higher rates of erosion occur on roads and trails where the directional slope follows the fall line. These roads and trails are difficult, if not impossible, to drain properly and often experience ongoing erosion.	X	X
Soil type/erodibility ¹	Roads and trails built on highly erodible or expanding soils will require more frequent and more expensive maintenance and will deposit greater loads of harmful sediment into nearby waterbodies.	X	X

Table 5.2 Inputs to the Road and Trail Evaluation Tool

Criterion	Rationale for Criterion	Applicability	
		New Road/Trail	Existing Road/Trail
Number and condition of mapped "Problem Sites" ¹	Problem Sites were mapped in the <i>Road and Trail Assessment</i> (2011d) and correspond to features, such as poorly configured stream crossings, that present acute threats to trail maintenance, resource management, and/or visitor safety. Some road and trail segments contain more than one mapped Problem Site.	N/A	X
Trail width ¹	Road or trail width is a factor of sustainability, and also of sediment production. Roads have the potential to erode more than trails because of their greater width of disturbed area.	X	X
Drainage Condition ¹	The maintenance of natural drainage patterns is one of the most important considerations for road or trail sustainability.	X	X
Tread condition ¹	Tread condition describes the current condition of the road/trail tread with respect to roughness, erosion, and obstacles. Tread condition provides a general measure of where erosion has occurred.	N/A	X
Wet/muddy conditions ¹	Seasonal wetness or muddiness may be an indication of poor drainage and may lead to tread widening as users seek to circumvent wet areas.	N/A	X
Maintenance requirements ¹	One of the objectives of this plan is to prioritize and direct maintenance staff and resources to the roads/trails where the cost/benefit ratio, in terms of effort and benefit, is positive. Trails requiring more than routine maintenance to remain in a good or fair-good condition are generally not considered sustainable without additional management.	N/A	X
Social Criteria			
Road/Trail length	Trail length is used to assess the opportunity to travel long distances, which is an idea that was raised several times during public scoping meetings.	X	X
Distance from development	This criterion was used as a proxy for opportunities to travel long distances. The greater the distance of a particular trail segment from development, the greater the opportunity to experience solitude.	X	X
Distance from trail intersection	The further a particular trail segment is from an intersection, the better the opportunity to experience fewer contacts with other visitors.	X	X
Average length of sight lines	Moderate sight lines are assumed to be preferable because they offer a balance of safety on the one hand with relative solitude and visual diversity on the other. Longer sight lines can offer the road and trail user expansive views and are assumed to be second best and very short sightlines are assumed to be the least preferable due to safety considerations.	X	X
Variability of road/trail grade	Rolling terrain, with numerous changes in grade, offers a diverse physical and visual trail experience and is generally assumed to be preferable to either very flat terrain, which is given a moderate score, or very steep terrain, which is presumed to be the least desirable.	X	X
Connects to a regional trail or road/trail on adjacent public land	Trail segments connecting to regional trails (Bay Area Ridge Trail and the Bay Trail) contribute to achieving regional goals for public access and trail-based recreation. These trails also often provide access to scenic vistas and opportunities to experience nature.	X	X
Vegetation community variety	Higher vegetation variety is associated with better opportunities for visitors to learn about and appreciate nature.	X	X

¹Data derived from MCOSD 2011d.

Figure 5.2 Example of some of the GIS datasets, overlain over the existing road and trail network, which would be used to evaluate biological, physical, and social characteristics of a road or trail. The GIS data would be used to inform a model, described in more detail in the appendix, which would guide decision making about road and trail projects.

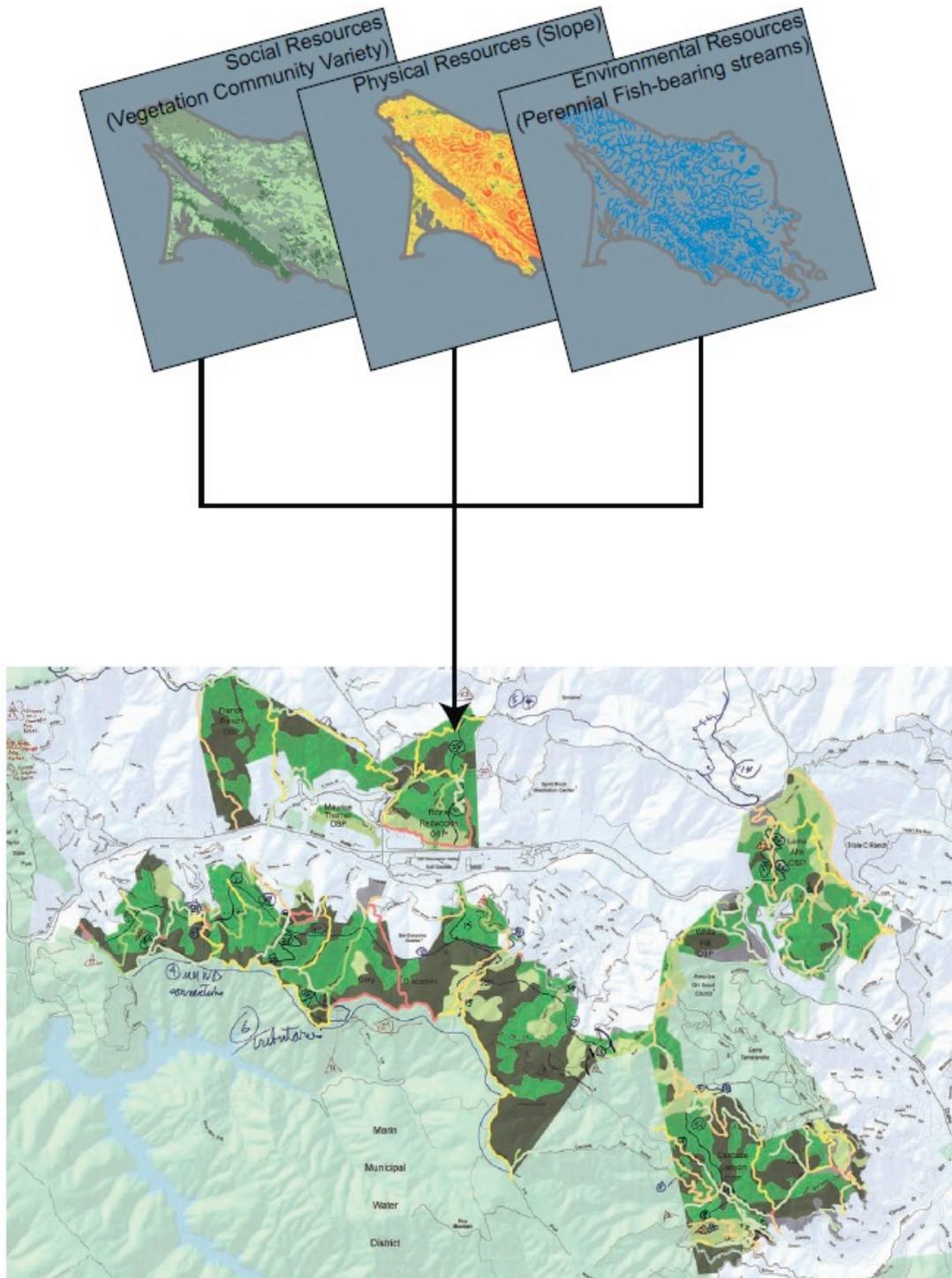


Figure 5.3 Example of some of the GIS datasets, overlain over a potential new trail alignment that would be used to evaluate biological, physical, and social characteristics of the road or trail. The GIS data would be used to inform a model, described in more detail in the appendix, which would guide decision making about road and trail projects.

